

Summer 8-1-2017

Effects of a Function-Based Peer Management Intervention with Middle-School Students with ADHD

Kate A. Helbig
University of Southern Mississippi

Follow this and additional works at: https://aquila.usm.edu/masters_theses



Part of the [School Psychology Commons](#)

Recommended Citation

Helbig, Kate A., "Effects of a Function-Based Peer Management Intervention with Middle-School Students with ADHD" (2017). *Master's Theses*. 301.
https://aquila.usm.edu/masters_theses/301

This Masters Thesis is brought to you for free and open access by The Aquila Digital Community. It has been accepted for inclusion in Master's Theses by an authorized administrator of The Aquila Digital Community. For more information, please contact aquilastaff@usm.edu.

EFFECTS OF A FUNCTION-BASED PEER MANAGEMENT INTERVENTION

WITH MIDDLE-SCHOOL STUDENTS WITH ADHD

by

Kate Alexandra Helbig

A Thesis

Submitted to the Graduate School,
the College of Education and Psychology,
and the Department of Psychology
at The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts

August 2017

EFFECTS OF A FUNCTION-BASED PEER MANAGEMENT INTERVENTION
WITH MIDDLE-SCHOOL STUDENTS WITH ADHD

by Kate Alexandra Helbig

August 2017

Approved by:

Dr. Evan H. Dart, Committee Chair
Assistant Professor, Psychology

Dr. Brad A. Dufrene, Committee Member
Professor, Psychology

Dr. D. Joe Olmi, Committee Member
Professor, Psychology

Dr. D. Joe Olmi
Chair, Department of Psychology

Dr. Karen S. Coats
Dean of the Graduate School

COPYRIGHT BY

Kate Alexandra Helbig

2017

Published by the Graduate School



THE UNIVERSITY OF
SOUTHERN
MISSISSIPPI®

ABSTRACT

EFFECTS OF A FUNCTION-BASED PEER MANAGEMENT INTERVENTION WITH MIDDLE-SCHOOL STUDENTS WITH ADHD

by Kate Alexandra Helbig

August 2017

Attention Deficit/Hyperactivity Disorder (ADHD) is characterized by impairment in functioning due to inattention, hyperactivity, or impulsivity, as well as difficulties in school with social rejection and academic underachievement (American Psychiatric Association, 2013). The purpose of this study was to investigate the effectiveness of a peer-mediated non-contingent reinforcement (NCR) intervention informed by functional assessment data to decrease disruptive behavior for students with a special education classification of OHI-ADHD. Participants included three student dyads in a middle school setting located in the Southeastern United States. An A/B/A/B withdrawal design was used to evaluate the effectiveness of this intervention. The primary dependent variables were target student disruptive and on-task behavior. Student interventionist integrity was also evaluated. Results indicated this intervention was effective in decreasing percentages of disruptive behavior as well as increasing percentages of on-task behavior during academic instruction across all participants. Additionally, each student interventionist was able to implement the NCR intervention with high integrity.

ACKNOWLEDGMENTS

First, I would like to thank my chair, Dr. Dart, for his time, dedication, and support for this project. I truly appreciate all of your feedback, guidance, expertise and encouragement throughout this extensive process. I would also like to thank my committee members, Dr. Dufrene and Dr. Olmi for their direction and advice. Additionally, I am forever grateful to the graduate students, Ashley Murphy and Madeline Potter, that assisted in data collection procedures, as it was time intensive journey to the school district site. Lastly, I would like to thank the target students, teachers, and especially the student interventionists that devoted their time and effort to participating in this study.

DEDICATION

I would like to express my gratitude to all of the individuals who have made up my support team throughout this process. To Jordan, for all of the late night pep talks and encouragement, you are a saint. Also, I can never thank you enough for uprooting your entire life and moving to the South with me, all so I can have my best friend and a piece of Illinois while pursuing my career dreams.

I would also like to thank my parents, for always pushing me to achieve my goals and showing me the value in helping others, which lead to me end up in this program. To my dad, Chuck, for talking on the phone for endless hours and letting me bounce ideas off you as well as reminding me of the more important things in life and to forget the small stuff. To my mom, Meri, for making me laugh on stressful days and being the person I can vent to. To my sisters, Serene and Sam, for always checking in on my when I am homesick. To Cole and Phillip, for brightening my day and continuously providing reasons for me to laugh.

Finally, I would like to thank my friends. First to my friends back home, Veronica, Haley, and Megan, you keep me sane. Even though I now live 600 miles away from you guys instead of 6 minutes, it feels as though I have never left. Also, to all of the new friends I have met in Mississippi, you guys make grad school a much more fun experience and I couldn't do it without you!

TABLE OF CONTENTS

ABSTRACT ii

ACKNOWLEDGMENTS iii

DEDICATION iv

LIST OF TABLES x

LIST OF ILLUSTRATIONS xi

CHAPTER I - INTRODUCTION 1

 Potential Outcomes of Students with ADHD 1

 Academic 1

 Behavior 2

 Social..... 3

 Types of Treatment 4

 Medication 4

 Behavioral Interventions 6

 Antecedent. 6

 Consequent..... 7

 Self-management. 7

 Peer-Mediated Interventions 9

 Functional Behavior Assessment 12

 Students with ADHD 18

Noncontingent reinforcement (NCR)	20
Peer implemented function-based intervention for students with ADHD.....	20
Research Questions.....	22
CHAPTER II – METHODS	24
Participants.....	24
Target Students	24
Student Interventionists	25
Student-Interventionist Dyad 1.	25
Student-Interventionist Dyad 2.	26
Student-Interventionist Dyad 3.	27
Materials	28
Student-Interventionist Self-Monitoring Integrity Form	28
Student Interventionist Training Procedural Integrity Checklist	28
Peer-Mediated NCR Intervention Protocol.....	28
MotivAIDer®®. (http://www.motiv-aider.com/).....	28
Measures	29
Systematic Direct Observation	29
Functional Assessment Informant Record for Teachers – II (FAIR-T II).	30
Usage Rating Profile – Intervention Revised (URP-IR; Briesch, Chafouleas, Neugebauer, & Riley-Tillman, 2013)	30
Children Intervention Rating Profile (CIRP; Turco & Elliott, 1986)	31

Dependent Variables	31
Experimental Design and Reliability	33
Design	33
Reliability	33
Interobserver Agreement (IOA).....	33
Procedures	35
Functional Behavior Assessment	35
Baseline	36
Student Interventionist Training.	36
Procedural Integrity.	37
Intervention	37
Withdrawal.....	38
Re-implementation.....	39
Fading	39
Treatment Integrity	39
Analyses	41
CHAPTER III - RESULTS.....	42
Visual Analysis	42
Disruptive Behavior	42
Cory.....	42

Shawn.....	43
Rachel.	44
On-task Behavior	45
Cory.....	45
Shawn.....	47
Rachel.	48
Student Interventionist Integrity	49
Topanga.....	49
Eric.....	51
Angela.	51
Singe Case Effect Sizes	52
Social Validity	54
URP-IR.	54
CIRP.....	56
CHAPTER IV – DISCUSSION.....	57
Implications for Practice	59
Limitations and Future Directions	60
Conclusion	62
APPENDIX A – TARGET STUDENT CONSENT.....	63
APPENDIX B – TEACHER CONSENT	66

APPENDIX C – STUDENT INTERVENTIONIST CHARACTERISTICS	69
APPENDIX D – STUDENT INTERVENTIONIST CONSENT	70
APPENDIX E – INTEGRITY CHECKLIST	73
APPENDIX F – PROCEDURAL INTEGRITY CHECKLIST	74
APPENDIX G – NCR PROTOCOL.....	75
APPENDIX H – OBSERVATION SHEET	76
APPENDIX I – FAIR T – II	77
APPENDIX J – URP-IR	84
APPENDIX K –CHILDREN’S INTERVENTION RATING PROFILE	86
APPENDIX L – SCHOOL APPROVAL LETTER.....	87
APPENDIX M – IRB APPROVAL LETTER.....	88
REFERENCES	89

LIST OF TABLES

Table 1 NAP Effect Sizes for Disruptive Behavior	53
Table 2 NAP Effect Sizes for On-Task Behavior.....	54
Table 3 Mean Ratings Across Each Factor on the Usage Rating Profile – Revised Across Teachers	55
Table 4 Mean Ratings Across Each Factor on the Usage Rating Profile – Revised Across Interventionists.....	56

LIST OF ILLUSTRATIONS

Figure 1. Percentage of intervals of Cory’s disruptive behavior..... 43

Figure 2. Percentage of intervals of Shawn’s disruptive behavior..... 44

Figure 3. Percentage of intervals of Rachel’s disruptive behavior..... 45

Figure 4. Percentage of intervals of Cory’s on-task behavior..... 47

Figure 5. Percentage of intervals of Shawn’s on-task behavior..... 48

Figure 6. Percentage of intervals of Rachel’s on-task behavior..... 49

Figure 7. Percentage of Topanga’s Treatment Integrity..... 51

Figure 8. Percentages of Eric’s Treatment Integrity 51

Figure 9. Percentages of Angela’s Treatment Integrity..... 52

CHAPTER I - INTRODUCTION

Attention Deficit/Hyperactivity Disorder (ADHD) is the most common neurobehavioral disorder of childhood (American Academy of Pediatrics, 2011). Approximately eleven percent of children between 4 and 17 years of age have been diagnosed with ADHD (Centers for Disease Control and Prevention, 2011). ADHD, along with learning disabilities, speech and language impairments, and emotional and/or behavioral disorders (EBD), are considered high incidence disabilities, meaning they are the most prevalent disabilities among students (Leko, Brownell, & Lauterbach, 2010). ADHD is characterized by impairment in functioning or development due to inattention, hyperactivity, or impulsivity, as well as difficulties in school associated with social rejection and academic underachievement. (American Psychiatric Association, 2013). Furthermore, children with ADHD may have social difficulty with their family at home (Johnston & Mash, 2001) in addition to difficulties interacting with teachers and peers at school (Stormont, 2001). Children with ADHD also have difficulties forming and maintaining friendships (Stormont, 2001); additionally, parents of children with a history of ADHD report approximately three times as many peer problems compared to those without a history of ADHD (i.e., 21.1% and 7.3%, respectively; Centers for Disease Control and Prevention, 2011).

Potential Outcomes of Students with ADHD

Academic

Students with ADHD are more likely to exhibit deficits in academic achievement compared to typical peers (Frazier, Youngstrom, Glutting, & Watkins, 2007). This is likely due to the core inattentive symptoms typical of students with ADHD, such as

making careless mistakes on schoolwork, trouble remaining attentive to instruction, not following through with directions, and losing necessary school supplies, such as pencils and books (American Psychiatric Association, 2013). According to Steiner, Sheldrick, Frenette, Rene, and Perrin (2014), children diagnosed with ADHD are more likely to be off task compared to peers without ADHD during teacher-led instruction. Deficits in academic engagement are concerning because of the positive correlation between academic engagement and academic achievement (Finn & Zimmer, 2012).

Regarding their performance in school settings, children with ADHD are more likely to drop out of school, repeat grades, and receive special education services than typically developing children (Barkley, Fischer, Smallish, & Fletcher, 2006).

Furthermore, students with ADHD scored lower than students without ADHD on academic achievement tests in all subjects, as measured by the Mini-Battery of Achievement (MBA; Barry, Lyman, & Klinger, 2002).

Behavior

In addition to academic difficulties, students with ADHD have difficulties engaging in appropriate classroom behavior. More specifically, students with ADHD often engage in disruptive behaviors, such as talking out without permission, talking with peers at inappropriate times, and responding inappropriately when reprimanded or during difficult task demands (DuPaul & Stoner, 2014), in turn inhibiting the learning and instruction of other peers. Additionally, students with ADHD frequently leave their seats without teacher permission, play with objects unrelated to the current task demand, repeatedly tap their hands and feet, and fidget in their seats, resulting in disrupted classroom instruction. Noncompliance is also frequently exhibited by students with

ADHD, including failure to comply with commands issued from authority figures, argumentativeness and verbal hostility, and lack of control of their temper (DuPaul & Stoner, 2014). In the classroom, noncompliance is typically manifested as speaking without permission, refusing to adhere to classroom and school rules, openly disobeying teacher directives, and acting verbally or physically aggressive towards peers (DuPaul & Jimerson, 2014).

Another difficulty to consider is that children with ADHD are more likely to engage in behavior that results in disciplinary consequences than children without ADHD. Robb and colleagues found that the frequency of discipline referrals, defined as the number of times a student was sent to the principal's office or received warnings or detentions for their behavior, occurring at least once per month during the school year was much higher for children with ADHD (29.6%) than the comparison group of children without ADHD (2.5%) (Robb et al., 2011).

Social

Students with ADHD also often endure social rejection from their peers (Hodgens, Cole & Boldizar, 2000), which may stem from various poor social interactions, such as interrupting when others are speaking, difficulty taking turns while playing games, refusal to solicit permission before using others' possessions, and excess talking (American Psychiatric Association, 2013). Additionally, students with ADHD also have difficulties creating and maintaining friendships, which could be a result of inattentive and impulsive behaviors that disturb their social behaviors (Stormont, 2001). Specifically, behaviors that may interfere with maintaining friendships include attempts to join ongoing group activities (e.g., interrupting games in progress), poor

conversational skills (e.g., inattentive during conversations, repeatedly interrupting while others are speaking), and utilization of aggression as a means to solve personal conflicts (Barkley, 2006).

Types of Treatment

Due to the high prevalence of ADHD relative to other disorders and the accompanying academic, behavioral, and social difficulties associated with the disorder, it is necessary that school systems have effective treatment strategies to address the variety of concerns that a student with ADHD may pose within a learning environment (Cole & Shapiro, 2005). Traditionally, symptoms of ADHD have been addressed using two distinct treatments: medications (Nathan & Gorman, 2015) and psychological interventions based in behavioral psychology (Fabiano et al., 2009). Though it is not the intention of this study to offer a comprehensive review of the literature related to medication and behavioral interventions for individuals with ADHD, a brief overview of the medication and behavioral intervention literature is provided.

Medication

Stimulant and non-stimulant medications have been demonstrated to be effective treatments for core symptoms of ADHD. Stimulant medications are typically effective for decreasing core symptoms of ADHD such as short attention span, impulsive behavior, and hyperactivity (Finks, 2012); however, there may be some aversive effects associated with the use of stimulant medication. Associated side effects of stimulant medication include loss of appetite, sleep disturbance, increase in blood pressure and heart rate, as well as the potential for an increase of tics and growth suppression, though there is mixed literature regarding these topics (Budur, Mathews, Adetunji, Mathews, & Mahmud,

2005). Additionally, approximately thirty percent of children do not respond to stimulant medication (Budur et al., 2005). Non-stimulant medication is an alternative option for those children that do not respond or that experience the aversive side effects associated with stimulant medication (Banaschewski, Roessner, Dittmann, Santosh, Rothenberger, 2005). Although, it is important to note that there are still limitations associated with non-stimulant medication, such as abdominal pains, decreased appetite, fatigue, and irritability (Wigal, 2009).

Regarding medication, poor adherence and early termination are also factors that should be considered, as it decreases efficacy of the treatment (Pappadopulos, et al., 2008). Additionally, medication is generally effective for reducing inappropriate behaviors, however increases in prosocial behaviors are not necessarily observed (Pelham et al., 1999). This may be because appropriate replacement behaviors are not typically trained as part of a medication treatment. Considering all factors, it may be beneficial to explore forms of treatment other than medication when serving students with ADHD, such as a combination of medication and behavioral therapy. Treatments combining medication management and intensive behavioral interventions were found to be superior to community care services and behavior therapy alone (MTA, 2004). This is consistent with the American Academy of Pediatrics (2011) treatment recommendation for elementary and middle school-aged students involving both an FDA approved medication paired with an evidence-based behavioral intervention implemented by a parent or teacher. Furthermore, school personnel cannot legally require students to obtain a prescription for psychotropic medication, therefore ruling out medication as an appropriate, feasible and reliable treatment that can be provided by school personnel

(Carlson, Thaler, & Hirsch, 2008). Behavioral interventions alone offer an alternative treatment option as it introduces replacement behaviors for students with ADHD and is legally permissible for personnel to provide within a school setting.

Behavioral Interventions

Behavioral interventions are an evidence-based treatment that has been demonstrated to be highly effective and improve the functioning of children with ADHD (Fabiano et al., 2009). Particularly within the school setting, behavioral interventions are effective in reducing disruptive behaviors for students with ADHD (Pelham & Fabiano, 2008). According to DuPaul and Weyandt (2006), categories of behavioral interventions within the schools include antecedent-based strategies, consequent-based strategies, and self-management approaches.

Antecedent. Antecedent interventions focus on the prevention of problematic behaviors by manipulating events that precede the target behavior. Variations of antecedent interventions include active teaching of classroom rules, modification of task assignments by decreasing the length of assignment or the addition of breaks, and offering the student a choice of academic tasks (DuPaul & Weyandt, 2006). Additional antecedent strategies involve manipulating the environment of the student (e.g., proximity of student to the teacher), the amount and/or type of feedback student is receiving (e.g., immediate feedback for completing work or staying on task), or sequencing the curriculum being taught based off student interest (Reid & Maag, 2006). Another antecedent modification is the provision of an announcement indicating an upcoming transition as well as the maintenance of a consistent schedule (Reid & Maag,

2006). It has been suggested in the literature that antecedent interventions are effective for students with ADHD (DuPaul & White, 2006).

Consequent. Consequent-based strategies manipulate the student's environment after the target behavior occurs. Reinforcement and punishment are utilized to formulate consequent-based interventions. In school settings, examples of consequent-based interventions using reinforcement that are effective for students with ADHD include praise and tokens that are provided when students demonstrate behavioral expectations (Ayllon, Layman, & Kandel, 1975; Gresham, 2004; Reid & Maag, 2006, DuPaul & Stoner, 2003). Consequent-based punishment interventions that have been demonstrated to be effective for students with ADHD include reprimands (White, 1975; Gresham, 2004) and response cost (Rapport, Murphy, & Bailey, 1980; Gresham, 2004; DuPaul & Weyandt, 2006); however, it is important to note that punishment procedures should be used concurrently with positive reinforcement procedures (Reid & Maag, 2006). Additionally, extinction (i.e. withholding reinforcement from a child when he or she engages in inappropriate behavior) is another consequent-based procedure that can be used for students with ADHD.

Self-management. Finally, self-management procedures are implemented by the student and are typically put in place to improve students' self-control (DuPaul & Weyandt, 2006). Self-monitoring, self-monitoring plus reinforcement, self-evaluation, and self-reinforcement are different variations of self-management procedures (Reid, Trout, & Shartz, 2005). The logic behind self-management procedures is that changes in behavior occur with less teacher feedback and/or reinforcement (DuPaul & Weyandt, 2006); however, at the beginning stages of the intervention there is a considerable amount

of teacher involvement, as the student will need more feedback (Shapiro, DuPaul, & Bradley-Klug, 1998). Self-management may not be the most logical choice of interventions for students with ADHD, due to some students not having the capability of obtaining levels of independent self-management (Shapiro et al., 1998). According to DuPaul and Weyandt (2006), self-management may only be appropriate for children with less severe ADHD symptoms.

However, there are concerns with the feasibility of these behavioral interventions, especially for teachers. Typically, as the only adult in the classroom, teachers are responsible for implementing classroom interventions. This may lead to difficulties regarding the implementation of behavioral intervention strategies utilized with students with ADHD (DuPaul & Weyandt, 2006) due to teacher-mediated interventions requiring a time commitment that may not be realistic (Abramowitz & O'Leary, 1991).

Researchers have attempted to alleviate these problems by investigating behavioral interventions for students with ADHD that employ alternative intervention agents. These alternative interventionists have included typically developing peers as well as peers with ADHD (DuPaul & Weyandt, 2006). Peers seem to be a logical choice of intervention agent because they are an abundant resource (i.e. convenient) and may have more opportunities to closely observe and respond to the behavior of other students than a teacher (Abramowitz & O'Leary 1991). Additionally, when a peer is involved, an appropriate social interaction may be structured as part of the intervention, which can generalize to future improved social interactions and peer relationships (Kohler & Strain, 1990). The culmination of all of the benefits of utilizing students as intervention agents leads to the more detailed discussion of peer-mediated interventions

Peer-Mediated Interventions

In the school-based intervention literature, peer-mediated interventions are strategies that employ students as intervention agents for their classmates (Lloyd, Crowley, Kohler & Strain, 1988). There are four subtypes of peer-mediated interventions, including peer management, peer tutoring, peer modeling, and group-oriented contingencies (Kohler & Strain, 1990). Peer management involves training a student interventionist to prompt and reinforce behaviors by administering consequences to a target student based on the occurrence or nonoccurrence of target behaviors. Peer tutoring involves teaching a student interventionist to provide instructions, consequences, and feedback contingent on a specific academic response. Peer modeling interventions involve teaching a student interventionist to demonstrate specific behaviors for a target student. Finally, group-oriented contingencies do not require formal training of student interventionists, but instead utilize reinforcement contingencies that promote peer mediation by reinforcing the behavior of a group of students.

Because peer tutoring interventions solely focus on academic problems, this type of peer intervention strategy may not be the best fit for students with ADHD due to their difficulties engaging in on-task and appropriate classroom behavior, a pre-requisite skill for successful academic behavior. Peer modeling may not be appropriate either, as the peer interventionist is only modeling the desired response and not necessarily providing corrective feedback to the target student for incorrect responses. Additionally, group-oriented contingencies focus upon a group of students and may not require a student with ADHD to participate in the intervention in order to receive reinforcement. Peer management strategies, however, hold promise as a type of peer-mediated intervention

for students with ADHD because they target non-academic behavior and can be individualized to fit the target student's needs. Also, they elicit participation from the target student due to the individual nature of the prompting and reinforcement by the peer interventionist.

Dart, Collins, Klingbeil and McKinley (2014) conducted a meta-analysis synthesizing school-based peer management interventions. Studies included in the analysis evaluated the effects of peer-mediated interventions implemented within a school environment, targeting a non-academic behavior, and utilizing single-case design methodology. Twenty-nine articles that met these criteria were included in the meta-analysis. The results indicated that peer management interventions are moderately effective when implemented to improve students' behavioral outcomes (Tau-U = 0.78). Individual effect sizes for specific behavioral outcomes were also calculated. Peer management interventions were equally effective when targeting social skills (Tau-U = 0.78), communicative behavior (Tau-U = 0.76), and increased on-task behavior or decreased disruptive behavior (Tau-U = 0.77). This meta-analysis was the first to analyze and quantify the school-based peer management literature and revealed that peer management interventions are generally effective strategies.

Peer management interventions have been used across a variety of populations to alter a variety of target behaviors. For example, Goldstein, Kaczmarek, Pennington, and Shafer (1992) utilized a peer management intervention for preschoolers with significant language, social, and cognitive deficits. The study included 15 children, five of which had disabilities and ten of which were typical peers. Peer interventionists' were required to attend to, comment on, and acknowledge their classmates' communicative behavior.

Student interventionists were allotted 10 seconds to initiate an interaction with the target students. If neither peer initiated social interaction, interventionists were issued a general prompt to engage in conversation with the target child while simultaneously playing. The social interaction involved establishing mutual attention, saying the target student's name, talking about current activities and watching to see if target student takes a turn, followed by talking again. During baseline, target children issued approximately five social behaviors per play session with peers, with the exception of one participant. During the intervention phase, the frequency of social behaviors increased to 6.5 to 13.0 occurrences per play session for the target students. These phases were replicated and during the reversal phase, the participants' frequencies of social behaviors decreased. Finally, during the second intervention phase, the target students' social behaviors increased. Overall, the peer-management intervention was effective in improving social interaction between preschoolers with significant language, social, and cognitive deficits and typically developing preschoolers (Goldstein et al., 1992).

Peer management interventions also appear to be effective for elementary aged students engaging in disruptive behavior within a general education classroom. A study by Broussard and Northup (1997) examined the disruptive behavior of four boys between the ages of 7 and 9 years old. The peer management intervention consisted of differential reinforcement of other behavior (DRO); specifically, the target students had access to peer attention contingent upon time periods without exhibiting disruptive behavior. Reinforcement was delivered by providing the target student with token coupons that were later exchanged for one minute of time with the peer. The interactive activity with a peer took place immediately after the ten-minute intervention session. An extinction

procedure for peer attention was used by instructing other students not to interact with the participants, as well as allowing the other students to either earn or lose coupons contingent upon their classroom behavior. A fading component was also added by increasing the DRO schedule and session length. Results indicated that there was a significant increase in on-task behavior for all participants (Broussard & Northup, 1997)

Peer management interventions are effective in altering behavior in the intended direction. Additionally, previous research suggests that student interventionists can implement interventions as they were intended to be implemented. Peer management interventions should be considered by school personnel as it saves resources by utilizing students as intervention agents and has been effective for multiple populations.

Another component to consider when utilizing peer management interventions is the function of the behavior. Specifically, by matching the intervention to the function of the behavior, there may be a greater likelihood that the intervention is effective. The next section provides a detailed discussion of assessment procedures to identify the function of the behavior as well as the effectiveness of various function-based interventions.

Functional Behavior Assessment

A functional behavior assessment (FBA) is a procedure used to identify reinforcers within the environment that are maintaining problem behavior (Cooper, Heron, & Heward, 2007). The function of a behavior refers to the purpose that the behavior serves to an individual, specifically the type of reinforcement (attention, tangible, escape, automatic) a behavior contacts. (Cooper, Heron, & Heward, 2007; Hanley, Iwata, & McCord, 2003). Function can also refer to the relation between two variables (e.g. a behavior and environmental event) where one variable changes in the

addition or removal of the other variable (Hanley, Iwata, & McCord, 2003). FBAs include the identification of antecedents (i.e., stimuli that precede the occurrence of problem behavior) and consequences (i.e., stimuli that follow the occurrence of problem behavior; Gresham, Watson, & Skinner, 2001). Consequences that may serve as positive reinforcement for problem behavior include attention (i.e. reprimands, praise), access to edibles or tangibles, and sensory-seeking behaviors that result in automatic reinforcement. Consequences that may serve as negative reinforcement for problem behavior include, but are not limited to, escape from, or delay, of an academic task demand and sensory stimulation or automatic negative reinforcement. (Cooper Heron, & Heward, 2007).

There are three different types of FBAs that can be used to inform school-based interventions, including functional analysis, direct FBA and indirect FBA. Functional analysis involves experimental manipulations of different environmental conditions to determine the function of the target behavior (Gresham et al., 2001). Indirect FBA methods occur away from the time and place of the target behavior. Methods of indirect assessment include interviews, review of historical or archival records, and behavior rating scales and checklists. Direct functional assessment involves observations of the antecedents preceding the target behavior, the target behavior, and the consequences that follow the target behavior.

School-based FBAs are needed to decrease the likelihood that ineffective and potentially harmful treatments are implemented to students (Steege & Watson, 2009). Doggett and colleagues (2001) identified a feasible FBA strategy that could be used in schools. The approach consists of a three-step process to conduct an FBA within a

general education classroom. The first step involves conducting teacher interviews. This can be done by administering the Functional Assessment Informant Record for Teachers (FAIR-T) to teachers. The FAIR-T is a teacher interview that is used to collect information regarding a students' problem behavior and determine hypotheses about the function of the problem behavior (Miller, Dufrene, Olmi, Tingstrom, & Filce, 2015). The next step is to conduct direct observations of the target student to calculate conditional probabilities between antecedents, behaviors, and consequences. The last step is an interpretive phase in which the hypothesis is generated by utilizing information from the teacher interview and direct observations (Doggett et al., 2001). Based on the information gathered during the assessment portion, a hypothesized behavior function can be used to inform intervention design.

Functional behavior assessments are important within schools for multiple reasons. Not only is it considered best practice to utilize FBA's when creating behavioral interventions (Gresham, 2004), but the information provided by an FBA is utilized to better inform and design interventions to decrease problem behavior and encourage positive behaviors (Gresham, Watson, Skinner, 2001). Additionally, FBAs are important within school settings because they are legally required by the regulations of IDEA (IDEA, 2004). There are various interventions that could be selected once the function of a behavior has been identified. The next section discusses a few studies that compare the effects of function and non-function based interventions.

An intervention developed around a student's behavior function is likely to be more effective when compared to an intervention created by trial and error (Miller & Lee, 2013). This is because the informed intervention has identified antecedents and

consequences surrounding the problem behavior that can be manipulated to create an intervention that matches the function of the problem behavior; however, there is some research to support non-function based interventions as equally effective to their function-based counterparts. Gresham, McIntyre, Olson-Tinker, Dolstra, McLaughlin, and Van (2004) conducted a review of school-based interventions and compared the effectiveness of interventions informed by behavior function and interventions developed without functional data. The results indicated that non-function-based interventions produced larger effect sizes compared to function-based interventions.

In an attempt to resolve the debate surrounding the necessity of function-based interventions, Ingram, Lewis-Palmer, and Sugai, (2005) evaluated the differential effectiveness of function-based and non-function-based intervention plans. The participants in this study consisted of two boys, both in the sixth grade. Researchers used an FBA procedure that included the Teacher-Directed Functional Assessment Interview, the Student-Directed Functional Assessment Interview, and direct observations, to inform the development of a function-based intervention for each participant. They compared this to intervention plans not utilizing information derived from FBAs. Results indicated that participant 1 exhibited disruptive behavior during a mean of 49% of intervals in the baseline phase. After implementation of the function-based behavior plan, rates of disruptive behavior decreased to a mean of occurring for 9% of the observed intervals. The function-based intervention was removed followed by the implementation of the non-function based intervention plan, which resulted in an increase of problem behavior ($M = 49\%$). Finally, the non-function based intervention was removed, and the function-based intervention was re-introduced, as well as an immediate decrease of problem

behavior ($M = 6\%$). Participant 2 demonstrated problem behavior for 61% of intervals during baseline. Following the implementation of the non-function based intervention, there was a decrease in problem behavior ($M = 38\%$). The non-function based intervention was then removed, and the function-based intervention was implemented, with problem behavior further decreasing ($M = 10\%$). The removal of the function-based intervention and reintroduction of the non-function-based intervention resulted in the problem behavior increasing ($M = 56\%$). Finally, in the last phase in which the non-function based intervention was removed and the function-based intervention was re-implemented, there was an immediate decrease in problem behavior ($M = 8\%$). Overall, results of this study support the idea that function-based interventions are more effective than non-function based interventions (Ingram et al., 2005). Although no single study is conclusive, these results appear to be promising for the effectiveness of function-based interventions.

Filter and Horner (2009) also conducted a study that compared the effects of a function- based intervention to the effects of a non-function based intervention. Participants consisted of two fourth grade boys that had a history of engaging in problem behavior during work times. Problem behavior and on-task engagement were measured using a 10s interval-based observation scheme. The function-based interventions were based upon results from a functional analysis, while the non-function-based interventions were not linked to any information derived from functional analyses. Results indicated that during baseline for participant 1, the levels of problem behavior occurred during 13.1% of intervals, decreased slightly during the non-function-based intervention ($M = 9.3\%$), and decreased greatly during the function-based intervention ($M = 0.1\%$). For on-

task behavior, participant 1 averaged 69.2% on-task behavior during baseline, during the non-function based intervention on-task behavior decreased ($M = 43.2\%$), and increased during the function-based intervention ($M = 76.6\%$). Participant 2 engaged in problem behavior during 28.2% of intervals in baseline, then problem behavior decreased during the non-function based intervention ($M = 21\%$), and decreased significantly more during the function-based intervention ($M = 3\%$). Participant 2 engaged in on-task behavior during 51% of intervals in baseline, on-task behavior increased slightly during the non-function-based intervention ($M = 56\%$), and increased significantly more during the function based intervention ($M = 95\%$). Overall, the findings of this study suggest that the function-based intervention was associated with less problem behaviors than the non-function based intervention.

Newcomer and Lewis (2004) found that function-based behavioral interventions were more effective than non-function based behavioral interventions. This study consisted of three participants between the ages of 9 and 11 years old. Descriptive assessment data were collected via interviews with teachers and students as well as direct observation. Then, an experimental analysis was conducted by manipulating antecedent and consequence variables that were found through the descriptive assessment data. During treatment, each participant experienced both a function-based and non-function based intervention. Results indicate that for all three participants, the most significant decreases of the percentage of intervals that inappropriate behavior occurred was during the function-based intervention.

Although there are a number of studies comparing the effectiveness of function-based and non-function-based interventions, the sample size of the previously described

studies was very small, limiting the generalizability of the results. Additional issues with specific studies also hinder the confidence that can be placed in their findings. For example, the length of the non-function-based intervention phase was considerably shorter than the function-based intervention phase (Filter & Horner, 2009), reducing their comparability. Furthermore, order effects of the function-based and non-function based interventions could be an influential factor in the results of another study (Newcomer & Lewis, 2004). Though there are benefits to both function and non-function based interventions, this rest of the information will incorporate the use of function-based interventions, as the present study evaluated the effectiveness of a function-based intervention.

Students with ADHD

A variety of function-based interventions (i.e. differential reinforcement and NCR) can be utilized as a form of treatment for children with ADHD. A study utilizing all of the previously discussed components, conducted by Flood, Wilder, Flood, and Masuda (2002) investigated the effectiveness of a function-based, peer-mediated intervention for three 10-year-old children with ADHD. A functional analysis was conducted to determine the function of the children's off-task behavior. Results of the functional analysis identified that all participants exhibited the highest levels of off-task behavior in the alone and peer-attention conditions. This information was used to develop an intervention. During the treatment phase, a peer interventionist was responsible for delivering differential reinforcement of alternative behavior (DRA) plus prompting. This entailed the peer interventionist praising the target student contingent upon engagement in on-task behavior and prompting the target student to get back to

work contingent upon engagement in off-task behavior. If the participant continued engaging in off-task behavior, the peer interventionists withdrew all social attention until the participant engaged in on-task behavior. A reversal design was utilized for two participants to evaluate treatments and a combination of a reversal and alternating treatment design was used for the third participant. Results indicated that after the peer-mediated intervention was implemented, the levels of target students' off-task behavior decreased; however, a limitation of this study was the fact that it occurred in a university psychology department where a large clinic room was designed to simulate a classroom. Therefore, it is unclear whether or not these findings would generalize to an actual classroom setting.

A study conducted by Grauvogel-MacAleese and Wallace (2010) also evaluated the effectiveness of a function-based peer management intervention for children with ADHD in an after school program. A functional analysis was conducted and the results were used to inform a peer management intervention for children with ADHD. The participants were three boys diagnosed with ADHD and three boys that were typically developing, all ranging between ages 6 and 10. Each target student picked a typically developing peer that they would most like to work with and paired up with that peer. The functional analysis indicated that each of the participants' off-task behavior was maintained by attention provided by peers, therefore the intervention consisted of the peer providing praise and help contingent upon the target student being on task. Off-task behavior was put on extinction, meaning the student interventionists were instructed to not provide attention to the target students if they appeared off-task. Results indicated that during baseline, all target students engaged in high levels of off-task behavior,

however during implementation of the peer-management intervention, off-task behavior immediately decreased and consistently remained below baseline levels. This study demonstrates the effectiveness of a function-based peer-management intervention in regards to decreasing off-task behavior for children with ADHD.

Noncontingent reinforcement (NCR). Functional assessment data are utilized by linking results to inform treatment. Interventions typically selected using functional assessment data include extinction, differential reinforcement, and NCR (Jones, Drew, & Weber, 2000). For the purpose of this study, NCR will be the emphasized intervention because of the simplicity of implementation, specifically it requires less observation of the target student as the intervention utilizes a fixed schedule of reinforcement, as opposed to a specific response contingent upon the behavior. NCR can be defined as the presentation of a reinforcer on a fixed or variable time schedule (Cooper, Heron, & Heward, 2007). Jones and colleagues (2000) evaluated the effectiveness of a NCR intervention intended to decrease disruptive behavior in a clinic-based summer academic program for a child with ADHD. Results of this study demonstrated that when peer attention was provided on a noncontingent basis, the target student engaged in the least amount of disruptive behavior compared to conditions providing contingent peer attention, contingent teacher attention and escape.

Peer implemented function-based intervention for students with ADHD. Though there is a considerable amount of research in regards to students with ADHD, peer-mediated interventions, and FBAs, there is limited research utilizing all these components cohesively. Anderson, Rodriguez, and Campbell (2015) reviewed the literature regarding FBAs within in the schools as well as provided various future directions. Thus far,

students with intellectual disabilities are the subject of the majority of research conducting school-based FBAs. This highlights the need for research regarding the utilization of FBAs to inform treatment for other student populations, including those with ADHD. Additionally, a meta-analysis was conducted that evaluated function-based and non-function-based intervention specifically for children with ADHD (Miller & Lee, 2013). The meta-analysis synthesized the results of 82 studies and indicated that there were significant effect size differences between function-based and non-function-based interventions with function-based interventions having a greater effect size. Specifically, function-based interventions produced a larger effect on effective interventions (SMDES = 3.94) compared to the non-function-based-interventions (SMDES = 2.63); however, it is important to note that the effect sizes that were used in this study were outdated compared to the current effect size metrics (i.e. NAP and Tau-U). Overall, studies utilizing FBAs to inform intervention planning had significantly greater effects than interventions that were not based on FBA information with participants with ADHD, thus providing further support of the utilization of function-based interventions.

One interesting finding from the meta-analysis involved the individuals responsible for implementing the intervention. Of the 82 studies included in the analysis, 32 (41%) FBA-based studies utilized classroom teachers as interventionists. 33 (37%) of the non-FBA-based studies also utilized teachers as interventionists. Researchers and research assistants were the second most frequent intervention agent followed by categories of 'multiple', 'other', and 'not specified'; however, it appears that peer-mediated interventions were so infrequently utilized in these studies they did not warrant

their own category. This finding highlights a gap in the current literature that exists for function-based peer-mediated behavioral interventions for students with ADHD.

In summary, there are some gaps within the literature pertaining to students with ADHD. Specifically, though there is some research regarding the utilization of FBAs to inform treatment for students with ADHD, there needs to be additional research to support the effectiveness of function-based interventions. There is also a lack of research regarding the utilization of peer interventionists for students with ADHD. Finally, for the few studies that have involved function-based peer-mediated interventions for students with ADHD, there is a lack of translating this research into an applied school setting, as they were conducted in a clinic setting, thus leading to the need and purpose of the current study.

The purpose of this study was to investigate the effectiveness of a peer-mediated non-contingent reinforcement intervention informed by functional assessment data to decrease disruptive behavior for middle school students with a special education classification of OHI-ADHD. It extended the work of Flood and colleagues (2002) by transporting a similar intervention into an actual classroom instead of a simulated classroom. Additionally, an experimental functional analysis was not conducted. Instead, direct functional behavior assessment methodology was utilized to generate a hypothesized behavior function. The following research questions were used to guide the investigation.

Research Questions

1. Will implementation of a function-based peer-mediated behavioral intervention decrease disruptive behavior in elementary students with ADHD?

2. Will implementation of a function-based peer-mediated behavioral intervention increase on-task behavior in elementary students with ADHD?
3. Will a student interventionist be able to implement a function-based behavioral intervention with integrity?
4. Will the function-based peer-mediated behavioral intervention be identified as a socially valid strategy by classroom teachers and student interventionists?

CHAPTER II – METHODS

Participants

Participants in this study consisted of three middle school student dyads; three target students and three student interventionists. Target students were identified through the districts' behavior consultants, who were graduate students in a doctoral school psychology program. Any student referrals received by the consultants that indicated impaired academic performance related to ADHD were considered for inclusion as target students. Student interventionists were recruited through teacher nominations.

Target Students

A screen-in process to determine eligibility of target students was utilized in this study. First, the student had to have a special education classification of Other Health Impairments (OHI) due to ADHD. Students with classifications of OHI not related to ADHD (e.g. Diabetes, epilepsy) were excluded from the study. Second, target students needed to exhibit disruptive behavior hypothesized to be maintained by access to attention as determined by an FBA. Specifically, students had to exhibit substantial levels of disruptive behavior during at least 30% of observed intervals of three screen-in observation with at least 20% of those intervals followed by attention from either the teacher and/or peers as the consequence. Additionally, a teacher-completed the FAIR-T II that had to indicate a score of at least 2 on an item related to attention as a consequence. Teacher and parental consent were obtained prior to any observations occurring (Appendices A and B). None of the target students shared a classroom, to eliminate potential of contamination.

Student Interventionists

To be included as an interventionist in this study, students had to share a classroom with the target student that was exhibiting disruptive behavior. Student interventionists were recruited through teacher nominations based off of a checklist (Appendix C). After a student interventionist was nominated, a 10-minute screen-in observation of that student was conducted. To be included in the study, the student interventionist had to be on-task for at least 70% of observed intervals. Teacher and parental consent were obtained prior to any observations occurring (see Appendices B and D).

Student-Interventionist Dyad 1. Cory was a Caucasian male in sixth grade with a special education ruling of OHI-ADHD. The class in which he was referred for disruptive behavior was a general education computer skills class. The class consisted of 17 students, 7 males and 10 females; all students were Caucasian. The teacher was a female Caucasian and had obtained her education specialist's degree. She had taught for a total of five years, three of those years were at the school in which this study was conducted. Cory's teacher reported that he often engaged in off-task behavior, inappropriate vocalizations, and non-compliance. She also reported that Cory received medication at home for ADHD; however, the school did not collect any information regarding medication adherence. During the screen-in procedure, there was at least one attention item endorsed by his teacher with a score of 2 on the FAIR-T-II. Cory's percentage of disruptive behavior for the screen-in observation was 48.33% with attention following occurrences of disruptive behavior during 70.69% of the intervals. During the second observation, disruptive behavior occurred during 39.17% of the time

with attention following 60.83% of intervals with occurrences of disruptive behavior. Lastly, during the third observation, disruptive behavior occurred during 65.83% of the intervals with attention following 49.38% of intervals with occurrences of disruptive behavior.

Cory's student interventionist, Topanga, was a Caucasian female in the same sixth grade computer class. She did not have a special education classification. During her screen-in observation, she was on task for a total of 91.67% of intervals.

Student-Interventionist Dyad 2. Shawn was a Caucasian male in the seventh grade with a special education ruling of OHI-ADHD. The subject in which he was referred for disruptive behavior was a general education computer class. The class consisted of 16 students, all male. Twelve of the students were Caucasian and 4 of the students were African-American. The teacher was a female Caucasian and had obtained her bachelor's degree in biology and chemistry. She had taught for a total of ten years, three of those years that were at the school in which this study was conducted. Shawn's teacher reported that he often engages in off-task behavior, fidgeting or playing with objects, and sleeping in class. She also reported that Sean received medication at home for ADHD; however, the school did not collect any information regarding medication adherence. During the screen-in procedure, there was at least one attention item endorsed by his teacher with a score of 2 on the FAIR-T-II. Shawn's percentage of disruptive behavior for the first screen-in observation was 53.33% with attention following occurrences of disruptive behavior 43.75% of the intervals. During the second observation, disruptive behavior occurred during 75% of the time with attention following occurrences of disruptive behavior 71.11% of intervals. During the last screen-

in observation, disruptive behavior occurred 30.83% of the time with attention following occurrences of disruptive behavior 54.05% of intervals.

Shawn's student interventionist, Eric, was a Caucasian male in the seventh grade and in the same computer class as Shawn. He did not have a special education classification. During Eric's screen-in observation, he was on-task for 91.67% of intervals.

Student-Interventionist Dyad 3. Rachel was a Caucasian female in the seventh grade with a special education ruling of OHI-ADHD. The subject in which she was referred for disruptive behavior was during an inclusion math class. The class consisted of 23 students; 16 males and 7 females. Sixteen of the students were Caucasian and 7 students were African-American. Additionally, 9 of the students were receiving special education services and had one of the following rulings; OHI-ADHD, Specific Learning Disability, Emotional Disturbance, or Autism. The teacher was an African American female and had obtained her bachelor's degree. She had four years of teaching experience, all of which were at the school this study was conducted. Rachel's teacher indicated that she often engages in off-task behavior, non-compliance, and failure to speak or talk in class. She also reported that Rachel received medication at home for ADHD; however, the school did not collect any information regarding medication adherence. During the screen-in procedure, specifically there was at least one attention item endorsed by her teacher with a score of 2 on the FAIR-T-II. Rachel's percentage of disruptive behavior during the first observation was 54.17% with attention following occurrences of disruptive behavior 43.08% of the intervals. During the second observation, disruptive behavior occurred 63.33% of intervals, with attention following

occurrences of disruptive behavior 43.42% of intervals. Lastly, during the third screen-in observation, disruptive behavior occurred 55% of intervals with attention following occurrences of disruptive behavior 27.27% of intervals.

Rachel's student interventionist, Angela, was a Caucasian female in the seventh grade and in the same math class as Rachel. Angela had a special education classification of Specific Learning Disability in reading. During Angela's screen-in observation, she was on-task 93.33% of intervals.

Materials

Student-Interventionist Self-Monitoring Integrity Form

In this study, non-contingent reinforcement was provided in the form of attention; specifically, a verbal statement. A self-monitoring integrity form was provided to student-interventionists to document each time they provided reinforcement (Appendix E).

Student Interventionist Training Procedural Integrity Checklist

A procedural integrity checklist (Appendix F) was used to evaluate the researcher's implementation of training procedures protocol for the NCR intervention. This consisted of 8 steps providing training instruction. The observer completed this form every time a training session occurred.

Peer-Mediated NCR Intervention Protocol

A protocol (Appendix G) was used to outline and explain the procedures in the NCR intervention. The procedural integrity checklist was derived from this protocol.

MotivAIDer®®. (<http://www.motiv-aider.com/>)

The MotivAIDer® is a device that can be set to vibrate on specific intervals of time. It is small enough to be clipped onto a person's belt or waist. A MotivAIDer® was worn by student interventionists to cue them when to deliver consequences to the target student.

Measures

Systematic Direct Observation

Direct observations were conducted daily to obtain information on target student disruptive and on-task behavior as well as student-interventionist treatment integrity (Appendix H). Target student behavior was operationally defined and recorded using a 10-second momentary time sampling procedure during 20-minute observation sessions. If the observation lasted at least 50% of twenty minutes, it was included within the study. The time of the observation was contingent upon teacher report of disruptive behavior. The percentage of disruptive behavior was calculated by dividing the number of intervals with occurrences of disruptive behavior by the total number of intervals multiplied by 100. The primary researcher served as the primary observer while graduate students trained to 90% of agreement with the primary research assisted in conducting observations. Percentage of on-task behavior was calculated using the same formula for disruptive behavior.

Student-interventionist treatment integrity was recorded by using a frequency count of times reinforcement was provided. Percentage of treatment integrity was calculated by dividing the number of times reinforcement was delivered divided by the total number of opportunities reinforcement could have been provided multiplied by 100. The primary researcher served as the primary observer, while graduate students trained to

a 90% agreement with the primary researcher assisted with data collection. The student-interventionist also recorded the number of times he or she provided reinforcement.

Functional Assessment Informant Record for Teachers – II (FAIR-T II).

The FAIR-T II was used to determine hypotheses regarding the function of target students' problem behavior (Miller, Dufrene, Olmi, Tingstrom & Filce, 2015; Appendix I). The FAIR-T II is an indirect functional assessment measurement that utilizes a rating scale format for teachers. It is comprised of three sections regarding child behavior. The first section consists of questions for problem identification and topography of these behaviors. The second section includes questions related to identification of antecedents that may be influencing the maintenance of problem behavior. The final section of the FAIR T-II consists of questions related to identification of the consequences that typically follow occurrences of the problem behavior. The FAIR T-II was used to identify the target student's problem behavior, time of day of occurrence, and the frequency of the problem behaviors. This information was then used to formulate hypotheses of the function of the disruptive behavior. Currently there are no available data regarding the validity and reliability of the FAIR-T II, however the original FAIR-T demonstrated convergent validity with both descriptive and experimental functional analysis procedures and the FAIR-T II was based upon the original FAIR-T (Doggett, Edwards, Moore, Tingstrom & Wylczynski, 2001).

Usage Rating Profile – Intervention Revised (URP-IR; Briesch, Chafouleas, Neugebauer, & Riley-Tillman, 2013)

The URP-IR was completed at the end of the study by each teacher and student-interventionist to assess the quality of the peer-mediated NCR intervention (see Appendix

J). The original URP-IR consisted of 35 items and assessed five factors: acceptability, understanding, feasibility, integrity, and personal enthusiasm (Chafouleas, Briesch, Riley-Tillman, & McCoach, 2009). However, researchers identified that some of the factors such as general acceptability and personal acceptability loaded onto one factor; this also occurred with feasibility and integrity loading onto the same factor. Additionally, there was the emergence of an unanticipated factor, system support. Therefore, the URP-IR was restructured to include additional items to address the environmental level of influence. The URP-IR includes 29 items and consists of six factors; acceptability, understanding, feasibility, family-school collaboration, system climate, and system support. Items range from 1 (strongly disagree) to 5 (strongly agree). Regarding internal consistency, alpha coefficients for the each of the six subscales are acceptability (.95), understanding (.80), family-school collaboration (.79), feasibility (.84), system climate (.91), and system support (.72).

Children Intervention Rating Profile (CIRP; Turco & Elliott, 1986)

The CIRP was completed by the target students upon conclusion of the study (Appendix K). The CIRP consists of seven items to evaluate intervention effectiveness and fairness across one factor; the General Acceptability factor. However, modifications were made in that only six items were used, as one of the items addressed teacher behavior, which was not relevant for this study. Items range from 1 (strongly disagree) to 6 (strongly agree; Elliot, 1986), with higher scores indicating greater acceptability. Regarding internal consistency, the alpha coefficient is .89 (Witt & Elliott, 1986).

Dependent Variables

The primary dependent variable in this study was disruptive behavior. Disruptive behavior was idiosyncratically defined for each target student based upon FBA data. For both Cory and Shawn, disruptive behavior was operationally defined as the following behaviors; playing with objects, out of seat behavior, inappropriate vocalizations, noncompliance, touching others, and engaging in activities unrelated to the task demand. Playing with objects was defined as playing or manipulating objects in a way that was unrelated to the task demand. Out of seat was defined as a student breaking contact with his chair for at least 3 seconds. Inappropriate vocalizations were defined as any audible vocalization including making noises and talking to peers without teacher permission or talking about topics unrelated to the task demand. Noncompliance was defined as the student not complying with teacher instructions within three seconds. Touching others was defined as the student putting their hands or feet on another person. Finally, engaging in activities unrelated to the task demand were defined as playing internet games or orienting away from the teacher, lecture material, or computer. For Rachel, disruptive behavior was operationally defined as the following behaviors: playing with objects, out of seat behavior, inappropriate vocalizations, noncompliance, and touching others. The same operational definitions were used as the ones used for Cory and Shawn. Additionally, for Rachel, engaging in activities unrelated to the task demand was also part of disruptive behavior; however, it was operationally defined as drawing or sketching material unrelated to math or orienting away from the teacher, lecture material, or worksheet.

On-task behavior was operationally defined the same way for the target students. Specifically, on-task behavior was operationally defined as sitting in the assigned seat

and attending to the designated academic task by orienting head and eyes towards the academic task (e.g. working on assignment, attending to the teacher's lecture).

Experimental Design and Reliability

Design

This study utilized an A/B/A/B withdrawal design replicated across three dyads. The two A phases consisted of baseline and withdrawal, respectively, meaning there were no intervention procedures implemented other than what the classroom teacher typically used to manage student behavior. The B phases consisted of the implementation of the peer mediated non-contingent reinforcement (NCR) intervention. Phase changes were based upon level, trend, and variability of target student's disruptive behavior. Additionally, there was a minimum of four phases with at least five data points per phase in order to meet the What Works Clearinghouse (WWC) quality standards for single case design (Kratchowill et. al., 2010).

Reliability

Observers were comprised of trained graduate students. Prior to data collection, each observer was provided with operational definitions of each target behavior. All observers were trained within a classroom setting using the observational procedures described previously and obtained 90% agreement with the primary observer for one session before data collection for the study began. In the case that interobserver agreement (IOA) fell below 80% during the study, the observers were re-trained, however the datum point was still retained.

Interobserver Agreement (IOA). IOA was assessed for at least 33.33% of sessions across each phase for each target student. The total number of agreements (occurrence

and nonoccurrence) was divided by the total number of agreements and disagreements, multiplied by 100 (Cooper, Heron, & Heward, 2007).

For Cory, IOA was collected for 34.61% of all observations. IOA was collected for 50% of baseline observations; mean agreement was 94.72% (range = 91.67-98.33) for disruptive behavior and on-task behavior. IOA was collected for 40% of intervention observations; mean agreement was 89.58% (range = 89.17-90) for disruptive and on-task behavior. During withdrawal, IOA was collected for 42.86% of observations; mean agreement was 90.83% (range = 90-91.67) for disruptive and on-task behavior. During re-implementation, IOA was collected for 42.86% of observations; mean agreement was 86.43% (range = 80.95-95) for disruptive and on-task behavior.

For Shawn, IOA was collected for 54.17% of observations across all phases. IOA was collected for 42.86% of baseline observations; mean agreement was 92.22% (range = 85-97.50) for disruptive behavior and on-task behavior. During intervention, IOA was collected for 80% of observations; mean agreement was 93.13% (range = 84.17-96.67) for disruptive and on-task behavior. IOA was collected for 42.86% of withdrawal observations; mean agreement was 94.72% (range = 92.50-97.50) for disruptive and on-task behaviors. During re-implementation, IOA was calculated for 60% of observations; mean agreement was 98.06% (range = 96.67-100) of disruptive and on-task behavior.

For Rachel, IOA was collected for 71.42% of observations across all phases. During baseline, IOA was collected for 33.33% of observations; mean agreement was 86.25% (range = 85.83-86.67) of disruptive behavior and on-task behavior. IOA was collected for 100% of intervention observations; mean agreement was 88.37% (range = 82.50-91.67) for disruptive and on-task behavior. During withdrawal, IOA was collected

for 60% of observations; mean agreement was 90.01% (range = 87.17-91.67). IOA was collected for 100% of re-implementation observations; mean agreement was 84.50% (range = 76.67-88.33) for disruptive and on-task behavior.

Procedures

IRB approval was obtained prior to the start of data collection. Following referral of a student to the researcher for participation in the study, parental and teacher consent were obtained.

Functional Behavior Assessment

After administration of the FAIR-T-II, three screen-in conditional probabilities observations were conducted to assess target student's disruptive behavior and consequences following occurrences of disruptive behavior. Conditional probabilities observations were calculated by dividing the number of intervals that each consequence (attention, escape, tangible) followed an occurrence of disruptive behavior by the total number of intervals that disruptive behavior occurred multiplied by 100. The FBAs were conducted and calculated in this way because there are some data to indicate that these procedures converge with experimental analyses (Dufrene, Doggett, Henington, & Watson, 2007).

The data collected were used to hypothesize the function of students' disruptive behavior. If the data indicated that student's disruptive behavior was maintained by attention (as determined by the aforementioned criteria), students were included as participants in the current study. The first three participants that were screened-in were all attention-maintained.

Baseline

Baseline consisted of three conditional probability observations of each target student prior to any intervention being implemented. The remaining baseline sessions consisted of observations of each target student's disruptive and on-task behavior, as well as recording when attention was provided by both a teacher or peer. These data were used to determine the percentage of intervals in which disruptive behavior occurred and to set the criterion for how frequently reinforcement would be provided when the intervention was implemented. Baseline phases were run for each participant until at least five observations indicated stable or increasing levels of disruptive behavior, as evidenced by visual analysis. Additionally, the student interventionist was seated at least five feet away from the target student and integrity data were collected. Integrity data were collected during this phase to verify that no components of the intervention were being implemented.

Student Interventionist Training. Student interventionist training occurred during the baseline phase. Training sessions occurred separately for each student interventionist during non-instructional periods and lasted 10-15 minutes each. The primary researcher and an additional graduate student used a behavioral skills training procedure (BST; Dib & Sturmey, 2012) to train student interventionists to implement an NCR intervention. First, graduate students provided verbal instructions about implementation procedures to the student interventionists. Next, graduate students modeled intervention procedures with one individual acting as the target student and the other individual acting as the student interventionist. The student interventionists then rehearsed the intervention (using the MotivAider, providing neutral statements, and completing the integrity form) while

graduate students observed and provided corrective feedback. Training continued until each student interventionist demonstrated mastery of implementation (100%) of the intervention consecutively across three sessions. Five training sessions were required for Topanga to reach mastery of implementation while Eric and Angela required three training sessions to reach mastery. Procedural integrity was evaluated by graduate students conducting training by completing the treatment integrity checklist and direct observations.

Procedural Integrity. Procedural integrity of student-interventionist training was evaluated by completing a checklist following each training session for all student interventionists. Procedural integrity was collected for all training sessions and IOA was calculated for at least 33.33% of sessions. Procedural integrity as well as IOA was 100% for each session for all student interventionists.

Intervention

After completion of baseline phases and all student interventionists had met the training criterion, the NCR intervention was implemented. NCR was selected as the intervention implemented by the student-interventionist. NCR was selected because the student-interventionist is not required to observe the target student (preventing the student interventionist from attending to classroom instruction), as they would in a differential reinforcement procedure, where reinforcement is contingent upon specific responses. Instead with an NCR procedure, the student-interventionist is provided with a prompt to deliver reinforcement on a fixed-time schedule, eliminating the need for constant observation.

Student interventionists were moved from their assigned seat to a seat next to the target students in their classroom during the class period during which baseline observations occurred. The MotivAider was set idiosyncratically for each participant and was dependent upon baseline data and the frequency in which attention was delivered. More specifically, the total duration of baseline observations were divided by the occurrences of attention that were provided, and the schedule was set at an interval that occurred below (or more frequently). For Cory, Topanga delivered reinforcement every thirty seconds. For Shawn, Eric delivered reinforcement every three minutes. For Rachel, Angela delivered reinforcement once per minute. The student interventionist implemented the NCR intervention as described in the intervention protocol. That is, the student interventionist wore the MotivAider and delivered attention to the target student each time it vibrated. The attention was delivered in the form of neutral statements, such as “you are wearing a blue shirt” or “today is Tuesday”. This continued for the entire duration of the twenty-minute observation. This phase was completed after at least 5 observations had occurred and levels of disruptive behavior were stable or trending downward, as evidenced by visual analysis.

Withdrawal

The withdrawal phase was identical to the baseline phase. The student interventionist returned to his or her original seat in the classroom. Treatment integrity data were collected to verify that the student interventionist was no longer implementing the NCR intervention. The withdrawal phase was completed after at least five observations had been collected and levels of disruptive behavior were stable or increasing, as evidenced by visual analysis.

Re-implementation

This phase was identical to the first intervention phase. The student interventionist was seated next to the target student and implemented the NCR intervention. The schedule at which reinforcement was provided remained the same as the first intervention phase. Student interventionist integrity data were collected. This phase was completed after at least five observations had occurred and levels of disruptive behavior were stable, as evidenced by visual analysis.

Fading

After completion of the re-implementation phase, fading of the intervention occurred. Specifically, the student interventionist was seated next to the target student, however the MotivAider was removed. The student interventionist was not provided with any instructions regarding the frequency in which he or she could provide attention. Additionally, the student interventionist was not required to provide neutral statements of attention, instead the interventionists were able to naturally talk to the target student. Student interventionist integrity data were also collected.

Treatment Integrity

Direct observation and self-report were used to evaluate interventionist integrity. The student interventionist and primary observer were provided with a frequency count checklist by the primary researcher before the start of each observation period to monitor treatment integrity throughout all phases. Both the student interventionist and primary observers completed the checklist while the intervention was being implemented. The frequency with which the student interventionist was supposed to provide reinforcement was known prior to implementation of the intervention (i.e., 20 minutes divided by NCR

interval). The number of boxes on each target student's integrity checklist matched the number of times reinforcement should have been delivered.

For Topanga, integrity was assessed for 100% of sessions across all phases. During baseline and withdrawal, integrity was 0%; IOA was calculated for 50% of baseline observations and 42.86% of withdrawal observations, with 100% agreement of the specified rate reinforcement was delivered. During the first intervention phases, student interventionist integrity was 84.50%; IOA was calculated for 40% of sessions with 96% agreement of the rate reinforcement was delivered. Treatment integrity for the re-implementation phase was 95%; IOA was calculated for 42.86% of observations with 100% agreement of the rate reinforcement was delivered.

For Eric, integrity was assessed for 100% of sessions across all phases. During baseline and withdrawal, integrity was 0%; IOA was calculated for 42.86% of baseline observations and 42.86% of withdrawal observations, with 100% agreement of the rate of reinforcement delivered. During the intervention phase, student interventionist integrity was 92.66%; IOA was calculated for 60% of observations with 95.24% agreement to the degree in which the reinforcer was delivered. Treatment integrity for the re-implementation phase was 100%; IOA was calculated for 60% of observations with 88.67% agreement of the rate reinforcement was delivered.

For Angela, integrity was assessed for 100% of observations across all phases. During baseline and withdrawal, integrity was 0%; IOA was calculated for 33.33% of baseline observations and 60% of withdrawal interventions, with 100% agreement of the rate reinforcement was delivered. During the intervention phase, student interventionist integrity was 83.79%; IOA was calculated for 100% of observations with 96.75%

agreement of the rate reinforcement was delivered. Treatment integrity for the re-implementation phase was 100%; IOA was calculated for 100% of observations with 100% agreement of the rate reinforcement was delivered.

Analyses

Visual analysis was used to examine the level, trend, and variability of the data across phases, as well as the immediacy of effects, overlap of data points in adjacent phases, and consistency of data patterns regarding implementation and withdrawal of intervention (Horner et al., 2005). Additionally, effect sizes were calculated using nonoverlap of all pairs' (NAP; Parker and Vannest 2009), a non-parametric method that measures the nonoverlap of all pairs of data points between each phase. Although NAP is not a true effect size measure, because it is a nonoverlap measure, it correlates well with PAND, PND, and PEM, as well as Pearson's R^2 (Parker & Vannest, 2009). Scores of 1 represent an improved treatment and scores of 0 represent that no improvement is identified (Vannest and Ninci, 2015). Scores of 0 - 0.65 indicate weak effect sizes, 0.66 - 0.91 indicate moderate effect sizes, and 0.92-1.00 indicate strong effect sizes. NAP was calculated for each participant, comparing baseline to the first intervention and withdrawal to the re-implementation of the intervention. NAP was calculated to provide a quantitative estimate of the interventions' effect on disruptive behavior and on-task behavior.

CHAPTER III - RESULTS

Visual Analysis

Disruptive Behavior

Cory. The primary research question evaluated the impact of the peer-mediated NCR intervention in regards to target students' disruptive behavior. Percentages of Cory's disruptive behavior are presented in Figure 1. During baseline, levels of disruptive behavior were highly variable and ranged between moderate to high as well as appeared to have an upward trend ($M = 56.67\%$, range = 37.5 - 85.83%). During the first implementation of the peer-mediated NCR intervention, there was an immediate decrease in level and variability of disruptive behavior ($M = 20.82\%$, range = 16.67 - 25.83%). Regarding non-overlap, there was no overlap between baseline and the first intervention phase. During withdrawal, there was immediate increase in level of disruptive behavior, as well as variability and an increase in trend ($M = 50.35\%$, range = 29.17 - 80%). There was no overlap between the first intervention phase and the withdrawal phase. During the re-implementation phase, there was an immediate decrease in trend and variability, with the exception of one datum ($M = 24.23\%$, range = 14.17 - 60.83%). Regarding nonoverlap between the withdrawal and second intervention phase, there was one datum within the intervention phase that overlapped with the withdrawal phase. During the fading phase, there was a slight increase in trend and data were variable. ($M = 23.3\%$, range = 11.67 - 29%). Additionally, there was high overlap between the second intervention phase and fading phase. Across phases, levels of disruptive behavior were consistent during both baseline and withdrawal; additionally, levels of disruptive behavior decreased consistently in both intervention phases, with the exception of one

datum point in the second intervention phase.

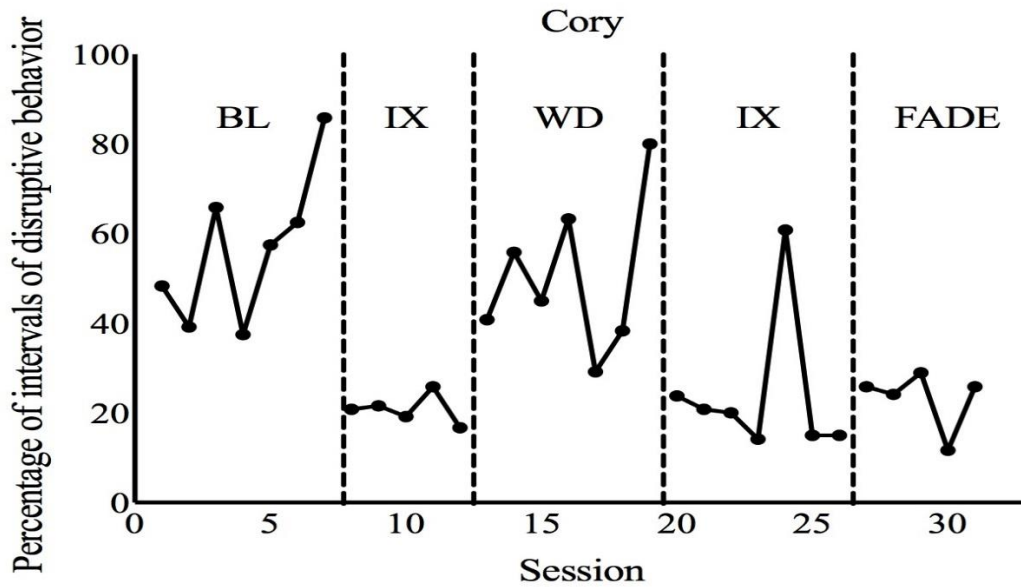


Figure 1. Percentage of intervals of Cory's disruptive behavior.

Shawn. Percentages of Shawn's disruptive behavior are presented in Figure 2.

During baseline, Shawn's level of disruptive behavior was highly variable and ranged between moderate to high levels ($M = 54.47\%$, range = 30.83 – 74.17%). During the first implementation of the intervention, there was an immediate decrease in percentage of disruptive behavior and levels remained slightly variable ($M = 25.05\%$, range = 13.33 – 42.5%). Regarding non-overlap, there was one datum in the first intervention phase that overlapped with baseline. During the withdrawal phase, there was an immediate increase in disruptive behavior and levels were highly variable ($M = 51.63\%$, range = 15 – 92.22%). There was some overlap between the first intervention phase and the withdrawal phase. During the re-implementation phase, there was an immediate decrease in disruptive behavior and stayed consistently low ($M = .028\%$, range = .01 - .05%). There was no overlap between the withdrawal phase and the second intervention phase.

In terms of consistency across similar phases, there were increases in disruptive behavior in both the baseline and withdrawal phases; additionally, decreases in disruptive behavior remained consistent across both intervention phases.

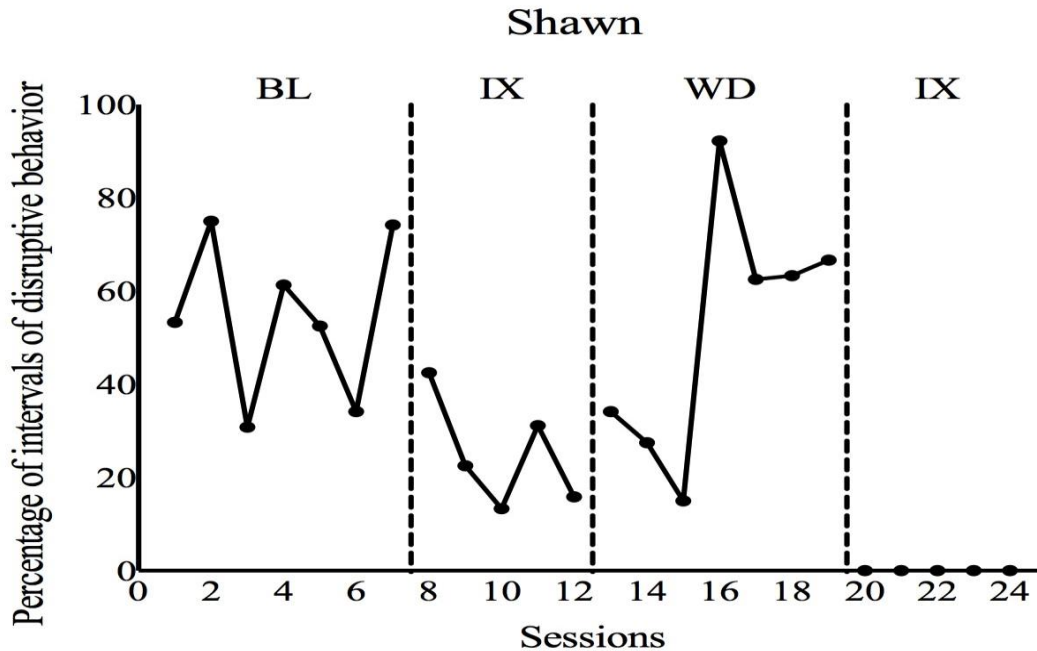


Figure 2. Percentage of intervals of Shawn's disruptive behavior.

Rachel. Percentages of Rachel's disruptive behavior are displayed in Figure 3. During baseline, disruptive behavior was at a moderate level and slightly variable ($M = 57.08\%$, range = 53.33 – 63.33%). During the first implementation of intervention, there was an immediate decrease in disruptive behavior and levels were low and stable with the exception of one datum point ($M = 24.27\%$, range = 19.67 – 33.33%), with no overlap observed between baseline and the first intervention phase. When the intervention was removed, there was an immediate increase in disruptive behavior and levels were consistently high ($M = 69.97\%$, range = 64.83 – 77.5%). Again, no overlap was observed between the first intervention phase and the withdrawal phase. When the

intervention was re-implemented, there was an immediate decrease in disruptive behavior as well as a downward trend ($M = 29.56\%$, range = 20.83 – 36.17%). No overlap of data was observed between the withdrawal phase and the second intervention phase. In terms of consistency across similar phases, the same effects were observed in baseline and the withdrawal phase as well as similar decreases in disruptive behavior in both intervention phases.

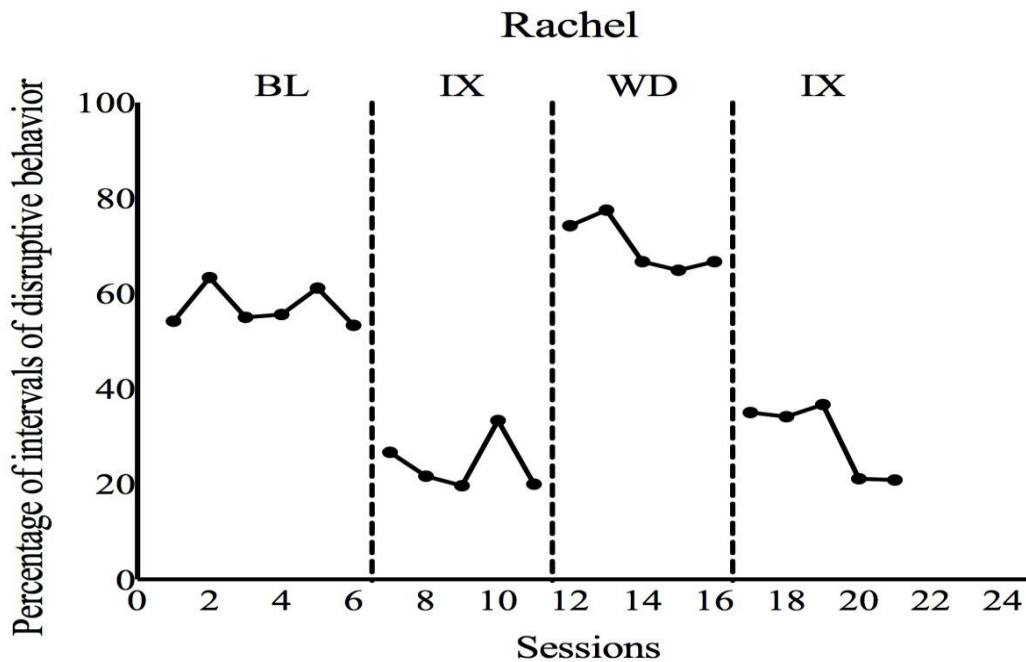


Figure 3. Percentage of intervals of Rachel’s disruptive behavior.

On-task Behavior

Cory. Percentages of Cory’s on-task behavior are presented in Figure 4. During baseline, levels of on-task behavior were moderate to low and highly variable with a downward trend. The average percentage of on-task behavior was 43.21% (range = 14.17 – 60.83%). During the first implementation of intervention, there was an immediate increase in Cory’s on-task behavior as well as no overlap between baseline

and intervention. The average percentage of on-task behavior during the first intervention phase was 79.01% (range = 74.17 - 83.33%). During the withdrawal phase, there was an immediate decrease in on-task behavior. The levels of on-task behavior were highly variable and ranged between moderate to low with a downward trend. Additionally, there were no overlap between data points in the first intervention and withdrawal phase. The average level of on-task behavior during the withdrawal phase was 49.65% (range = 20 - 70.83%). During the re-implementation of the intervention, there was an increase in on-task behavior, though it was not an immediate effect. Additionally, levels of on-task behavior remained stable with the exception of one datum. Some overlap between data points in the withdrawal and re-implementation phases were observed. During fading, there was a slight decrease in on-task behavior ($M = 63.9\%$, range = 7 - 88.33%). There was high overlap between the second intervention phase and fading phase. The average level of on-task behavior was 68.64% (range = 23.81-88.33%). Levels of on-task behavior consistently increased in both the intervention phases.

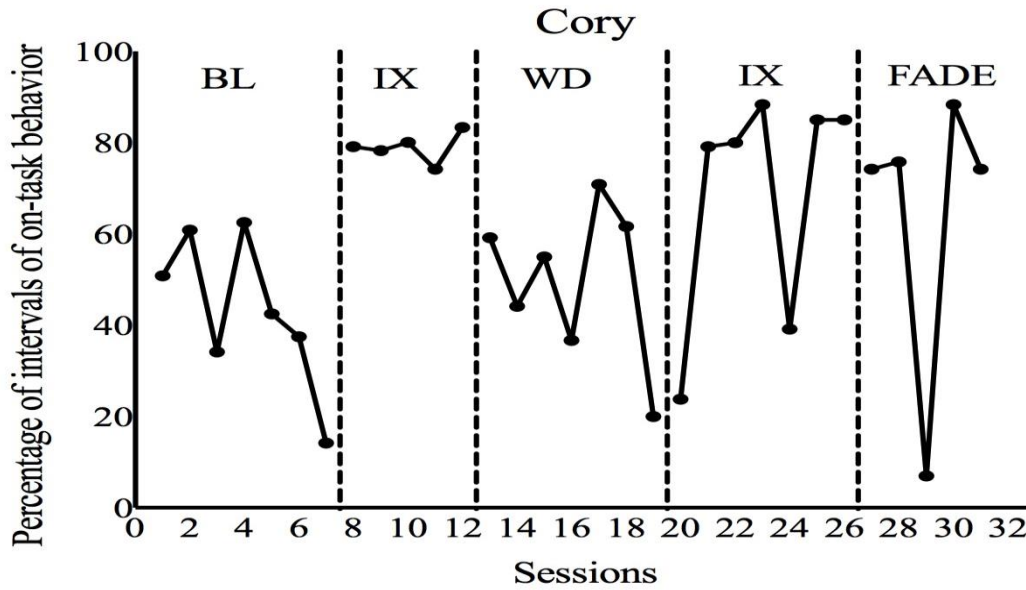


Figure 4. Percentage of intervals of Cory's on-task behavior.

Shawn. Percentages of Shawn's on-task behavior are displayed in Figure 5.

During baseline, levels of on-task behavior were variable and ranged between low and moderate with a downwards trend. The average percentage of on-task behavior was 46.36% (range = 25- 65.83%). When the intervention was first implemented, there was an immediate increase in levels of Shawn's on-task behavior with an upwards trend.

There was some overlap between baseline and intervention. The average percentage of on-task behavior was 74.85% (range = 57.5 – 86.67%). During the withdrawal phase, there was an immediate decrease in levels of on-task behavior. Levels of on-task behavior were variable and ranged from low to high. There was some overlap of data points between intervention and withdrawal. The average percentage of on-task behavior was 56.71% (range = 7 – 92.5-%). When the intervention was re-implemented, there was a slight increase in on-task behavior. On-task behavior remained stable at a high level.

There was no overlap between the withdrawal and re-implementation phase. The average

percentage of on-task behavior was 97.06% (range = 95 – 99.17%). In terms of consistency within similar phases, on-task behavior was consistently observed at lower levels compared to the intervention phases, where on-task behavior was observed at higher levels.

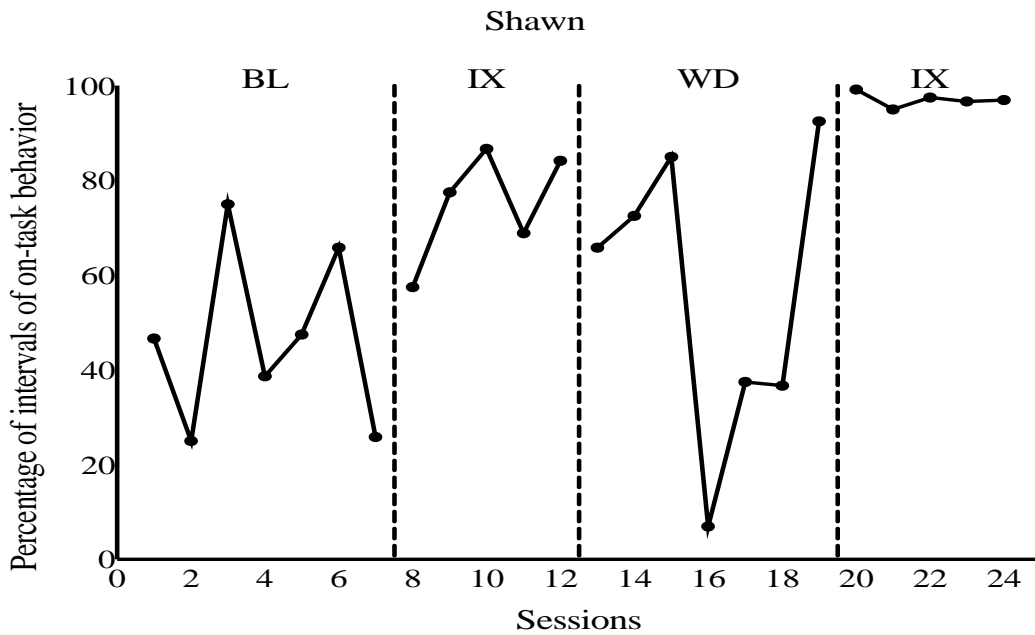


Figure 5. Percentage of intervals of Shawn’s on-task behavior.

Rachel. Percentages of Rachel’s on-task behavior are presented in Figure 6. During baseline, levels of on-task behavior remained stable at a low to moderate level. The average percentage of on-task behavior was 57.08% (range = 53.33 – 63.33%). During the first implementation of intervention, there was an immediate increase in Rachel’s on-task behavior, with levels ranging between moderate to high. The average percentage of on-task behavior was 24.27% (range = 19.76 – 33.33%). Additionally, there was no overlap between the baseline and intervention phase. When the intervention was removed, there was an immediate decrease in on-task behavior. Levels of on-task behavior were low and stable. There was no overlap between the intervention and

withdrawal phase. The average percentage of on-task behavior was 69.97%, (range = 64.83 – 77.5%). During the last implementation of the intervention, there was an immediate increase in on-task behavior. Levels of on-task behavior remained high and had an upward trend. The average percentage of on-task behavior was 29.57% (range = 20.83 – 36.67%). Regarding consistency across similar phases, levels of on-task behavior were consistently observed at low levels during baseline and withdrawal. Additionally, levels of on-task behavior were consistently at high levels during phases in which intervention was implemented.

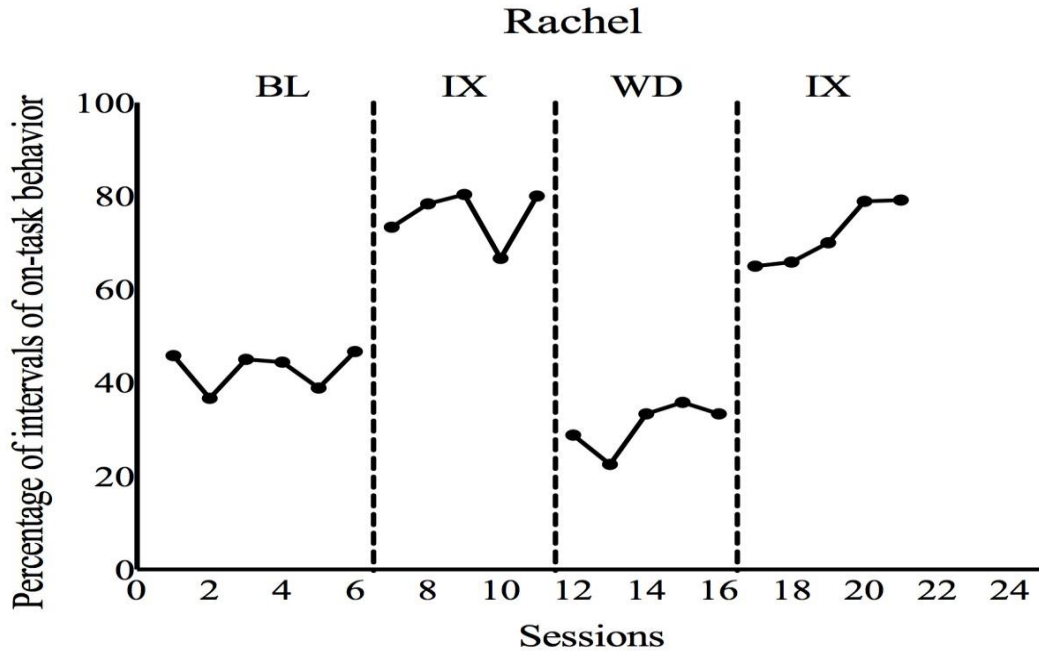


Figure 6. Percentage of intervals of Rachel’s on-task behavior.

Student Interventionist Integrity

Topanga. The integrity with which the student interventionists were implementing the intervention with was also evaluated. Treatment integrity data for Topanga are displayed in Figure 7. During baseline, integrity was low and stable, as

Topanga was not implementing any components of the intervention ($M = 0\%$, range = 0-0%). During the first intervention phase, there was an immediate increase in Topanga's level of treatment integrity. The average percent of Topanga's integrity during the first intervention phase was 84.5% (range = 70 – 92.5%). During withdrawal, when Topanga was instructed not to speak or provide any attention to Cory, there was no treatment implemented. Thus, there was an immediate decrease in treatment integrity and it remained stable at 0%. During the re-implementation of the intervention, Topanga's treatment integrity remained at a high and stable level. The average percentage of Topanga's integrity was 95% (range = 92.5 – 100%). During the fading phase, Topanga's treatment integrity immediately decreased, however it is important to note that during this phase the MotivAIDer was removed, to create a more naturalistic schedule of reinforcement. Treatment integrity remained low and variable. The average percentage of Topanga's treatment integrity was 20% (range = 10 – 30%).

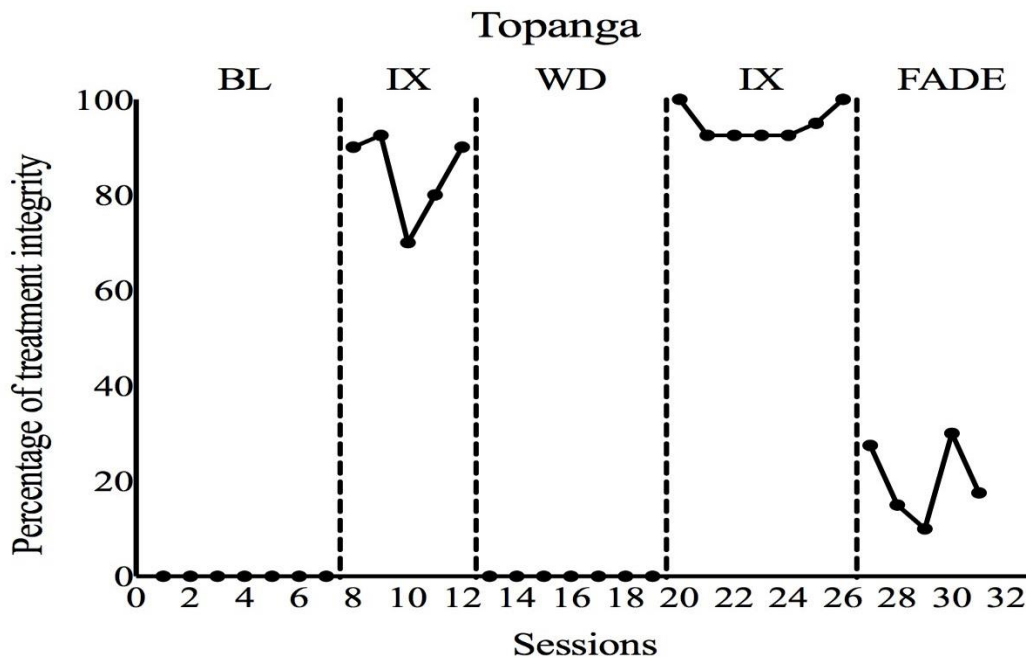


Figure 7. Percentage of Topanga’s Treatment Integrity

Eric. Percentages of Eric’s treatment integrity are represented in Figure 8.

During baseline, Eric’s treatment integrity was stable at 0%. During the first intervention phase, there was an immediate increase in Eric’s treatment integrity and remained at a relatively high and stable level. The average percent of student integrity during the first intervention phase was 92.66% (range = 80 – 100%). During the withdrawal phase, Eric’s treatment integrity immediately decreased and stabilized at 0%. During the re-implementation of the intervention, treatment integrity remained consistent and stable at 100%.

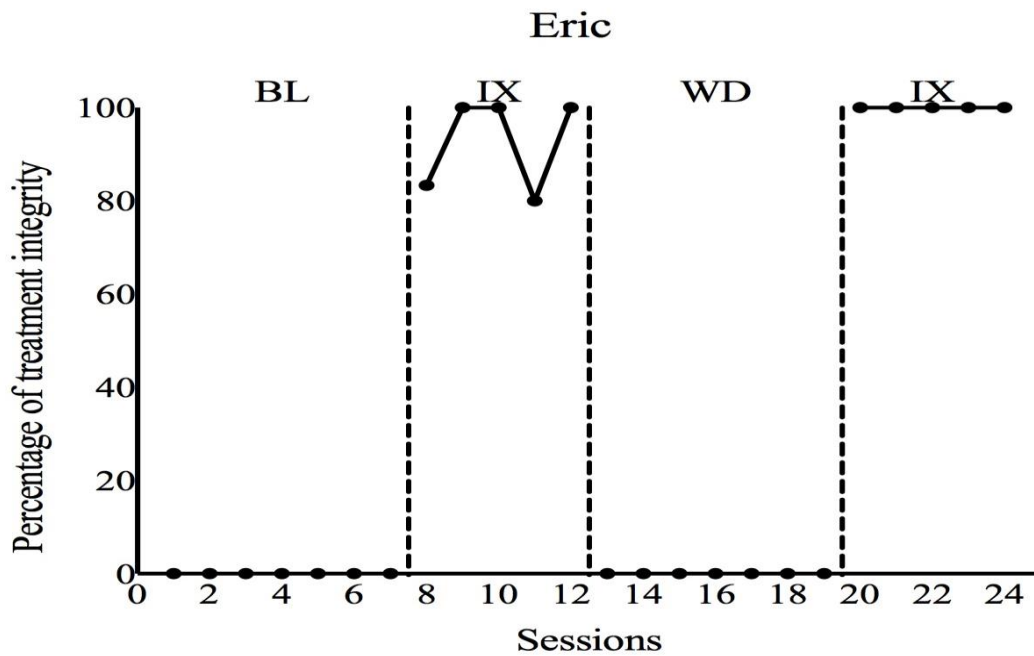


Figure 8. Percentages of Eric’s Treatment Integrity

Angela. Percentages of Angela’s treatment integrity are presented in Figure 9.

During baseline, Angela’s treatment integrity stabilized at 0%. During the first implementation of the intervention, there was an immediate increase in treatment

integrity, with an increase in trend. During the first intervention phase, the average percentage of student interventionist integrity was 83.78% (range = 50 – 100%). During withdrawal, there was an immediate decrease in Angela’s treatment integrity and treatment integrity stabilized at 0%. During the last phase of intervention, Angela’s treatment integrity immediately increased in level and remained stable at 100%.

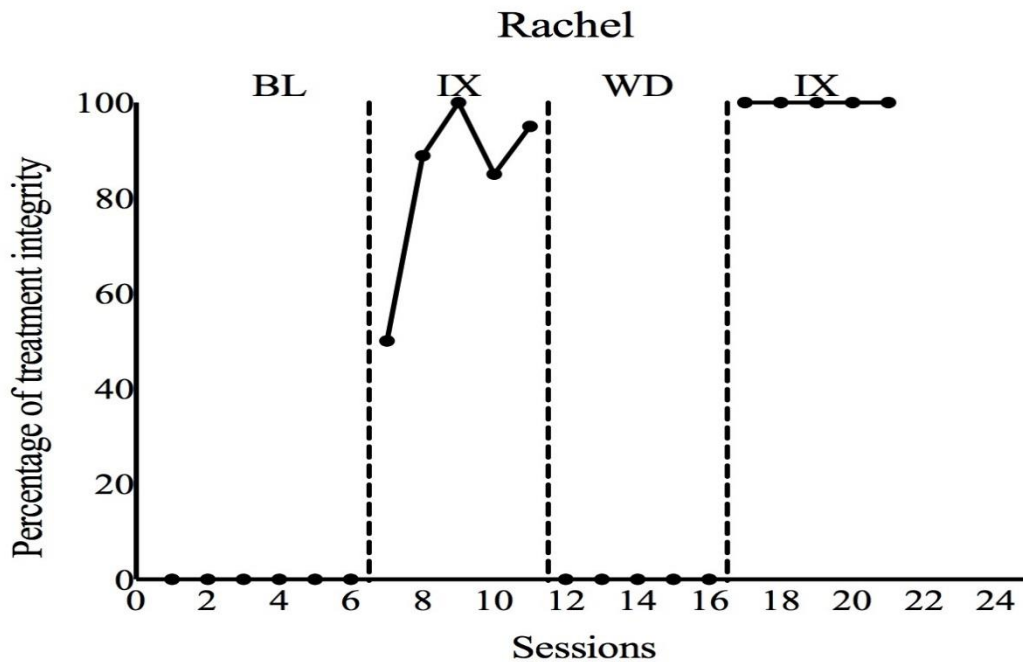


Figure 9. Percentages of Angela’s Treatment Integrity.

Singe Case Effect Sizes

NAP (Parker and Vannest, 2009) was calculated to evaluate the effect sizes of the peer-mediated NCR intervention on disruptive behavior and on-task behavior. Overall, large effect sizes were observed in regards to disruptive behavior (NAP = .96) for all participants combined. When comparing baseline to the first intervention phase, there were large effect sizes obtained for all participants (NAP = 0.97). Additionally, large effect sizes were obtained when comparing the withdrawal phase to the second

intervention phase for all participants (NAP = 0.95). For Cory, when comparing baseline to the first implementation of intervention, there were large effects (NAP = 1.00). Additionally, when comparing withdrawal to re-implementation of the intervention, large effects were observed (NAP = .89). In terms of an overall effect for Cory, a large effect size was produced (NAP = .94). For Shawn, a large effect size was observed when comparing baseline to the first implementation of intervention (NAP = 0.91) and large effect sizes were observed when comparing withdrawal to the re-implementation of intervention (NAP = 1.00). In terms of an overall effect for Shawn, a strong effect size was found (NAP = .95). For Rachel, large effect sizes were observed when comparing both baseline to intervention (NAP = 1.00) and withdrawal to re-implementation of the intervention (NAP = 1.00). In terms of an overall effect size for Rachel, the effect size was large (NAP = 1.00).

Table 1

NAP Effect Sizes for Disruptive Behavior

Target Students	Baseline-Intervention	Withdrawal-Intervention	Overall Effect
Cory	1	0.89	0.94
Shawn	0.91	1	0.95
Rachel	1	1	1
All Participants	0.97	0.95	0.96

Overall, large effect sizes were observed for all three participants in regards to on-task behavior (NAP = 0.94). Large effect sizes were also obtained when comparing baseline to the first intervention phase (NAP = 0.97) and withdrawal phase to the second intervention phase (NAP = 0.91) for all participants. For Cory, when comparing baseline

to intervention, a large effect was observed (NAP = 1.00). Additionally, when comparing the withdrawal phase to the re-implementation phase, a moderate effect was observed for Cory (NAP = 0.77). An overall moderate effect was observed for Cory (NAP = 0.87). For Shawn, a large effect was produced when comparing baseline to intervention (NAP = 0.91). When comparing withdrawal to intervention, a large effect was observed (NAP = 1.00). Additionally, a large overall effect was observed for Shawn (NAP = 0.95). Lastly, for Rachel, large effect sizes were observed for the comparison of baseline to intervention (NAP = 1.00) and the comparison of withdrawal to re-implementation (NAP = 1.00). A large overall effect was observed for Rachel (NAP = 1.00).

Table 2

NAP Effect Sizes for On-Task Behavior

Target Students	Baseline-Intervention	Withdrawal-Intervention	Overall Effect
Cory	1	0.77	0.87
Shawn	0.91	1	0.95
Rachel	1	1	1
All Participants	0.97	0.91	0.94

Social Validity

URP-IR.

This measure was used to evaluate teacher and student interventionist's acceptability of the peer-mediated NCR intervention. Higher scores indicate a higher rating of acceptability. Teacher 1 rated the intervention with an overall score of 4.97, Teacher 2 rated the intervention with an overall score of 4.76 and Teacher 3 rated the

intervention with an overall score of 4.38 (see Table 2). Topanga rated the intervention with an overall score of 4.52, student interventionist 2 rated the intervention with an overall score of 4.62, and student interventionist 3 rated the intervention with an overall score of 4.14 (see Table 3).

Table 3

Mean Ratings Across Each Factor on the Usage Rating Profile – Revised Across Teachers

Factors	Teacher 1	Teacher 2	Teacher 3
Acceptability	5.67	5	5.2
Understanding	6	5	3.67
Family-School	3	2.67	5
Feasibility	5.4	5.17	3.67
School Climate	4.6	5.8	5
System Support	3.67	3.3	3
Total	4.97	4.76	4.38

Table 4

Mean Ratings Across Each Factor on the Usage Rating Profile – Revised Across Interventionists

Factors	Topanga	Eric	Angela
Acceptability	4.55	4.20	4.33
Understanding	6	5	5.33
Family-School	2	5	3
Feasibility	5	5.16	4.67
School Climate	4.80	4.40	4.20
System Support	4	5	2.33
Total	4.52	4.62	4.14

CIRP

The CIRP was used to assess the target student’s acceptability of the peer-mediated intervention. Higher scores indicate higher overall ratings of acceptability. Cory rated the intervention an average of 4.3. Shawn rated the intervention an average of 5.67 and Rachel had an average rating of 5.

CHAPTER IV – DISCUSSION

The purpose of this study was to evaluate the effectiveness of a function-based peer-mediated NCR intervention for middle school students with ADHD. This intervention was effective in decreasing percentages of disruptive behavior as well as increasing on-task behavior during academic instruction across all participants in this particular setting. Additionally, in terms of the intervention being implemented with integrity, each student interventionist was able to implement the NCR intervention with high integrity to a peer with ADHD.

Regarding social validity, teachers 1 and 2 reported higher ratings in acceptability, indicating that they found this intervention to be appropriate and fair, as well as feasible, meaning that they thought there were enough resources, time and reasonable effort involved to implement this intervention. Understanding and school climate were also rated high for teachers 1 and 2, indicating that they easily understood the intervention procedures and that this intervention fit within their school climate and environment. However, teachers 1 and 2 indicated lower ratings for system support and family-school collaboration. Teacher 3 also rated the intervention as an acceptable, however she endorsed family-school collaboration and school climate higher than the previous two teachers. Teacher 3 additionally rated understanding, feasibility, and system support lower than the previous teachers.

In regards to the student interventionists, Topanga had higher ratings in acceptability, understanding, feasibility, and school climate and lower ratings in family-school collaboration and system support. Eric found this intervention to be feasible and easy to understand, however in regards to family-school collaboration and system

support, Eric rated these categories lower. Lastly, Angela had higher scores for acceptability, feasibility, understanding, and school climate, and lower ratings of family-school collaboration and system support.

Regarding target students, each student rated the intervention as acceptable, as their rating scale only consisted of one-factor. Their scores indicated that the target students perceived the intervention to be fair, appropriate to use with other children, and helpful.

The findings of this study are consistent with previous research surrounding behavioral interventions for students with ADHD. Antecedent interventions are an effective strategy for improving behavior for students with ADHD (DuPaul & Weyandt, 2006). As evidenced by the implementation of an NCR intervention in this study, on-task behavior improved, supporting the suggestion that antecedent interventions are an appropriate strategy for students with ADHD. In terms of peer-mediated interventions, specifically peer management interventions, these findings are also consistent with previous research suggesting that peer management interventions are effective (Dart et al, 2014). This is evidenced by the large effect sizes that were found in this study. Additionally, this study also consistent with previous research pertaining to function-based interventions. Specifically, the research that supports the idea that function-based interventions are effective for students with ADHD (Miller & Lee, 2013).

The results of this study extend previous research by incorporating various components, specifically a function-based NCR intervention implemented by peers for students with ADHD. These results are meaningful because they demonstrate that peers can effectively implement an intervention within an applied setting. Additionally,

findings indicate that a function-based intervention is an effective strategy for decreasing disruptive behavior for students with ADHD.

Implications for Practice

Results from this study provide various implications for practitioners. First, they suggest that students can be utilized to implement interventions with integrity. This information is valuable in that it can save school districts and practitioners time and money in terms of resources. This study also utilized a function-based intervention, and the procedure used to determine the hypothesis function was a relatively feasible process in that it took only 3 observations to complete, as opposed to an experimental functional analysis. This is important because previous research has indicated that function-based interventions are effective for students with ADHD (Miller & Lee, 2013), in that the treatment matches the function of the behavior.

If a school psychologist is consulting and writing FBAs, they should consider this FBA procedure as well as peer-mediated interventions for a potential strategy. In order to do this, a school psychologist should obtain parental consent for the target student and peer interventionist. The school psychologist should then seek a teacher nomination of a student interventionist for the target student and confirm the student interventionist's on-task behavior with a direct observation. A functional rating scale should then be administered to the primary teachers as well as conditional probabilities should be implemented. Following this, the student interventionist should be trained to implement the NCR intervention. Lastly, integrity checks should be conducted by the school psychologist.

Additionally, it is important to note that both teachers and student interventionists rated this intervention with overall higher scores on the URP-I. This is important because previous literature indicated that the usage of an intervention is related to the influence of multiple factors, as opposed to an isolated factor such as overall acceptability. More specifically, these factors include the fairness and appropriateness of the intervention (Briesch et al, 2013), implementer's motivation of implementing the intervention (Perepletchikova & Kazdin, 2005), the knowledge and understanding of the intervention (Witt et al., 1997), the intervention's disruption on the environment (Riley-Tillman & Chafouleas, 2003), and the influence of the school system in regards to implementation of the intervention (Broughton & Hester, 1993). As all of these factors are included within the URP-I, the higher scores suggest that this intervention was perceived as acceptable by the teachers and student interventionists.

Limitations and Future Directions

Though findings indicate that this intervention was effective in decreasing disruptive behavior, it is important to note limitations associated with these findings. First, the primary researcher could not control for the target students' use of medication, and therefore it is unknown how this affected the results. Teachers occasionally reported that they thought that the students had not taken their medication; however, there were no data collected regarding students' adherence to a medication regimen or a way to verify teacher statements.

Another issue with the study surrounded the fact that comparison peer data were not collected. This would have been beneficial in demonstrating how target student's levels of disruptive behavior compared relative to other peers in the class. It also would

have provided more description in reasonable levels of on-task and disruptive behavior for that particular classroom.

In regards to the function-based component, a direct FBA was utilized, which could raise concerns in terms of the accuracy of the hypothesized function, and in turn can affect the appropriateness of the selection of an NCR intervention. Previous research has indicated that in order to truly define a functional relationship, there must be an experimental manipulation present (Gage, Lewis, Stichter., 2012). Though the intervention in this study may not be truly function based according to this definition, there are some data indicating that the procedures used converge with experimental analysis (Dufrene et al., 2007). It is also important to note that an experimental analysis may not be feasible within a school setting for various reasons, including school personnel with adequate knowledge and expertise to conduct the procedures required within an FA as well as sufficient time to run multiple trials (Lewis, Mitchell, Harvey, Green, & McKenzie, 2015).

Future research should explore various interventions that could benefit students with ADHD. NCR may not always be an appropriate intervention for the problem behavior or referral concern because the nature of the intervention could inadvertently reinforce disruptive behavior. Therefore, the effectiveness of other function-based peer-mediated interventions should be examined, as there are a variety of referral concerns and problem behaviors for students with ADHD.

The current study evaluated a fading procedure for only one participant due to time constraints. Future research should evaluate the effectiveness of the intervention with a fading procedure. Topanga had to deliver reinforcement to Cory every thirty

seconds which may not be feasible, as that is a very rich schedule of reinforcement.

Further evaluation of the minimum schedule of reinforcement needed to meet the target student's needs could potentially help with the feasibility of this intervention.

Lastly, the current study did not address generalization of the intervention, specifically for the target student's behavior. The evaluation of generalization would be beneficial to see if the intervention could be generalized across settings and other student-interventionists. Some strategies that could be invoked to promote generalization include introducing natural maintaining contingencies and programming common stimuli (Stokes and Baer, 1977).

Conclusion

ADHD affects eleven percent of children between ages 4 and 17 years old (Centers for Disease Control and Prevention, 2011). Previous research has been conducted to evaluate the effectiveness of a function-based peer-mediated NCR intervention for students with ADHD, however these studies have been conducted within a clinical setting. This study evaluated the effectiveness of a function-based peer-mediated NCR intervention within an actual school setting for students with an OHI-ADHD special education ruling. Results appeared to be effective in reducing levels of disruptive behavior and increasing levels of on-task behavior. Student interventionist training procedures also appeared to be sufficient in that the student interventionists could implement an NCR intervention with 80% or above in accuracy. However, more research is needed in the area of function-based peer-mediated behavioral interventions for additional populations as well as maintenance and generalization of these interventions

APPENDIX A – TARGET STUDENT CONSENT

Dear Parent,

I am a doctoral student in the School Psychology Program at The University of Southern Mississippi working under the supervision of faculty member Dr. Evan Dart. The purpose of my project is to evaluate the effects of a peer-mediated intervention designed to decrease disruptive behavior in elementary school students with ADHD with a secondary purpose of increasing on-task behavior. The rationale behind this study is to utilize functional assessment data to inform and design an intervention implemented by peers for students with ADHD. Contingent on this study yielding effective results, this information could be used not only in a way to provide services to students with ADHD, but also use peers as interventionists. This is important because the intervention will still be implemented without increasing the demands of the teacher.

If you agree to have your child be part of this study, he or she will receive an intervention implemented by a high-achieving peer in their classroom. The study will consist of eight students, 4 target students and 4 student interventionists. All participants will spend no more than 20 minutes a day participating in the study. I, the primary researcher, will be training and supervising the student interventionist the entire time of the study, and the student interventionist will only implement the intervention when I am in the room. The intervention consists of the peer interventionist providing attention to your child with the intention that this will eliminate the need for your child to access attention by engaging in disruptive behaviors.

Potential benefits that could occur during this study is the decrease in rates of disruptive behavior for your student as well as the increase in on-task behavior. Additionally, the student interventionist will be modeling appropriate social interactions with the target student, with the potential for that to generalize to future appropriate social interactions. At this time, there are very few foreseeable risks that your child would endure, however both the target student and interventionist will be observed to account for any undesirable effects (such as increases in disruptive behavior). Contingent upon any undesirable effects, modifications to the intervention will be implemented or the study will be discontinued and additional services will be provided.

All information collected during this process (i.e. interviews, data from observations, etc.) will be kept confidential. Identifying information regarding your child will not be disclosed to any person not involved in this study. It is possible that results from this study will be shared at professional conferences or published in scholarly journals, however all identifying information will be removed prior to presentations and/or publications.

Your consent of your child's participation in this study is completely voluntarily. You also have the right to withdraw your child from the study at any time without penalty, prejudice, or loss of benefits. Additionally, further services may be provided outside the study if requested. The primary researcher will take every precaution to conduct this study with the best scientific practice procedures. This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the IRB at 601-266-5997.

If you give consent for your child to participate in this study, please read, sign, and return the last page of this document. Please keep this letter for your records. If you have any questions about this study, please contact the primary researcher, Kate Helbig at (309) 750-2991 and/or kate.helbig@eagles.usm.edu or the primary researcher's supervisor, Dr. Evan Dart (evan.dart@usm.edu).

Sincerely,

Kate Helbig, B.A.
School Psychologist-in-Training
Department of Psychology
The University of Southern Mississippi

THIS SECTION TO BE COMPLETED BY PARENT

Please Read and Sign the Following:

Consent is hereby given to participate in this research project. All procedures and/or investigations to be followed and their purpose, including experimental procedures, were explained to me. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

The opportunity to ask questions regarding the research and procedures was given. Participation in the study is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss of benefits. All personal information is strictly confidential, and no names will be disclosed. Any new information that develops during the project will be provided if that information may affect the willingness to continue participation in the project.

Questions concerning the research, at any time during or after the project, should be directed to the Principal Investigator with the contact information provided above. This project and this consent for have been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-5997.

Name of Child

Signature of Parent

Person Explaining the Study

Date

Date

APPENDIX B – TEACHER CONSENT

Dear Teacher,

I am a doctoral student in the School Psychology Program at The University of Southern Mississippi working under the supervision of faculty member Dr. Evan Dart. The purpose of my project is to evaluate the effects of a peer-mediated intervention designed to decrease disruptive behavior in elementary school students with ADHD with a secondary purpose of increasing on-task behavior. The rationale behind this study is to utilize functional assessment data to inform and design an intervention implemented by peers for students with ADHD. Contingent on this study yielding effective results, this information could be used not only in a way to provide services to students with ADHD, but also use peers as interventionists. This is important because the intervention will still be implemented without increasing the demands of the teacher.

If you agree to be part of this study, you will be asked to complete a few small tasks prior to the intervention beginning. First, you will be asked to complete a semi-structured interview regarding the target student's occurrences of disruptive behavior. Additionally, you will be asked to nominate a student to act as the student interventionist according to a list of characteristics that will be provided by the primary researcher. Finally, you will be asked to complete a rating scale regarding how acceptable and effective you perceived the intervention to be.

If you agree to participate in the study, your student will receive an intervention implemented by a high-achieving student peer in their classroom. The study will consist of eight students, 4 target students and 4 student interventionists. All participants will spend no more than 20 minutes a day participating in the study. I, the primary researcher, will be training and supervising the student interventionist the entire time of the study, and the student interventionist will only implement the intervention when I am in the room. The intervention consists of the peer interventionist providing attention to the target student with the intention that this will eliminate the need for your child to access attention by engaging in disruptive behaviors.

Potential benefits that could occur during this study is the decrease in rates of disruptive behavior for your student as well as the increase in on-task behavior.

Additionally, the student interventionist will be modeling appropriate social interactions with the target student, with the potential for that to generalize to future appropriate social interactions. At this time, there are very few foreseeable risks that your students would endure, however both the target student and interventionist will be observed to account for any undesirable effects (such as increases in disruptive behavior). Contingent upon any undesirable effects, modifications to the intervention will be implemented or the study will be discontinued and additional services will be provided.

All information collected during this process (i.e. interviews, data from observations, etc.) will be kept confidential. Identifying information regarding your name, student's names, and any other identifying information will not be disclosed to any person not involved in this study. It is possible that results from this study will be shared at professional conferences or published in scholarly journals, however all identifying information will be removed prior to presentations and/or publications.

Your participation in this study is completely voluntarily. You also have the right to withdraw from the study at any time without penalty, prejudice, or loss of benefits. Additionally, further services may be provided outside the study if requested. The primary researcher will take every precaution to conduct this study with the best scientific practice procedures. This project has been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the IRB at 601-266-5997.

If you give consent to participate in this study, please read, sign, and return the following page. Please keep this letter for your records. If you have any questions about this study, please contact the primary researcher, Kate Helbig at (309) 750-2991 and/or kate.helbig@eagles.usm.edu or the primary researcher's supervisor, Dr. Evan Dart (evan.dart@usm.edu).

Sincerely,

Kate Helbig, B.A.

School Psychologist-in-Training

Department of Psychology
The University of Southern Mississippi

THIS SECTION TO BE COMPLETED BY TEACHER

Please Read and Sign the Following:

Consent is hereby given to participate in this research project. All procedures and/or investigations to be followed and their purpose, including experimental procedures, were explained to me. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

The opportunity to ask questions regarding the research and procedures was given. Participation in the study is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss of benefits. All personal information is strictly confidential, and no names will be disclosed. Any new information that develops during the project will be provided if that information may affect the willingness to continue participation in the project.

Questions concerning the research, at any time during or after the project, should be directed to the Principal Investigator with the contact information provided above. This project and this consent for have been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-5997.

Signature of Teacher

Person Explaining the Study

Date

Date

Characteristics of a Good Student Interventionist

Responsible

High-achieving

Motivated

Willingness to help

Mature

Adequate social skills

Trustworthy

APPENDIX D – STUDENT INTERVENTIONIST CONSENT

Dear Parent,

I am a doctoral student in the School Psychology Program at The University of Southern Mississippi working under the supervision of faculty member Dr. Evan Dart. The purpose of my project is to evaluate the effects of a peer-mediated intervention designed to decrease disruptive behavior in elementary school students with ADHD with a secondary purpose of increasing on-task behavior. The rationale behind this study is to utilize functional assessment data to inform and design an intervention implemented by peers for students with ADHD. Contingent on this study yielding effective results, this information could be used not only in a way to provide services to students with ADHD, but also use peers as interventionists. This is important because the intervention will still be implemented without increasing the demands of the teacher

If you are receiving this letter, your child has been nominated by their teacher to be a high-achieving, responsible, student with a willingness to help others. If you agree to have your child be part of this study, he or she will implement an intervention to a student struggling to engage in on-task behavior during class. The study will consist of eight students, 4 target students and 4 student interventionists. All participants will spend no more than 20 minutes a day participating in the study. I, the primary researcher, will be training and supervising the student interventionist the entire time of the study, and the student interventionist will only implement the intervention when I am in the room. The training for the student interventionist will occur during the last 10 minutes of an elective period (e.g. activity or music) so that your child will not miss any core class instruction. The intervention consists of your child, the peer interventionist, providing attention to the target student with the intention that this will eliminate the need for that student to access attention by engaging in disruptive behaviors.

Potential benefits that could occur during this study is the decrease in disruptive behavior in the target students. Additionally, the student interventionist will be modeling appropriate social interactions with the target student, with the potential for that to generalize to future appropriate social interactions. At this time, there are very few foreseeable risks that your child would endure, however both the target student and

interventionist will be observed to account for any undesirable effects (such as increases in disruptive behavior). Contingent upon any undesirable effects, modifications to the intervention will be implemented or the study will be discontinued and additional services will be provided. Your child may experience discomfort when missing the last ten minutes of an elective period to receive training, however the primary researcher will explain to the student interventionist that they were selected because they are a ‘role-model student’ in the classroom and they were selected them to help a classmate.

All information collected during this process (i.e. interviews, data from observations, etc.) will be kept confidential. Identifying information regarding your child will not be disclosed to any person not involved in this study. It is possible that results from this study will be shared at professional conferences or published in scholarly journals, however all identifying information will be removed prior to presentations and/or publications.

Your consent of your child’s participation in this study is completely voluntarily. You also have the option to withdraw your child from the study at any time without penalty, prejudice, or loss of benefits. Additionally, further services may be provided outside the study if requested. The primary researcher will take every precaution to conduct this study with the best scientific practice procedures.

If you give consent for your child to participate in this study, please read, sign, and return the following page. Please keep this letter for your records. If you have any questions about this study, please contact the primary researcher, Kate Helbig at (309) 750-2991 and/or kate.helbig@eagles.usm.edu or the primary researcher’s supervisor, Dr. Evan Dart (evan.dart@usm.edu).

Sincerely,

Kate Helbig, B.A.
School Psychologist-in-Training
Department of Psychology
The University of Southern Mississippi

THIS SECTION TO BE COMPLETED BY PARENT

Please Read and Sign the Following:

Consent is hereby given to participate in this research project. All procedures and/or investigations to be followed and their purpose, including experimental procedures, were explained to me. Information was given about all benefits, risks, inconveniences, or discomforts that might be expected.

The opportunity to ask questions regarding the research and procedures was given. Participation in the study is completely voluntary, and participants may withdraw at any time without penalty, prejudice, or loss of benefits. All personal information is strictly confidential, and no names will be disclosed. Any new information that develops during the project will be provided if that information may affect the willingness to continue participation in the project.

Questions concerning the research, at any time during or after the project, should be directed to the Principal Investigator with the contact information provided above. This project and this consent for have been reviewed by the Institutional Review Board, which ensures that research projects involving human subjects follow federal regulations. Any questions or concerns about rights as a research participant should be directed to the Chair of the Institutional Review Board, The University of Southern Mississippi, 118 College Drive #5147, Hattiesburg, MS 39406-0001, (601) 266-5997.

Name of Child

Signature of Parent

Person Explaining the Study

Date

Date

APPENDIX E – INTEGRITY CHECKLIST

Directions: Mark a check mark in the box each time the student interventionist delivers reinforcement to the target student.

APPENDIX F – PROCEDURAL INTEGRITY CHECKLIST

Participant: _____

Observer: _____

Teacher: _____

Date: _____

- | | | | |
|--|---|---|-----|
| 1. Begin training by explaining student will be helping a classmate do better in class | Y | N | N/A |
| 2. Introduce MotivAIDer to students
“this is a tool that let’s us know when to do something by buzzing’ | Y | N | N/A |
| 3. Explain NCR intervention
“when the Motivaider buzzes, your job is to say encouraging words to your buddy. You can say things like ‘great job working!’ or ‘awesome listening to the teacher!’” | Y | N | N/A |
| 4. Explain data collection procedures
“every time you say something encouraging to your buddy, put a check mark in the box” | Y | N | N/A |
| 5. Graduate students model NCR intervention | Y | N | N/A |
| 6. Student interventionists role play implementing NCR intervention to graduate students | Y | N | N/A |
| 7. Graduate students provide praise and corrective feedback to student interventionists during role play | Y | N | N/A |
| 8. Student interventionists demonstrate mastery of implementation at a minimum of once per session | Y | N | N/A |

Steps completed ____ / Total steps x 100 = ____%

University of Southern Mississippi
SCHOOL PSYCHOLOGY PROGRAM
PEER-MEDIATED NCR INTERVENTION

Session Duration:	20 minute observations
Setting:	Classroom
Materials:	Motivaider, self-monitoring sheet, pencil

Graduate Student Procedures:

1. Provide student interventionist with materials (i.e. Motivaider, self-monitoring sheet, pencil)
2. Signal to the student interventionist when to start the Motivaider
3. Instruct the student interventionist to sit next to the target student

Student Interventionist Procedures:

1. When the Motivaider signals, provide a neutral statement to the target student. Say statements such as “your shirt is yellow” or “today is Tuesday”
2. Mark an X on the self-monitoring sheet every time a statement is provided
3. Only provide statements when the Motivaider signals to do so
4. Continue for the entire 20 minute session

DO NOT:

1. Prompt the target student (i.e. say things like “get back to work” or “pay attention”)
2. Praise the target student (i.e. say things like “great job doing your work” or “nice job paying attention”)
3. Talk to the target student during the intervention

Procedural Fidelity: Assess for every session.

APPENDIX H – OBSERVATION SHEET

Student:
Observer:

Date:
IOA:

Observation:
IOA Observer:

Interval	Antec		Target Bx			Consequences				Interval	Antec		Target Bx			Consequences			
	Tsk	No Dmd				T Att	Peer Att	E/A	Tangible		Tsk	No Dmd				T Att	Peer Att	E/A	Tangible
1.1										6.1									
2										2									
3										3									
4										4									
5										5									
6										6									
2.1										7.1									
2										2									
3										3									
4										4									
5										5									
6										6									
3.1										8.1									
2										2									
3										3									
4										4									
5										5									
6										6									
4.1										9.1									
2										2									
3										3									
4										4									
5										5									
6										6									
5.1										10.1									
2										2									
3										3									
4										4									
5										5									
6										6									

APPENDIX I – FAIR T – II

FUNCTIONAL INFORMANT RECORD FOR TEACHERS VERSION II

**Functional Assessment
Informant Record for
Teachers-II**

Teacher Name:

School:

Date:

Student Information

Name: _____

Date of Birth: _____ Age: _____

Gender: _____ Grade: _____

Race: African American Asian Caucasian Hispanic Native American

Other: _____

Classification: General Education Special Education Eligibility Category:

Problem Behaviors

FAIR-T II

Please circle **1 to 3** problem behaviors only and rank the behaviors in order of severity with 1 being the most severe and 3 being the least severe.

Potential Problem Behaviors (only circle 3; rank in order of severity 1= most; 3 = least)

Rank Order

Off-task behavior (e.g., looking away from academic work/ teacher; failing to complete work)	1 2 3
Inappropriate Vocalizations (e.g., talking without permission; making sounds; calling out)	1 2 3
Fidgeting or playing with objects (e.g., tapping pencil; playing with toys)	1 2 3
Out of Seat or Area (e.g., leaving assigned seat or area; student leaves classroom)	1 2 3

Non-complaint behavior (e.g., failing to follow adult instructions)	1	2	3
Disrespectful behavior (e.g., arguing with adults, using profanity)	1	2	3
Aggressive Behavior (e.g., hitting, kicking, biting others; throwing objects at others)	1	2	3
Self-injurious Behavior (e.g., hurting oneself)	1	2	3
Bullying (e.g., picking on peers; making fun of others; coercive comments)	1	2	3
Tantrum (e.g., yelling, screaming, crying, throwing oneself on the floor)	1	2	3
Inappropriate social behavior (e.g., staring at others; too close in physical proximity)	1	2	3
Failure to speak/talk in class (e.g., will not talk to others despite ability to do so)	1	2	3
Emotional behavior (e.g., student shuts down; student cries excessively outside of tantrums)	1	2	3
Sleeping in class (e.g., student lays head down or sleeps during instruction)	1	2	3
Other behavior:	1	2	3

1. Rate how manageable the behavior is:

- | | | | | | |
|-----------------------|------------|---|---|---|--------------|
| a. Problem Behavior 1 | 1 | 2 | 3 | 4 | 5 |
| | Manageable | | | | Unmanageable |
| b. Problem Behavior 2 | 1 | 2 | 3 | 4 | 5 |
| | Manageable | | | | Unmanageable |
| c. Problem Behavior 3 | 1 | 2 | 3 | 4 | 5 |
| | Manageable | | | | Unmanageable |

2. Rate how disruptive the behavior is:

- | | | | | | |
|-----------------------|--------|---|---|---|------|
| a. Problem Behavior 1 | 1 | 2 | 3 | 4 | 5 |
| | Mildly | | | | Very |
| a. Problem Behavior 2 | 1 | 2 | 3 | 4 | 5 |
| | Mildly | | | | Very |
| a. Problem Behavior 3 | 1 | 2 | 3 | 4 | 5 |
| | Mildly | | | | Very |

3. How often does the behavior occur per day (please circle)?

- | | | | | | |
|-----------------------|---------|-------|-------|---------|------|
| a. Problem Behavior 1 | < 1 - 3 | 4 - 6 | 7 - 9 | 10 - 12 | > 13 |
| a. Problem Behavior 2 | < 1 - 3 | 4 - 6 | 7 - 9 | 10 - 12 | > 13 |
| a. Problem Behavior 3 | < 1 - 3 | 4 - 6 | 7 - 9 | 10 - 12 | > 13 |

4. How many months has the behavior been present?
- | | | | | | |
|-----------------------|-----|---|---|---|--------------------|
| a. Problem Behavior 1 | < 1 | 2 | 3 | 4 | entire school year |
| a. Problem Behavior 2 | < 1 | 2 | 3 | 4 | entire school year |
| a. Problem Behavior 3 | < 1 | 2 | 3 | 4 | entire school year |
5. How long does the problem behavior last in duration?
- | | | | | |
|-----------------------|---------|-----------|------------|----------|
| a. Problem Behavior 1 | < 1 min | 1 - 5 min | 6 - 10 min | > 10 min |
| b. Problem Behavior 2 | < 1 min | 1 - 5 min | 6 - 10 min | > 10 min |
| c. Problem Behavior 3 | < 1 min | 1 - 5 min | 6 - 10 min | > 10 min |

6. For each problem behavior, provide an appropriate replacement behavior that you would like the student to perform instead of the current problem behavior.

- | | |
|-----------------------|--------------------------------|
| a. Problem Behavior 1 | a. Replacement Behavior: _____ |
| b. Problem Behavior 2 | b. Replacement Behavior: _____ |
| c. Problem Behavior 3 | c. Replacement Behavior: _____ |

Antecedents:

0= never happens 1 = happens a little 2 = happens some
 3 = happens very often

Please circle the corresponding number for each of the three behaviors listed.

	Behavior 1	Behavior 2	Behavior 3
Academic Task Demand			
1 Does the behavior occur during a certain <u>type</u> of task?	0 1 2 3	0 1 2 3	0 1 2 3
2 Does the behavior occur during <u>easy</u> tasks?	0 1 2 3	0 1 2 3	0 1 2 3
3 Does the behavior occur during <u>difficult</u> tasks?	0 1 2 3	0 1 2 3	0 1 2 3
4 Does the behavior occur during <u>certain subject areas</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
5 Does the behavior occur during <u>new</u> subject material?	0 1 2 3	0 1 2 3	0 1 2 3

I				
I				
.	Transitions			
6	Does the behavior occur when a request is made to <u>stop</u> an activity?	0 1 2 3	0 1 2 3	0 1 2 3
7	Does the behavior occur when a request is made to <u>begin a new activity</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
8	Does the behavior occur during <u>transition</u> periods (academic subjects or locations)?	0 1 2 3	0 1 2 3	0 1 2 3
I				
I				
I				
.	Academic Settings			
9	Does the behavior occur in <u>certain settings</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
10	Does the behavior occur in <u>large group</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
11	Does the behavior occur in <u>small group</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
12	Does the behavior occur in <u>independent work</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
13	Does the behavior occur in <u>one-to-one interaction</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
I				
V				
.	Non-Classroom Settings			
14	Does the behavior occur in the <u>bathroom</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
15	Does the behavior occur at <u>recess</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
16	Does the behavior occur in the <u>cafeteria</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
17	Does the behavior occur on the <u>bus</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
18	Does the behavior occur in <u>other situations</u> ? Specify other:			

V				
.	Presentation Style			
19	Does the behavior occur when items are presented <u>auditorily</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
20	Does the behavior occur more often during motor activities?	0 1 2 3	0 1 2 3	0 1 2 3
21	Does the behavior occur when items are presented <u>visually</u> ?	0 1 2 3	0 1 2 3	0 1 2 3
VI.	Time of Day			
22	Does the behavior occur in the morning (before lunch)?	0 1 2 3	0 1 2 3	0 1 2 3
23	Does the behavior occur in the afternoon (after lunch)?	0 1 2 3	0 1 2 3	0 1 2 3
VII.	Physiological			
24	Does the behavior occur when the student is having complications with a medical condition?	0 1 2 3	0 1 2 3	0 1 2 3

2 5	Does the behavior occur if the student appears to be hungry?	0 1 2 3	0 1 2 3	0 1 2 3
3 3	Does the behavior occur if the student appears to be tired?	0 1 2 3	0 1 2 3	0 1 2 3
V				
I				
I				
I				
. Other				
2 6	Does the behavior occur when a <i>disruption</i> occurs in the normal routine?	0 1 2 3	0 1 2 3	0 1 2 3
2 7	Does the behavior occur when the student's <i>request has been denied</i> ?	0 1 2 3	0 1 2 3	0 1 2 3
2 8	Does the behavior occur when a <i>specific person is in the room</i> ?	0 1 2 3	0 1 2 3	0 1 2 3
2 9	Does the behavior occur when a <i>specific person is absent from the room</i> ?	0 1 2 3	0 1 2 3	0 1 2 3
3 0	Are there any other behaviors that usually <i>precede</i> the problem behavior? What?	0 1 2 3	0 1 2 3	0 1 2 3
3 1	Is there anything you could do that would <i>ensure</i> the occurrence of the behavior? What?	0 1 2 3	0 1 2 3	0 1 2 3
3 2	Are there any events occurring in the child's home that seem to <i>precede</i> the occurrence of the behavior at school? What?	0 1 2 3	0 1 2 3	0 1 2 3
3 4	Does anything else precede the problem behavior that is likely to "set it off"?	0 1 2 3	0 1 2 3	0 1 2 3

Consequences:

Please circle the corresponding number for each of the three behaviors listed.				
1	Positive Reinforcement: Access to Preferred Activities or Items	Behavior 1	Behavior 2	Behavior 3
1	Does someone provide the student with access to an activity after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
2	Does someone provide the student with access to a toy or item after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
3	Does the student take possession of an activity after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
4	Does the student take possession of a toy or item after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
5	Does the student bring activities, toys, or items to school that are associated with the behavior?	0 1 2 3	0 1 2 3	0 1 2 3
I				
1	Negative Reinforcement: Escape, Delay, Reduction or Avoidance of Demands	0 1 2 3	0 1 2 3	0 1 2 3
6	Are ongoing task demands removed or terminated during or after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
7	Are ongoing task demands reduced during or after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
8	Is the start of a new task demand delayed after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
9	Is the start of a new task demand completely avoided after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
1 0	Is there any task you have stopped presenting to the student as a result of the problem behavior? If yes,			

describe:

I
I
I **Positive Reinforcement: Attainment of Peer and Teacher Attention**

1 Does the student receive positive attention from peers during or after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
1 Does the student receive negative attention from peers during or after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
1 Does the student receive positive attention from adults during or after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
1 Does the student receive negative attention from adults during or after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
1 Does the teacher re-direct or interrupt the child during or after the behavior is exhibited?	0 1 2 3	0 1 2 3	0 1 2 3

I
V **Negative Social Reinforcement: Escape, Delay, Reduction or Avoidance of Attention**

1 Are ongoing social interactions with peers stopped during or after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
1 Are upcoming social interactions with peers avoided after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
1 Are ongoing social interactions with adults stopped during or after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
1 Are upcoming social interactions with adults avoided after the behavior has occurred?	0 1 2 3	0 1 2 3	0 1 2 3
2 Specific individuals stopped interacting with this student due to the behavior?	0 1 2 3	0 1 2 3	0 1 2 3

V
V **Automatic Reinforcement:**

2 Does the student display the behavior when alone without interaction from others?	0 1 2 3	0 1 2 3	0 1 2 3
2 Does the student appear to be calm or relaxed as a result of performing the behavior?	0 1 2 3	0 1 2 3	0 1 2 3
2 Does the student appear to be excited or aroused as a result of performing the behavior?	0 1 2 3	0 1 2 3	0 1 2 3
2 Does the student appear to obtain pleasure or enjoyment from performing the behavior itself?	0 1 2 3	0 1 2 3	0 1 2 3
2 Does the student appear to obtain stimulation (visual, auditory, motor) as a result of performing the behavior?	0 1 2 3	0 1 2 3	0 1 2 3

V
I
I
I **Other Problems**

2 Are there other problem behaviors that often occur after the behavior is exhibited? If yes, describe:	0 1 2 3	0 1 2 3	0 1 2 3
---	---------	---------	---------

V
I
I **Intervention**

2 Does the student typically receive praise or any positive consequence when behavior occurs that you would
7 like to see instead of the problem behavior? If yes, describe:



URP-Intervention

Directions: Consider the described intervention when answering the following statements. Circle the number that best reflects your agreement with the statement, using the scale provided below.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. This intervention is an effective choice for addressing a variety of problems.	1	2	3	4	5	6
2. I would need additional resources to carry out this intervention.	1	2	3	4	5	6
3. I would be able to allocate my time to implement this intervention.	1	2	3	4	5	6
4. I understand how to use this intervention.	1	2	3	4	5	6
5. A positive home-school relationship is needed to implement this intervention.	1	2	3	4	5	6
6. I am knowledgeable about the intervention procedures.	1	2	3	4	5	6
7. The intervention is a fair way to handle the child's behavior problem.	1	2	3	4	5	6
8. The total time required to implement the intervention procedures would be manageable.	1	2	3	4	5	6
9. I would not be interested in implementing this intervention.	1	2	3	4	5	6
10. My administrator would be supportive of my use of this intervention.	1	2	3	4	5	6
11. I would have positive attitudes about implementing this intervention.	1	2	3	4	5	6
12. This intervention is a good way to handle the child's behavior problem.	1	2	3	4	5	6
13. Preparation of materials needed for this intervention would be minimal.	1	2	3	4	5	6

URP-IR was created by Sandra M. Chafouleas, Amy M. Briesch, Sabina Rak Neugebauer, & T. Chris Riley-Tillman. Copyright © 2011 by the University of Connecticut. All rights reserved. Permission granted to photocopy for personal and educational use as long as the names of the creators and the full copyright notice are included in all copies.



	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
14. Use of this intervention would be consistent with the mission of my school.	1	2	3	4	5	6
15. Parental collaboration is required in order to use this intervention.	1	2	3	4	5	6
16. Implementation of this intervention is well matched to what is expected in my job.	1	2	3	4	5	6
17. Material resources needed for this intervention are reasonable.	1	2	3	4	5	6
18. I would implement this intervention with a good deal of enthusiasm.	1	2	3	4	5	6
19. This intervention is too complex to carry out accurately.	1	2	3	4	5	6
20. These intervention procedures are consistent with the way things are done in my system.	1	2	3	4	5	6
21. This intervention would not be disruptive to other students.	1	2	3	4	5	6
22. I would be committed to carrying out this intervention.	1	2	3	4	5	6
23. The intervention procedures easily fit in with my current practices.	1	2	3	4	5	6
24. I would need consultative support to implement this intervention.	1	2	3	4	5	6
25. I understand the procedures of this intervention.	1	2	3	4	5	6
26. My work environment is conducive to implementation of an intervention like this one.	1	2	3	4	5	6
27. The amount of time required for record keeping would be reasonable.	1	2	3	4	5	6
28. Regular home-school communication is needed to implement intervention procedures.	1	2	3	4	5	6
29. I would require additional professional development in order to implement this intervention.	1	2	3	4	5	6

URP-IR was created by Sandra M. Chafouleas, Amy M. Briesch, Sabina Rak Neugebauer, & T. Chris Riley-Tillman. Copyright © 2011 by the University of Connecticut. All rights reserved. Permission granted to photocopy for personal and educational use as long as the names of the creators and the full copyright notice are included in all copies.



APPENDIX K –CHILDREN’S INTERVENTION RATING PROFILE

CHILDREN’S INTERVENTION RATING PROFILE

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
The intervention to deal with behavior was fair.	1	2	3	4	5	6
The intervention used to deal with behavior may cause problems with this child’s friends.	1	2	3	4	5	6
There are better ways to handle this child’s problem than the one used here	1	2	3	4	5	6
The intervention used here would be good to use with other children	1	2	3	4	5	6
I liked the intervention used for this child’s behavior	1	2	3	4	5	6
I think that this intervention helped this child do better in school	1	2	3	4	5	6

APPENDIX L – SCHOOL APPROVAL LETTER

October 13th, 2015

Kate Helbig, B.A
School Psychologist-in-Training
Department of Psychology
University of Southern Mississippi

Re: Research project support

To Whom It May Concern,

Greene County School District supports Kate Helbig, a doctoral graduate student in the school psychology program at the University of Southern Mississippi, and her proposed project titled “The Effects of a Function-Based Peer-Mediated Behavioral Intervention with Elementary School Students with ADHD”.

We anticipate that this project will provide insight to utilizing interventionists other than teachers so we can still provide services to students in need without increasing teacher demands. The goal of this project is to decrease disruptive behavior and increase classroom on-task behavior in students with ADHD by training a model peer to implement the intervention. Both students will be trained, monitored, and supervised by a USM graduate student throughout the entire project.

I fully support the efforts of Kate Helbig and the School Psychology Program at the University of Southern Mississippi as they seek IRB approval for this studies.

Sincerely,



APPENDIX M – IRB APPROVAL LETTER



INSTITUTIONAL REVIEW BOARD
118 College Drive #5147 | Hattiesburg, MS 39406-0001
Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional.review.board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: 15110309
PROJECT TITLE: The Effects of a Function-Based Peer-Mediated Behavioral Intervention with Elementary School Students with ADHD
PROJECT TYPE: New Project
RESEARCHER(S): Kate Helbig
COLLEGE/DIVISION: College of Education and Psychology
DEPARTMENT: Psychology
FUNDING AGENCY/SPONSOR: N/A
IRB COMMITTEE ACTION: Expedited Review Approval
PERIOD OF APPROVAL: 11/06/2015 to 11/05/2016
Lawrence A. Hosman, Ph.D.
Institutional Review Board

REFERENCES

- Abramowitz, A., J. & O'Leary, S., G. (1991). Behavioral Interventions for the classroom: Implications for students with ADHD. *School Psychology Review, 20*, 220-234.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.) Arlington, VA: American Psychiatric Publishing.
- American Academy of Pediatrics. (2011). ADHD: Clinical practice guideline for the diagnosis, evaluation, and treatment of attention-deficit/hyperactivity disorder in children and adolescents, *Pediatrics, 128*, 1007-1022.
- Anderson, C. M., Rodriguez, B. J., & Campbell (2015). Functional behavior assessment in schools: Current status and future directions. *Journal of Behavioral Education, 24*, 338-371.
- Ayllon, T., Layman, D., & Kandel, H. J. (1975). A behavioral-educational alternative to drug control of hyperactive children. *Journal of Applied Behavior Analysis, 8*, 137-146.
- Banaschewski, T., Roessner, V., Dittmann, R. W., Santosh, P. J., & Rothenberger, A. (2005). Non-stimulant medications in the treatment of ADHD. *European Child Adolescent Psychiatry, 13*, 102-116.
- Barkley, R. A. (Ed). 2006. Attention-deficit/hyperactivity disorder: A handbook for diagnosis and treatment (3rd ed). New York, NY: Guilford Press.
- Barkley, R. A., Fischer, M, Smallish, L., & Fletcher, K. (2006). Young adult outcome of hyperactive children: Adaptive functioning in major life activities. *Journal of the American Academy of Child & Adolescent Psychiatry, 45*, 192-202.

- Barry, T. D., Lyman, R. D., & Klinger, L. G., 2002. Academic underachievement and Attention-Deficit/Hyperactivity Disorder: The negative impact of symptom severity on school performance, *Journal of School Psychology, 40*, 259-283.
- Briesch, A. M., Chafouleas, S. M., Neugebauer, S. R., & Riley-Tillman, T. C. (2013). Assessing influences on intervention implementation: Revision of the Usage Rating Profile-Intervention. *Journal of School Psychology, 51*, 81-96.
- Broughton, S. F., & Hester, J. R., (1993). Effects of administrative and community support on teacher acceptance of classroom interventions. *Journal of Educational and Psychological Consultation, 4*, 169-177.
- Broussard, C., & Northup, J. (1997). The use of functional analysis to develop peer interventions for disruptive classroom behavior. *School Psychology Quarterly, 12*, 65-67.
- Budur, K., Mathews, M., Adetunji, B., Mathews, M., & Mahmud, J. (2005). Non-stimulant treatment for attention deficit hyperactivity disorder. *Psychiatry, 2*, 44-48.
- Carlson, J. S., Thaler, C. L., & Hirsch, A. J. (2008). Psychotropic medication consultation in schools: Ethical and legal dilemma for school psychologists. *Journal of Applied School Psychology, 22*, 29-41.
- Chafouleas, S. M., Briesch, A. M., Riley-Tillman, T. C., & McCoach, D. B. (2009). Moving beyond assessment of treatment acceptability: An examination of the factor structure of the Usage Rating Profile — Intervention (URP-I). *School Psychology Quarterly, 24*, 36–47.

- Cole, C. L. & Shapiro, E. S. (2005). Perceptions of trainers and practitioners regarding assessment and intervention for students with low incidence disabilities. *Psychology in the Schools, 42*, 677-689.
- Centers for Disease Control and Prevention. (2011). ADHD. Retrieved from <http://www.cdc.gov/ncbddd/adhd/features/key-findings-adhd72013.html>
- Cooper, J. O., Heron, T. J., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Boston, MA: Pearson.
- Dart, E. H., Collins, T. A., Klingbeil, D. A., & McKinley, L. E. (2014). Peer management interventions: A meta-analytic review of single-case research. *School Psychology Review, 43*, 367-384.
- Dib, N., & Sturmey, P. (2012). Behavioral skills training and skill learning. In N. M. Seel (Ed.), *Encyclopedia of the Sciences of Learning*, (pp. 437-438). US: Springer.
- Doggett, R. A., Edwards, R. P., Moore, J. W., Tingstrom, D. H., Wilczynski, S. M. (2001). An approach to functional assessment in general education classroom settings. *School Psychology Review, 30*, 313-328.
- Dufrene, B. A., Doggett, R. A., Henington, C., & Watson, T. S. (2007). Functional assessment and intervention for disruptive classroom behaviors in preschool and head start classrooms. *Journal of Behavioral Education, 16*, 368-388.
- DuPaul, G. J. & Jimerson, S. R. (2014). Assessing, understanding, and supporting students with ADHD at school. Contemporary science, practice, and policy. *School Psychology Quarterly, 29*, 379-384.
- DuPaul, G. J. & Stoner, G. (2003). *ADHD in the schools*. New York: Guilford.

- DuPaul, G. J. & Stoner, G. (2014). *ADHD in the schools: Assessment and intervention strategies* (3rd ed.). New York, NY: The Guilford Press.
- DuPaul, G. J. & Weyandt, L. L. (2006). School-based intervention for children with attention deficit hyperactivity disorder: Effects on academic, social, and behavioural functioning. *International Journal of Disability, Development, and Education*, 53, 161-176.
- DuPaul, G. J. & White, G. P. (2006). ADHD: Behavioral, educational, and medication interventions. *The Education Digest*, 71, 57-60.
- Fabiano, G. A., Pelham Jr. W. E., Coles, E. K., Gnagy, E. M., Chronis-Tuscano, A. & O'Connor, B. (2009). A meta-analysis of behavioral treatments for attention-deficit/hyperactivity disorder. *Journal of Clinical Psychology Review*, 29, 129-140.
- Filter, K. J. & Horner, R. H. (2009). Function-based academic interventions for problem behavior. *Education and Treatment of Children*, 31, 1-19.
- Finks, K. (2012). Attention Deficit Hyperactive Disorder. *NASN School Nurse*, 27, 24-25.
- Finn, J. D. & Zimmer, K. S. (2012) Student engagement: What is it? Why does it matter?. In Christenson, S. L., Reschly, A. L., & Wylie, C. (Eds.), *Handbook of Research on Student Engagement* (97-132). New York, NY: Springer.
- Flood, W. A., Wilder, D. A., Flood, A. L., & Masuda, A. (2002). Peer-mediated reinforcement plus prompting as treatment for off-task behavior in children with attention-deficit hyperactivity disorder. *Journal of Applied Behavior Analysis*, 35, 199-204.

- Frazier, T. W., Youngstrom, E. A., Glutting, J. L., & Watkins, M. W. (2007). Meta-analysis of the child, adolescent, and adult literatures and concomitant study with college students. *Journal of Learning Disabilities, 40*, 49-65.
- Gage, N. A., Lewis, T. L., & Stichter, J. P. (2012). Functional behavioral assessment-based interventions for students with or at risk for emotional and/or behavioral disorders in school: A hierarchical linear modeling meta-analysis. *Behavioral Disorders, 37*, 55-77.
- Goldstein, H., Kaczmarek, L., Pennington, R., & Shafer, K. (1992). Peer-mediated interventions: Attending to, commenting on, and acknowledging the behavior of preschoolers with autism. *Journal of Applied Behavior Analysis, 25*, 289-305.
- Grauvogel-MacAleese, A. N., & Wallace, M.d. (2010). Use of peer-mediated intervention in the children with attention deficit hyperactivity disorder. *Journal of Applied Behavior Analysis, 43*, 547-551.
- Gresham, F. M., Watson, T. S., & Skinner, C. H. (2001). Functional Behavioral Assessments: Principles, Procedures, and Future Directions. *School Psychology Review, 30*, 156-172.
- Gresham, F. M. (2004). Current status and future directions of school-based behavioral interventions. *School Psychology Review, 33*, 326-343.
- Gresham, F. M., McIntyre, L., Olson-Tinker, H., Dolstra, L., McLaughlin, V., & Van, M. (2004). Relevance of functional behavioral assessment research for school-based interventions and positive behavioral support. *Research in Developmental Disabilities, 25*, 19-37.

- Hanley, G. P., Iwata, B. A., & McCord, B. E. (2003). Functional analysis of problem behavior: A review. *Journal of Applied Behavior Analysis, 36*, 147-185.
- Hodgens, J. B., Cole, J., & Boldizar, J. (2000). Peer-based differences among boys with ADHD. *Journal of Clinical Child Psychology, 29*, 443-452.
- Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Council for Exceptional Children, 71*, 165-179.
- Individuals with Disabilities Act, SECTION (2004).
<http://idea.ed.gov/download/finalregulations.html>
- Ingram, K., Lewis-Palmer, T., & Sugai, G. (2005). Function-based intervention planning: Comparing the effectiveness of FBA function-based and non-function-based intervention plans. *Journal of Positive Behavior Interventions, 7*, 224-236.
- Johnston, C. & Mash, E. J. (2001). Families of children with Attention-Deficit/Hyperactivity Disorder: Review and recommendations for future research. *Clinical Child and Family Psychology Review, 4*, 183-207.
- Jones, K. M., Drew, H. A., & Weber, N., L. (2000). Noncontingent peer attention as treatment for disruptive classroom behavior. *Journal of Applied Behavior Analysis, 33*, 343-346.
- Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M & Shadish, W. R. (2010). Single-case designs technical documentation. Retrieved from What Works Clearinghouse website:
http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf.

- Kohler, F. W., & Strain, P. S. (1990). Peer-assisted interventions: Early promises, notable achievements, and future aspirations. *Clinical Psychology Review, 10*, 441-452.
- Lewis, T. J., Mitchell, B. S., Harvey, K., Green, A., & McKenzie, J. (2015). A comparison of functional behavioral assessment and functional analysis methodology among students with mild disabilities. *Behavioral Disorders, 41*, 5-20.
- Leko, M. M., Brownell, M. T., Lauterbach, A. A. (2010). High-incidence disabilities. In Boon, R. T., & Spencer, V. G. (Eds.), *Best practices for the inclusive classroom: Scientifically based strategies for success (25-50)*. Waco, TX: Prufrock Press Inc.
- Lloyd, J. W., Crowley, E. P., Kohler, F. W., & Strain, P. S. (1988). Redefining the applied research agenda: Cooperative learning, prereferral, teacher consultation, and peer-mediated interventions. *Journal of Learning Disabilities, 21*, 43-52.
- Miller, L., Dufrene, B. A., Olmi, D. J., Tingstrom, D. H., & Filce, H. (2015). Self-monitoring as a viable maintenance strategy in Check-in/Check-out. *Journal of School Psychology, 53*, 121-135.
- Miller, F. G. & Lee, D. L. (2013). Do functional behavioral assessments improve intervention effectiveness for students diagnosed with ADHD? A single-subject meta-analysis. *Journal of Behavior Education, 22*, 253-282.
- MTA Cooperative Group: National Institute of Mental Health Multimodal Treatment Study of ADHD follow-up: changes in effectiveness and growth after the end of treatment. *Pediatrics* 2004;113:762-769.

- Nathan, P.E., & Gorman, J. M. (Eds.). (2015). A guide to treatments that work. Oxford University Press.
- Newcomer, L. L. & Lewis, T. J. (2004). Functional Behavioral Assessment: An investigation of assessment reliability and effectiveness of function-based interventions. *Journal of Emotional and Behavioral Disorders, 12*, 168-181.
- Parker, R. I. & Vannest, K. (2009). Effect size for single-case research: nonoverlap of all pairs. *Behavior Therapy, 40*, 357-367.
- Pappadopulos, E., Jensen, P., Chait, A. R., Arnold, E., Swanson, J. M., Greenhill, L. L., Hechtman, L., Chuang, S., Wells, K. C., Pelham, W., Cooper, T., Elliott, G., Newcorn, J. H. (2008). Medication adherence in the MTA: Methylphenidate samples versus parent report and mediating effect of concomitant behavioral treatment. *Journal of the American Academy of Child and Adolescent Psychiatry, 48*, 501-510.
- Pelham, W. E., Aronoff, H. R., Midlam, J. K., Shapiro, C. J., Gnagy, E. M., Chonis, A. M., Onyango, A. N., Forehand, G., Nguyen, A., Waxmonsky, J. (1999). A comparison of Ritalin and Adderall: Efficacy and time-course in children with Attention-deficit/Hyperactivity Disorder. *Pediatrics, 103*, 805-819
- Pelham, W. E., & Fabiano, G. A., (2008). Evidence-based psychosocial treatments for Attention-Deficit/Hyperactivity Disorder. *Journal of Clinical Child and Adolescent Psychology, 37*, 184-214.
- Perepletchikova, F., & Kazdin, A. E. (2005). Treatment integrity and therapeutic change: Issue and research recommendations. *Clinical Psychology: Science and Practice, 12*, 365-383.

- Rappoport, M. D., Murphy, A., & Bailey, J. S. (1980). The effects of a response cost treatment tactic on hyperactive children. *Journal of School Psychology, 18*, 98-111.
- Reid, R. & Maag, J. W. (2006). Functional assessment: A method for developing classroom-based accommodations and interventions for children with ADHD. *Journal of Reading, Writing, and Learning Disabilities International, 14*, 9-42.
- Reid, R., Trout, A. L., & Schartz, M. (2005). Self-regulation interventions for children with Attention Deficit/Hyperactivity Disorder. *Council for Exceptional Children, 71*, 361-377.
- Riley-Tillman, T. C., & Chafouleas, S. M. (2003). Using interventions that exist in the natural environment to increase treatment integrity and social influence in consultation. *Journal of Educational and Psychological Consultation, 14*, 139-156.
- Robb, J. A., Sibley, M. H., Pelham, W. E. Jr, Foster, E. M., Molina, B. S.G., Gnagy, E. M., Kuriyan, A. B. (2011). The estimated annual cost of ADHD to the U.S. education system. *School Mental Health, 3*, 169-177.
- Shapiro, E. S., DuPaul, G. J., & Bradley-Klug, K. (1998). Self-Management as a Strategy to Improve the Classroom Behavior of Adolescents with ADHD. *Journal of Learning Disabilities, 31*, 545-555.
- Steege, M. W. & Watson, T. S. (2009). Conducting school-based functional behavioral assessments (2nd ed.). New York, NY: The Guilford Press

- Steiner, N. J., Sheldrick, C., Frenette, E. C., Rene, K. M., & Perrin, E. C. (2014). Classroom behavior of participants with ADHD compared with peers: Influence of teaching format and grade level. *Journal of Applied School Psychology, 30*, 209-222.
- Stokes, T. F. & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis, 10*, 349-367.
- Stormont, M. (2001). Social outcomes of children with AD/HD: Contributing factors and implications for practice. *Psychology in the Schools, 38*, 521-531.
- Turco, T. L., & Elliott, S. N. (1986). Assessment of students' acceptability ratings of teacher-initiated interventions for classroom misbehavior. *Journal of School Psychology, 24*, 277-283.
- Vannest, K. J., & Ninci, J. (2015). Evaluating intervention effects in single-case research designs. *Journal of Counseling & Development, 93*, 403-411.
- White, M., A. (1975). Natural rates of teacher approval and disapproval in the classroom. *Journal of Applied Behavior Analysis, 8*, 367-372.
- Wigal, S., B. (2009). Efficacy and safety limitations of attention-deficit hyperactivity disorder pharmacotherapy in children and adults, *CNS Drugs, 23*, 21-31.
- Witt, J. C., Noell, G. H., LaFleur, L. H., & Mortenson, B. P. (1997). Teacher use of interventions in general education settings: Measurement and analysis of the independent variable. *Journal of Applied Behavior Analysis, 30*, 693-696.