PSYCHOSOCIAL INTERVENTION FOR A FEMALE WITH A TRAUMATIC BRAIN INJURY SUSTAINED IN INFANCY

Thesis

Submitted to

The School of Education and Health Sciences of the

UNIVERSITY OF DAYTON

In Partial Fulfillment of the Requirements for

The Degree of

Educational Specialist in School Psychology

By

Heather A. Fehring

Dayton, Ohio

August, 2015

PSYCHOSOCIAL INTERVENTION FOR A FEMALE WITH A TRAUMATIC BRAIN INJURY SUSTAINED IN INFANCY

Name: Fehring, Heather A.

APPROVED BY:

_____
Susan C. Davies, Ed.D.
Advisory Committee Chair
Associate Professor
Department of Counselor Education
& Human Services

_____
Elana R. Bernstein, Ph.D.
Committee Member
Clinical Faculty
Department of Counselor Education &
Human Services

_____
Joni L. Baldwin, Ed.D.
Committee Member
Associate Professor
Coordinator Early Childhood Program

ABSTRACT

PSYCHOSOCIAL INTERVENTION FOR A FEMALE WITH A TRAUMATIC BRAIN INJURY SUSTAINED IN INFANCY

Name: Fehring, Heather
University of Dayton

Advisor: Dr. Susan Davies

Students who experience a traumatic brain injury may develop challenges in the areas of academics, behavior, and social emotional functioning. Many of these difficulties may be attributed to executive functioning deficits, which include impairments to higher-order cognitive processes such as reasoning, making decisions, monitoring, thinking critically, and metacognition. This study evaluated the efficacy of a school based psychosocial intervention for a student with a traumatic brain injury sustained in infancy who has related executive functioning deficits.

I'd like to dedicate this thesis to my dad, Paul, who has been supportive throughout my educational journey-who has cheered me on, or pushed me when I needed it the most, and has served as my role model. I'd also like to dedicate this thesis to my fiancé, Matt, who has been by my side throughout this entire process and there to offer support, encouragement, and a good laugh when needed.

ACKNOWLEDGEMENTS

I would like to acknowledge my thesis chair, Dr. Susan Davies for her constant advice and support during this process, and throughout graduate school. I would also like to thank the members of my committee, Dr. Elana Bernstein and Dr. Joni Baldwin for their feedback and support throughout the process. I also want to acknowledge my research partner, Natalie Anderson, for her dedication, support, and motivation. I'd also like to thank the urban Ohio school district that welcomed me into their school to work with their students.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Approximately 1.7 million individuals sustain traumatic brain injuries (TBI) every year in the United States (Center for Disease Control, 2013). Many of these individuals are students, who consequently experience difficulties in the academic setting. Individuals who have sustained TBI may face many daily consequences such as social, behavioral, cognitive, neurological, and academic. All of these may be caused or exacerbated by executive functioning (EF) difficulties. EF involves higher-order cognitive processes such as reasoning, making decisions, thinking critically, and monitoring one's cognitive process (metacognition). Strong EF skills permit more effective learning, attention, decision-making, and critical thinking (Santrock, 2011). Few studies have examined interventions for individuals who have sustained TBI and who display EF deficits.

Often, children who have sustained a TBI are mislabeled as having attention-deficit/hyperactivity disorder (ADHD; Holcomb et al., 2010), and may also have executive functioning difficulties (Cooper, Heron, & Heward, 2007). Due to the fact that TBI and ADHD can both involve EF deficits, interventions for students with ADHD are often applied to students with TBI (Jantz, Davies, & Bigler, 2014). Several interventions have been evaluated for EF deficits in students with ADHD, such as cognitive behavioral

therapy (CBT) and psychosocial interventions. However, more research is needed to evaluate effective interventions for students with TBI who also have EF deficits. The current study examined the use of a psychosocial intervention involving CBT techniques for a female in an urban school who sustained a TBI in infancy that resulted in poor EF skills.

During the course of this study, a colleague (Anderson, 2015) evaluated the efficacy of the same intervention with an elementary aged male in a rural district who sustained a TBI in kindergarten. The purpose of implementing this study with different sexes, typology of the school district, and age of TBI was to explore how the same intervention would effect different populations of students with TBI.

CHAPTER II

LITERATURE REVIEW

This literature review provides a basic overview of traumatic brain injury (TBI), including the definition and prevalence rates, the types and severity of TBI, how TBI is related to the age of injury, the recovery process of TBI, and special education and 504 plans. The literature review will also cover the possible consequences of TBI in a school setting. Social, emotional, neurological, behavioral and cognitive consequences will be reviewed. Existing cognitive behavioral interventions for executive functioning deficits will be discussed. Finally, the specific intervention that will be used in this study will be described, including existing research support for the program.

Overview of Traumatic Brain Injury

Approximately 1.7 million individuals sustain TBI's every year in the United States (Center for Disease Control, 2013). TBI is an acquired injury to the brain caused by an external physical force (e.g., a bump, blow, jolt to the head, or a penetrating head injury) (Centers for Disease Control and Prevention, 2012). In some states, the definition of TBI is expanded. According to the Ohio department of Education TBI also includes medical conditions including stroke, anoxia, infectious disease, aneurysm, and brain tumors (Ohio Department of Education, 2013).

Children ages zero to four years, adolescents age 15 to 19 years, and adults age 65

years and older are most likely to sustain TBI (Faul, Xu, Wald, & Coronado, 2010). These individuals are most likely to have a fall or a motor vehicle accident resulting in TBI. Children age 0 to 14 years make approximately half a million emergency department visits for TBI annually. For this age group, the highest reported cause is falls, followed by struck by/against another object, and unknown causes. For every age group TBI rates are higher for males than females. Throughout all age groups, motor vehicle traffic injury is the leading cause of TBI-related death (Faul, Xu, Wald, & Coronado, 2010).

Types and severity. There are three levels of severity of TBI: mild, moderate, and severe. The severity of TBI is determined by several measures, including: the Glasgow Coma Scale, length of loss of consciousness, and the length of posttraumatic amnesia. The Glasgow Coma Scale (GCS) rates patients' current level of functioning. It is scored between 3 (poor) and 15 (best), and is composed of three parameters: eye response, verbal response, and motor response. Approximately 75-85% of TBIs are classified as mild with a GCS rating of 13-15. Another 8–10% are moderate with a GCS rating of 9-12, and 6–13% are severe with a GCS of 3-8 (Peiniger et al., 2012; See Table 1 for the classifications of TBI; Davies, 2014). A concussion is at the mildest end of the TBI continuum; it has an immediate onset and involves either a direct blow to the head or acceleration/deceleration of the brain that is significant (Lezak, Howieson, Bigler, & Tranel, 2012). Generally the less severe the injury, the better children adapt following TBI (Arroyos-Jurado, Paulsen, Merrell, & Lindgren, 2000).

Table 1

Levels of TBI Severity

	Length of Loss of Consciousness	Glasgow Coma Score	Length of Posttraumatic Amnesia
Mild	None to approximately 30 minutes	13-15	<1 hour
Moderate	30 minute to hours (definitions range from 6 to 24 hours)	9-12	1-24
Severe	>24 hours	3-8	>24 hours to <1 week

Recovery. Some children may have an early recovery but then start to show symptoms of TBI as time passes (Davies, 2014). Each TBI is different, thus each recovery path is unique and highly dependent on the severity level. For mild TBIs, recovery rates are variable and some students have persistent post concussive symptoms. These symptoms include chronic headaches, fatigue, sleep difficulties, personality change (e.g., irritability and emotionality), sensitivity to light or noise, dizziness when standing quickly, short-term memory problems, difficulty in problem solving, and/or general academic difficulty (Moran et al., 2012). Most symptoms of a mild TBI resolve in a few weeks (Lau, Kontos, Collins, Mucha, & Lovell, 2011).

Moderate to severe TBIs can result in a number of problems that affect students, including cognitive deficits, emotional and behavioral problems, impaired social and adaptive functioning, declines in school performance, impaired alertness and orientation,

fatigue, impaired language skills, and executive functioning deficits. Typically, physical problems related to an injury (i.e., bruises, stitches, casts) resolve the fastest, resulting in a child who may appear to have recovered when; in fact, a complicated constellation of invisible symptoms may remain (Davies, 2014).

Special education. In 1990, TBI was added as a disability category under the Individuals with Disabilities in Education Act (IDEA) after discovering that TBI occurs much more frequently than previously thought (Davies, 2014). In order to qualify for special education services, students must meet the following criteria of TBI

> Traumatic Brain Injury means an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. The term applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem-solving; sensory, perceptual, and motor abilities; psycho-social behaviour; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma. (US Federal Register, 57 [189], September 29, 1992, p. 44,802)

Students who meet the criteria described above will receive an Individualized Education Program (IEP). An IEP provides detailed academic, social, or behavioral annual goals based on students' needs. Related services such as speech and language therapy, occupational therapy, and physical therapy may also be included in the IEP.

Section 504 of the Rehabilitation Act of 1973 was established to protect the rights of individuals with disabilities. A student is determined to qualify under Section 504 by a

team of individuals within the child's school. If a student with TBI meets the eligibility requirements for Section 504 he/she is entitled to accommodations or modifications of policies, practices, or procedures (Davies, 2014). A 504 plan might be necessary for students who do not require specialized instruction via special education but who have some academic needs such as a student who understands the concepts being taught but cannot keep up with the note-taking demands of a classroom, which results in poor performance on tests and assignments. For example, an accommodation plan might allow the student to audiotape lectures or have a scribe in the classroom (Bohmann, 2007).

Consequences of TBI in the School Setting

TBI-related neurological, cognitive, behavioral, social, and emotional consequences can negatively impact a student's academic performance, regardless of the severity of the TBI. The daily life of a student in a school is a consistent, regimented pattern of activities. Academic success in this environment requires a student to utilize a variety of cognitive, communicative, neurological, and psychosocial skills and abilities (Jantz et al., 2014).

Academic consequences. Students with TBI may experience a variety of consequences such as: delayed reading skill acquisition, problems in math and slowed thinking. Students may also experience inconsistent classroom participation, difficulties in sequencing, loss of interest in school, poor handwriting, poor test performance, failure in some subjects, and grade retention (Holcomb, Davis, & D'Amato, 2010).

Neurological and cognitive consequences. Research has shown that TBI can cause significant impairments in cognitive flexibility up to at least one year post-injury

(Milders, Ietswaart, Crawford, & Currie, 2008). Individuals who have had TBI often have an impaired awareness of their neurological or cognitive deficits (Evans, Sherer, Nick, Nakase-Richardson, & Yablon, 2005). The severity of the injury is the best predictor of intellectual change following TBI. Performance IQ is usually lower for individuals who have experienced TBI and is lower with more severe TBIs (Arroyos-Jurado, Paulsen, Ehly, & Max, 2006). Individuals who have sustained TBI may also have difficulty with balance or other physical problems that can contribute to fatigue or difficulty navigating stairs or crowded walkways (Bohmann, 2007).

One of the most commonly reported neurological symptoms following TBI is frequent headaches. These may occur within days of the injury or they can be delayed (Dikmen, Machamer, Fann, & Temkin, 2010). Individuals with TBI are likely to experience fatigue and sleepiness, they may spend more time napping and in bed (Siebern & Guilleminault, 2012). Sleep-wake disturbances occur in as many as three-quarters of individuals with TBI and include insomnia, hypersomnia, sleep apnea, excessive daytime sleepiness, and fatigue. These have the potential to last for years (Jantz et al., 2014). Sensory and motor difficulties may also occur, and can include vision difficulties, motor difficulties, and difficulties with balance and dizziness. Along with neurological and cognitive consequences, an individual with TBI may experience social and emotional consequences as well.

Social and emotional consequences. Difficulties with emotional regulation and social interactions are common consequences of TBI. These social and emotional deficits may not be as obvious as academic struggles but still need to be treated.

Depression and anxiety. More than half of participants who sustained TBI reported significant levels of depressive symptoms, with 37% reporting moderate or severe symptoms (Evans, Sherer, Nick, Nakase-Richardson & Yablon, 2005). The older a student is at the time of the TBI, the higher the risk the student will develop clinically significant levels of depression (Max et al., 2012). Anxiety disorder symptoms have also been shown in children who have experienced TBI. They can include obsessive-compulsive behavior, separation anxiety, and simple phobias (Max et al., 2011).

Emotional dysregulation. Research has shown that TBI can cause significant impairments in emotional regulation, understanding the intention of others, and social situations (Milders, Ietswaart, Crawford, & Currie, 2008). If students who have acquired TBI are experiencing any of these difficulties, there can be significant issues as they interact with people in their school such as peers, teachers, and administrators, as they may not pick up on common social cues. For example: an individual with TBI may not apologize to someone after hurting his or her feelings. Emotional consequences of TBI, such as poor emotional regulation, angry outburst/irritability, depression, anxiety, and apathy can affect relationships (Jantz et al., 2014). For example: an individual with TBI who is suffering from depression and anxiety may not seek out or maintain friendships, leaving them lonely and with a weak support system.

Difficulty with anger and/or irritability is common following all severity levels of TBI and can worsen over time (Jantz et al., 2014). Feelings of apathy (i.e. diminished motivation in comparison to the person's previous level of functioning) are commonly reported in the TBI population and are associated with a wide range of negative

consequences for the individual with the TBI and caregivers (Arnould, Rochat, Azouvi, & Van der Linden, 2013). The social and emotional consequences may lead to behavioral problems for some individuals with TBI.

Behavioral consequences. Behavioral difficulties are common following TBI (Karver et al., 2012). It appears that the younger the age at the time of injury and the more severe the TBI, the worse the behavioral difficulties will be and the longer they will persist. Adaptive functioning deficits may be a consequence as well. In a study done by Arroyo-Juardo, Paulsen, Merrell, and Lindgren (2000), it was found that students with TBI experienced adaptive functioning difficulties. This was measured by the *Vineland Adaptive Behavior Scales-Interview* (Sparrow, Balla, & Cicchetti, 1984). There is a newer version of this scale now available, *Vineland Adaptive Behavior Scales- Second Edition.* The *Vineland* evaluates several domains of functioning, including communication, daily living skills, socialization, motor skills, and maladaptive behavior. A child who has sustained TBI can perform well in school but experience difficulty on the playground and in social situations at home and school, both of which are considered adaptive functions. Arroyo-Juardo et al. (2000) found that TBI severity is related to the impact on adaptive functions.

Dysfunctional or inappropriate behavior may occur for a person who has experienced TBI based on where in the brain the injury occurred (Karver et al., 2012). The limbic system is a group of brain regions including the anterior thalamic nuclei, amygdala, hippocampus, limbic cortex, and parts of the hypothalamus, as well as their interconnecting fiber bundles (Carlson, 2011). Damage to the limbic system, which can

occur as a result of TBI, can result in acting impulsively in response to emotions and urges, for example: inappropriate sexual contact, inappropriate responses/comments, use of drugs or alcohol, dangerous behavior, withdrawal or isolation, noncompliance, engaging in behaviors without consideration for cause and effect relationships (e.g., picking a fight with dangerous others), and conflict with authority. Students who have sustained limbic system damage may engage in these behaviors (Jantz et al., 2014).

Executive Functioning

All of the above areas of impairment may be associated with some degree of executive functioning (EF) impairment, which is common following TBI. Executive functioning involves higher-order cognitive activities such as: reasoning, decision making, monitoring critical thinking and monitoring one's cognitive process. Improvement in executive functioning permits more effective learning and an improved ability to determine how attention will be allocated, to make decisions, and to engage in critical thinking (Santrock, 2011). One study found that between 18 and 38% of children with traumatic brain injury in a study had significant executive dysfunction in the first year after injury (Sesma, Slomine, Dingo, & McCarthy, 2007). Compared to matched controls, a group of children with severe TBIs had significantly higher scores on a number of the metacognition scales and the Behavior Regulation Index from the Behavior Rating Inventory of Executive Functioning (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000). A child with any type of TBI is likely to present with executive skill deficits at some point (Dawson & Guare, 2010).

EF difficulties can result in inconsistent behaviors such as impulsive acts and responses, incongruent emotional outburst such as laughing when someone gets hurt, and difficulties with completing complex or multistep tasks. Difficulties may also include poor planning, poor follow-through, poor problem solving, rigid thinking, and impaired communication (Jantz et al., 2014). Executive functioning can greatly affect a student's performance in school due to impulsive acts or responses, emotional outbursts, difficulties completing complex or multi-step tasks, impaired communication, and poor planning, follow through, and problem solving (Ganesalingam, 2011). If a student is struggling with executive functioning, it is best to target those deficits to improve their academic, social, and behavioral performance.

Interventions for TBI

TBI recovery and rehabilitation are closely related to the nature of the injury, the injury severity level, and the availability of medical treatment at the time of the injury. TBI recovery occurs along a continuum. On occasion, recovery may occur very rapidly; however, it generally occurs slowly over time (Jantz et al., 2014). A variety of school-based interventions may be helpful for students with TBI, such as self-monitoring, functional communication training, and applied behavior analysis.

School-based behavioral interventions for TBI. Due to the various behavioral consequences of TBI, intervention options for students with TBI should be tailored to the individual student. The student may need environmental and curriculum modifications, accommodations, and/or interventions that target emotional, behavioral, and social issues (Jantz et al., 2014). Students may benefit from detailed classroom routines along with a regular review of these routines. Students who have sustained a TBI may also benefit from

being taught specific routines they may encounter during school. These students may also benefit from having more reminders than typical students (Center on Brain Injury Research and Training, 2014). Several interventions that have emerging empirical support for use in schools include self-monitoring, functional communication training, and applied behavior analysis.

Self-monitoring. An evidence-based intervention for students who sustained TBI is self-monitoring. Davies, Jones, and Rafoth (2010) examined the use of self-monitoring for students who have sustained TBI. Students utilized twice-daily ratings on a five-point rubric to monitor performance in classroom and behavior. These were based on work completion, work accuracy, and number of reminders. Student ratings were compared to teacher ratings, and students were reinforced for both accuracy and positive scores. The intervention positively impacted the students' behavior.

Functional communication training (FCT). Another behavioral intervention that has been shown to be effective for students with TBI is functional communication training. FCT involves determining, through observation, the communicative function of the problem behavior, and teaching a communicative alternative that serves the same function. For example, teaching the individual to use a simple, easily interpretable response (e.g. verbal, gestural, handwritten, mechanical) and providing easy access to the outcomes that previously had been achieved through problem behavior, the maladaptive response can be rendered non-essential (Ducharme, 1999).

Applied behavior analysis (ABA). Applied behavioral analysis (ABA) emphasizes the management and modification of behavior by deliberately manipulating consequences. ABA is a contingency management approach, a systematic and planned manipulation of

consequences. It is based on the operant principle that behaviors increase or decrease in frequency as a result of positive and negative consequences. A review of studies on individuals with TBI and behavior problems using ABA has proved successful (Ylvisaker et al., 2007). These studies focus on general behavior of students with TBI, however many students had executive functioning difficulties that needed to be targeted.

Interventions for executive functioning. Few studies have directly evaluated rehabilitation of executive skills post-TBI in school-age youth (Kennedy et al., 2009). Children with executive functioning difficulties fall into one of three categories: the first category comprises those children who have weaknesses in one or more executive skills in the absence of any other disorder or condition. A second category comprises those children who, by virtue of a certain condition or diagnosis, are likely to have a number of executive skills deficits. This category includes children with attention deficit hyperactivity disorder (ADHD), children with autism spectrum disorders, and children with TBIs. The third category includes children who have suspected executive skills weaknesses that are confounded by other complex learning and/or social-emotional factors. Because children with TBIs are in the same category as children with ADHD, interventions with supported efficacy for children with ADHD may be effective for those with TBI (Dawson & Guare, 2010).

Executive functioning deficits, such as difficulty sustaining attention, are symptoms that both students with TBI and ADHD may exhibit. Thus, interventions for students with ADHD are often applied to students with TBI (Jantz et al., 2014). As

previously noted, children who have sustained TBI are often even mislabeled as having ADHD (Holcomb et al., 2010).

Cognitive behavioral techniques. Cognitive behavioral therapy (CBT) focuses on a person's thoughts and beliefs, and how they influence a person's mood and actions; it aims to change a person's thinking to be more adaptive and healthy (U.S. Department of Health and Human Services, n.d.). The counselor's role in CBT is to improve the cognitive information processing of clients in social contexts and attend to the client's emotional state(s) by using structured behavioral practice. These strategies are designed to produce changes in thinking, feeling, and behavior.

A CBT intervention by Miranda, Presentacion, Siegenthaler, and Jara (2013) designed to improve EF skills in students with ADHD consisted of small groups for 16 sessions lasting 45 minutes each. The intent of the program was to teach self-instruction, problem-solving, anger management and social skills. It was complemented with a token economy system to reinforce positive behaviors. To assess outcomes, the researchers used several measures, including the Continuous Performance Test (CPT), Stroop test, Working Memory Sentences, WISC-R Inverse Digits subtest, Temporal Spatial Recall Task, Tower of London, and the Wisconsin Card Sorting Test.

All of the students who participated in the intervention demonstrated improvements in executive functioning and working memory skills compared to the control group who demonstrated a decrease or no change in these skills. The intervention program had the most significant effect on planning (Miranda et al., 2013). Due to the success of this CBT intervention with students who have ADHD and executive functioning deficits, more research is needed on CBT techniques for students with TBI and

related executive functioning deficits. Other interventions such as psychosocial interventions also have demonstrated success with students who have ADHD.

Psychosocial interventions. Psychosocial interventions are any intervention that emphasizes psychological or social factors rather than biological factors (Ruddy & House, 2005). Psychosocial interventions are known to provide support, education, and guidance to individuals with mental illnesses and their families. Some examples of psychosocial treatment methods for students with EF deficits, such as ADHD, include daily report cards, behavioral contracts and charts with consequences, and group contingencies (Center for Children and Families, n.d).

One intervention that has demonstrated success in students with ADHD who have related EF deficits is a packaged program called Homework, Organization, and Planning Skills (HOPS; Langberg, 2011). This intervention is delivered individually and consists of 16 sessions, each lasting no longer than 20 minutes. This psychosocial intervention was developed to address the association between organizational skills, or executive functioning skills, and academic performance. Three main skills were covered: school materials organization, homework recording and management, and planning/time management.

The students were taught an organizational system for transferring homework materials to and from school. The intervention agent visually inspected student materials and students received points for each criterion met on a skills tracking checklist (e.g., no loose papers in book bag = 1 point). Students also received points for effectively studying for tests and projects (e.g., recorded a test in the planner = 1 point). These points

accumulated and students traded in the points for gift card rewards (Langberg, Epstein, Becker, Girio-Herrara, & Vaugh, 2012). Individuals who participated in the intervention demonstrated large and significant improvements in comparison to a control group on task planning and organized action scales.

Catroppa, Anderson, and Muscara (2009) combined cognitive behavioral and psycho-educational strategies to improve executive functioning skills in students with TBI. This intervention involved six sessions and demonstrated partial success that varied between participants. A limitation of this study was the small sample size of only three participants. Further, the participants were adolescents or young adults who participated in the intervention as a group in an outpatient clinic. Catroppa et al. (2009) concluded their study by asserting additional research is needed with more participants and in evaluating the efficacy of this type of intervention with both younger and older participants. One research-based program that combines both CBT and psychosocial principles is *Skillstreaming.*

Skillstreaming. *Skillstreaming the Elementary School Child a Guide for Teaching Prosocial Skills is* a psychoeducational intervention that involves cognitive behavioral techniques. It is an evidence-based intervention designed to teach social and executive skills to students with problem behaviors (McGinnis, 2012). *Skillstreaming* was introduced in 1973 as one of the first social skills training approaches. It has been widely used in the United States and is implemented in hundreds of schools, agencies, and institutions serving children and youth.

Skillstreaming has five different categories focusing on different social skill areas. The categories include: classroom survival skills, friendship-making skills, skills for

dealing with feelings, skill alternatives to aggression, and skills for dealing with stress. A main category of social skills training is survival skills, which may also be referred to as EF skills, this may include skills such as: listening, following instructions, ignoring distractions, and asking for help (National Association of School Psychologists, 2002).

The teaching process in *Skillstreaming* focuses on four principles of learning: modeling, role-playing, performance feedback, and generalization training. These foci are carried out in nine steps: (1) define the skills, (2) model the skill, (3) establish student skill need, (4) select the first role-player, (5) set up the role-play, (6) conduct the role-play, (7) provide performance feedback, (8) select the next role-player, and (9) assign skill homework.

Skillstreaming has been shown to positively impact elementary-aged children in social inclusion. *Skillstreaming* also decreased oppositional behavior and attention-deficit hyperactive type behaviors (Denhamn, Hatfied, Smethurst, Tan & Tribe, 2006; Maddern, Franey, McLaughlin & Cox, 2004). Despite these promising results, there is currently no evidence regarding the efficacy of *Skillstreaming* for students who have sustained TBIs and now have executive functioning impairments.

Purpose of the Present Study

The present study examined the impact of *Skillstreaming*, a psychoeducational intervention that involves cognitive behavioral techniques (McGinnis, 2012) on the executive functioning of students who have sustained TBI. Because of the positive effects of CBT interventions for individuals with TBI and ADHD, it is beneficial to further study the use of CBT techniques for improving executive functioning in individuals who have experienced TBI.

Skillstreaming is a social skills program with an academic portion that includes direct EF skill instruction. For the present study, *Skillstreaming* lessons that target executive functioning skills were implemented. Colleague (Anderson, 2015) implemented the same intervention for a student with different demographics. By improving EF skills, students with TBI may improve their academics, social relationships, and behavioral functioning in school.

CHAPTER III

METHOD

Research Question and Prediction

What is the effectiveness of a psychosocial intervention for a student who has sustained a traumatic brain injury (TBI) in early infancy and has related executive functioning deficits?

Based on previous research supporting the efficacy of cognitive behavioral therapy (CBT) for adolescents/young adults with TBIs with EF deficits, (Catroppa, Anderson, & Muscara, 2009), along with empirical support for psychosocial interventions for students with ADHD and EF deficits (Langberg, Epstein, & Becker, 2012; Miranda, Presentacion, Siegenthaler, & Jara, 2013), it was predicted that a psychosocial intervention with CBT techniques would significantly improve executive functioning skills for a student who sustained TBI who also exhibited EF deficits.

Research Design

This study used a single-case design, focusing on outcomes for a student with TBI and related executive functioning deficits. The design involved implementation of an intervention within a small group setting along with two other students identified with ADHD. This design was chosen because the under-identification of TBI results in a small potential number of participants. The participants' pre-test/post-test measures served as a

measure of growth for comparison purposes, so no control group was required. The independent variable was the psychosocial intervention (*Skillstreaming)* and the dependent variable was executive functioning skills.

Participants and Setting

Students. The sample included (*n*=3) students from a local public school in the Midwestern region of the United States. A fourth student also attended the group, but was not included as a study participant because she did not meet the inclusion criteria. Participants in the current study included one student who sustained TBI and two students with a diagnosis of ADHD. All students demonstrated executive functioning deficits. After consent forms were collected, (see Appendix A), the students were selected for participation based on the following criteria. The participant with TBI met the following criteria:

1. Child received special education identification of TBI based on physicians report and the school evaluation team.
2. Child is on an Individualized Education Program but receiving educational services primarily (more than 50% of the day) in a general education setting.
3. Child has poor executive functioning skills, in the at risk range, as measured by the BRIEF.
4. TBI is more than one year old.

Participants with ADHD met the following criteria:

1. Child is on a 504 plan or individualized education program but receiving special educational services primarily (more than 50% of the day) in a general education setting.
2. Child has a medical diagnosis of ADHD.
3. Child has low executive functioning skills, in the at risk range, as measured by the BRIEF.

Participants were excluded if: (a) the student or parents did not speak proficient English or (b) the school, teacher, and/or parent was unwilling to participate in the intervention. Recruitment of teacher participant's occurred through convenience sampling. The student's teachers were asked to participate via email followed by providing written consent.

Emily. Emily was the target student in this study. Emily is a Caucasian female attending first grade in "Miles" City School district. She was referred for an evaluation for special education in December of 2011. Emily receives speech and language, reading intervention, and occupational therapy services under the disability category of Traumatic Brain Injury. Emily is an Ohio resident, and is under the special education category of TBI, however, in other states; because of various definitions of TBI she may not receive services under the same category. At 5.5 months of age Emily was diagnosed with encephalitis meningitis, which caused her to suffer a stroke in the right hemisphere of her brain. After the stroke she was diagnosed with status post infantile

spasms. She is currently on medication for a seizure disorder. She suffered a grand mal seizure in December of 2011. Emily was diagnosed with refractory med resistant epilepsy. Emily had surgery for epilepsy in March of 2013 and received homebound instruction for four weeks. Emily's intervention teacher reported that Emily has trouble staying on task and is unorganized. Emily had a *t* score of 69 when measured by the BRIEF, placing her in the at-risk range.

Darren. Darren is an African American male attending second grade in "Miles" City School district. Darren received a medical diagnosis of ADHD when he entered first grade. He also has a diagnosis of Asthma. He takes medication and receives a 504-accommodation plan for ADHD. His skills are below average in reading when compared to his same-age peers. His teachers have reported that Darren has trouble making and maintaining friendships. He frequently gets into fights at school, most of which occur when he rides the bus. Darren's teacher reports that he has a difficult time planning and getting started on tasks. Darren had a *T*-score of 67 on the BRIEF, placing him in the at-risk range.

Bill. Bill is a Caucasian male attending second grade in "Miles" City School district. He receives small group instruction for math, writing, and reading. He also receives occupational and speech-language services under the disability category of specific learning disability. He was found eligible for special education services under the category of speech and language when he entered preschool. Bill's teachers report that he has trouble staying on task. He has a medical diagnosis of ADHD and takes medication. Bill had a t score of 79 on the BRIEF, placing him in the at-risk range.

Materials

Measures. The Behavior Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000) was used to measure the severity of students' executive functioning skills. This measure was given to teachers to assess students. The BRIEF assesses executive functioning skills in the home and school environments through a questionnaire developed for teachers of school-aged children. It was administered before the psychosocial intervention and after the intervention. The measure took approximately 10-15 minutes to administer and 15-20 minutes to score. The participants were assessed on the eight clinical scales of the BRIEF, including: (a) inhibit, (b) shift, (c) emotional control, (d) initiate, (e) working memory, (f) plan/organize, (g) organization of materials, and (f), monitor. In addition, students received two broader Indexes (Behavioral Regulation and Metacognition) and an overall score, the Global Executive Composite. In order to qualify for the study, participants had to earn a score in the at-risk or clinically significant range on the composite score of the BREIF. The BRIEF has a high internal consistency (alphas = .80-.98) and test-retest reliability (r = .82 for parents, .88 for teachers; Gioia, Isquith, Guy, & Kenworthy, 2000).

Intervention materials. The psychosocial intervention used in the present study included lesson plans adapted from *Skillstreaming the Elementary School Child* (McGinnis, 2006). The treatment consisted of a 5-week intervention program covering various topics related to executive functioning (see Appendix B). Researchers selected the 10 sessions based on an initial needs-based assessment administered called the Teacher Checklist, which is part of the *Skillstreaming* program. The sessions occurred twice per

week and lasted approximately 30 minutes. Examples of session topics included: asking for help, bringing materials to class, following instructions, completing assignments, contributing to discussions, setting a goal, making a decision, using self-control, and problem-solving.

Teacher/staff checklist. Student progress was monitored throughout the intervention on a weekly basis through teacher observation of student behavior. Teachers completed the teacher/staff checklist (see Appendix C), which was taken from the program *Skillstreaming,* before the intervention began and at the end of each weeks of intervention. The checklist contained a rating scale measuring how the child used the seven skills covered in the intervention. Examples of behaviors that were measured included: problem-solving skills, asking questions, completing assignments, and turning in homework.

Treatment acceptability interview. A semi-structured treatment acceptability interview (Kratochwill, Elliott, & Callan-Stoiber, 2002; see Appendix D) was administered to students and teachers. This interview provided information on student and teacher perceptions of intervention acceptability and feasibility.

Treatment integrity checklist. A treatment integrity checklist (see Appendix E) was completed following each intervention session to ensure that the intervention was implemented as intended. The checklist outlined the nine steps that must be completed during each intervention session by the researcher.

Observer checklist. In order to determine that the group leader completed all necessary steps of the intervention, a second trained researcher observed one intervention session during the study. The second researcher completed one Observer Checklist (see Appendix F) to determine the inter-observer reliability.

Homework and progress monitoring. Each week students were given homework (see Appendix B, intervention materials) and progress monitoring forms (see Appendix G). Students completed homework by explaining what they did (i.e., asked for help, brought materials to class, contributed to discussions) and how well they completed the steps. Students also logged how many times they practiced the weekly skill by coloring in balloons, cheese holes, or colors in a rainbow on progress monitoring forms.

Procedures

Phase I: IRB approval. This study was approved by the University of Dayton's Institutional Review Board prior to data collection.

Phase II: Recruitment. School psychologists in the region were contacted via email with a recruitment letter (See Appendix H). An email was sent to a local school psychologist who forwarded the email to colleagues in her district. A colleague stated she had several students in her school identified with TBI and ADHD. The researcher then contacted the school psychologist.

Phase III: Consent. Once a student with TBI was identified in a school district, consent was collected. District/school, parent, and teacher consent were all collected along with student assent prior to beginning the study (see Appendix A for consent/assent forms).

Phase IV: Screening. The teacher of the student with TBI was on maternity leave; the substitute did not know the student well enough to fill out a BRIEF. Therefore, the intervention specialist was given the BRIEF to fill out for the student with TBI. Students with ADHD and reported executive functioning difficulties were then identified in the same grade as the student with TBI. Consent was obtained for all students with ADHD.

The teachers of the students with ADHD completed the BRIEF to determine executive functioning skills of students. Once students were determined to be eligible for the study, a record review was completed for all students in the study.

The participating students were assigned a pseudonym to protect their confidentiality in any publications or presentations of the data, including this thesis project. Data was stored in a locked file cabinet and will be maintained for three years and will then be destroyed.

Phase V: Baseline. The BRIEF data were used to establish baseline of the students' EF skills.

Phase VI: Intervention. The intervention was implemented twice a week for five weeks with the participating students for approximately 30 minutes (10 sessions total). A reinforcement system was used during the intervention and explained to students at the beginning. When the students turned in homework they could choose between a pencil, sticker, or candy. Students completed a weekly self-rating form during the intervention sessions. The researcher filled out an intervention integrity checklist during each session. The classroom teachers also completed a checklist for each student once a week during intervention.

Phase VII: Post-intervention data collection. The students' teachers completed the BRIEF on their students following the intervention. Treatment acceptability was also reviewed with the teachers. The intervention integrity checklist and the observer checklist measured intervention integrity and inter-rater reliability.

Phase VIII: Results. Following data collection results were analyzed to determine the effectiveness of the psychosocial intervention for students who sustained TBI and have

related executive functioning deficits. Improvements in students with ADHD and related executive functioning deficits were also examined.

CHAPTER IV

RESULTS

Following are the results of the psychosocial intervention. Results of the pre/post BRIEF are presented. Next, the results for the student and teacher weekly progress monitoring are presented. Finally, each weekly group session is discussed, as well as the treatment acceptability and integrity results.

Data Analyses

The pre-test and post-test results of the BRIEF were analyzed by visual inspection of data and comparison of global executive composite and subtest scores from pre to post measurement. The teacher checklist for each participant was analyzed using visual analysis of the data. Descriptive statistics from the treatment acceptability form were used, and produced qualitative data. The treatment integrity was also determined using quantitative data.

BRIEF analysis. BRIEF scores were compared using the *t* scores of the global executive composite (GEC) score; the higher the *t* score, the less developed the skills. The student with the TBI, Emily, showed an increase in her GEC score. See Table 2.

Table 2

BRIEF pre and post GEC t scores

Student	Pre	Post
Emily	69	75
Darren	67	67
Bill	79	74

The BRIEF has eight clinical scales and two index scales that make up the GEC score. Below are the *t* scores for all subtest results both pre and post intervention. Prior to the intervention, Emily had six subtest scores that fell within the clinically significant range. After the intervention Emily had eight subtest scores that fell within the clinically significant range. Emily's emotional control subtest score was 59 before the intervention and decreased to 56 post intervention. Her monitor score remained the same.

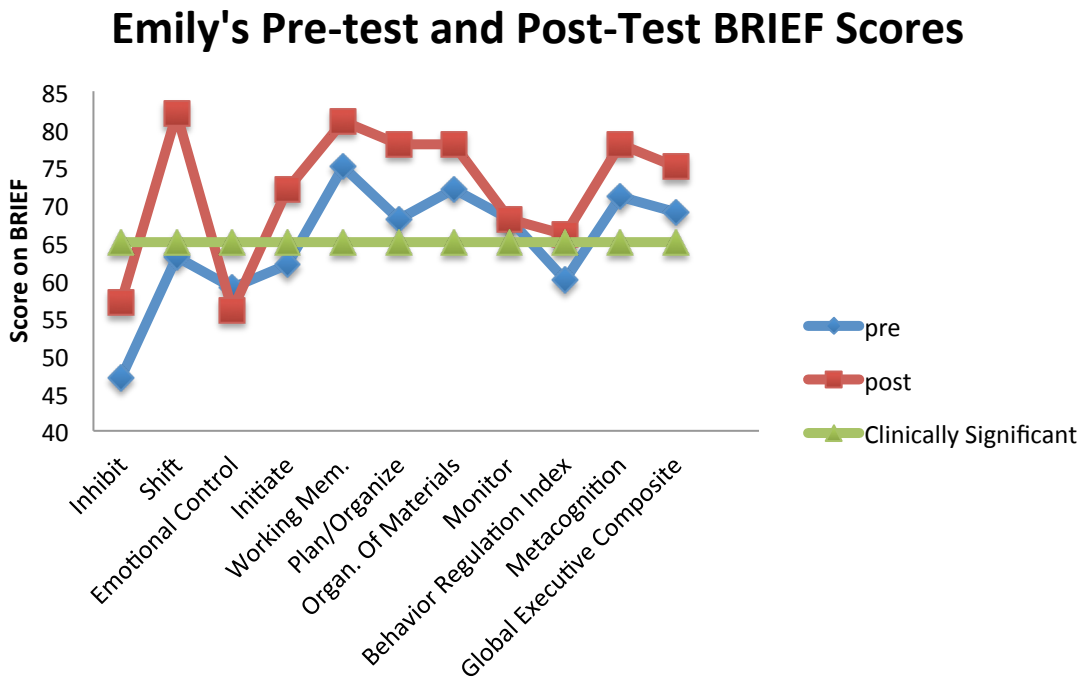


Figure 1: Emily's pre-test and post-test BRIEF scores

Both before and after the intervention Darren had seven subtests score in the clinically significant range. Darren showed a decrease in a few areas, indicating that he improved his skills in those areas. He demonstrated improvement on the following subscales: shift, initiate, monitor, behavior regulation index, and metacognition. His overall GEC score stayed the same.

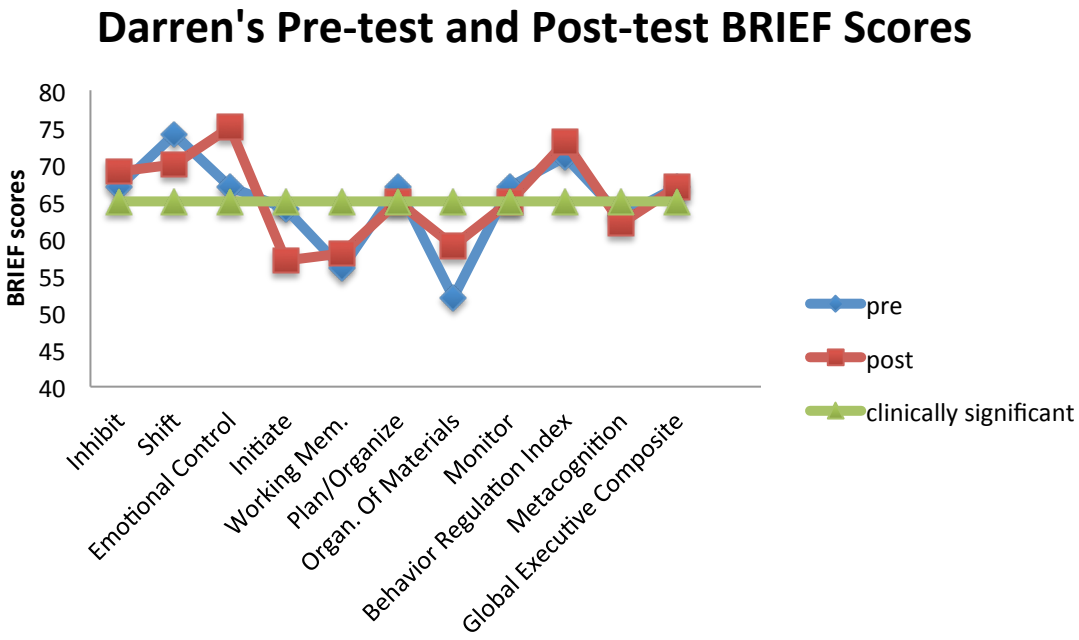


Figure 2: Darren's pre-test and post-test BRIEF scores

Both before and after the intervention Bill had ten subtest scores in the clinically significant range. Like Darren, Bill improved on a few EF skills. He demonstrated improvement on the following subscales: shift, emotional control, organization of materials, monitor, behavior regulation index, and his global executive composite. His GEC score decreased by five points, but remained in the clinically significant range.

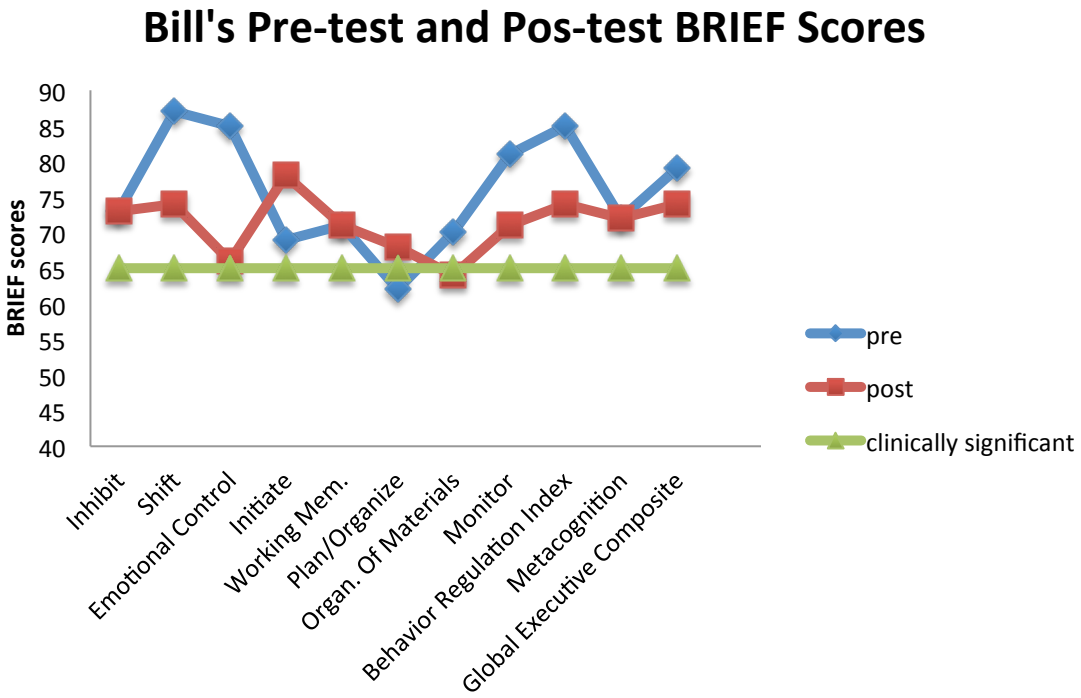


Figure 3: Bill's pre-test and post-test BRIEF scores

Weekly rating forms. Students completed weekly progress-monitoring forms, assessing their EF skills. During the first week students rated their skills on a scale of 1 to 5 with 1 being 'almost never' and 5 being 'almost always'. The students completed this form once during the baseline phase. The researcher noticed that the students struggled with the number version of the checklist, using the 1 to 5 scale. Thus, the checklist was modified for the rest of the progress monitoring data collection to have a 5-point scale with faces for the students to choose. The faces ranged from a frown face to a smile face. Emily's mean baseline score increased and Darren's mean baseline score stayed the same. Bill's mean score decreased. Teachers also completed weekly progress monitoring for students to measure generalization of the skills learned into the classroom. Emily was the

only student who didn't demonstrate an increase in her mean teacher weekly progress monitoring rating. Below are comparisons of student and teacher weekly progress monitoring for all students.

A visual analysis of Emily's weekly average self and teacher rating showed consistency in the beginning of the intervention. However, during the last three weeks Emily rated herself higher than her teacher did; Emily's teacher reported a decrease in her executive functioning skills, while Emily saw an increase.

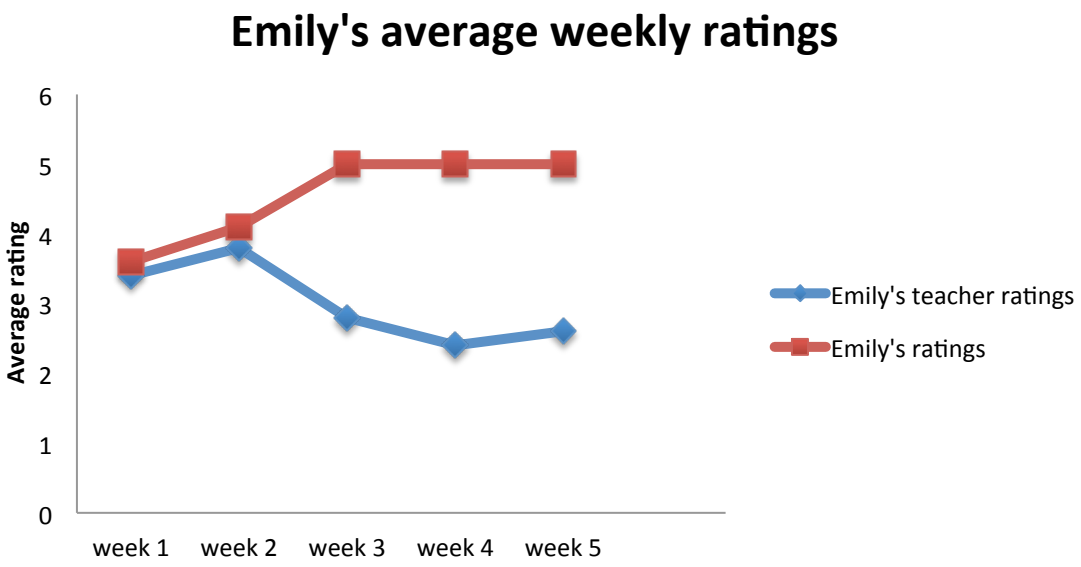


Figure 4: Emily's weekly average self and teacher rating

A visual analysis of Darren's ratings shows that his teacher saw a slight increase in his executive functioning skills. However, Darren and the teacher ratings were not closely aligned except for week four, when Darren rated his skills as a 3.2 and his teacher rated his skills as a 2.6. Darren viewed his skills as '5' at the beginning of the intervention and '5' at the end.

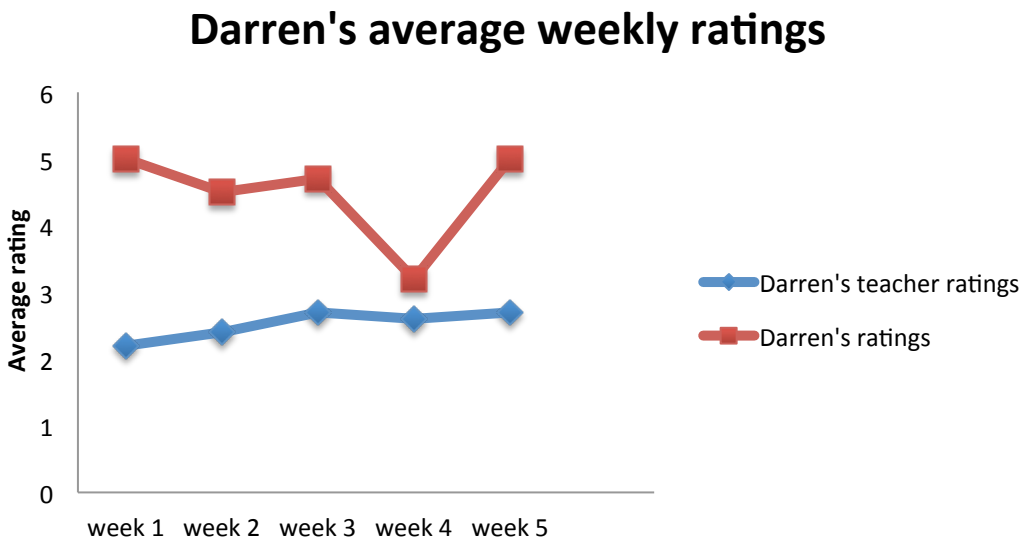


Figure 5: Darren's weekly average self and teacher rating

A visual analysis of Bill's weekly ratings shows that Bill's teacher saw an increase in his executive functioning skills, but Bill saw a decrease.

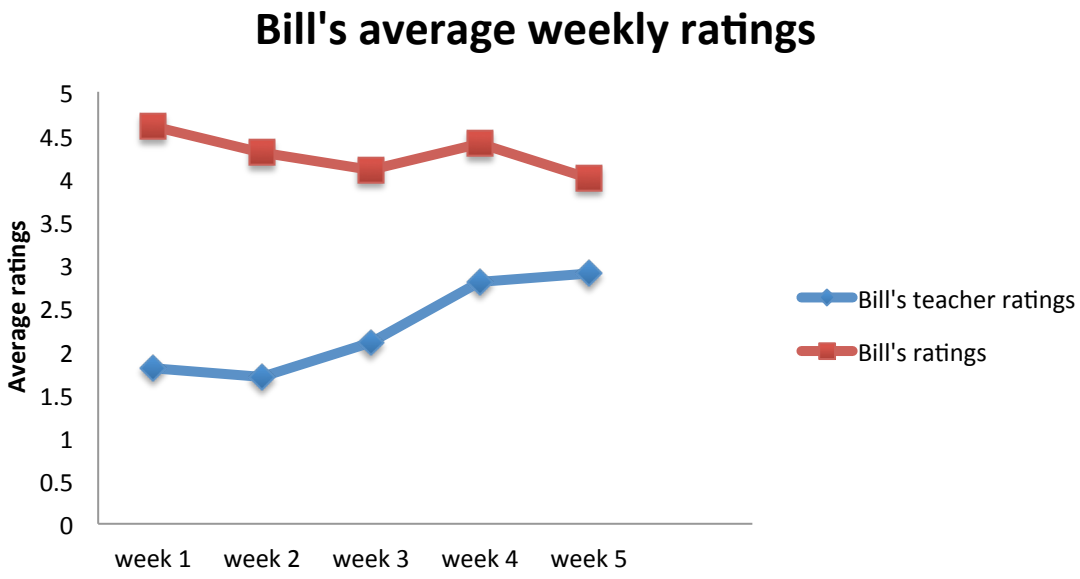


Figure 6: Bill's weekly average self and teacher rating

Homework and self-monitoring forms. Students were assigned weekly homework, where they had to practice the skill learned in group and write about how it went, and self-monitoring forms. These were collected together. Darren turned in 6/8, Bill turned in 7/8, and Emily turned in 6/8. Students completed the homework mainly by themselves at home. Emily said that she had her brother help her complete it a couple of times.

Group Sessions

The group consisted of Emily, Darren, and Bill. There was a fourth student, Gabriella, who did not meet the study inclusion criteria, but was included in the group as a peer model. Gabriella is a Caucasian female attending second grade in "Miles" City School district. Gabriella and Bill had the same teacher. Gabriella has a medical diagnosis of ADHD for which she takes medication. Gabriella is on a 504 plan for her ADHD. Gabriella had a GEC *t* score of 44 at the beginning of this study; her score was not in the clinically significant range. After the intervention, Gabriella had a GEC *t* score of 50. Gabriella participated in the group as a group model in that she was often the first one to volunteer to model a skill. She encouraged Bill to participate in group and often asked for him to be her partner to model skills. Gabriella also reminded Bill to bring his group folder to lunch with him.

The first group session met on April 14, 2014; all students were present. Participants were read the student assent form and were given the opportunity to sign. All students provided assent. The students completed their initial student questionnaire. No homework or self-monitoring forms were collected at this session. The students asked

several questions about the group and Darren asked if they would play games. Darren frequently looked at the shelf of board games in the school psychologist's office; Bill tried to get a board game down to play.

The second group session met on April 21, 2014; all students were present. The topic was asking for help. No homework or self-monitoring forms were collected at this session. This was the first session that homework and progress monitoring forms were assigned.

The third group session met on April 25, 2014; Bill was absent. The topic was bringing materials to class. Darren did not turn in his homework from the previous session, saying he forgot it at home; he never found it and didn't turn it in during the following group sessions. Students also turned in their progress monitoring forms. Emily said she practiced asking for help four times. Emily gave the example of asking her mom for help with her homework. Bill said he practiced 50 times. It was unclear if Bill understood the assignment, he said he practiced 50 times but he couldn't give an example of a time that he practiced. Student progress monitoring forms were collected during this session.

The fourth group session met on April 28, 2014; all students were present. The topic was following instructions. Bill stated he lost his homework and thus didn't turn it in. Emily said she practiced bringing materials to class six times and Darren said he practiced six times. It is unclear if these students understood the progress monitoring because they colored in all the balloons on the form. Students were only supposed to color in items on progress monitoring forms when they practiced the weekly skill. When asked for specific

examples of when they practiced, Darren was able to give examples, but Emily was not. Darren said that he practiced by bringing his group folder home and brought it back to group.

The fifth group session met on May 2, 2014; all students were present. The topic was problem solving. Emily reported that she practiced following instructions 10 times; Darren said he practiced 10 times, and Bill said he practiced 6 times. Emily was not able to give an example of when she practiced her skills. Darren said that he followed instructions when his mom told him how to fix his Xbox, but he did not give another example. Bill said that he followed his mom's instructions when she told him to go to bed. Student progress monitoring forms were collected during this session.

The sixth group session met on May 5, 2014; all students were present. The topic was completing assignments. All group members turned in their homework. Emily and Darren said they practiced it 6 times, and Bill said he practiced once. Emily said she forgot what she did and couldn't provide an example of problem solving. Darren said that he solved a problem on the bus. Darren's girlfriend was hit by a boy on the bus and yelled for Darren. Darren said he thought about his options and he decided it would be best to tell the bus driver. Bill said he practiced when his Xbox wasn't working correctly.

The seventh group session met on May 9, 2014; all students were present. The topic was setting a goal. Emily did not turn in her homework; she said she lost it at school. Darren and Bill said they practiced six times. Darren said he practiced in math class and Bill said he practiced in reading class. Student progress monitoring forms were collected during this session.

The eighth group session met on May 12, 2014; all students were present. The topic was contributing to a discussion. All group members turned in their homework. Darren said that he practiced the skill of setting a goal ten times, Emily practiced five times and Bill didn't practice at all. Emily said she set a goal to read a book and she did. Darren said he set a goal to fix his bike and he was able to, he did not give any further examples.

The ninth group session met on May 16, 2014; all students were present. The topic was making a decision. Emily did not turn in her homework; she said she lost it at her house. Bill said he practiced five times, he said he practiced one time with his cousins. Darren said he practiced three times at school. Student progress monitoring forms were collected during this session.

The last group session met on May 19, 2014; Bill was absent. The topic was asking a question and generalization. Darren did not turn in his homework. Though Bill was absent, his teacher gave his folder to the researcher with his homework completed. Bill reported that he practiced making a decision ten times. Emily reported that she did not practice this skill. Student progress monitoring forms were collected during this session.

Treatment Integrity and Acceptability

The researcher filled out a treatment integrity form during every group session. The treatment was implemented with 100% integrity. Another student researcher, who was familiar with *Skillstreaming*, observed the researcher during one session and completed the observer checklist. According to the points on the observer checklist, which is part of the *Skillstreaming* program, the researcher scored in the 'Mastery of Intervention

Demonstrated' category.

Each teacher completed a treatment acceptability form. Two of the three teachers agreed that this intervention was acceptable for strengthening executive functioning skills. Two of the three teachers agreed that they would suggest the use of this intervention to other teachers and use the intervention in the classroom setting. One teacher agreed that the child's executive functioning skills would remain at an improved level even after the intervention is discontinued. Two of the three teachers agreed that using the intervention should not only improve the child's executive functioning skills in the classroom but also elsewhere such as in the home or community setting. One teacher agreed that other behaviors related to executive functioning also are likely to be improved by the intervention.

Darren's teacher noted that Darren liked group but she didn't see any measureable improvement in his behavior or decision-making. She suggested incorporating day-to-day situations throughout the whole year with classroom visits. Bill's teacher noted that she would improve the program by allowing teachers to have input regarding which students were selected for the program; she also noted that her student enjoyed going to group. Two of the three teachers said they would recommend this intervention to other students who have TBI or ADHD and executive functioning difficulties. One teacher added that she would especially recommend the program if it was continued for a longer amount of time.

During the last group session the students were asked to provide feedback about the group. Bill was not able to add his input because he was absent during this session. When asked if they liked participating in the group and to give an example of what they

liked the most/least, all of the students said that they liked the group. Emily said she liked acting out scenarios the most, and that she didn't like the homework. Darren stated that he liked the candy and the game that was played during the first session. Emily said that she couldn't think of something she didn't like. The students were also asked what they learned from the group sessions. Emily said she learned how to be organized. Darren said he learned how to solve a problem. When asked what they thought could make the program better Darren answered that he would like more candy. The researcher explained that she wanted to know what the students thought would make the program easier for future students to learn. Emily replied that students could act out more and maybe make their own movies of the steps learned for each skill. Darren said he wanted more candy and less homework.

CHAPTER V

DISCUSSION

Review of Purpose and Major Findings

The purpose of this study was to evaluate the effects of a psychosocial intervention for students with TBI who exhibit executive functioning deficits. Because students are expected to use their executive functioning skills in a school, it can be helpful to conduct interventions in the same environment where a student is expected to use those skills. This intervention was conducted in a group setting with students who have a diagnosis of ADHD and executive functioning deficits, as well. Because students with TBI and ADHD often show similar symptoms, it is beneficial to provide them with the same intervention in a group, to make the intervention more feasible. The main focus of this study was on improving the EF skills of the student with TBI; however, the impact of the intervention on the students with ADHD was also examined, and a comparison of the results was conducted.

Interpretation of Findings Relative to Predictions

In order to investigate the effectiveness of the psychosocial intervention, students who participated in the intervention had their teachers complete the BRIEF before and following the intervention. As a weekly repeated measure of progress, students completed weekly self-rating forms of their executive functioning skills, and teachers completed weekly ratings of students' executive functioning skills.

BRIEF. Emily, the student with the TBI, demonstrated an increase in her BRIEF GEC score, indicating that her executive functioning skills worsened. Darren had the sameGEC score after the intervention; Ben's GEC score improved slightly, but this difference was not clinically or statistically significant.

Self-ratings and teacher-ratings. Emily's average self-ratings increased, indicating that she thought her EF skills were improving, while the other two students' self-ratings either stayed the same or decreased. It wasn't clear if Emily understood the ratings, they were not correlated with her teacher ratings. Emily's average weekly teacher ratings declined, meaning Emily's teacher saw a slight decrease in her EF skills. Deficits in self-awareness can be a resulting symptom for individuals with TBI, and it potentially limits rehabilitation (Sherer, Hart, Whyte, Nick & Yablon, 2005). Emily's teacher reported a decrease in her EF skills, while the other students' teachers reported an increase during the intervention. Darren's and Bill's teacher reported an improvement in both of their EF skills, as measured by the weekly ratings, however Darren and Bill did not show an increase in their self-ratings, this may be caused by their damaged self-awareness. Similar to individuals with TBI, individuals with ADHD also demonstrate deficits in self-awareness (Barkley, 2011).

During the sessions Emily forgot to turn in her homework twice. When asked about the weekly skills that she practiced, she frequently was unable to give examples. Emily was the youngest student in the group; this could have affected her outcomes. Perhaps this intervention was not developmentally appropriate for her. Since it was unclear if Emily understood the homework and self-monitoring forms, she may not have practiced

the skill outside of the intervention. Without practice of the skill it is unlikely that she would improve. Due to Emily's pre and post scores on the BRIEF increasing, meaning demonstrating that Emily had an increase in her EF skill deficits, and her teacher reporting that her EF skills were also slightly decreasing, the hypothesis was not accepted.

Session-specific data. All ten session were administered to students and while students were in the sessions they all participated. However, each student forgot to turn in homework at least once. Students could sometimes give examples of when they practiced the skills; however, they could usually only give one example despite reporting that they practiced the skills outside of group several times. Gabriella usually volunteered to start role-playing first. Group members were respectful of each other and appeared as if they were paying attention when other group members were practicing and role-playing the skills.

Treatment integrity. During each session the researcher had the observer's checklist in front of her as a reference to make sure she didn't skip any steps. The researcher checked off the boxes for each session as she completed them. This checklist served as a reminder as to what steps to complete next, because of this constant reminder the researcher completed all steps for every session.

Treatment acceptability. The teachers who filled out a treatment acceptability form gave detailed feedback on the intervention. Though teachers did not observe the intervention, they were informed of what the students were doing and observed differences in the students' EF skills. Two of the three teachers agreed that the intervention was acceptable for strengthening EF skills. The teacher who didn't agree that the intervention was acceptable listed a few ways to improve the intervention, including: focusing on

transfer to day-to-day situations all year long with classroom visits. The role modeling done in-group was focused on day-to-day situations in home, school, and the community. However, because students had difficulty completing homework and telling the researcher about when they practiced, it is unclear if the students applied the skills they learned in-group in the classroom. Though the intervention did focus on day-to-day situations, the classroom teacher did not see the student use the skills taught in the classroom. All teachers said that their students enjoyed coming to group.

Students were also asked their opinion on the group. Like the teachers reported, the students said they enjoyed coming to group. Emily said she liked acting but didn't like the homework, when Emily said this the other students shook their heads. When going over homework in the sessions it was unclear if the students understood what they were supposed to do with it, this may be why the students didn't like completing it. Emily and Darren said that they enjoyed acting out scenarios and suggested that they take videos of themselves acting scenarios.

Limitations

The current study has several limitations. One limitation is that there was no baseline data on students' behavior ratings. The only data collected on students prior to the intervention was from the BRIEF. This made it impossible to do effect size calculation; to calculate an effect size; three baseline points would be needed. A visual analysis of graphed data was the only way to measure effectiveness of the intervention. Based on the severity of the TBI, Emily could have improved without interventions, which could be a threat to the internal validity of this study. Another limitation is that the lessons were not

taught in the typical environment that the students would be expected to demonstrate the behavior (i.e., the classroom). Thus, although the intervention took place in the school setting, the students were taught skills in the school psychologist's office; the students were expected to perform the skills in the classroom. The researcher didn't work full time in the school, she was not available to help program and plan for generalization.

Time was a limitation during this study; some lessons were rushed to get all of the information in and allow all students to participate. Another limitation was group absences. If a student missed group, he or she missed the lesson and had no opportunities to make it up. The group went on until the last week of school, and lasted five weeks. One of the teachers suggested in her treatment acceptability form that the group be held for a longer period of time. Group was conducted during the students' lunchtime, which made it difficult to keep everyone in the group engaged. Some group sessions were rushed so that the students could all have an opportunity to participate in role-play.

Another limitation was the students' ages; it appears that some of the students in the group did not fully understand the progress monitoring or self-monitoring forms, they usually chose the smiley face and their scores did not match up with the teacher ratings. The students colored all of the progress monitoring options and couldn't give specific examples of when it helped them; Emily demonstrated the most difficulty with this task.

During the intervention weeks, Emily's classroom teacher was on maternity leave. Emily had a long-term sub in her classroom that, at the beginning of the intervention only knew Emily for three days. Emily's intervention specialist completed the ratings for Emily since he knew her better, however, he didn't see her most of the day. He only had Emily for reading intervention.

Implications for Future Research

There continues to be a need for increased research on effective interventions for students with TBI and related executive functioning deficits. Future research could examine the intervention used in the current study with an older student population. The students' age may have impacted their understanding of the homework and progress monitoring forms. The youngest student in this study demonstrated the most difficulty with these tasks.

Future research could also be done with a larger sample size. The small sample size of three was a comfortable size for a group with one intervention agent; however, to strengthen future research a larger group could be done with two intervention agents. Future research could also have more students with TBI in the group.

Future research should also focus on more communication and collaboration with teachers and parents to improve use of skills learned in group. Teachers could also be the intervention agents along with someone who has experience and knowledge of *Skillstreaming.* There was limited generalization of the skills from group to the classroom environment in the present study.

Conclusion

The present study examined the effectiveness of a psychosocial group intervention aimed at improving students' executive functioning skills for someone who has sustained TBI. The findings indicated that the group intervention did not increase the student with TBI's executive functioning skills, as measured by both the BRIEF and average weekly teacher ratings. There was, however, an average weekly increase of skills for comparison

students with ADHD. One student with ADHD scored the same BRIEF GEC scores both pre and post intervention. One student with ADHD demonstrated an increase in their EF skills, as measured by the BRIEF GEC score.

This study demonstrated minimal improvements, though not significant, in students with ADHD, as found in other studies using a psychosocial intervention (Langberg, Epstein, & Becker, 2012; Miranda, Presentacion, Siegenthaler, & Jara, 2013). Though students with ADHD and students with TBI show similar symptoms and exhibit EF deficits, the same intervention may not always be successful for both groups.

Catroppa, Anderson, and Muscara (2009) combined cognitive behavioral and psycho-educational strategies to develop executive functioning skills in students with TBI. This intervention had a small sample size and only demonstrated partial success that varied between participants. This current study only had one student with TBI; however, each participant displayed varied results. In the current study one participant's EF skills improved, one stayed the same, and the third student's EF skills decreased. More research is needed on effective school-based interventions, including those with larger sample sizes, for students who have sustained TBI and have related executive functioning deficits.

REFERENCES

Anderson, N.L. (2015). A psychosocial intervention for a male elementary student with a traumatic brain injury and executive functioning deficits. *University of Dayton.*

Arnould, A., Rochat, L., Azouvi, P., Van der Linden, M. (2013). A multidimensional approach to apathy after traumatic brain injury. *Neuropsychology rev, 23,* 210-233. doi: 10.1007/s11065-013-9236-3

Arroyos-Jurado, E., Paulson, J. S., Ehly, S., Max, J. E. (2006). Traumatic brain injury in children and adolescents: Academic and intellectual outcomes following injury. *Exceptionality, 14,* 125-140.

Arroyos-Juardo, E., Paulsen, J.S., Merrell, K.W., & Lindgren, S.D. (2000). Traumatic brain injury in school-age children academic and social outcome. *Journal of School Psychology. 38*(6), 571-587.

Barkley, R. (2011). The important role of executive functioning and self-regulation in ADHD. Retrieved from http://www.russellbarkley.org

Bohmann, J. (2007). Traumatic brain injury and teens: Information for school administrators. *Principal Leadership,* 12-15. Retrieved from http://nasponline.org/resources

Carlson, N.R. (2011). *Foundations of behavioral neuroscience*. Boston, Massachusetts: Allyn & Bacon.

Catroppa, C., Anderson, A., & Muscara, F. (2009). Rehabilitation of executive skills post-childhood traumatic brain injury (TBI): A pilot intervention study. *Developmental Neurorehabilitation 12*(5), 361-369. doi: 10.1080/17518420903087335

Center for Children and Families. Evidence-based Psychosocial Treatment for ADHD Children and Adolescents. University at Buffalo. Retrieved from http://ccf.buffalo.edu

Center for Disease Control and Prevention. (2012). *Injury prevention and control: Traumatic brain injury*. Atlanta, GA: Author. Retrieved from http://www.cdc.gov/TraumaticBrainInjury/statistics.html

Center for Disease Control and Prevention [CDC] (2013). *Facts about Concussion and Brain Injury: Where to Get Help*. Retrieved from http://www.cdc.gov/concussion/clinician.html

Center on Brain Injury Research and Training (2014). Classroom Routines. Retrieved from http://www.intheclassroom.cbirt.org

Cooper, J. O., Heron, T. E. & Heward, W. L. (2007). *Applied Behavior Analysis (2nd ed.)*. Upper Saddle River, NJ: Pearson.

Davies, S. (2014). Best Practices in Working With Children With Traumatic Brain Injuries. In P.L. Harrison & A. Thomas (Eds.), *Best Practices in School Psychology: Systems-level services*. Bethesda, MD: National Association of School Psychologists.

Davies, S. C., Jones, K., & Rafoth, M.A. (2010). Effects of a self-monitoring intervention on children with traumatic brain injury. *Journal of Applied School Psychology, 26,* 308-326. doi:10.1080/15377903.2010.518587

Dawson, P., & Guare, R. (2010). *Executive skills in children and adolescents a practical guide to assessment and intervention.* New York, NY: The Guilford Press

Denham, A., Hatfield, S., Smethurst, J., Tan, E., & Tribe, C. (2006). The effect of social skills interventions in the primary school. *Educational Psychology in Practice, 22*(1). 33-51. doi: 10.1080/02667360500512411

Dikmen, S., Machamer, J, Fann, J. R. & Temkin, N. R. (2010). Rates of symptom reporting following traumatic brain injury. *Journal of International Neuropsychological Society, 16,* 401-411.doi: 10.1017/S1355617710000196

Ducharme, J. M. (1999). Subject review: A conceptual model for treatment of externalizing behavior in acquired brain injury. *Brain Injury*, *13,* 645-668.

Dykeman, B.F. (2003) School-based interventions for treating social adjustment difficulties in children with traumatic brain injury. *Journal of Instructional Psychology, 30*(3), 225-230.

Evans, C. C., Sherer, M., Nick, T. G., Nakase-Richardson, R. & Yablon, S. A. (2005). Early impaired self-awareness, depression, and subjective well-being following traumatic brain injury. *Journal of Head Trauma Rehabilitation, 20,* 488-500.

Faul, M., Xu, L., Wald, M. M., & Coronado, V. G. (2010). Traumatic brain injury in the United States: Emergency department visits, hospitalizations and deaths 2002-2006. Atlanta, GA: Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.

Ganesalingam, K., Yeates, K. O., Taylor, H. G., Walz, N. C., Stancin, T., & Wade, S. (2011). Executive function and social competence in young children 6 months following traumatic brain injury. *Neuropsychology, 25,* 466-476.

Gioia, G. A., Isquith, P.K., Guy, S.C., & Kenworthy, L. (2000). *Behavior Rating Inventory of Executive Function.* Odessa, FL: Psychological Assessment Resources.

Hofman, S.G., Asnaani, A., Vonk, J.J., Sawyer, A.T., & Fang, A. (2012). The efficacy of cognitive behavioral therapy: a review of meta-analyses. *Cognitive Therapy and Research, 36,* 427-440. doi:10.1007/s10609-012-9476-1

Holcomb, M.J., Davis, A.S., & D'Amato, R.C. (2010). Traumatic brain injury: Information for parents. *Helping Children at Home and at School III.* Retrieved from http://www.nasponline.org/resources

Individuals with Disabilities Education Improvement Act of 2004 [IDEIA 04], P.L. 108-446, §601 et seq., 118 Stat. 2647 (2005).

Jantz, P., Davies, S., & Bigler, E. (2014). *Working with Traumatic Brain Injury in Schools: Transition, Assessment, and Intervention.* New York, NY: Routledge Press.

Karver, C. L., Wade, S. L., Cassedy, A., Taylor, H. G., Stancin, T., Yeates, K. O., & Walz, N. C. (2012). Age at injury and long-term behavior problems after traumatic brain injury in young children. *Rehabilitation Psychology, 57,* 256-265.

Kennedy, R.T., Coelho, C., Turkstra, L., Ylvisaker, M., Sohlberg, M.M., Yorkston, K,… Kan, P.F. (2008). Intervention for executive functions after traumatic brain injury: A systematic review, meta-analysis and clinical recommendations. *Neuropsychological rehabilitation, 18,* 257-299. doi: 10.1080/09602010701748644

Kratochwill, T. R., Elliott, S. N., & Callan-Stoiber, K. (2002). Best practices in school-based problem-solving consultation. In A. Thomas & J. Grimes (Eds.) *Best practice in School Psychology IV*, (pp. 603-604), Bethesda, MD: NASP.

Langberg, J. M. (2011). *Homework, Organization and Planning Skills (HOPS) Interventions: A treatment manual*. Bethesda, MD: National Association of School Psychologists (NASP) Publications.

Langberg J.M., Epstein, J.N., & Becker, S.P. (2012). Evaluation of the homework, organization, and planning skills (HOPS) intervention for middle school students with attention deficit hyperactivity disorder as implemented by school mental health providers. *School Psychology Review 41*(3), 342-364.

Lau, B. C., Kontos, A. P., Collins, M. W., Mucha, A., & Lovell, M. R. (2011). Which on-field signs/symptoms predict protracted recovery from sports-related concussion among high school football players? *The American Journal of Sports Medicine, 39*, 2311–2318. doi:10.1177/0363546511410655

Lezak, M. D., Howieson, D. B., Bigler, E. D., & Tranel, D. (2012). *Neuropsychological assessment (5th ed.)*. New York, NY: Oxford University Press, Inc.

Maddern, L., Franey, J., McLaughlin, V., & Cox, S. (2004). An evaluation of the impact of an inter-agency programme to promote social skills in primary school children. *Educational Psychology in Practice, 20(*2), 135-155. doi: 10.1080/02667360410001691062

Max, J. E., Keatley, E. Wilde, E. A., Bigler, Levin, H. S., Schachar, R. J.,…Yang, T. T. (2011). Anxiety disorders in children and adolescents in the first six months after traumatic brain injury. *Social Care & Neurodisability, 2*, 200-207.

Max, J. E., Keatley, E. Wilde, E. A., Bigler, E. D., Schachar, R. J., Saunders, A. E., …Levin, H. S. (2012). Depression in children and adolescents in the first 6 months

after traumatic brain injury. *International Journal of Developmental Neuroscience, 30,* 239-245.

McGinnis, E. (2012). *Skillstreaming the Elementary School Child A Guide for Teaching Prosocial Skills.* Champaign, Illinois: Research Press.

Milders, M., Ietswaart, M., Crawford, J. R., & Currie, D. (2008). Social behavior following traumatic brain injury and its association with emotion regulation, understanding of intentions, and cognitive flexibility. *Journal of the International Neuropsychological Society, 14, 318*-326. doi: 10.10170S1355617708080351

Miranda, A., Presentacion, M.J., Siengenthaler, R., & Jara, P. (2013). Effects of a psychosocial intervention on the executive functioning in children with ADHD. *Journal of learning disabilities, 46,* 363-376. doi: 10.1177/0022219411427349

Moran, L. M., Taylor, H.G., Rusin, J., Bangert, B., Dietrich, A., Nuss, K.E., …Yeates, K. O. (2012). Quality of life in pediatric mild traumatic brain injury and its relationship to postconcussive symptoms. *Journal of Pediatric Psychology, 37*, 736–744. doi:10.1093/jpepsy/jsr087

National Association of School Psychologists [NASP] (2002). Social skills: Promoting positive behavior, academic success, and school safety. Retrieved from http://www.nasponline.org/resources/factsheets/socialskills_fs.aspx

Ohio Department of Education (2013). Traumatic Brain Injury. Retrieved from http://www.education.ohio.gov

Peiniger, S., Nienaber, U., Lefering, R., Braun, M., Wafaisade, A., Borgman, M. A., & Maegele, M. (2012). Glasgow Coma Scale as a predictor for hemocoagulative

disorders after blunt pediatric traumatic brain injury. *Pediatric Critical Care Medicine, 13*, 455–460. doi:10.1097/PCC.0b013e31823893c5

Ruddy R., & House A. (2005). Psychosocial interventions for conversion disorder. Cochrane Database of Systematic Reviews 4. Art. No.: CD005331. doi: 10.1002/14651858.CD005331.pub2

Santrock, J.W. (2011). *Life-Span Development (13th edition)*. New York, NY: McGraw Hill.

Sesma, H.W., Slomine, B.S., Ding, R., & McCarthy, M.L. (2007). Executive functioning in the first year after pediatric traumatic brain injury. *Pediatrics, 121* doi:10.1542/peds.2007-2461. doi: 10.1542/peds.2007-2461

Sherer M., Hart T., Whyte J., Nick T.G., Yablon S.A (2005). Neuroanatomic basis of impaired self-awareness after traumatic brain injury: findings from early computed tomography. *Journal of Head Trauma Rehabilitation, 20,* 287-300.

Siebern, A.T., & Guilleminault, C. (2012) Sleepiness and fatigue following traumatic brain injury: a clear relationship? *Sleep Medicine, 13,* 559-560. http://dx.doi.org/10.1016/j.sleep.2012.03.003

Sparrow, S. S., Balla, D., & Cicchetti, D. (1984). *The Vineland Adaptive Behavior Scales*. Circle Pines, MN: American Guidance Services.

U.S. Department of Health and Human Services, National Institute of Mental Health. *Psychotherapies.* Retrieved from http://www.nimh.nih.gov/health/topics/psychotherapies

Ylvisaker, M., Turkstra, L., Coehlo, C., Yorstown, K., Kennedy, M., Sohlberg, M.M., & Avery, J. (2007). Behavioural interventions for children and adults with behavior disorders after TBI: A systematic review of the evidence. *Brain Injury, 21*(8), 769-805.

APPENDIX A: CONSENT FORMS

UNIVERSITY OF DAYTON-CONSENT TO PARTICIPATE IN RESEARCH

Parent Consent Form

Dear Parent,

My name is Heather Fehring and I am a graduate student in the School Psychology program at the University of Dayton. I am writing to invite your child to participate in a research project on an intervention for students with Traumatic Brain Injury (TBI) and Attention Deficit Hyperactivity Disorder (ADHD).

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of this study is to investigate the effects of a group psychosocial intervention on executive functioning skills in students with TBI or ADHD. Executive functioning involves higher-order cognitive activities such as: reasoning, decision making, monitoring, and critical thinking. This project is important because if students with TBI and ADHD can receive effective intervention in a school setting, it may improve their academic and social skills.

WHAT WILL BE DONE IN THIS STUDY?

This project involves adapting a program developed by Ellen McGinnis (*Skillstreaming the Elementary Child a guide for Teaching Prosocial Skills, 2012).* The current study involves using this program in a school setting; it requires some parent and teacher involvement. If you agree to have your child participate in this project, you will be asked to fill out a questionnaire, the *Behavior Rating Inventory of Executive Function* (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000), which asks you to rate your child's skills both before the beginning of the group sessions and after the last group session. It will take you about 15-20 minutes to complete each questionnaire. Our group will meet for 5-7 weeks, twice a week, for 30-minute sessions during the school day, at a time that is convenient for your child and his/her teacher. Your child will bring home a skill card each week, showing what we are working on in group. You will be encouraged to discuss these skills with your child and practice them at home. At the end of the seven weeks you will be asked a few questions about any changes you notice in your child's behavior. Your child will complete a weekly behavior contract where one behavior will be targeted in the classroom per week. These targeted behaviors will be determined between the teacher, student, and the researcher at the start of each intervention week. Examples of behaviors to target may include turning in homework, completing assignments, asking relevant questions, etc. The program involves rewards and consequences for meeting or not meeting the behavior contract. For example your student may agree to practice the skill of organizing their

notebook 5 times and receive extra iPad time. Rewards and consequences will be determined at the start of the intervention for each student

POTENTIAL RISKS AND DISCOMFORTS

Your child may not respond to the intervention and therefore may need additional services by an outside provider, which may be associated with financial cost. Potential risks for your child include your being pulled out of class for the intervention sessions. To minimize this risk the researcher will collaborate with the teacher to find the best time to implement the group. The researcher will also be discreet when removing your child from his/her classroom. Potential risks associated with your participation include the time to fill out paperwork associated with the study and discuss sessions with your child.

ANTICIPATED BENEFITS TO PARTICIPANTS

There are a number of benefits related to participation in the study. Your child may respond to the intervention and learn skills to help improve their executive functioning skills. Stronger executive functioning skills may lead to improved academic skills and social behaviors.

IN CASE OF RESEARCH RELATED ADVERSE EFFECTS

If you experience any kind of discomfort as a result of your participation in this study, you may contact me (Heather Fehring) at 513-885-8566 or the project advisor, Dr. Susan Davies at 937-229-3652.

CONFIDENTIALITY

If results from this study are published or discussed in conferences, no identifying information will be included. Your child's identity will be protected by replacing their name and their school's name with pseudonyms.

PARTICIPATION AND WITHDRAWAL

Your participation in this study is voluntary. If you decide to participate, you can withdraw your consent and cease participation in the study at any time without discrimination or penalization. Also, the principal investigator may withdraw you from participating in this study if necessary circumstances develop.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about this study you may contact: Heather Fehring, M.S., researcher, University of Dayton, 513-885-8566, heatherfehring@yahoo.com the Principal Investigator, Dr. Susan Davies, University Dayton, 937-229-3652, sdavies1@udayton.edu

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, you may contact the Chair of the Institutional Review Board (IRB) at the University of Dayton: Dr. Mary Connolly, (937) 229-3493, Mary.Connolly@udayton.edu.

SIGNATURE OF RESEARCH PARTICIPANT *(or legal guardian)*

I have read the information provided above. I have been given an opportunity to ask questions and all of my questions have been answered to my satisfaction. I have been given a copy of this form. **I certify that I am at least 18 years of age.**

Name of Participant (please print) _____

Address

_____

Signature of Participant

_____Date_____

SIGNATURE OF WITNESS

My signature as witness certifies that the Participant signed this consent form in my presence.

Name of Witness (please print)

_____

Signature of Witness _____

Date_____

(Must be same as participant signature date)

UNIVERSITY OF DAYTON – CONSENT TO PARTICIPATE IN RESEARCH

Principal Consent Form

Dear Principal,

My name is Heather Fehring and I am a graduate student in the School Psychology program at the University of Dayton. I am writing to invite you to participate in a research project on an intervention for students with Traumatic Brain Injury (TBI) and Attention Deficit Hyperactivity Disorder (ADHD).

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of this study is to investigate the effects of a psychosocial intervention on executive functioning skills in students with TBI or ADHD. Executive functioning involves higher-order cognitive activities such as: reasoning, decision making, monitoring, and critical thinking. This project is important because if students with TBI and ADHD can receive effective intervention in a school setting, it may improve their academic and social skills.

WHAT WILL BE DONE IN THIS STUDY?

This project involves adapting a program developed by Ellen McGinnis (*Skillstreaming the Elementary School Child A guide for Teaching Prosocial Skills* 2012). The current study involves using this program in a school setting; it requires some parent and teacher involvement.

If you agree to allow teachers at your school to participate in my study, the school psychologist will be asked to refer any student who may be suspected of having TBI or ADHD for participation. Next, parent consent for participation will be obtained and the teachers and parents will complete a screening questionnaire called the *Behavior Rating Inventory of Executive Function (BRIEF;* Gioia, Isquith, Guy, & Kenworthy, 2000*),* which asks them to rate their child/student's skills both before the beginning of the group sessions and after the last group sessions. It will take them about 15-20 minutes to complete each questionnaire. If the student demonstrates a score in the at risk range the student will be eligible to participate and the researcher will contact the student's parents to discuss the group intervention.

Group sessions will occur twice a week for five to seven weeks at the student's school in an empty classroom or office space at a time that is convenient for the student and his/her teacher. The duration of each session will be approximately half an hour. Sessions will occur with a goal to not disrupt regular instruction in order to prevent missed school assignments. The program involves rewards and consequences for meeting or not meeting the behavior contract. For example your student may agree to practice the skill of

organizing their notebook 5 times and receive extra iPad time. Rewards and consequences will be determined at the start of the intervention for each student. The intervention will conclude with a follow-up meeting with the child's parent and teacher to discuss the child's outcomes and acceptability of the program.

POTENTIAL RISKS AND DISCOMFORTS

The student may not respond to the intervention and therefore may need additional services by an outside provider, which may be associated with financial cost. Potential risks for your student include your student being pulled out of class for the intervention sessions. To minimize this risk the researcher will collaborate with the teacher to find the best time to implement the group. The researcher will also be discreet when removing your student from his/her classroom.

ANTICIPATED BENEFITS TO PARTICIPANTS

There are a number of benefits related to participation in this study. The student may respond to the intervention and learn skills to increase their executive functioning skills. Stronger executive functioning skills may lead to improved academic skills and social behaviors. Also, contribution to research will be made to support evidence-based interventions.

IN CASE OF RESEARCH RELATED ADVERSE EFFECTS

If you experience any kind of discomfort as a result of your participation in this study, you may contact me (Heather Fehring) at 513-885-8566 or the project advisor, Dr. Susan Davies at 937-229-3652.

CONFIDENTIALITY

If results of research from this study are published or discussed in conferences, no identifying information will be included. Moreover, the school's, students', and teachers' identities will be protected by replacing their names with pseudonyms.

PARTICIPATION AND WITHDRAWAL

Your participation in this study is voluntary. If you decide to participate, you are able to withdraw your consent and cease participation in my study at any time without discrimination or penalization. Also the principal investigator may withdraw you from participating in this study if necessary circumstances develop.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about this study you may contact: Heather Fehring,

M.S., researcher, University of Dayton, 513-885-8566, heatherfehring@yahoo.com the Principal Investigator, Dr. Susan Davies, University Dayton, 937-229-3652, sdavies1@udayton.edu.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, you may contact the Chair of the Institutional Review Board (IRB) at the University of Dayton: Dr. Mary Connolly, (937) 229-3493, Mary.Connolly@udayton.edu.

SIGNATURE OF RESEARCH PARTICIPANT *(or legal guardian)*

I have read the information provided above. I have been given an opportunity to ask questions and all of my questions have been answered to my satisfaction. I have been given a copy of this form. **I certify that I am at least 18 years of age.**

Name of Participant (please print) _____

Address

_____

Signature of Participant

_____Date_____

SIGNATURE OF WITNESS

My signature as witness certifies that the Participant signed this consent form in my presence.

Name of Witness (please print)

_____

Signature of Witness _____

Date_____

(Must be same as participant signature date)

UNIVERSITY OF DAYTON – ASSENT TO PARTICIPATE IN RESEARCH

Student Assent Form
(To Be Read Aloud To Student)

Dear Student,

My name is Heather Fehring and I am a student at the University of Dayton. I am studying a program to help students with organization and planning and I would like you to be a part of this program.

You will be asked to meet with me and a few other children at your school twice a week for several weeks. We will meet in an empty classroom or office where other people cannot see or hear our group. You will also be asked to complete some short activities with your mom or dad at home as well.

When you meet with me we will play games, do activities, and decide on rewards you can work for during the program. We will also discuss the activities you do at home with your parents and learn about things that will help you keep your work and class materials organized.

You do not have to participate in the group. If you start the group and change your mind about participating, you can tell your teacher, your parents, or me at any time. Everything we talk about in the group will be kept confidential. This means what anyone says in the group will be kept in the group. However, if you tell me that you are going to hurt yourself, someone else, or someone is hurting you I would have to tell someone like your parents or a safe adult to make sure you are safe.

Please print your name on the next page and let me know if you want to be a part of my program or not. Thank you!

If you have any questions or concerns about this project you may contact me (Heather Fehring) at 513-885-8566 or my thesis advisor, Dr. Susan Davies at 937-229-3652

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, you may contact the Chair of the Institutional Review Board (IRB) at the University of Dayton: Dr. Mary Connolly, (937) 229-3493, Mary.Connolly@udayton.edu.
Please complete this form and return this form to the principal investigator.

I have been told about this project and I understand it. If I have any questions I know I can ask my teacher, my parents, or Ms. Fehring/Anderson. I also understand that I can stop participating at any time and that everything will be kept confidential.

_____ _____

Child's name Child's signature Date

_____ Yes, I want to participate in this project.

_____ No, I do not want to participate in this project.

I certify that I have explained to the above participant the potential risks and potential benefits to participating in this study. I also certify that I have answered all questions that have been raised.

_____ _____

Principal Investigator's signature Date

UNIVERSITY OF DAYTON – CONSENT TO PARTICIPATE IN RESEARCH

Teacher Consent Form

Dear Teacher,

My name is Heather Fehring and I am a graduate student in the School Psychology program at the University of Dayton. I am writing to invite you to participate in a research project on an intervention for students with Traumatic Brain Injury (TBI) and Attention Deficit Hyperactivity Disorder (ADHD).

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of this study is to investigate the effects of a psychosocial intervention on executive functioning skills in students with TBI and ADHD. Executive functioning involves higher-order cognitive activities such as: reasoning, decision making, monitoring, and critical thinking. This project is important because if students with TBI and ADHD can receive effective intervention in a school setting, it may increase their academic and social skills.

WHAT WILL BE DONE IN THIS STUDY?

This project involves adapting a program developed by Ellen McGinnis (*Skillstreaming the Elementary School Child A guide for Teaching Prosocial Skills* 2012). The current study involves using this program in a school setting; it requires some teacher involvement.

If you agree to have your student participate in this project, you will be asked to fill out a questionnaire, the Behavior Rating Inventory of Executive Function (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000), which asks you to rate your student's skills both before the beginning of the group sessions and after the last group session. It will take you about 15-20 minutes to complete each questionnaire. Our group will meet for 5-7 weeks, twice a week, for 30-minute sessions during the school day, at a time that is convenient for your student and you. You will also be asked to complete a weekly survey; this will take about 5 minutes of your time. At the end of the group sessions you will be asked a few treatment acceptability questions regarding the group intervention.

Your student will complete a weekly behavior contract where one behavior will be targeted in the classroom per week. These targeted behaviors will be determined between the you, your student, and the researcher at the start of each intervention week. Examples of behaviors to target will be based of the student's executive functioning deficits and may include turning in homework, completing assignments, asking relevant questions, etc. The rewards and consequences for meeting or not meeting the behavior contract will be

determined at the start of the intervention for each student. For example your student may agree to practice the skill of organizing their notebook 5 times and receive extra iPad time.

POTENTIAL RISKS AND DISCOMFORTS

The student may not respond to the intervention and therefore may need additional services by an outside provider, which may be associated with financial cost. Potential risks for your student include your student being pulled out of class for the intervention sessions. To minimize this risk the researcher will collaborate with you to find the best time to implement the group. The researcher will also be discreet when removing your student from his/her classroom.

ANTICIPATED BENEFITS TO PARTICIPANTS

There are a number of benefits related to participation in this study. The student may respond to the intervention and learn tools to help strengthen their executive functioning skills. Stronger executive functioning skills may lead to improved academic skills and social behaviors. Also, contribution to research will be made to support evidence-based interventions.

IN CASE OF RESEARCH RELATED ADVERSE EFFECTS

If you experience any kind of discomfort as a result of your participation in this study, you may contact me (Heather Fehring) at 513-885-8566 or the project advisor, Dr. Susan Davies at 937-229-3652.

CONFIDENTIALITY

If results of research from this study are published or discussed in conferences, no identifying information will be included. Moreover, the student's identity, as well as your identity, will be protected through replacing names with pseudonyms.

PARTICIPATION AND WITHDRAWAL

Your participation in this study is voluntary. If you decide to participate, you may withdraw your consent and cease participation at any time without discrimination or penalization. Also the principal investigator may withdraw you from participating in this study if extenuating circumstances develop.

IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about this study you may contact: Heather Fehring, M.S., researcher, University of Dayton, 513-885-8566, heatherfehring@yahoo.com the

Principal Investigator, Dr. Susan Davies, University Dayton, 937-229-3652, sdavies1@udayton.edu.

RIGHTS OF RESEARCH PARTICIPANTS

If you have questions regarding your rights as a research participant, you may contact the Chair of the Institutional Review Board (IRB) at the University of Dayton: Dr. Mary Connolly, (937) 229-3493, Mary.Connolly@udayton.edu.

SIGNATURE OF RESEARCH PARTICIPANT *(or legal guardian)*

I have read the information provided above. I have been given an opportunity to ask questions and all of my questions have been answered to my satisfaction. I have been given a copy of this form. **I certify that I am at least 18 years of age.**

Name of Participant (please print) _____

Address_____

Signature of Participant

_____Date_____

SIGNATURE OF WITNESS

My signature as witness certifies that the Participant signed this consent form in my presence.

Name of Witness (please print)

_____

Signature of Witness _____

Date_____

(Must be same as participant signature date)

APPENDIX B-INTERVENTION MATERIALS

Skill 4: Bringing Materials to Class

SKILL
STEPS

1. **Ask yourself, "What materials do I need for this class?"**
   Students may have to make a list of needed items, such as pencil, crayons, paper, or notebook.
2. **Gather the materials together.**
   Students should remember not to take things that aren't needed—for example, toys.
3. **Ask yourself, "Do I have everything I need?"**
4. **Recheck your materials and pack them up.**

SUGGESTED MODELING

- School: You are going to a special area class (art, music, physical education) or attending a class in another classroom.
- Home: You are going to attend an outside club event or activity, or you are getting your backpack ready for school in the morning.
- Peer group: You will be staying overnight at a friend's house.
- Community: You are going on a school field trip to a museum.

This skill helps students become more organized. For some students, at first you may need to provide a written list of what is needed. Also, providing a notebook or folder where the materials can be kept may help students perform this skill.
Placing a poster of the skill steps near the classroom door may help students remember to check for the materials they will need before they leave the classroom.

Note. From "Skillstreaming the Elementary School Child: Teaching Prosocial Skills (3rd Ed), Copyright 2012 by E .McGinnis, Champaign, IL: Research Press. Reprinted with Permission.

Skill 4: Bringing Materials to Class

Name _____Date_____

SKILL STEPS

1. Ask yourself, "What materials do I need for this class?"

2. Gather the materials together.

3. Ask yourself, "Do I have everything I need?"

4. Recheck your materials and pack them up

FILL IN NOW
With whom will I try this?_____
When?_____

FILL IN AFTER YOU PRACTICE THE SKILL
How did I do?

Why did I circle this? _____

Note. From "Skillstreaming the Elementary School Child: Teaching Prosocial Skills (3rd Ed), Copyright 2012 by E.McGinnis, Champaign, IL: Research Press. Reprinted with Permission

APPENDIX C- TEACHER/STAFF CHECKLIST

1. Asking For Help

Does the student decide when he or she needs assistance and ask for help in a pleasant manner?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

2. Bringing Materials to Class

Does the student remember the books and materials he or she needs for class?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

3. Following Instructions

Does the student understand instructions and follow them?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

4. Completing Assignments

Does the student complete assignments at his/her independent academic level?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

5. Contributing to Discussions

Does the student participate in class discussions in accordance with classroom rules?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

6. Asking a Question

Does the student know how and when to ask a question of another person?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

7. Setting a Goal

Does the student set realistic goals for himself/herself and take the necessary steps to meet these goals?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

8. Problem Solving

When a problem occurs, does the student think of alternatives, choose an alternative, then evaluate how well this solved the problem?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

9. Making a Decision

Does the student make thoughtful choices?

	1	2	3	4	5	
Almost Never	○	○	○	○	○	Almost Always

APPENDIX D-TREATMENT ACCEPTABILITY

Students:

1. Did you like participating in the group? Tell me what you liked the most/least
2. What did you learn from the group sessions?
3. What do you think could make our program better?

APPENDIX D- TREATMENT ACCEPTABILITY –TEACHER

Respondent:_____ Date:_____

Please indicate ratings by printing or typing an "X" in the appropriate parenthesis

	Strongly Disagree	Disagree	Slightly Disagree	Agree	Strongly Agree
	1	2	3	4	5
1. This is an acceptable intervention for strengthening executive functioning skills.	( )	( )	( )	( )	( )
2. I would suggest the use of this intervention to other teachers.	( )	( )	( )	( )	( )
3. I would be willing to use this intervention in the classroom setting.	( )	( )	( )	( )	( )
4.The child's executive functioning skills will remain at an improved level even after the intervention is discontinued.	( )	( )	( )	( )	( )
5.Using the intervention should not only improve the child's executive functioning in the classroom, but also elsewhere.	( )	( )	( )	( )	( )
6.Other behaviors related to executive functioning also are likely to be improved by the intervention.	( )	( )	( )	( )	( )

Adapted from Kratochwill, T. R., Elliott, S. N., & Callan-Stoiber, K. (2002). Best practices in school-based problem-solving consultation. In A. Thomas & J. Grimes (Eds.) *Best practice in School Psychology IV*, (pp. 603-604), Bethesda, MD: NASP.

1. Tell me what you thought about the intervention.
2. How would you recommend this program be improved?
3. Would you recommend this intervention to other students who have TBI and executive functioning difficulties? Why or why not?

APPENDIX E- TREATMENT INTEGRITY

LEADER'S CHECKLIST

Instructions: Leader(s) may complete this checklist at the conclusion of the Skillstreaming group by marking "yes" or "no" relative to each procedure implemented.

Leader:_____ Date:_____

	Yes	No
Step 1: Define the skill		
1. The skill to be taught was defined, and the group understood its meaning.	☐	☐
2. Skill steps were presented and discussed (via poster or skill cards).	☐	☐
(For all sessions after the first)		
3. Group members' skill homework was discussed.	☐	☐
4. Appropriate reinforcement was provided for group members who completed homework.	☐	☐
Step 2: Model the skill		
5. Two examples of the skill were modeled.	☐	☐
6. Each skill step was identified as the modeling unfolded.	☐	☐
7. Modeling displays were relevant to group members' real-life circumstances.	☐	☐
8. Group members were directed to watch for the steps being modeled.	☐	☐
9. The model was friendly and helpful.	☐	☐
10. A coping model was presented if indicated.	☐	☐
11. The model used self-talk to illustrate the steps and thinking about skill performance.	☐	☐
12. The modeling display depicted positive outcomes.	☐	☐
13. The model was rewarded for skill performance (following the skill steps).	☐	☐
Step 3: Establish student skill need		
14. Each group member's need for skill use was defined (when, where, and with whom) and listed.	☐	☐
Step 4: Select the first role-player		
15. The main actor was selected for role-play (e.g., "Who would like to go first?")	☐	☐
Step 5: Set up the role-play		
16. Main actor selected a coactor who reminded him/her most of the real-life person with whom he/she has the skill need.	☐	☐
17. Main actor described the physical setting, events preceding the problem, mood/manner of the person, and any other relevant information.	☐	☐

Step 6: Conduct the role-play18. Group members were assigned specific step(s) to observe. □ □

19. Main actor was instructed to follow the behavioral steps. □ □
20. Main actor was reminded to "think aloud." □ □
21. Coactor was reminded to stay in the role of the other person. □ □
22. Group leader assisted the main actor as needed (pointed to skill steps, coached). □ □

Step 7: Provide performance feedback

23. Coactor was asked to provide feedback (e.g., how he/she felt, how well the main actor enacted the steps). □ □
24. Group members were asked if the main actor followed each step. □ □
25. Leaders provided appropriate feedback (praise, approval, encouragement), identifying specific aspects of the main actor's performance. □ □
26. Reinforcement in an amount consistent with the quality of role-play was provided. □ □
27. Main actor was invited to give comments. □ □

Step 8: Select the next role-player

28. Volunteer participant asked to act as the main actor in the next role-play and coached in Steps 5 through 7. □ □
29. All group members were given a chance to role-play, or plans were made to role-play for those who did not have a chance. □ □

Step 9: Assign skill homework

30. Skill homework was assigned to each main actor. □ □
31. Assistance was provided as needed in identifying the day, place, with whom the skill will be used, and so forth. □ □

TOTAL YES _____ TOTAL NO _____

APPENDIX F-OBSERVER CHECKLIST

OBSERVER'S CHECKLIST

Instructions: A highly skilled observer may complete this observation checklist as the Skillstreaming group is taking place. The observer will note whether leader(s) completed each procedure with a low level of competence (score 1), medium proficiency (score 2), or a high level of skill (score 3). At the conclusion of the observation, the observer may provide leader(s) with recommendations for specific steps needing improvement.

Group leader(s) _____ Observers _____

Date of group _____ Time of group _____

	Proficiency Level
	1 2 3
Step 1: Define the skill	
1. The skill to be taught was defined and the group understood its meaning.	□ □ □
2. Skill steps are presented and discussed (via poster or skill cards).	□ □ □
(For all sessions after the first)	
3. Group members' skill homework was discussed.	□ □ □
4. Appropriate reinforcement was provided for group members who completed homework.	□ □ □
Step 2: Model the skill	
5. Two examples of the skill were modeled.	□ □ □
6. Each skill step was identified as the modeling unfolded.	□ □ □

7. Modeling displays were relevant to group members' real-life circumstances. □ □ □

8. Group members were directed to watch for the steps being modeled. □ □ □

9. The model was friendly and helpful. □ □ □

10. A coping model was presented if indicated. □ □ □

11. The model used self-talk to illustrate the steps and thinking about skill performance. □ □ □

12. The modeling display depicted positive outcomes. □ □ □

13. The model was rewarded for skill performance (following the skill steps). □ □ □

Step 3: Establish student skill need

14. Each group member's need for skill use was defined (when, where, and with whom) and listed. □ □ □

Step 4: Select the first role-player

15. The main actor was selected for role-play (e.g., "Who would like to go first?") □ □ □

Step 5: Set up the role-play

16. Main actor selected a coactor who reminded him/her most of the reallife person with whom he/she has the skill need. □ □ □

17. Main actor described the physical setting, events preceding the problem, mood/manner of the person, and any other relevant information. □ □ □

Step 6: Conduct the role-play

18. Group members were assigned specific step(s) to observe. □ □ □

19. Main actor was instructed to follow the behavioral steps. □ □ □

20. Main actor was reminded to "think aloud." □ □ □

21. Coactor was reminded to stay in the role of the other person. □ □ □

22. Group leader assisted the main actor as needed (pointed to skill steps, coached). □ □ □

Step 7: Provide performance feedback

23. Coactor was asked to provide feedback (e.g., how he/she felt, how well the main actor enacted the steps). □ □ □

24. Group members were asked if the main actor followed each step. □ □ □

25. Leaders provided appropriate feedback (praise, approval, encouragement), identifying specific aspects of the main actor's performance. □ □ □

26. Reinforcement in an amount consistent with the quality of role-play was provided. □ □ □

27. Main actor was invited to give comments. □ □ □

Step 8: Select the next role-player

28. Volunteer participant asked to act as the main actor in the next role-play. Repeated Steps 5 through 7. □ □ □

29. All group members were given a chance to role-play, or plans were made to role-play for those who did not have a chance. □ □ □

Step 9: Assign skill homework

30. Skill homework was assigned to each main actor. □ □ □

31. Assistance was provided as needed in identifying the day, place, with whom the skill will be used, and so forth. □ □ □

TOTAL _____

59 points or below Group leader intervention needed.

60–74 points Continued monitoring of instruction necessary.

75–83 points Consultation with master leader available.

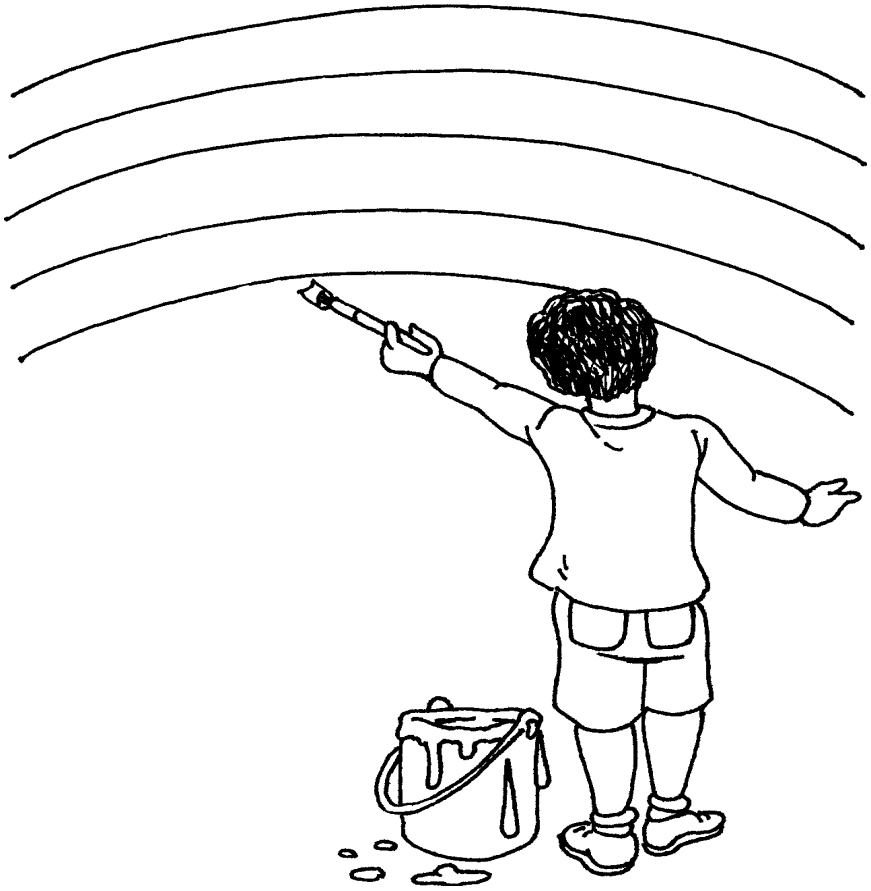
84–93 points Mastery of intervention demonstrated.

Comments:

Recommendations for improvement:

Note. From “Skillstreaming the Elementary School Child: Teaching Prosocial Skills (3rd Ed), Copyright 2012 by E.McGinnis, Champaign, IL: Research Press. Reprinted with Permission.

APPENDIX G- PROGRESS MONITORING



Color in a space each time you use the skill of

_____

APPENDIX H- RECRUITMENT LETTER

Heather Fehring
(513) 885-8566
fehring1@udayton.edu

January 29, 2014

To Whom It May Concern:

My name is Heather Fehring and I am a school psychology student at the University of Dayton. I am currently seeking participants to participate in a research project evaluating the efficacy of a cognitive-behavioral intervention for students with a traumatic brain injury (TBI) who also have executive functioning difficulties. The intervention would involve 5-7 weeks of small group counseling sessions (using the Skillstreaming curriculum) for one or two students with TBI, plus several students with ADHD. Executive functioning difficulties are common following a TBI and can result in academic, social, and behavioral difficulties. If the intervention improves executive functioning skills other areas of functioning improve as well. If you have a student with a TBI in your school (either on an IEP, 504 plan, or under evaluation), who demonstrates executive functioning difficulties, please contact me so we can discuss the possibility of him/her participating in the intervention. After we obtain consent for one or two students with TBI in a building, we will then seek consent for several students with ADHD to also participate in the group.

Sincerely,

Heather Fehring, M.S.
School Psychology student

Dr. Susan Davies
Thesis Chair, University of Dayton