A PSYCHOSOCIAL INTERVENTION FOR A MALE ELEMENTARY STUDENT
WITH A TRAUMATIC BRAIN INJURY AND EXECUTIVE FUNCTIONING
DEFICITS

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A PSYCHOSOCIAL INTERVENTION FOR A MALE ELEMENTARY STUDENT

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ABSTRACT

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Students with traumatic brain injuries (TBI) often experience a range of behavioral, academic, social, and emotional difficulties. The present study examined the effectiveness of a psychosocial intervention, Skillstreaming, on a student who sustained a TBI and presented with executive functioning (EF) difficulties. Three students with non-TBI related executive functioning deficits and one student with a TBI participated in a five week intervention designed to improve executive functioning skills. Each student’s teacher completed the Behavior Rating Inventory of Executive Function (BRIEF) before and after the intervention period to measure the efficacy of the intervention. Results indicated that the intervention is potentially effective in improving executive functioning skills in the student who sustained a TBI. Suggestions are made for improvements to the intervention to increase the EF skills of students.
Dedicated to Janice Kopec

Thank you for supporting and believing in me throughout my education.
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CHAPTER I

INTRODUCTION

When individuals are injured from a fall, a car accident, or a sporting accident, they often sustain a Traumatic Brain Injury (TBI). These accidents typically involve an individual hitting the front of their heads, which causes damage to the frontal lobe. When the frontal lobe is damaged, an individual’s executive functioning skills are typically impaired (Alvarez & Emory, 2006). Executive functions (EF) are a set of higher order skills that allow an individual to engage in goal setting, attention regulation, impulse disinhibition, planning future behavior, problem-solving, and engaging in abstract reasoning and mental flexibility (Ganesalingam, 2011). When these functions are impaired, serious disruptions in a student’s functioning in school can occur, affecting their academic performance, social relationships, and behavioral functioning.

Students with TBI are not the only individuals who may struggle with executive functioning skills. Students with attention-deficit hyperactivity disorder (ADHD) and other related disorders may have EF difficulties (Cooper, Heron, & Heward, 2007). There are various empirically supported psychosocial interventions for students with EF difficulties; however, research is lacking on effective interventions for individuals who sustain a TBI and have resulting EF impairments. Because many psychosocial interventions target the executive functioning skills of students with ADHD, these interventions could be applied to students who have TBIs and impaired executive
functioning skills. Executive functioning difficulties are common among students who have sustained traumatic brain injuries. However, there are few empirically validated interventions for students with traumatic brain injuries. This present study involved evaluating the efficacy of a psychosocial intervention for a second grade boy who sustained a TBI in kindergarten as a result of surgical complications. The study measured the student’s executive functioning skills throughout the intervention to determine the efficacy of the intervention. Also during the course of this study, a colleague (Fehring, 2015) evaluated the efficacy of the same intervention with a young girl who sustained a TBI in infancy. Thus, a broader purpose of this study was to begin exploring whether there might be differences in intervention efficacy for students who sustained TBIs in infancy versus those who were typically developing throughout early childhood, whose injuries were more recent.
CHAPTER II
LITERATURE REVIEW

This literature review begins with an overview of TBI, including the definition, prevalence, and common causes. The age at the time of injury and its effects on severity are described, as well as the types of brain injuries that occur. TBIs are classified on a continuum of severity: mild, moderate, or severe. The severity level of a TBI often indicates the level of recovery and the amount of assistance needed for these individuals in the educational setting. The literature review describes the behavioral, academic, emotional, social, cognitive, and neurological consequences that may result from a TBI. Executive functioning, a higher order processing skill, is discussed in terms of impairment post-TBI. Finally, interventions for students who have executive functioning deficits are described.

TBI: Basic Overview

Causes and prevalence. A traumatic brain injury (TBI) is caused by a bump, blow, or jolt to the head or a penetrating head injury that disrupts the normal function of the brain (CDC, 2013). In Ohio, where the research study was conducted, the definition of a traumatic brain injury is expanded to include other medical conditions. Examples include but are not limited to stroke, anoxia, infectious disease, aneurysm, brain tumors and neurological insults resulting from medical or surgical treatments (ODE, 2014).
TBIs are caused by motor vehicle-traffic accidents, fall, assaults, sports and recreation-related injuries, and other external causes (Faul, Xu, Wald, & Coronado, 2010). According to the Center for Disease Control (CDC, 2013), at least 1.7 million TBIs occur each year in the United States as an isolated injury or in combination with other injuries. Of this estimate, 52,000 people die from their injury and an additional 275,000 individuals are hospitalized. Of all injury-related deaths in the US, TBI contributes to one-third (30.5%) of these (CDC, 2013). According to the Center for Disease Control (2013), preschool boys sustain a TBI 1.5 times more than preschool girls. By the time these children reach school age, boys are 2 times more likely than girls to sustain these injuries. In addition, males sustain more severe injuries than females with TBIs, with a 4 to 1 rate of mortality (CDC, 2013).

**Age of injury.** Infants, children, and adolescents between the ages of 0-19 account for almost 700,000 of the 1.7 million Americans injured from TBIs each year (Faul et al., 2010). Infants and very young children between zero and four years old have the highest rates of emergency department visits for a TBI-related injury (1,256 per 100,000 in the general population), followed by adolescents age 15 to 19 years old (757 per 100,000 in the general population). The majority of these 0-19 year olds will be treated at the emergency department and released to go home (Jantz, Davies, & Bigler, 2014). Data shows the greater the age at the time of the TBI, the more likely the injury will result in hospitalization or death (Faul et al., 2010; Shi et al., 2009).

**Types of head injuries.** When an individual’s head is injured and the brain is affected, it is classified as either an open/penetrating head injury or a closed /non-penetrating head injury. A penetrating head injury (PHI) occurs when an object pierces
the cranial vault and dura mater, or a blunt force impact from an object fractures the cranial vault that ends up piercing the dura mater with bone fragments (Erdogan, Gonul, & Seber, 2002; Harcke, Levy, Getz, & Robinson, 2008). The three types of PHIs include: penetrating, where an object enters but does not exit the head; perforating, where an object enters into and passes completely through the cranial vault, including an identifiable entrance and exit point; and tangential when an object strikes the head with enough force that the cranial bones are broken inward and tear the dura mater.

Closed head injuries are those which result from a blunt force impact that does not pierce the dura mater, or results from a rapid acceleration or deceleration of the brain within the cranial vault. The two subcategories include: contact force injury, when a person’s head is stationary and is struck by a moving object, and inertial force injury, when an individual’s moving head comes into contact with a non-moving object (Jantz et al., 2014).

**Injury severity classifications.** TBI severity is classified into three categories (mild, moderate, severe), but actually occur on a continuum; therefore, two individuals with the same severity classification may display different outcomes, strengths, and limitations (Jantz et al., 2014). The scale ranges in increasing severity from mild (mTBI), to moderate, to severe.

**Mild TBIs.** According to the CDC (2013), around 80% of all TBIs in the US are considered mTBI. Under the classification of mTBI, there are uncomplicated and complicated mTBIs (Corrigan, Selassie, & Orman, 2010). Uncomplicated mTBIs do not have any primary or secondary intracranial damage displayed in neuroimaging technology on the date of the injury. Conversely, the complicated mTBI has evidence of
intracranial damage measured by neuroimaging technology on the date of the injury (CDC, 2013). A concussion is at the mildest end of the mTBI continuum, which has an immediate onset and results from either a direct blow to the head or acceleration/deceleration of the brain that is significant. The majority of individuals with a mTBI fall on the least severe end (Lezak, Howieson, Bigler, & Tranel, 2012). On the more severe end of the mTBI continuum, individuals may experience amnesia, seizures, headaches, vomiting, and neurological deficits, such as working memory impairment and slowed processing speed (Lezak et al., 2012).

**Moderate TBIs.** According to the Center for Disease Control (2013a), approximately 10% of all TBIs in the U.S. are classified as moderate. Moderate TBIs typically involve the loss of consciousness for 1-24 hours, abnormal brain imaging results, or a coma that lasts within six hours (Corrigan et al., 2010; Jantz et al., 2014). The majority of individuals who sustain a moderate TBI can function independently and return to work or school; however, they typically experience symptoms or consequences that are derived from their injury. They may experience difficulties with everyday living, headaches, memory problems, loss of spontaneity and initiative, and cognitive difficulties that may last six months following their injury. Individuals with moderate TBIs may experience affective, behavioral, and learning problems, which may include flattened affect or empathy, anger outbursts, impulsivity, and difficulties self-monitoring their behavior (Jantz et al., 2014).

**Severe TBIs.** Approximately 10% of all TBI injuries in the U.S. are classified as severe, involving a loss of consciousness for more than 24 hours, abnormal brain imaging results, or a coma for more than six hours after the injury occurred (CDC, 2013a;
Individuals who sustain a severe TBI and survive do not return to their pre-injury levels of social functioning or independent living (CDC, 2013a; Corrigan et al., 2010). Individuals with severe TBIs typically have significant cognitive and motor deficits, executive dysfunction, as well as emotional or psychiatric disorders as a result of the injury. Unfortunately those with the most severe classification often die or remain in a minimally conscious state (Corrigan et al., 2010). The following section will describe the rate of recovery based on the three main classifications of head injuries.

**Recovery.** The rate of recovery from a TBI depends on the characteristics of the injury and is often measured in terms of the degree of restoration of anatomical structures, return to pre-injury levels of functioning, and medical improvement (Jantz et al., 2014). For the majority of individuals with mTBIs, symptoms decrease within minutes, hours, or days and leave no lasting measurable consequences. These individuals typically return to their pre-injury activities without any problems (Bigler, 2012).

Individuals who sustain moderate or severe TBIs have primary damage to their brain that is typically irreversible in addition to some degree of functional impairment. Medical professionals agree that a full recovery with moderate and severe TBIs is highly unlikely. TBI is associated with high costs both on a monetary level as well as personal level for the individual (Jantz et al., 2014).

**Consequences of TBI in School**

Students are expected to follow the rules, norms, and social standards of the educational environment upon entering the school building. When class begins, teachers often review previously learned information, introduce new knowledge or skills, and then practice what was learned under the guidance of the teacher (Jantz et al., 2014). Students
with TBI, regardless of the severity level, typically experience difficulties in the academic setting (Fulton, Yeates, Taylor, Walz, & Wade, 2012). This may include difficulties with acquiring new information, retrieving previously learned information, short and long-term memory, speed of information processing, attention, executive functions, and psychomotor skills (Fulton et al., 2012). The TBI can affect the student’s ability in a number of academic areas, including but not limited to, receptive and expressive language, reading accuracy, reading comprehension, spelling, and math (Fulton et al., 2012).

**Cognitive and neurological consequences.** Individuals with TBI may experience a range of symptoms affecting cognitive and neurological processes. Some cognitive and neurological symptoms may include headaches, epileptic seizures, memory difficulties, and sensory-motor difficulties, such as vision problems, motor difficulties, and problems with dizziness and balance. Cognitive difficulties may prevent students from integrating, retaining, and retrieving presented and learned information; paying attention to instruction or concentrating in class; and planning, organizing and following through with tasks and assignments.

Neurological deficits that interfere with academic success may prevent a student from asking for clarification when needed, understanding new information, and demonstrating levels of competency (Jantz et al., 2014). In addition, TBI-related injuries that strike the frontal lobes, or the front of the head, may disrupt an individual’s executive functioning. According to Jantz and Coulter (2007) executive functioning can affect an individual’s ability to reason, problem-solve, set goals, prioritize, self-monitor, self-
correct, organize, and plan. In addition to cognitive difficulties, students with TBI may experience emotional and social deficits.

**Emotional and social consequences.** Common consequences following a TBI include difficulty with emotion regulation and social interactions. One emotional consequence is depression (Max et al., 2012). The likelihood of developing depression is not contingent on the severity level of the injury, but rather the location of the brain in which the injury occurred, such as the left temporal pole lesions. In addition to depression, another common emotional consequence of a TBI is experiencing increased levels of anger and irritability (Goucik & Gentlemen, 2004). Often this anger is caused by preexisting mental health issues, new levels of dependency on others, and damage to the area of the brain that involves executive functioning (Hart, Vaccaro, Hays, & Maiuro, 2012). If the anger is caused by executive functioning deficits, a student may have trouble controlling his or her temper and managing frustration. These individuals may have trouble de-escalating their anger, recognizing cause and effect relationships, or understanding the consequences of their outbursts. Other common emotional consequences of TBIs can include displaying apathy, or a decreased sensitivity of emotional expression, as well as post-traumatic stress disorder and anxiety disorders (Lane-Brown & Tate, 2011).

Students with TBI often experience difficulties interacting with peers and may receive differential treatment from peers, family members, and friends (Jantz et al., 2014). For example, if a student has difficulty speaking, it may be challenging for others to comprehend his or her expressive language, potentially limiting his or her ability to form meaningful relationships with others. Peers will often ignore, tease, or avoid the
student. In addition, students with TBI may not pick up on social cues or implied meanings during conversations, so they may appear uninterested, thus leading to peers avoiding the student (Jantz et al., 2014). Students with TBI who have trouble interacting with peers or adults due to inappropriate emotional or behavioral self-control will experience difficulties that may influence their academic success (Jantz et al., 2014). This can affect their relationships with adults, such as their teachers.

**Behavioral consequences.** Students with TBI often experience behavioral difficulties that can last for years after their injury (Karver et al., 2012). These behavioral problems are influenced by the age at the time of their injury, as well as the severity of the TBI. The younger the individual at the time of the injury and the more severe the TBI, the greater the chances are that the individual will experience behavioral problems (Benedictus, Spikman, & Van Der Naalt, 2010). Behavioral difficulties are typically related to either damage to the brain structures, such as the frontal lobe, or associated with TBI-induced emotional difficulties.

Behavioral consequences include limbic system difficulties, such as dysfunctional or inappropriate behavior related to motivation, emotions, memory, or biological drives. Examples include acting impulsively in response to emotions/urges, sexual promiscuity, unprovoked aggressive behavior, reckless or dangerous behavior, conflict with authority, and over- or under-reacting to situations (Wilde et al., 2010). Pragmatic skill deficits are common among students with TBI, which can explain the individual’s difficulty appropriately communicating with peers, teachers, or family members. According to Douglas (2010) these pragmatic impairments include poor response inhibition, excessive distractibility, rigid thinking, impaired memory, difficulty with motor speech, and
difficulty with verbal fluency. In the academic setting, this might include difficulty providing requested information to listeners, difficulty picking up implied meanings in conversations, inappropriate topics or content, introducing new topics at the wrong time, and decreased quality of content in conversations (Douglas, 2010). Besides pragmatic impairments, students with TBIs often have difficulty recognizing facial affect in others (Babbage et al., 2011). As a result, they may be unable to engage in socially appropriate behavior. The cognitive, behavioral, and social consequences described above may all be caused, or exacerbated, by executive functioning impairment.

**Executive functioning difficulties.** According to Ganesalingam (2011) executive functions are a set of higher order skills that allow an individual to engage in goal setting, attention regulation, impulse control, planning future behavior, problem-solving, and engaging in abstract reasoning and mental flexibility. If a TBI damages the frontal lobe, prefrontal cortex, or its underlying connected areas, the executive functions can be disrupted, resulting in cognitive, academic, emotional, social, and behavioral difficulties. 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). One example of how executive functioning deficits affect a student’s performance in school is the inability to follow multi-step directions. Students with this deficit may have difficulty completing a full task or planning enough time to complete assignments.

Students with TBI often have executive functioning (EF) problems caused by neurological impairments that may prevent them from achieving academic success due to
a number of factors. First, response inhibition is decreased, so students may blurt out answers or seem to act without thinking. Students may experience difficulty with cognitive flexibility, where they have trouble persevering on concepts or tasks, shifting tasks, or multitasking. They may have trouble setting and achieving goals or strategies for problem solving, as well as initiating tasks and displaying proper attention control. In addition, students with EF problems have trouble controlling emotions and social behaviors, often displaying a tendency to blame others and have poor frustration tolerance. EF deficits may also result in poor planning, organization, and time management, as well as poor abstract reasoning and concept formation. Finally, students with EF deficits often have trouble with self-monitoring, poor self-control, reduced insight, and difficulty learning from past experiences (Maricle, Bauman, & Avirett, 2010). Children who experience deficits in executive functioning skills often need increased support in the schools in order to be successful.

**Interventions for Students with Executive Functioning Deficits**

Students with EF difficulties need increased support in the classroom through various interventions or related services. Unfortunately, the research is currently limited on specific executive functioning interventions for students with a TBI. However, there are successful evidence-based interventions for students with related difficulties, such as attention deficit hyperactivity disorder (ADHD), who also experience executive functioning deficits (Barkely, 1989; Jantz et al., 2014; Kray, Karback, Haenig, & Freitag, 2012). In addition, students with specific learning disabilities, autism, Tourette’s syndrome, sleep disorders, and neurological impairments may demonstrate EF difficulties (Maricle, Bauman, & Avirett, 2010). Because there is a gap in empirically validated
literature on interventions for students with TBIs who experience executive functioning difficulties, it is worthwhile to investigate the efficacy of interventions designed for students with ADHD that might be used with individuals who sustain a TBI.

**Behavioral and academic interventions.** Students who demonstrate behavioral issues in school often struggle academically. Academics and behavior are often linked together, which may be influenced by a student’s deficits in executive functioning skills. One behavioral strategy that has reduced challenging behavior among students with a TBI is Positive Behavioral Interventions and Supports (PBIS). PBIS is a comprehensive set of strategies used in the school setting to reduce problem behavior and increase positive behaviors by modifying the environment, teaching new skills, and controlling staff responses. PBIS targets problem behaviors in the natural settings and focuses on the control of antecedents (Ylvisaker et al, 2007).

Behavioral interventions that demonstrate effectiveness for students with ADHD include token economy systems, response cost systems, contingency management, and time out from positive reinforcement (Barkely, 1998). In addition, direct instruction (DI) of EF skills can be effective. In this, students can be directly taught EF skills that have not yet developed by having the student’s teacher describe the problem behaviors to the student, what the behavior should look like, set a goal and a procedure for reaching the goal, and evaluate the process and procedure. (Maricle et al, 2010).

Direct instruction can also be used for students with TBIs who experience academic problems due to their injury. With this technique, the instructional targets are broken down into steps that are taught to the student, including errorless learning, teaching to mastery, and systematic review (Ross & Frey, 2009). Another technique used
is task modification, which includes breaking the tasks into pieces with breaks, using close-ended notes, and building in variety and choice in tasks (Maricle et al., 2010).

Finally, students with EF difficulties may benefit from modifying the classroom environment. Environmental support that can be helpful includes increased supervision, preferential seating, daily rules and routines, and visual and verbal cues (Barkely, 1998). Students might also benefit from other strategies such as self-talking through steps of an assignment; using planners, schedules and checklists; practicing rehearsal strategies for memory; and learning “cool down” procedures (Jantz et al., 2014). There are several academic or behavioral interventions and strategies that educators can use to increase the executive functioning skills of students. In addition to these, students with EF deficits may also benefit from psychosocial interventions.

**Psychosocial interventions.** Psychosocial interventions are known to provide support, education, and guidance to individuals with mental illnesses and their families (Center for Children and Families, n.d). Psychosocial treatment, such as behavior modification, in combination with medication, has been found to be the most effective intervention for children with ADHD (CCF). Some examples of other psychosocial treatment methods for students with executive functioning deficits, such as ADHD, include daily report cards, behavioral contracts and charts with consequences, and group contingencies (CCF). Psychosocial interventions include the categories of cognitive-behavioral interventions and social skill interventions that may aid in the improvement of executive functioning skills.

**Cognitive-behavioral interventions.** Impaired executive functioning affects one’s functioning in most life settings, particularly where one’s sense of self is constructed,
such as home, school, or work (Ramsey, 2010). The nature of a TBI can lead to the
development of pessimistic outlooks, negative assumptions about one’s abilities, and a
dysfunctional belief system. These maladaptive outlooks or thoughts can interfere with
the individual’s perceived ability to take proactive steps to change their circumstances
(Ramsey, 2010). Cognitive-behavioral strategies emphasize the role of thinking as
mediators of behavior change. This strategy is focused on the assumption that when
students understand how and why they are behaving the way they are, they can begin to
alter or control their behavior (Corey, 2013). Some techniques within this model include
metacognition, or thinking about thinking, and verbal self-regulation, which is positive
self-talk to guide problem-solving. Finally, self-management teaches the student to
manage their own behavior, which attempts to address the lack of self-awareness issue in
students with a TBI (Barkely, 1989; Jantz et al., 2014).

Adults who experience a TBI and have executive functioning difficulties can
benefit from a variety of evidence-based cognitive behavioral interventions. A
systematic review by Kennedy et al. (2008) examined thirty studies on the effectiveness
of cognitive behavioral therapy (CBT) interventions for middle aged adults who
sustained a TBI. These studies used different aspects of problem-solving, planning,
organization, and multi-tasking through three different types of CBT interventions:
multiple steps with metacognitive strategy instruction, strategic thinking, and multi-
tasking. The systematic review found these interventions resulted in immediate positive
changes in functional activities and reductions in impairment following implementation.
None of these studies used children as participants; however, the results are promising
and could benefit children who have sustained a TBI and experience executive functioning difficulties.

**Social skills intervention: Skillstreaming.** According to Gresham (1998) social skills are any socially acceptable learned behaviors that allow individuals to interact effectively with others and escape or avoid socially unacceptable behaviors that others display. According to the National Association of School Psychologists (2002), there are four broad domains of social skills: survival skills, interpersonal skills, problem-solving skills, and conflict-resolution skills. Examples of these skills include listening, following directions, rewarding yourself, asking for help, and decision making. These skills are taught in social skills trainings and are consistent with executive functioning skills.

Students who have poor social skills have been shown to evoke highly negative responses from peers that can lead to peer rejection; experience difficulties in interpersonal relationships with parents, teachers and peers; demonstrate poor academic performance, and show signs of depression and anxiety (NASP, 2002). In order to improve a student’s social skills, school personnel can implement various interventions. Social skills training should emphasize learning, performance, generalization, and maintenance of appropriate behaviors through modeling, coaching, and role-playing (NASP, 2002). Students should be provided with immediate feedback and focus on facilitating the desirable behavior. The social skills training should include practice opportunities in a wide range of settings with different groups or individuals to generalize the skills. If possible, social skills groups should include parents and caregivers to assist with the intervention (NASP, 2002).
Instruction of social skills has been shown to positively impact a variety of individuals: elementary-age children, adolescents, and students with learning disabilities, emotional and behavioral disorders, or traumatic brain injuries (Dykeman, 2003). Social skills training combined with medication have demonstrated statistical significance for the treatment of students with ADHD, who oftentimes experience executive functioning difficulties (Dykeman, 2003).

The psychosocial intervention used in the present study is from the evidence-based strategy, *Skillstreaming the Elementary School Child: A Guide for Teaching Prosocial Skills* (McGinnis, 2012). *Skillstreaming* involves a cognitive behavioral framework to teach desirable behaviors to replace those less desirable in nature (McGinnis, 2012). This approach differs from strictly behavioral interventions because the student may not have a grasp of the needed skill or it may not be in the person’s repertoire. Educators increasingly understand that students need to be taught desirable behaviors the same way they are taught academic skills (Maag, 2005). *Skillstreaming* also provides remediation for students who are deficient in pro-social skills, whether they receive special education services or not.

The five categories of social skill lessons that educators can use in *Skillstreaming* include: classroom survival skills, friendship-making skills, skills for dealing with feelings, skill alternatives to aggression, and skills for dealing with stress (McGinnis, 2012). The social skill category most closely related to executive functioning skills is classroom survival skills and skills for dealing with stress. These socially based executive functioning skills include topics such as bringing materials to class, contributing to discussions, asking for help, making a decision, and following instructions. These two
categories of social skills were selected because students who experience deficits in executive functioning skills oftentimes have trouble with these skills sets, such as planning ahead, organizing materials, decision-making, and problem-solving. During each *Skillstreaming* session, the teacher/leader defines the skill, models the skill, establishes each group member’s need for the skill, role-plays the skill, provides performance feedback to group members, and assigns skill homework (McGinnis, 2012). This social skill training helps students learn the desired skill or behavior and then generalize it into the classroom.

**The Present Study**

*Skillstreaming* is a social skills intervention with individual lesson plans that targets classroom survival skills or socially based EF skills, the most underdeveloped skill set for students who experience executive functioning deficits. The purpose of the present study is to determine if the psychosocial intervention, *Skillstreaming*, helps a student who sustained a TBI early in his elementary career improve his executive functioning skills. By strengthening EF skills, students with TBIs may improve their day to day functioning, which includes their academic skills, social relationships, and behavioral functioning. The present study, in combination with research from a colleague (Fehring, 2015), contributes to the limited research on effective school-based EF interventions for students who have sustained a TBI.
CHAPTER III
METHOD

Research Question and Prediction

The current study examined the following research question: What is the effect of a psychosocial intervention on executive functioning (EF) in a student who sustained a traumatic brain injury (TBI) during their early elementary career?

It was predicted that a psychosocial intervention focusing on classroom survival skills would significantly improve the executive functioning skills for a student who sustained a TBI who also exhibited EF difficulties. Cognitive behavioral interventions have demonstrated effectiveness for middle-aged adults with TBIs and EF deficits (Kennedy et al., 2008). In addition, psychosocial interventions have demonstrated effectiveness for students who have EF impairments due to other disorders such as ADHD (Maricle et al., 2010). *Skillstreaming* is predicted to be effective for students with executive functioning deficits because it is a psychosocial intervention that utilizes a cognitive behavioral approach (McGinnis, 2012).

Research Design

A case study design was used in the present study. This methodology was chosen for several reasons, including: (a) the low prevalence of TBI, a control group was not feasible, (b) it did not require a large group of participants, (c) growth was measured by participant’s pre-test/post-
tests (d) it was feasible in a school setting.

This study used a one-group pretest/posttest design because the primary researcher administered a pre-test, the treatment, and then a post-test to the group of participants. The independent variable was the psychosocial intervention (Skillstreaming) and the dependent variable was improvements in executive functioning as measured by scores on the BRIEF and teacher weekly rating forms.

Participants

Convenience sampling was used to recruit a sample of participants from schools in southwestern Ohio through their school district’s director of special education. The group included (n=4) elementary-aged (6-12 years old) students, one with TBI and three who demonstrated deficits in non-TBI related executive functioning.

To be included in the study, the student with a TBI must have met either “a” or “b”, in addition, to “c”, “d”, and “e,” of the following requirements: (a) the student was classified through Individuals with Disabilities Education Act (IDEA) with Traumatic Brain Injury by his or her school district; (b) the student was on a 504 plan because of a documented brain injury; (c) the student’s TBI occurred more than 1 year ago; (d) school records indicated general intelligence in the low average range or higher following the head injury; (e) the student demonstrated executive functioning (EF) difficulties in the clinically significant range on one or more subscales as determined by results of the Behavior Rating Inventory of Executive Functioning to be completed by the student’s teacher.

To be included in the study, the other students (without TBI) must have met “a”, “b”, and “c” of the following requirements: (a) the student was identified through the
school psychologist, classroom teacher, or intervention specialist as a student who struggled with executive functioning skills; (b) school records indicated general intelligence within the low average range or higher; and (c) the student demonstrated EF difficulties in the clinically significant range for one or more of the subscale scores as determined by results of the Behavior Rating Inventory of Executive Functioning to be completed by the student’s teacher.

Student 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. In order to recruit teacher participants, convenience sampling was used. The student’s teachers were asked to participate via face to face meeting followed by receiving written consent. The following four students were included in the intervention. Names have been changed to protect participants’ privacy.

**Student with a TBI: Carter.** Carter was an eight year old second grader at a midwestern elementary school. As a young child, Carter had an excess of cerebrospinal fluid in his brain, a condition called hydrocephalus seizure disorder that caused medical staff to use ventriculoperitoneal shunting to drain the fluid. As a complication from this, Carter sustained a traumatic brain injury that occurred immediately following the surgery when he was 5 years old. Carter has received special education services for TBI, including Occupational Therapy and Speech Language/Communication, since February 2010 of his kindergarten year. The areas emphasized on Carter’s Individualized Education Plan (IEP) included goals related to visual motor skills, visual perception, and social communication skills. According to the intervention specialist at his school, Carter struggled with transitions and had trouble reacting appropriately to unexpected situations.
Carter had difficulty with problem-solving, making decisions, managing his time, and setting goals.

Carter scored a 23 on the Kindergarten Readiness Assessment-Literacy (KRAL) assessment, demonstrating above proficient skills before entering kindergarten. Carter performed in the average range academically, receiving A’s and B’s during first and second grade, and had no academic needs at the time of intervention. During his evaluation for special education, Carter scored an 86 on a cognitive assessment, which is low average range. On a standardized academic assessment, he scored in the average range in all categories except math reasoning, which fell in the low average range. On the Behavior Assessment Scale for Children- Second Edition (Reynolds & Kamphouse, 2004), a behavior rating scale, Carter scored in the clinically significant range in areas of anxiety, depression, atypicality, and withdrawal. According to a curriculum based assessment performed by his second grade teacher, Carter was “not on track” for meeting the 3rd grade reading guarantee. He met grade level expectations for math and writing. Carter demonstrated excellent attendance during the three years at his current school and did not have any discipline referrals.

**Other group members.**

**Andrew.** Andrew was a nine year old second grader at a midwestern elementary school. Andrew had good attendance at his present school; he attended a different elementary school for Kindergarten and first grade. According to his teacher, Andrew had minimal parent support at home. Curriculum based assessments administered by his first grade teacher demonstrated that Andrew was “not on track” for meeting the 3rd grade reading guarantee. He was also not on track for writing and performed below average in
math, based on results from his first grade teacher. Andrew received C’s, D’s, and F’s on his report card in reading, writing, and math. The teacher noted that Andrew struggled to write high frequency words. According to the intervention specialist, Andrew had a high number of visits to the clinic for problems such as bumping his head and falling down, but was only sent home once during the school year in which this research study took place. Andrew did not have any discipline referrals. Andrew’s teacher stated that he has trouble focusing in school and was frequently off-task. He was referred to the primary researcher through the intervention specialist as a student who would be a good fit for this intervention due to difficulties sustaining attention, managing his time, and setting goals. The intervention specialist did not work with Andrew directly since he was not on an IEP/504 plan at the time of the research study, but consultation was provided on classroom interventions to help Andrew with his EF deficits. Andrew was taking medication to improve his focus in school. Andrew began taking this medication during the first week of the intervention.

**William.** William was an eight year old second grader at a midwestern elementary school. William had asthma and was often in the clinic for respiratory problems. William’s mother passed away in 2011 and he lived with his grandma during the time of the intervention. William had poor vision in one eye and wore glasses for reading. William passed the hearing screening. He participated in a friendship group with the school counselor, where he met once per week for a quarter in 2013. William had difficulty staying focused and completing his work. According to curriculum based assessments from his first grade teacher, William was not on track for meeting the 3rd grade reading guarantee. He was on track with writing and math for meeting grade level
expectations. His grades in all classes were A’s and B’s. William attended his current school for the last 3 years and did not attend preschool. William had good attendance and had no discipline referrals. William was referred to the primary researcher from the intervention specialist due to concerns with sustaining attention, initiating tasks, and problem solving. The intervention specialist did not work with William directly since he was not on an IEP/ 504 plan at the time of the research study, but consultation was provided on classroom interventions to help William with his EF deficits.

**Jackie.** Jackie was an eight year old second grader who attended all three years at the current midwestern elementary school. Jackie did not attend preschool prior to Kindergarten. Jackie had good attendance the past three years. According to curriculum based assessments from her first grade teacher, Jackie was not on track for meeting the 3rd grade reading guarantee. She was not on track with writing and math for meeting grade level expectations. Jackie struggled most with writing. She received C’s and D’s in math, writing, and reading. Jackie passed her vision and hearing screenings. She took medication to help her focus in school due to inattentiveness and off-task behavior. At the time of the study, there was no medical diagnosis of ADHD. She began taking medication at the start of the intervention sessions. She was referred to the primary researcher for the intervention by the intervention specialist due to difficulty sustaining attention in the classroom and managing her time. She did not have an IEP/ 504 plan during the intervention, but her classroom teacher did receive consultation from the intervention specialist on how to better assist Jackie in the classroom. She did not have any referrals for discipline problems.
Materials

**Measures.** The *Behavior Rating Inventory of Executive Functioning* (BRIEF; Gioia, Isquith, Guy, & Kenworthy, 2000) was completed by the teachers of each the four participants. The BRIEF assesses executive functioning skills in the school environment through a questionnaire developed for teachers of students ages 5-18. It was completed before and after the intervention to determine the severity of executive functioning deficits and growth of executive functioning skills following the intervention. The measure takes approximately 10-15 minutes to administer and 15-20 minutes to score. Students’ scores were kept confidential and used only for the purpose of the current study; they did not become part of the students’ school records.

Participants were measured on the BRIEF’s eight clinical scales: (a) inhibit, (b) shift, (c) emotional control, (d) initiate, (e) working memory, (f) plan/organize, (g) organization of materials, and (f), monitor. Student also obtained two broader Indexes, Behavioral Regulation and Metacognition, and an overall composite score, the Global Executive Composite (GEC).

The BRIEF has high internal consistency ($r = 0.80-0.98$) and test-retest reliability ($rs = 0.88$ for teachers; Gioia et al., 2000). In order to qualify for the study, participants needed to score in the clinically significant range on one of the subtest scores of the BRIEF.

**Intervention materials.** The psychosocial intervention used lesson plans from *Skillstreaming the Elementary School Child* (McGinnis, 2012). Sessions lasted 30 minutes and covered topics including 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. The intervention began with one introduction/rapport building session followed by nine sessions with various topics related to executive functioning difficulties. During each *Skillstreaming* session, the researcher defined the skill, modeled the skill, established each group member’s need for the skill, role-played the skill, provided performance feedback to group members, and assigned skill homework (McGinnis, 2012). Examples of activities and worksheets are found in the Appendix B.

**Self-monitoring and homework.** Students were assigned a self-monitoring “rainbow” coloring page to color in one stripe at a time when they exhibited a targeted skill outside of the intervention session. For example, if the targeted skill was asking for help, students colored in a stripe of the rainbow each time that they appropriately asked their teacher or a peer for help. Students were also assigned a homework page to practice the learned skill following each session. Students were assigned a homework sheet and a self-monitoring sheet that was to be completed and turned in to the primary researcher at the start of the next session. Students were rewarded with a small piece of candy, a sticker, or verbal praise at the start of the class if they completed both of their assignments. See Appendix C for the self-monitoring worksheet.

**Teacher weekly checklist.** In order to monitor student’s progress, teachers completed a weekly rating from the *Skillstreaming* intervention, known as Teacher Weekly Checklist. The checklist contained a rating scale of how the child used the executive functioning skills covered in the intervention. Teachers gauged the students’ general progress throughout the week through observations. Examples of behaviors that
were measured include contributing to discussions, asking for help, completing assignments, and listening. See Appendix D for the Teacher Checklist.

*Treatment acceptability interview.* Following the completion of the intervention, teachers and students were interviewed on the acceptability of the intervention through a paper interview form (see Appendix E). Teachers responded to six questions which asked them to rate specific components of the intervention on a 5 point scale. The questionnaire was adapted and modified to fit the intervention topic from Kratchowill, Elliot, & Callan-Stoiber (2002). They also responded to three open-ended questions requesting additional feedback. In addition to feedback from teachers, students were interviewed about their perceptions of the intervention through three open-ended questions (see Appendix F).

*Treatment integrity checklist.* During each *Skillstreaming* session, the researcher leading the group completed a Treatment Integrity Checklist (see Appendix G). This checklist was adapted from the *Skillstreaming* intervention and outlined the 9 steps to be completed during each session to ensure treatment was delivered the same way across sessions (McGinnis, 2012). The 31 total steps completed were used to determine the intervention’s treatment integrity.

*Observer checklist.* In order to ensure that the primary researcher was implementing the intervention with integrity, a second trained researcher observed one intervention session and provided feedback to the primary researcher. The second researcher completed the Observer Checklist (see Appendix H), adapted from the *Skillstreaming* intervention, which determined the inter-observer reliability (McGinnis, 2012).
Procedures

Phase I: IRB approval. This study was approved by the University of Dayton Institutional Review Board (IRB).

Phase II: Recruitment. Directors of Special Education or school psychologists at school districts in southwest Ohio were contacted to see if any students matched the study’s TBI criteria. Once the student with a TBI was identified in a school district, the school psychologists and intervention specialists at the respective district were contacted to determine students diagnosed with ADHD or known to have difficulties with executive functioning skills.

Phase III: Consent. Once a student with TBI was identified in a school district, informed consent was obtained. The district/school consent, parent consent, teacher consent, and child assent were collected prior to beginning the study (see Appendix A). Selected students were assigned a pseudonym to protect their confidentiality in publications or presentations of the data, including the thesis project. All data were kept in a locked file cabinet. After two years, the data will be shredded (paper records) or deleted (electronic records).

Phase IV: Screening and pre-assessment. The teacher of the student with a TBI was administered the BRIEF to determine executive functioning deficits. Once this student was identified as a group member, the school psychologist was contacted to refer three additional students who experience symptoms of executive functioning deficits. These students were all identified within the same grade level as the selected student with a TBI. Teachers completed the BRIEF to establish the students’ executive functioning deficits. From these results along with the criteria described in the third paragraph of the
participants section of this report, three students were selected to participate in the intervention with the student who had sustained a TBI. Record reviews were completed once participants were confirmed. Background information was collected to determine students’ medical history (i.e., severity of executive functioning skills or TBI), academic performance, general intelligence, and behavioral concerns.

**Phase V: Intervention.** The intervention involved two sessions per week for five weeks using materials adapted from the *Skillstreaming*. Teachers completed the Teacher Checklist once during each week of the intervention to measure students’ improvements in executive functioning skills. Students received a weekly self-monitoring sheet with one specific behavior to focus on each week. Students received homework after each session, which consisted of practicing the specific skill learned with a peer, teacher, or parent and rating themselves on their performance of that skill practiced. Intervention integrity checklists and the Observer Checklist were used to calculate intervention integrity and reliability throughout the intervention.

**Phase VI: Post-intervention data collection.** The students’ teachers were administered the BRIEF following the completion of the intervention. Teachers and students were interviewed using the Treatment Acceptability Interview form.

**Phase VII: Analyze results.** Following the data collection, results were analyzed to determine the effectiveness of the psychosocial intervention for the student who sustained a TBI and experienced executive functioning deficits. Improvements in the other students with executive functioning impairments were also determined.

**Phase VIII: Participant compensation.** Student participants were awarded a certificate of achievement at the end of the intervention along with small pieces of candy.
Teachers and the supporting school psychologist were provided with a thank you card and a $10 gift card for their participation.
CHAPTER IV

RESULTS

Following are the results of the *Skillstreaming* intervention, including an analysis of the data for each student in the group using the *Behavior Rating Inventory of Executive Functioning* (BRIEF), the students’ weekly self-rating results, the teacher weekly rating form results, and the students’ self-monitoring results. In addition, results include inter-observer reliability, results of the intervention integrity checklist, and outcomes from the treatment acceptability interviews.

Research Question

The current study examined the research question: What is the effect of a psychosocial intervention on executive functioning (EF) in a student who sustained a traumatic brain injury (TBI)? It was predicted that a psychosocial intervention focusing on classroom survival skills would significantly improve the executive functioning skills for a student who sustained a TBI who also exhibited EF difficulties. In order to determine the effect of the psychosocial intervention on executive functioning skills, the BRIEF was completed by each participant’s teacher before and after the intervention. Additionally, the students and their teachers completed weekly rating forms of behavior. The following sections describe the results for each of the four students in the *Skillstreaming* intervention.
Carter

**BRIEF analysis.** Carter, the student who experienced a TBI, scored a BRIEF pre-test Global Executive Composite (GEC) score of 67, which falls at the 90th percentile. Carter’s GEC score falls in the clinically significant range, scoring equal to or higher than 90% of his same-aged peers. On the post-test, Carter’s GEC score was 65, which is in the clinically significant range and at the 88th percentile when compared to typical same-age peers. On both the pre- and post-test, the negativity scales and inconsistency scales were within acceptable levels. Thus, they are likely reliable ratings of his true behavior.

Figure 1 displays Carter’s pre-test and post-test scores on the BRIEF by subtest. Scores above 65 are considered clinically significant. Carter reduced his score on the shift subtest by 12 points, from 76 to 65; he also decreased his score on emotional control from 73 to 65. In addition, Carter’s score on the Behavior Regulation Index improved from 69 to 64. The only subtests that did not show a decrease in score were “initiate” and “organization of materials.” Overall, Carter’s score on the BRIEF GEC was reduced by 2 points and was on the border of the clinically significant range.
Weekly rating forms. Carter completed a nine-question rating form once per week for five weeks during the intervention period. The form used five “smiley faces” of varying degrees from frowning to smiling to help depict his feelings. Scores of one are the lowest and five are the highest. Figure 2 depicts how Carter rated his behaviors during each week of the intervention. Carter self-reported his behaviors as increasing from an average of 3.55 at the start of the intervention session to 4.22 at the end of the sessions.

Carter’s teacher rated him weekly for five consecutive weeks during the intervention period on nine different behaviors. Scores of one indicate that the student never displayed the behavior while scores of five indicate that students always displayed the behavior. Table 3 depicts how Carter’s teacher rated his behaviors during each week of the intervention. Figure 2 also demonstrates the average score per week that Carter’s teacher rated specific executive functioning skills. Carter’s teacher rated his executive
functioning skills as increasing from an average of 1.89 at the start of the sessions to 2.67 after the final session. As reported in the weekly rating forms, both Carter and his teacher reported improvement in his executive functioning skills by the end of the intervention.

![Carter & Teacher Average Rating](image)

*Figure 2. Carter and his teacher’s average score per week on rating form*

**Homework and self-monitoring.** During each intervention session, Carter was provided with homework to complete and a self-monitoring “rainbow” to color in each time a specified behavior is displayed outside of the group session. The homework and self-monitoring assignments were both to be turned into the primary researcher on the subsequent session. Carter completed and turned in 1/8 (12%) of homework assignments and 2/8 (25%) self-monitoring assignments.

**Andrew**

**BRIEF analysis.** Andrew’s BRIEF pre-test Global Executive Composite (GEC) score was 60, which falls at the 80th percentile. Andrew’s GEC score falls in the typical range and he scored equal to or greater than 80% of his same aged peers. On the post-test,
Andrew’s GEC score was 50, which is ranked at the 61\textsuperscript{st} percentile compared to same-age peers. On both the pre- and post-test, the negativity and inconsistency scales were within acceptable levels; therefore, they are likely ratings of his true behavior. Figure 3 displays a comparison of Andrew’s pre-test and post-test scores on the BRIEF by subtest. Scores above 65 are considered clinically significant. Andrew decreased his score on the inhibit subtest 18 points from 69 to 51, his working memory score was reduced from 66 to 50, and his organization of materials score decreased from 64 to 50. All subtests decreased from the pre-test to the post-test by a minimum of 3 points thus bringing his GEC score down 10 points to 50.

![Andrew's Pre-Test & Post-Test BRIEF Scores](image)

*Figure 3. Andrew’s Pre-test and Post-test scores from the BRIEF assessment*

**Weekly rating forms.** Andrew completed a nine-question rating form weekly for six weeks during the intervention period. The form used five “smiley faces” of varying degrees from frowning to smiling to help the student depict his feelings. Scores of one
are the lowest and five are the highest. Figure 4 depicts how Andrew rated his behaviors during each week of the intervention. Andrew’s self-rating forms increased from an average of 4.55 at the start of the intervention to 5 at the end of the intervention.

Andrew’s teacher rated him weekly for five consecutive weeks during the intervention period on nine different behaviors. Scores of 1 indicate that the student never displays the behavior while scores of 5 indicate that students always display the behavior. Figure 4 also depicts how Andrew’s teacher rated his behaviors during each week of the intervention. Andrew’s teacher rated his behaviors at an average of 3.33 to begin the intervention and his score increased to an average of 4.77 by the end of the intervention.

![Andrew & Teacher Average Rating](image)

*Figure 4. Andrew and his teacher’s average score per week on rating form*

**Homework and self-monitoring.** During each intervention session, Andrew was assigned homework to complete and a self-monitoring “rainbow” to color in each time he exhibited a particular behavior outside of the group session. The homework and self-
monitoring assignments were both to be turned into the primary researcher on the subsequent session. Andrew completed and turned in 6/6 (100%) of homework assignments and 6/6 (100%) self-monitoring assignments.

William

**BRIEF analysis.** William’s BRIEF pre-test Global Executive Composite (GEC) score was 69, which falls in the 94th percentile. William’s GEC score falls in the clinically significant range, scoring equal to or higher than 94% of his same aged peers. On the post-test, William’s GEC score is 68, which is in the clinically significant range and at the 94th percentile when compared to typical same age peers. On both the pre-test and post-test, the negativity scales and inconsistency scales were within acceptable levels. Thus, they are likely reliable ratings of his true behavior. Figure 5 displays William’s pre-test and post-test scores on the BRIEF by subtest. William reduced his score in the plan/organization subtest from 74 to 67, a decrease of 7 points. William also reduced his scores in the area of shift, emotional control, and behavior regulation index. William did not improve his scores from the pre-test to the post-test in the areas of inhibit, working memory, organization of materials, monitor, and metacognition index. Overall, William reduced his score on the GEC by 1 point, which placed him in the clinically significant range on the BRIEF.
Weekly rating forms. William completed a nine-question rating form once per week for five weeks during the intervention period. The form used five “smiley faces” of varying degrees from frowning to smiling to help depict his feelings. Scores of one are the lowest and five are the highest. Figure 6 depicts how William rated his behaviors during each week of the intervention. William self-reported his behaviors with average score of 3.44 at the start of the intervention and increased his average score at the end of the intervention to 4.33.

William’s teacher rated him weekly for five consecutive weeks during the intervention period on nine different behaviors. Scores of one indicate that the student never displays the behavior while scores of five indicate that students always displayed the behavior. Figure 6 also depicts how William’s teacher rated his behaviors during each week of the intervention. William’s teacher rated his behaviors at an average of
2.11 to begin the intervention and his score decreased to an average of 1.33 by the end of the intervention.

![William & Teacher Average Rating](image)

*Figure 6. William and his teacher’s average score per week on rating form*

**Homework and self-monitoring.** During each intervention session, William was assigned homework to complete and a self-monitoring “rainbow” to color in each time he exhibited a particular behavior outside of the group session. The homework and self-monitoring assignments were both to be turned into the primary researcher on the subsequent session. William completed and turned in 1/8 (12%) of homework assignments and 2/8 (25%) self-monitoring assignments.

**Jackie**

**BRIEF analysis.** Jackie’s BRIEF pre-test Global Executive Composite (GEC) score was 75, which falls at the 97th percentile. Jackie’s GEC score falls in the clinically significant range, scoring equal to or higher than 97% of her same aged peers. On the
post-test, Jackie’s GEC score is 67, which was in the clinically significant range, and ranks at the 92nd percentile for her typical same age peers. Jackie’s score on the BRIEF GEC decreased by 8 points following the conclusion of the intervention. On both the pre-test and post-test, the negativity and inconsistency scales were within acceptable levels. Thus, they are likely reliable measures of her behavior. Figure 7 displays Jackie’s pre-test and post-test scores on the BRIEF by subtest. Every subtest score, with the exception of emotional control, decreased from the pre-test to the post-test with the change in scores ranging from a decrease in 4 points to 12 points. Jackie’s score on the inhibit subtest decreased by 7 points, shift by 12 points, initiate and monitor subtests by 10 points, and organization of material subtest by 8 points. Overall, Jackie’s GEC score on the BRIEF decreased by 8 points, although still in the clinically significant range.

![Jackie's Pre-Test & Post-Test BRIEF Scores](image)

*Figure 7. Jackie’s Pre-test and Post-test scores from the BRIEF assessment*
**Weekly rating forms.** Jackie completed a nine question rating form weekly for five weeks during the intervention period. The form used five “smiley faces” of varying degrees from frowning to smiling to help depict her feelings. Scores of one are the lowest and five are the highest. Figure 8 depicts how Jackie self-reported her behaviors during each week of the intervention. Her average score on the rating form was a 3.67 at the start of the intervention and by the end of the intervention, her average score fell to 2.

Jackie’s teacher rated her weekly for five consecutive weeks during the intervention period on nine different behaviors. Scores of one indicate that the student never displays the behavior while scores of five indicate that students always display the behavior. Figure 8 also demonstrates the average score that her teacher rated her behavior per week on the weekly rating form. The teacher’s average on the rating form was 1.89 at the start of the intervention and increased to 2.89 by the end of the intervention session.

![Jackie & Teachers Average Rating](image)

*Figure 8. Jackie and her teacher’s average score per week on rating form*
**Homework and self-monitoring.** During each intervention session, Jackie was assigned homework to complete and a self-monitoring “rainbow” to color in each time she exhibited a particular behavior outside of the group session. The homework and self-monitoring assignments were both to be turned into the primary researcher on the subsequent session. Jackie completed and turned in 6/7 (85%) of homework assignments and 6/7 (85%) self-monitoring assignments.

**Session Specific Data**

Following are qualitative observations of the group process, from the researcher’s perspective. The first session was a rapport building session during which the students got to know each other through an ice breaker and group rules were established. During the second session, students were taught the skill step “asking for help” and homework and self-monitoring procedures were assigned. Carter did not appear to understand the homework assigned, even though half of it was completed during the session. When practicing the skill steps for “asking for help”, Carter became angry when he was not selected for the initial opportunity to volunteer to role play. The third lesson taught was “bringing materials to class” and was held in the library rather than a small confined space like the previous two sessions. Carter needed to be redirected multiple times during this session and was not engaged in the scenarios as he was often trying to lie on the floor during the group session. William frequently interrupted other group members and the primary researcher when they were talking during this session. The group members would become off-task and it took redirection from the primary researcher in order to get the group back on task. During the week of the fourth session, the students took a
statewide achievement test prior to the intervention session. This testing occurred on both
the days of sessions four and five of the intervention. All of the students’ exhibited
greater off-task behavior during this week of sessions. Andrew did not participate much
and was a distraction to the group. For example, he would make immature comments or
noises to get the attention of others in the group. The fourth session topic was “following
instructions”. The fifth session covered “completing assignments” and was also held
during statewide testing week. The students were praised more often by the researcher
and received candy as reinforcement when appropriate. All students, including Carter,
responded positively to the praise and worked hard to earn the candy.

The sixth session covered the topic “contributing to discussions” and all the
students were well behaved. The session was held in a small conference room with
minimal distractions which helped the students remain engaged in the scenarios. The
students were very specific in role playing and received positive praise and candy was
earned at the end of the session. All students remained on task during lesson seven, which
covered “asking a question”. The lesson was held in a larger conference room and the
students maintained focus during the session despite sitting on large conference chairs.
The students role played the “question asking” skillfully and provided good examples of
times to ask questions. During lesson eight, “setting a goal”, students were asked about
who they role played their homework assignment with. Andrew and Jackie were the only
two who completed their assignment, but neither could remember who they practiced
their skill with. Because William and Carter did not do their homework or self-
monitoring worksheet, they did not earn candy, which they became verbally upset about.
During the ninth session, only William and Carter were present because the other two
students were completing testing during the afternoon. William’s teacher expressed to the researcher that he was having a bad day prior to the intervention session. Carter and William were both off-task during this session. Carter was walking around the room during instruction and was exhibiting immature behavior; it appeared he was doing this in order to get the attention of the other researcher, who was present to complete the inter-rater reliability form. During the final session, students covered “making a decision”. Carter was absent during the final session. Carter attended 9/10 intervention sessions.

**Intervention Integrity**

Measures of intervention integrity were conducted by the primary researcher following the completion of every intervention session for a total of 10 sessions. An intervention integrity checklist with 31 items was completed during each of the integrity checks. The intervention was upheld with 96% integrity. Time constraints were one obstacle the primary observer faced when upholding the integrity of the intervention.

**Inter-observer Reliability**

The second researcher observed the primary researcher during the ninth group session to determine the inter-observer reliability. The observer’s checklist contains 31 items and the researcher was rated on a proficiency level of 1-3, with 3 being the most proficient. The primary researcher was rated at a proficiency level 3 on 30 items and proficiency level 2 on 1 item. The primary researcher earned a score of 92/93 points and fell into the level, “mastery of intervention demonstrated.” Feedback was also provided on how to improve the remainder of intervention sessions. On the session observed for inter-observer reliability, only two out of four students were present. The second researcher noted that the item the primary researcher did not “remind the primary actor to
think out loud” during the role-playing. The primary researcher did not have that item checked off on the intervention integrity checklist for the session observed. Both the primary and secondary researcher stated that the intervention was upheld with 98% integrity during the ninth session, thus demonstrating that it was upheld with significant reliability.

**Treatment Acceptability**

Students were collectively interviewed on the last group session about their reactions and feedback on the intervention. When asked what they enjoyed about the group, students stated, “getting stickers and candy”, “the homework”, “the in-group papers”, and one student stated “I loved everything.” When asked what students liked the least, one student stated “that every group session we were in a different room” and another student did not enjoy the homework. When asked what they learned from the group, students stated “to be nice”, “problem-solve” and to “make good choices”. The primary researcher asked what could make the group sessions better to the students. All four students agreed that they would like to meet every day of the week instead of two days and would like to meet for a longer period of time.

The students’ teachers were asked to rate the intervention using a five-point rating scale for six questions and then answer three short response questions. The five-point rating scale was as follows: 1-strongly disagree, 2-disagree, 3-slightly disagree, 4-agree, and 5- strongly agree. When asked if it was an acceptable intervention for strengthening executive functioning skills, teachers averaged a 3.33, indicating that two teachers slightly disagreed while one agreed. When asked if they would suggest this intervention for other teachers, teachers averaged a 3.33; two teachers slightly disagreed while one
agreed. The average response for the question “I would be willing to use this intervention in the classroom setting?” was a 3, where all the teachers stated they slightly disagreed. Teachers were asked if using the intervention should not only improve the child’s executive functioning skills in the classroom but also elsewhere. Two teachers stated they agreed and one teacher slightly disagreed. Finally, teachers were asked if other behaviors related to executive functioning also are likely to be improved by this intervention. Two teachers stated they agreed and one teacher slightly disagreed to this statement.

When asked their thoughts about the interventions, two teachers stated they did not know enough about what the primary researcher was doing to make a comment. The other teacher stated she did not see her students use much of the skills learned during her class time. The teachers were asked what could be done to improve this intervention. Two teachers stated there could be better communication between the teacher and primary researcher about what the students were learning each week and how they could help work on these skills with the students. Finally, teachers were asked if they would recommend this intervention to other students who have a TBI or other executive functioning deficits. One teacher stated “sure, it always helps to try new things” while another teacher was unsure since both of her students with EF impairments started medication at the start of the intervention.
CHAPTER V
DISCUSSION

Review of Purpose and Major Findings

At least 30% of all individuals who sustain a traumatic brain injury hit the front of their head from blows such as a car accident or an object coming towards them, which often damages their frontal lobe (CDC, 2013). The frontal lobe is responsible for executive functioning skills that allow an individual to plan ahead, make decisions, set goals, regulate attention, and manage his or her time. When these functions are impaired, students often experience difficulty in school with a range of behavioral, academic, social, and emotional challenges. Not only do students with TBI have impaired EF skills, but many students with attention-deficit hyperactivity disorder (ADHD) and other disorders have EF difficulties as well. Although there are numerous empirically supported psychosocial interventions for the latter population, research is sparse for students who have sustained a TBI and also suffer EF deficits. Because various psychosocial interventions target the EF skills of children with ADHD, interventions that have support for that population of students could be applied to students who have TBIs and impaired executive functioning skills. However, such strategies have not been adequately researched for this population.

The purpose of this study was to determine the effectiveness of a psychosocial intervention for a student who sustained a traumatic brain injury in his early elementary
career and experience executive functioning deficits. These studies have examined the efficacy of school based interventions for this population. Results from the present study indicated that the Skillstreaming intervention may have helped the executive functioning skills for a student who sustained a TBI.

**Interpretation of Findings Relative to Predictions**

**BRIEF.** All four students demonstrated reductions in scores on the BRIEF after the completion of the intervention, which demonstrates a perceived improvement in EF skills, as reported by each student’s teacher. Carter, the student with a TBI, reduced his Global Executive Composite score on the BRIEF by 2 points. He began in the clinically significant range and by the end of the intervention, his score fell on the borderline between typical and clinically significant. Although the decrease in GEC score may not initially appear significant, some of his composite scores were greatly reduced. These subtests include shift, emotional control, and the Behavior Regulation Index (BRI). The BRI was reduced considerably and no longer falls in the “clinically significant” range. Two of the other students in the group, Andrew and Jackie, reduced their scores by a greater point value on the BRIEF than the student with a TBI; however, those two students experienced less severe symptoms to start and also began a medication trial at the start of the group sessions.

**Student self-ratings.** Three of the four students, Andrew, William, and Carter, increased their scores on the self-rating form by the last week of the intervention sessions. This demonstrates the students’ belief that there was an increase in their own executive function skills that they learned and practiced over the sessions. Carter increased his score from 3.55 to 4.22 demonstrating that when reflecting on his own
behaviors, he believed there was an increase of EF skills over the sessions. Two of the three other students also perceived improvement in their own EF skills at about the same rate as Carter, based on their self-ratings.

**Teacher ratings.** Three out of four students increased their scores based on the Teacher Rating Scale at the end of the sessions. This indicates that teachers saw improvements in the students’ executive functioning skills over the five week period. Carter started with an average rating from his teacher of 1.89 and his score increased to an average rating of 2.67. The area that improved the most according to Carter’s teacher was asking questions, which increased from a 1 to a 4 by the end of the intervention. All other behaviors on his rating form either increased slightly or stayed the same. The two other students who increased scores on the teacher rating form, Jackie and Andrew, had approximately the same rate of improvement as the student with a TBI.

For most of the children, the teachers and students both saw improvements in the students’ behaviors over the course of the intervention, as demonstrated by the increase of scores on the weekly rating forms; however, there was a large discrepancy between the student’s perception of their behavior and the teacher’s perception of the student’s behavior. For example, Carter’s score at the end of the intervention on his weekly self-ratings was a 4.22 while his teacher rated him as 2.67. William’s score at the end of the intervention was a 4.33 and his teacher’s final rating was 1.33. This discrepancy demonstrates the student’s inability to accurately describe their own behavior, an essential component of metacognition. Metacognition, or “thinking about thinking” allows individuals to automatically reflect on, evaluate, and address breakdowns in their learning processes or behavior (Menzies, Lane, & Lee, 2009). When this skill is
underdeveloped, students may not be aware they are exhibiting problem behavior or experiencing any deficits in skills, thus they may not work toward improving their behaviors or skill deficits. Individuals experiencing executive functioning deficits, such as ADHD, often lack self-awareness of their social and academic deficits and typically rate themselves more favorably than external sources (Stewart, Tan, Delgaty, Gonzales, & Bunner, 2014). One reason this intervention may have been less effective for Carter and William was their inability to self-monitor their behavior. Perhaps they have not yet developed the skillset needed to monitor their behavior, in which case a more behaviorally based intervention, rather than cognitive behaviorally based, might have been more effective.

Session specific data. One of the greatest concerns throughout the sessions was that Carter and William did not understand the homework assignments or self-monitoring worksheets. Both students attempted to complete the self-monitoring worksheets during the intervention lesson even after prompted by the researcher that they are to complete these outside of the lesson. Two of the students, Jackie and Andrew, understood the homework and self-monitoring concept and also had the most significant reduction on their scores on the BRIEF. All students enjoyed positive praise and small candy rewards during the session, which increased their participation and on-task behavior during the group session. The small candy treats were not implemented until the fifth session; however, students received stickers and praise throughout the entirety of the intervention. If candy incentives were implemented from the first session, the students may have exhibited greater on-task behavior during the first few sessions.
**Treatment integrity.** The intervention was upheld with 96% integrity, thus the intervention was implemented as it was designed in *Skillstreaming* (McGinnis, 2012). Time constraints were one factor that reduced the intervention integrity since the primary researcher only had 30 minutes to work with the students during each session. There were often room schedule conflicts or students needing redirection, thus taking time away from completing all necessary steps of the intervention.

**Treatment acceptability.** All students in the group agreed that they would rather meet every week day instead of only two days per week and increase the time on the group sessions. It was evident that the students enjoyed the group intervention, perhaps due to the role playing and incentives. The teachers had differing opinions than the students on the *Skillstreaming* intervention. This difference of opinions could have been improved in various ways. First, teachers played a minimal role in the intervention. Teachers were not instructed to reinforce specific EF behaviors, assist students on the skills learned, or help with their skill homework. Since there was minimal collaboration with the teachers, it was difficult for them to understand the intervention and find it useful in improving the students’ executive functioning skills. Secondly, the rating form used for treatment acceptability did not include an option for a neutral response. Instead it included three options for levels of disagreements and only two levels of agreement. Teachers may have selected the option for “slightly disagree” when they might have felt more towards “neutral” when rating the intervention. Due to these factors, teachers may have rated the intervention less positively than students.
**Limitations**

There were several limitations to this research study. First, the primary researcher began the intervention session late into the school year so there was no opportunity to collect baseline data on the students’ behavior ratings prior to implementation of the intervention. Without baseline data, it was impossible to calculate effect size; therefore, only a visual analysis of graphed data was used to determine the efficacy of the intervention. Secondly, each intervention session was held in different rooms throughout the school building. This inconsistency often caused students to become easily distracted upon entering each room location thus causing a loss of intervention time. Another limitation was that both Andrew and Jackie began medication for inattention at the start of the five week intervention period. Although there were some school days where the teacher reported they forgot to take their medication in the morning, Andrew’s and Jackie’s improvements in executive functioning skills cannot solely be determined as due to the intervention session, rather the combination of the intervention with medication (and, possibly, other factors that were unknown to the researcher). In addition, not all students were present at every session, thus reducing their capability of learning and improving executive functioning skills. For example, Andrew was absent for two sessions and Carter and Jackie were both absent for one session.

Another limitation is the data collection used only involved teacher’s subjective opinions about whether their students improved across weeks. There was not an objective measure of data collection used for this study, such as observation data tallying how many times the targeted student asked for help in the classroom or tracking how many times the student did not have their materials prepared for class. The teachers
merely rated the students based upon their observations of the student’s behavior. The teachers might not have been able to see all of the behaviors that one student exhibited throughout a school day thus reducing the likelihood they will see improvement in a student.

Another limitation is that some students in the group did not understand the concept of skill homework, or practicing your skill with a friend or family member. Carter and William did not understand the concept of the homework or self-monitoring rainbow. They were often seen coloring parts of their rainbow in during the intervention session, and they were redirected to color it outside of the sessions when they displayed the specified behavior. Both of these students completed only 1/8 homework assignments and only 2/8 self-monitoring rainbows. It is important that students perceive their own behavior accurately otherwise they may not realize any behavior problems they are experiencing. These students’ difficulty with self-monitoring their behavior is also consistent with their self-ratings on a weekly basis versus their teacher’s weekly ratings. Both students rated their behavior significantly higher than the teachers rated their behavior. This discrepancy could indicate an intervention that is less effective.

Another limitation was in the rating scale of the treatment acceptability for the teachers about their feedback on the intervention. The rating scale neglected to include an option for neutral, thus the teachers might have rated the intervention more negatively than expected. Finally, the lessons presented to the students could have been selected for the group based on the student’s results on the BRIEF during their pre-test. For example, if the students all showed deficits in the subsection plan/organize on the BRIEF, the researcher could have included more intervention sessions on organizing books, lockers,
desks, etc. All of these factors might have contributed to a stronger effect of the Skillstreaming intervention in improving the EF skills of the student with a TBI.

Implications for Future Research

This study could be expanded or differentiated in various ways that might result in greater outcomes. First, researchers should conduct the study using a different progress monitoring tool and pre/post-test measure in order to determine a student’s progress from week to week. Some students only decreased their scores on the BRIEF by a small amount, which may minimize the actual improvements the students made. There might be more effective pre/post-tests available to show growth in executive functioning areas. In addition, it might be helpful to involve both the parents and teachers more directly so they would have the opportunity to practice the executive functioning skills with their student. The researchers should have more communication with the teachers and parents to provide them with the skills taught and what they can do to help their student. Finally, future researchers should design an intervention to last longer than five weeks and to occur during the beginning or middle of the school year in hopes of increasing the students EF skills.

Conclusion

The present study examined if the Skillstreaming psychosocial intervention would help improve the executive functioning skills of students who sustained a Traumatic Brain Injury. The findings indicate that it is a potentially effective intervention for students with TBI, but requires further research. Such studies can help close the literature gap related to school-based interventions for students with traumatic brain injuries and executive functioning deficits.
REFERENCES


http://www.cdc.gov/traumaticbraininjury/statistics.html


Section 504 of the Rehabilitation Act of 1973, as Amended 29 U.S.C.§ 794 et seq.


Dear Parent,

My name is Natalie Anderson 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 interventions 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 you 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 (Natalie Anderson) at 440-465-7245 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: Natalie Anderson, M.S., researcher, University of Dayton, 440-465-7245, andersonn4@udayton.edu or 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)
Dear Principal,

My name is Natalie Anderson 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 interventions 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 students and his/her teachers. 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 (Natalie Anderson) at 440-465-7245, 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 schools, 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: Natalie Anderson/Heather Fehring, M.S., researcher, University of Dayton, 440-465-7245, andersonn4@udayton.edu or 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)
Dear Student,

My name is Natalie Anderson 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 (Natalie Anderson) at 440-465-7245 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. 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
Teacher Consent Form

Dear Teacher,

My name is Natalie Anderson 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 interventions 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 you, your student, and the researcher at the start of each intervention week. Examples of behaviors to target will be based on 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 (Natalie Anderson) at 440-465-7245 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: Natalie Anderson, M.S., researcher, University of Dayton, 440-465-7245, andersonn4@udayton.edu or 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 SITUATIONS

- 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.

COMMENTS

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.

**Homework Report 1**

*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**

What happened? ____________________________________________________________

How did I do? 

Why did I circle this?

---

Skill 4: Bringing Materials to Class

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.

When did I practice? How did I do?

APPENDIX C – SELF-MONITORING

Color in a space each time you use the skill of

___________________________

# 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?
   
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. **Bringing Materials to Class**
   Does the student remember the books and materials he or she needs for class?
   
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. **Following Instructions**
   Does the student understand instructions and follow them?
   
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. **Completing Assignments**
   Does the student complete assignments at his/her independent academic level?
   
<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. **Contributing to Discussions**  
Does the student participate in class discussions in accordance with classroom rules?  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. **Asking a Question**  
Does the student know how and when to ask a question of another person?  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

7. **Setting a Goal**  
Does the student set realistic goals for himself/herself and take the necessary steps to meet these goals?  

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9. **Making a Decision**

Does the student make thoughtful choices?

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Almost Always</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

APPENDIX E - TREATMENT ACCEPTABILITY: TEACHER

Respondent ________________ Date __________

(Please indicate ratings by printing or typing an “X” in the appropriate parentheses.)

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

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 F - TREATMENT ACCEPTABILITY: STUDENT

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 G - 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:_________________

<table>
<thead>
<tr>
<th>Step 1: Define the skill</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The skill to be taught was defined, and the group understood its meaning.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>2. Skill steps were presented and discussed (via poster or skill cards).</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>(For all sessions after the first)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Group members’ skill homework was discussed.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>4. Appropriate reinforcement was provided for group members who completed homework.</td>
<td>☐ ☐</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2: Model the skill</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Two examples of the skill were modeled.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>6. Each skill step was identified as the modeling unfolded.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>7. Modeling displays were relevant to group members’ real-life circumstances.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>8. Group members were directed to watch for the steps being modeled.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>9. The model was friendly and helpful.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>10. A coping model was presented if indicated.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>11. The model used self-talk to illustrate the steps and thinking about skill performance.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>12. The modeling display depicted positive outcomes.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>13. The model was rewarded for skill performance (following the skill steps).</td>
<td>☐ ☐</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3: Establish student skill need</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>14. Each group member’s need for skill use was defined (when, where, and with whom) and listed.</td>
<td>☐ ☐</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 4: Select the first role-player</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. The main actor was selected for role-play (e.g., “Who would like to go first?”)</td>
<td>☐ ☐</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 5: Set up the role-play</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. Main actor selected a coactor who reminded him/her most of the real-life person with whom he/she has the skill need.</td>
<td>☐ ☐</td>
<td></td>
</tr>
<tr>
<td>17. Main actor described the physical setting, events preceding the problem, mood/manner of the person, etc.</td>
<td>☐ ☐</td>
<td></td>
</tr>
</tbody>
</table>
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 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.

<table>
<thead>
<tr>
<th>TOTAL YES</th>
<th>TOTAL NO</th>
</tr>
</thead>
</table>

APPENDIX H - 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 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-play
<table>
<thead>
<tr>
<th>Step 5: Provide practice opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Group members were assigned specific step(s) to observe.</td>
</tr>
<tr>
<td>19. Main actor was instructed to follow the behavioral steps.</td>
</tr>
<tr>
<td>20. Main actor was reminded to “think aloud.”</td>
</tr>
<tr>
<td>21. Coactor was reminded to stay in the role of the other person.</td>
</tr>
<tr>
<td>22. Group leader assisted the main actor as needed (pointed to skill steps, coached).</td>
</tr>
</tbody>
</table>

**Step 7: Provide performance feedback**

<table>
<thead>
<tr>
<th>Step 7: Provide performance feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>23. Coactor was asked to provide feedback (e.g., how he/she felt, how well the main actor enacted the steps).</td>
</tr>
<tr>
<td>24. Group members were asked if the main actor followed each step.</td>
</tr>
<tr>
<td>25. Leaders provided appropriate feedback (praise, approval, encouragement), identifying specific aspects of the main actor’s performance.</td>
</tr>
<tr>
<td>26. Reinforcement in an amount consistent with the quality of role-play was provided.</td>
</tr>
<tr>
<td>27. Main actor was invited to give comments.</td>
</tr>
</tbody>
</table>

**Step 8: Select the next role-player**

<table>
<thead>
<tr>
<th>Step 8: Select the next role-player</th>
</tr>
</thead>
<tbody>
<tr>
<td>28. Volunteer participant asked to act as the main actor in the next role-play.</td>
</tr>
<tr>
<td>Repeated Steps 5 through 7.</td>
</tr>
<tr>
<td>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.</td>
</tr>
</tbody>
</table>

**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: