Summer 2017

Effects of executive function skills instruction on classroom behavior

Michelle Whitham
James Madison University

Effects of Executive Function Skills Instruction on Classroom Behavior

Michelle Whitham

A research project submitted to the Graduate Faculty of

JAMES MADISON UNIVERSITY

In

Partial Fulfillment of the Requirements

for the degree of

Education Specialist

Department of Graduate Psychology

August 2017

FACULTY COMMITTEE:

Committee Chair: Deborah Kipps-Vaughan

Committee Members/ Readers:

Ashton Trice

Patricia Warner

Table of Contents

    Parent Consent
    Student Questionnaire
    Teacher Questionnaire

List of Tables

Abstract

Executive functions, a set of interrelated processes that facilitate organization and self control, impact many aspects of academic and social success. This study investigates the benefits of executive function skills instruction on classroom behavior. Factor analyses reveal executive function orients around three distinct but interrelated factors: inhibition, working memory, and flexibility. Using a spiraling curriculum eight fourth and fifth grade students from a suburban Title 1 elementary school were directly taught these skills over ten 30 minute sessions. Using a pre/post survey of behavior indicative of executive function, both students and teachers expressed mixed results suggesting some impact of the intervention on classroom behavior. Six of eight teacher surveys report positive but limited behavior change and five of eight students reported growth in executive skills. Future interventions may benefit from more open communication with teachers and more specific pre-post survey questions.

Introduction

From the discipline of neuropsychology, executive function (EF), has been gaining traction within the field of educational psychology as a burgeoning area of investigation. Executive function refers to a set of processes located within the frontal cortex integral to higher order functioning. These processes cue skills that simply help you get things done using organization and self-control (Meltzer, 2011). EF has been associated with academic success as well as with better social and emotional skills (Best, Miller & Naglieri, 2011). This one region in the brain seems to play a role in several life domains, making it an area of interest for interventions that will be the most impactful in addressing academic and social/educational needs.

A lack of executive skills is a common thread among children having problems in school as they impact nearly every facet of student life. Students with clinical problems like Attention Deficit Hyperactive Disorder or Autism Spectrum Disorder have been shown to have deficits in EF (Brocki, Eninger, Thorell, & Bohlin, 2009; Cannon, 2011). It is apparent that many additional students have trouble with aspects of school and have weaknesses in executive function as well. These weaknesses influence academic, social and behavioral outcomes.

There is often a reciprocal relationship between classroom behavior and success as impulsive or abrasive behavior can color a student's relationship with their teacher and their classmates. These relationships in turn can affect academic achievement. This study aims to investigate the role of executive function in classroom behavior. If behavior associated with EF can be improved upon, it provides an area of intervention that can impact several spheres of functioning known to improve student success.

Design and implementation of evidenced based interventions for social and emotional learning has been supported by a breadth and depth of research in recent years, however, few have examined the effects of an intervention focused on executive function. This study seeks to address the gap in research by focusing attention on EF skill attainment and its relation to behavior in the classroom. To gain a better understanding of the role of executive function in behavior, this study will explore changes in participant scores on measures of executive function before and after a small group executive skills intervention. These results will be compared to changes in classroom behavior. Despite the inability to control for all extraneous variables in a school setting, this exploratory program will produce information on the effectiveness of a classroom based program to increase executive function and further the current understanding of the relationship between EF and classroom behavior.

Literature Review

Conceptualization of Executive Function

In recent years, executive function (EF) has surged as a topic of research. Originally, EF research was placed firmly in the realm of neuropsychology. As knowledge about this construct grows, researchers are increasingly drawing from developmental psychology and other fields to better understand the structure and operation of executive function. EF can be conceptualized as a set of control functions that better allow you to process, think and act on information presented to you. Beginning researchers sometimes referred to these processes as an "executive control" (Baddely, 1996). This broad definition can encompass a number of abilities such as attention, organization, planning, impulse control, and emotional control among many others.

Current models of the of EF describe the construct as a collection of inter-related processes for purposeful, goal-directed behavior (Anderson, 2002). It can be thought of as "the conductor and the section leaders of the mind's orchestra" (McCloskey, Perkins & Van Divner, 2009, page #). Multiple factor analyses of skills found within the EF subset orient themselves around distinct but inter-related factors (Mikaye et al, 2000). Further research has confirmed children have similar construction of EF as adults (Lehto et. Al, 2003). Different researchers have varied definitions for these factors, but a theme throughout the literature has identified inhibition, working memory, and flexibility (sometimes referred to as shifting) as the core components (Mikaye et. al., 2000; Diamond, 2012). The inhibition dimension involves processes charged with stopping or withholding an automatic response. Working memory refers to the ability to hold information mentally while simultaneously applying it and updating it based on sensory input. The flexibility, sometimes called shifting, represents the ability to switch attention between tasks or changes in rule sets. Within these domains, smaller more specific executive skills complete the discrete tasks, i.e. attending, inhibiting, modulating etc.

Evidence from neuroscience supports the conceptualization of EF as a set of interconnected yet distinct processes. Neuroimaging of the pre-frontal cortex shows specific recruitment of prefrontal regions in response to simple cognitive tasks; however a number of diverse cognitive problems repeatedly engage the same cluster of regions suggesting that a network of prefrontal regions is recruited to answer diverse challenges (Duncan & Owen, 2000).

This molecular view of the workings of executive function helps answer the "hows" of the construct. An evolutionary perspective of EF can help us understand why

humans developed these skills. Barkley (2001) postulates that the development of EF occurred as an accommodation for organisms living in a highly social, group-living environment. To maximize success, humans evolved from using public means of self-regulation to more private responses. This shift helps protect an individual by creating a buffer in social exchange and act as a form of social self-defense against possible interpersonal manipulation. Regardless of the exact reason for their development, the human population currently exhibits executive function skills in various situations everyday, and children are specifically asked to demonstrate mastery of these skills in a school setting. Students must show self control when regulating themselves in a class environment as well as inhibit themselves from blurting out the first answer that comes to mind. They have to hold new facts in their working memory as they solve applied problems or use flexibility when transitioning to a new task. Their environment constantly demands strong performances in executive functioning.

Development of Executive Function

Indicators of executive function can be witnessed from infancy as infants use planning to investigate their environments. It continues to develop through childhood and into adolescence as children mature physically and gain experience (Anderson, 2002). The various skills comprising executive function do not appear to develop synchronously or even linearly. Welsh, Pennington and Grossier (1991) found that EF skills developed in a non-linear, step-wise fashion, with full development peaking in spurts at various ages. Recognition and planning skills appear from age four and continued to progress with age. Other abilities, such as planning and organization skills develop quickly around middle childhood. Another spurt of development occurs around 12 years. During this

time, children become more adept at integrating information and switching from task to task. The fluency of these skills continues to improve in adolescence. After age 15 incremental improvements were minimal, suggesting that EF skills tend to set, or at least be more resistant to change, in adulthood (Friedman, Nessler, Johnson, Ritter, & Bersick, 2007).

Not all students possess the same abilities of executive control. A longitudinal study traced childhood self-control with outcomes in adulthood and found that children with lower self-control tended to have more health issues, exhibited limited financial planning resulting in credit problems, and were more likely to commit a crime. These differences in self-control measured from three to five years old were successfully able to predict health, wealth and crime across three decades. More staggeringly, these results were able to be isolated from the effects of other variables such as intelligence or socio-economic status (Moffit et. al., 2011). The differentiation of executive function between individuals begins early in life and these disparities continue throughout adulthood (Duckworth & Seligman, 2005).

Executive Function and School Success

Within the realm of school achievement, executive function has been used as a predictive measure of academic success. In a study analyzing the association between aspects of EF and academic success, researchers found that working memory ability and inhibitory control can predict reading/writing and that working memory ability uniquely predicted math achievement (Monette, Bigars, & Guay, 2011). Other studies duplicated these findings and have found that EF's play a significant role in early academic achievement, particularly in math. In a study conducted by Bull and Scerif (2001), they

found students with deficits in inhibiting pre-potent information and learned strategies, as well as in working memory, correlated with low math achievement.

When looking at the impact of specific EF domains on academic achievement, flexibility seems to have less of a direct linear relationship. However, research conducted by Best, Miller & Naglieri found complex EF scores (a score measuring performance on a composite of EF skills using t) significantly correlates on both Reading, and Math subtests in the Woodcock Johnson Achievement, suggesting EF tasks support general cognition. The EF scores were generated from performance on the Matching Numbers, Planned Codes, and Planned Connections subtests on the CAS assessment. These subtests all load on EF and provide a composite score for each individual. Correlation between executive function and achievement spikes in elementary school, but the strength of correlation tends to decrease as age increases (Best, Miller, & Naglieri, 2011). The structure of learning at an early age involves heavy usage of EF skills. As most information is not yet automatic, every task carries a heavy mental load. A student must choose the most appropriate strategy for the problem at hand and often thinks through a question using a mental model rather than having engrained symbolic language that allows for automaticity.

School success is reliant on multiple factors, such as pro-social behavior, in addition to academic achievement. Lower EF ability is associated with the inability to control disruptive behavior (Cole, Usher, & Cargo, 1993). Students with less EF mastery have more difficulty controlling themselves than those with a higher level of EF skills. A major component of EF, inhibitory control, is especially relevant to the development of behavior and emotional regulation. EF deficits have long been associated with Attention

Deficit Hyperactivity Disorder (ADHD) symptoms (Barkley, 2001). Recent

conceptualizations of the disorder have phrased ADHD as an inability to inhibit oneself.

Deficits in EF correlate to ADHD-inattentive type as well. Measures of inhibition and

selective attention (two EF skills) at age five were able to predict symptoms of inattention

two years later (Brocki, Eninger, Thorell, & Bohlin, 2009).

Lower executive function abilities are also correlated with oppositional behavior

in children diagnosed with Oppositional Defiant Disorder (ODD) or Conduct Disorder

(CD) not co-morbid with ADHD (Hobson, Scott, & Rubia, 2011). Both groups were

found to have lower overall EF levels than a control group, but their specific deficits

differed. Children and adolescents diagnosed with ODD struggled more with executive

function tasks that contained an emotional component while those diagnosed with ADHD

did not. Non-emotional executive function skills were measured using the computerized

Maudsley Attention and Response Suppression task battery (MARS). Executive function

tasks that require more emotional control were measured using the Iowa Gambling Task.

The link between executive function and behavior is present in non-clinical

populations as well. In a study of executive contribution to kindergarten outcomes, level

of executive function measured using select subtests from the NEPSY and other batteries

loading on EF, such as Auditory Attention, the Stroop task and a Go/No go task,

predicted math achievement, learning-related behavior and behavior management

(Brocki, Eninger, Thorell, & Bohlin, 2009). In a meta-analysis of 22 studies and 69 EF

assessments, there was a correlation of moderate effect size between overall EF ability

and externalizing behaviors in preschoolers. An analysis of how distinct components

influence externalizing behaviors revealed a different model of EF utilization than

associated with academic achievement. A medium effect size was found between inhibitory control and externalizing behavior problems compared to a small effect size for working memory and cognitive flexibility (Schoemaker, Mulder, Deković, & Matthys, 2012). Behavior associated with bullying involvement can also be linked to executive function deficits. Children who have problems with inhibition have an elevated risk for being a bully, victim, or bully-victim. Additionally, students at a higher risk of being a bully also had weaknesses in working memory (Coolidge, Denboer, & Segal, 2004).

A study by Ellis, Weiss, and Lochman (2009) addressed the two most common mental health problems requiring intervention in elementary school: aggressive and anti-social behavior. The researchers' analysis of executive function and aggressive behavior corroborated previous findings that deficits in EF are related to behavioral problems and differentiated between EF deficits indicating individual problems with social relationships and more specific difficulties with reactive aggression. While poor planning ability contributed to poor social relationships, it was not particularly relevant in explaining reactive aggression without hostile attribution bias as a moderator. However, when a hostile attribution bias is present, a deficit in planning ability is positively correlated with the severity of behavioral problems (Ellis, Weiss, & Lochman, 2009).

EF Skills Instruction

EF's significant role in an array of behaviors affecting school success make it an optimal area for intervention. If executive function can be improved upon, then students can become more successful in a number of different domains. This area of research is still emerging. Although there has been considerable interest in developing and promoting self-regulation to improve behavior, the research regarding how focused

teaching of EF skills is related to learning and academic achievement is more limited (Rhoades, Greenberg, & Domitrovich, 2008). A myriad of executive function instruction models have been reviewed to have various efficacy. Cogmed, a well-researched computerized intervention, targets working memory and inhibition through completion of tasks loading on each construct. As one task is completed, the next task becomes more difficult. Cogmed has been shown to improve working memory, including working memory tasks that the students had not been trained on (Klingberg et. al., 2005), but several studies have been unable to find any significant difference between students who have participated in the inhibitory training and those who have not. Groups that had only been trained in one domain did not show any improvement on the unpracticed skill and those who had mixed training showed less improvement on both suggesting a restricted ability to generalize the learned skills (Thorell, Lindqvist, Nutley, Bohlin, & Klingberg, 2009; Rueda et. al., 2005). While these studies show that EF skills can be improved with direct practice, they also indicate that with computerized training, transfer effects are narrow. This difficulty in generalization could result in even smaller effects in the classroom.

More integrative interventions that meld executive function training with classroom curricula have had more generalized effects of executive function (Diamond and Lee, 2005). One example is the Promoting Alternative Thinking Strategies (PATHS) program that builds children's abilities in self-control, recognition of feelings and inter-personal problem-solving. Seven to nine year olds who participated in PATHS for a year showed better inhibitory control and cognitive flexibility. One year later they also

showed fewer internalizing and externalizing behavior problems (Riggs et. al., 2006).

PATH's contains lessons intended for students in Pre-school to middle school.

Computerized training can improve skills specific to the training focus, but the menu of current program offerings is limited. Additionally, the transfer of these skills into a classroom environment and the programs themselves can be expensive. The Blueprints for Healthy Youth Development foundation cites first year expenses of the program to be up to $59,000 (http://www.blueprintsprograms.com/program-costs/promoting-alternative-thinking-strategies-paths .) The cost of intensive and integrative classroom based programs, such as PATHS, is limiting for use in many school districts. Other more pragmatic avenues to increase executive function in the schools may be a better option.

Preliminary research has linked exercise with increases in executive function. After having children play aerobic games where they had to think (e.g. basketball and soccer), EF skills improved while EF skills for children in a control groups remained level. Other studies measuring aerobic exercise (e.g. walking and running) did not affect changes in executive function leading to the conclusion that cognitively engaging exercise has a stronger affect than non-cognitively engaging exercise on executive function (Best, 2010; Davis et. al., 2011). A meta-review of 95 exercise studies found that physical activity has a significantly positive effect on children's cognitive outcomes and academic achievement (Fedewa & Ahn, 2011).

A study involving subbing martial arts classes twice a week in place of general physical education produced a significant improvement in executive function. Children in the experimental group also improved in attention control (Lakes et. al., 2013). A

previous study looking at self-regulation outcomes after completing a series of tae-kwon-doe classes for children with ADHD also showed gains in cognitive and affective dimensions of self-regulation (Lakes & Hoyt, 2004).

Many schools have adopted a response to intervention (RtI) approach to responding to student weaknesses both academically and behaviorally. Integrative interventions such as PATHs and Tools of the Mind (a separate social-emotional curriculum) that involve the entire school are categorized as universal interventions. They are administered to every student and lift up the school's skills in the focus area as a whole. Despite this comprehensive intervention, statistically, 20% of students will still struggle with a specific weakness. These students move to a second tier of intervention that is more focused and increasingly intensive. In the second tier the students receive small group instruction that matches their needs. Students who still show too little progress at this level are considered for inclusion at tier three, a more individual one-on-one intervention (Johnson). Inclusion in a small skills group is the second most common intervention recommendation by school psychologists for students with executive function deficits behind classroom modifications (Garrett, 2015).

Many of the reviewed EF interventions were not modeled with the RtI framework in mind, making implementation into a school as a framework more difficult. A small scale study analyzed the effectiveness of a comprehensive small group consisting of 26 middle school students enrolled in an academic support class. Students were administered Rush NeuroBehavioral Center's Executive Functions (EF) program by their special education teacher every day during that class. The program curriculum included eight sections: an overview, classroom structures and learning environment, materials

management, time management and planning, study strategies, goal setting, decision making and problem solving, and learning strengths. Changes in participant's subject's grades were not statistically significant, but did improve on a teacher rating scale describing executive function (Poulouse, 2012).

Another EF program evaluation study based in Sweden, did find differences in EF skills. Research by Röthlisberger (2012) demonstrated preliminary support for providing executive function intervention through a small group format. One hundred and thirty-five Swedish preschool and kindergarten students were administered a 30 session EF program over the course of 6 weeks. The program was led by the teacher three days a week and by the experimenter two days a week. Prekindergarten students demonstrated gains in flexibility and working memory, while kindergarten students exhibited traning effects in the area of interference control. Further research is needed to develop and evaluate EF school-based programs.

Program Development

While various approaches and skill lessons have been published regarding executive function, it is difficult to locate a brief small group curriculum that can be executed in a tier two format. Using the three factor structure of EF as a theoretical base, a new program was developed. The program addresses deficits in inhibition, flexibility, and working memory through skill building or learning compensatory skills. These activities will directly link the strategy instruction to what students are learning in the classroom, explicitly teach the strategy in a structured way and directly assess student

motivation and self-understanding, following the four principles of executive function instruction outlined by Meltzer, Pollica, and Barzillai (2007).

After an unsuccessful search for free and readily available programs focusing on executive function skills instruction, the researcher put together a new, novel program. The program was developed by pulling known techniques for building one of the three base factors in executive function: inhibition, working memory, and flexibility. Mindfulness lessons from MindUp were adapted to focus on increasing inhibitive control. Planning and organizing lessons were used to focus on supporting working memory, and flexibility lessons from Unstuck and On Target were adapted to target this age group specifically.

Mindfulness, a state of focused, un-judgmental awareness of the present moment, has been used effectively as an intervention and incorporated as a therapeutic technique (Baer, 2003). Higher levels of mindfulness have also been linked to high levels of self-control (Oberle, Schonert-Reichl, Lawlor & Thompson, 2011). Mindfulness training has been repeatedly related to increased attentional performance as well as cognitive flexibility, suggesting that greater impulse control and flexibility can be achieved through learning mindfulness skills (Moore & Malinowski, 2009). MindUp program is an empirically supported mindfulness program for elementary students that lends itself to adaptation and incorporation into a greater executive control small group (Long, McIver, & Olinger, 2015). These lessons will help develop skills within both the inhibition and working memory domains.

Flexibility allows a student to adapt to changes and create room for problem solving. Cannon, Kenworthy, Alexander, Werner, and Anthony, authors of "Unstuck and

On Target", identify teaching what flexibility is, explaining its importance, teaching how to be flexible, what goals are and how to want to be flexible and goal directed as major components in achieving flexibility in students. Their controlled trial in 2013, found that students using the curriculum improved more in the areas of flexibility, problem-solving and goal setting than students in a different social skills group.

Online working memory training programs have become popular and have shown to increase working memory in the short-term, however, a meta-analysis of 23 studies determined that these gains were not sustained in follow-up evaluations and failed to generalize (Melby-Lervåg & Hulme, 2013). Compensatory strategies such as chunking and training have also been shown to increase working memory capacity. These strategies can be more easily taken and generalized to other settings (Turkey-Ames & Whitfield, 2003; McNamara & Scott, 2001).

The research and resources discussed above were taken together and adapted to inform a more comprehensive executive function program. Program instruction will follow a spiral approach, a teaching technique introduced by Jerome Bruner. In a spiral approach, basic concepts are taught first and then revisited and added to as student learning progresses. This allows students to apply previous learned material to new information while reinforcing each concept. As students return to basic concepts, student competency will increase and be matched with greater skill difficulty (Johnston, 2012).

Research Questions

This study will address the following research questions.

1. Will the participants in the small group Executive Function program improve their EF skills as evidenced by an increased score on the Executive Questionnaire Teacher form developed by Dawson and Guare?

2. Will the participants in the small group Executive Function program perceive improvement in their own EF skills as evidenced by the Executive Questionnaire Self form developed by Dawson and Guare?

3. Will participants in the small group Executive Function program show better behavior in the classroom as evidenced by fewer office referrals?

Methods

Participants

A group of four fourth graders and four fifth graders who had been recommended by their teacher for inclusion in an Executive Function small group, participated in this study. The students attended an elementary school in suburban Denver. Of the 500 students attending, 67% received free or reduced lunch. The fourth grade group was all male, while the fifth grade group was comprised of two males and two females. The students were pulled from four different classrooms and the teachers served as their primary teacher throughout the day. The fifth graders were spread across three different classroom while the fourth grade group all shared the same teacher. The researcher needed both parent and teacher permission for student participation necessitating a convenience sampling of the population. Students at an elementary school level are still developing executive functioning skills and could benefit from targeted skills instruction.

Students A is a fifth grade student in the general education population, he also has received other tier 2 interventions this year. Student B is a fifth grade student in the

general education plan, she has not received additional interventions through special education this year. Student C is a general education student; he also has received other tier 2 interventions this year. Student D is a fifth grade student who has been found eligible and receiving services through special education.

Student E is a fourth grade student who has been found eligible and receiving services through special education. Student F is a fourth grade student in general education and has not received other tier 2 interventions this year. Student G is a fourth grade student who has been found eligible and receiving services through special education. Student H is a fourth grade student in general education and has not received other tier 2 interventions this year.

Measurement Instruments

Data were collected from both quantitative and qualitative sources. A teacher behavior rating scale, the Executive Skills questionnaire, was collected to monitor progress in skill development as well as a self-rated Executive Skills questionnaire. Descriptions of classroom behavior were obtained quantitatively through office referrals and qualitatively through teacher observations. The following instruments were used to measure data:

Executive Skills Questionnaire- teacher form: The content of the questionnaire changes according to age and contains Preschool/ Kindergarten, Lower Elementary, Upper Elementary, and Middle School versions. Each questionnaire contains 33 items that describe 11 different executive skill abilities: Response inhibition, emotional control, task initiation, organization, Goal-directed persistence, Metacognition, Working Memory, Sustained attention, Planning/ prioritization, Time Management and Flexibility. The rater

answers statements describing the child such as "Can adjust homework schedule to allow for other activities" or "Is able to follow a three- to four-step routine that has been practiced" using a five point Likert scale (Strongly disagree = 1, Strongly Agree = 5). This scale was developed by Peg Dawson and Richard Guare as part of the "Smart but Scattered" executive skills approach to helping kids reach their potential.

Executive Skills Questionnaire- student form: The questionnaire contains 27 items that describe 11 different executive skill abilities: Response inhibition, emotional control, task initiation, organization, Goal-directed persistence, Metacognition, Working Memory, Sustained attention, Planning/ prioritization, Time Management and Flexibility. The child answers statements such as "I have trouble keeping my bedroom tidy" or "I get in trouble for talking too much in class" using a five point Likert scale (Big Problem = 1, No Problem= 5). This scale was developed by Peg Dawson and Richard Guare as part of the "Smart but Scattered" executive skills approach to helping kids reach their potential.

Initially the *Behavior Rating Inventory of Executive Function Teacher form (BRIEF)* was also going to be used to measure behavior changes in the participants. The teachers cooperating in this study expressed concerns about filling out two rating scales and school administration were concerned about protocol costs. Due to these concerns the BRIEF was not used in this study.

Program Overview

Table 1: Program Overview

Session 1: Introduction Goals: 1. Introduce Group 2. Complete Self-Rating Scale 3. Set Goals	Activities: 1. Icebreaker 2. Self-rating scale worksheet 3. Goal setting worksheet
Session 2: What is mindfulness? Goals: 1. Understand concept of mindfulness 2. Discuss how mindfulness can help us calm down 3. Introduce 1 basic mindfulness strategy	Activities: 1. How are brains work 2. Mindful Awareness 3. Bubble breathing Adapted from MindUp
Session 3: What is flexibility? Goals: 1. Learn what flexible thinking is 2. Recognize individual approaches to flexible thinking 3. Introduce Plan A/Plan B	Activities: 1. The Facts of Life 2. My Two Choices- Stuck in the mud or flexible 3. Flexibility thermometer 4. Big deal/ little deal Adapted from Unstuck and On Target
Session 4: How can we use mindfulness in school? Goals: 1. Identify situations in schools where being calm and present would be helpful 2. Identify and practice individual strategies	Activities:1. Mindful senses 2. Mindful movement 3. Calm box Adapted from MindUp
Session 5: Why be flexible? Goals 1: Introduce the advantages of flexibility 2. How being flexible can make good things happen	Activities: 1. What do do when what I want is impossible? 2. My 2 Choices 3. Big Deal/ Little Deal Adapted from Unstuck and On Target

Session 6: Working Memory Goals: 1. Discuss problems with remembering information 2. Identify personal strengths and weaknesses in flexibility.	Activities: 1. 7 +/- 2 game 2. Applying strategies to current curriculum content 3. Minions mission game Adapted from Smart but Scattered
Session 7: Mindfulness Goals: 1. Learn what self-monitoring is 2. Self-monitor 1 behavior for 1 day 3. Integrate WM strategies	Activities: 1. Defining self-monitoring and metacognition 2. Developing own self-monitoring task 3. Learning self-talk strategies Adapted from: Executive Skills, PBIS world
Session 8: Goals: Getting what you want Goal: 1. Create an individual goal and plan to achieve it 2. Use WM strategies	Activity: 1. What is your goal 2. Mission Possible Adapted from Unstuck and On Target
Session 9: Wrapping it together Goals: 1. Monitor progress towards goal 2. Identify ways to use mindfulness and flexibility towards goal	Activity : 1. Mission Possible continued Adapted from Unstuck and On Target
Session 10: Termination	Activity: 1. Re-cap 2. Self-rating scale 3. Good-bye game

The two groups met for 30 minutes on Thursday mornings for ten sessions from February through May. The researcher would exit students from the classroom by alerting their teacher through a signal and the students would meet out in the hall to walk to the counseling suite. The groups were held in the office of the School Psychologist, except for the first session which was held in an extra room off of the library to allow for

more space. During the first session, the students completed a survey, played a getting-to-know- you game and set expectations for the group. In addition to the school expectations of being safe, respectful, responsible, and friendly the group also discussed that what is shared in the group stays in the group.

After the first session, the subsequent meetings followed a general order. The students first went around the circle sharing one highlight and one lowlight of their week. The researcher then circled back to the previously discussed topics before moving on to the main activity for the day. The students ended with a mindful minute in which they practiced focusing on their breath before getting to play for the length of one song. As the students lined up, they shared one thing they learned that day before giving the examiner a high five and walking back to class.

The students quickly came to look forward to the meetings and made comments that they felt comfortable and enjoyed the time spent together. When entering their classrooms on other business, the student's often asked when we would be meeting next or if they would get to go that day. As we went through the course material it became apparent that the students were already familiar with some of the concepts, particularly pertaining to mindfulness. This gave some students the chance to share their knowledge with others. Both the fourth and fifth graders enjoyed sharing their opinions and were active participants in group discussions.

The fourth grade group consisted of Students E, F, G, and H. Both Student E and Student G additionally receive services through Special Education. Student G has struggled with behavior problems throughout the year and was suspended twice. He seeks attention from others, but responds to positive praise. Although it is difficulty for Student

G to conform to group expectations, he particularly enjoyed being part of the after school soccer team. Student E has been diagnosed with ADHD and additionally receives mental health time with a different school psychologist once a week. He sometimes struggles with transitions at home, but looks forward to time he can spend with trusted adults at school. Student H is a general education student with an affinity for minecraft and gaming. He could become upset easily, especially by some of the other students in the group. Student F is also a general education student. He loves hockey and hopes to play in college and professionally. Student F often acted as a group model, he generally tended to remain on task.

The fifth grade group consisted of Student's A, B, C, and D. Student D is another student also receiving special education services. While she is generally quiet and compliant she could become annoyed with the other students quickly, particularly her cousin, Student C. Student C is an energetic fifth grader who loves to make connections with his peers and adults. He enjoys one on one or small group time. Student C struggled with controlling his impulses and with lying about various events in his life during group share time. Student B is more concerned about her academic performance than the other children, but could also become emotional easily. She struggled with change and when another student disagreed with her way of thinking or doing something. Student A moved quickly from task to task. It was often difficult to keep his attention in the group, but he also was very even-keeled. When other students became upset, Student A often provided emotional levity.

The fourth grade group had the most difficulty staying on track and maintaining group cohesion. They were more likely to point out any perceived unfairness in regards

to seating arrangements or fidget toy distribution. The four boys were from the same classroom, which was experiencing some discordance due to the disciplinary issues of a few students. Sometimes the classroom dynamics could carry over from the classroom to the counseling room. This required the counselor to consistently remind and enforce rules and expectations and allow less free discussion than took place in the fifth grade group. However, the boys were able to work together and complete all of the tasks assigned to them.

The fifth graders delved deeper into discussion about what it meant to be mindful or flexible in their own lives as well as how they deal with remembering assignments and the feeling of being overwhelmed. They were able to articulate their differences and similarities on how they approached and how they wanted to use what we learned together. By the end of the semester one student stated that the group "felt like a family."

Keeping the group times consistent was difficult in the face of other sudden duties, the examiner as a school psychologist was called to do. Additionally, there was a three weeks hiatus due to spring break and state testing. Pushing the sessions back disrupted the flow of the group and made it more difficult to recall previous lessons. Walking students to our group time also tended to eat into our group time, leaving less time to cover the content areas.

Results

Table 2 presents scores on the Student Executive Skills Questionnaire. Students completed the survey once before the program began and once again upon its completion. Higher scores reflect more behaviors consistent with greater flexibility, inhibition and

working memory skills. Lower scores report more difficulty with behaviors of executive dysfunction. The scores from the pre and post questionnaires were then compared. Gains in scores, and thus executive function skills, are reported using + while surveys that reported less levels of executive dysfunction are reported using -.

Table 2: Student Reported Changes on Executive Skills Questionnaire

Student	Pre Score	Post Score	Change
A	89	101	+12
B	110	130	+20
C	137	133	-4
D	83	95	+12
E	59	67	+8
F	80	57	-23
G	174	122	-52
H	127	131	+4

After the program completed, three students reported exhibiting behaviors characteristic of executive function less often while five students reported exhibiting more often behaviors characteristic of executive skills. As a group the students reported a slight decrease in their behaviors of executive function. However, the standard deviation across each category suggests a wide range of responses.

Table 3 presents scores on the Teacher Executive Skills Questionnaire. Teachers completed the survey once before the program began and once again upon its completion. Higher scores reflect more behaviors consistent with greater flexibility, inhibition and working memory skills. Lower scores report more difficulty with behaviors of executive dysfunction. The scores from the pre and post questionnaires were then compared. Gains

in scores, and thus executive function skills, are reported using + while surveys that reported less levels of executive dysfunction are reported using -.

Table 3: Teacher Reported Changes on Executive Skills Questionnaire

Student	Teacher	Pre- Score	Post Score	Change
A	W	46	40	-6
B	X	122	139	+17
C	Y	47	50	+3
D	Y	45	50	+5
E	Z	33	53	+20
F	Z	99	95	-4
G	Z	33	50	+17
H	Z	64	92	+28

Teacher reports describe most (seven) students demonstrated gains in executive function while two students demonstrated decreases in behavior indicative of executive skills. Of the eight students, five demonstrated changes within the standard of deviation (SD =12). Taken as a group, the four teachers overall reported more behaviors characteristic of executive function after the intervention took place.

In Table 4, official incident reports for each student were counted at the beginning of the Spring semester, before the program began and at the end of the semester, as the program was ending. These incident reports are completed by classroom teachers or para-professionals and submitted to the front office for entry into the School-Wide Information System (SWIS). The Change column records increases or decreases in report frequency from the beginning of the semester to the end.

Table 4: Incident Reports the first 3 weeks of 2017 compared to the last 3 weeks

Student	Pre	Post	Change
A	1	1	0
B	1	2	+1

C	0	0	0
D	0	0	0
E	1	2	+1
F	0	0	0
G	2	0	-2
H	0	0	0

Two students received one more incident the last three weeks of the 2017 Spring semester compare to the first three weeks. One student received two incident reports less the last three weeks compared to the first three weeks. The four students that did not have any incidents prior to the program continued to maintain their behavior through the duration of the semester.

Table 5 presents the pre/post changes from the Student Questionnaire, Teacher Questionnaire and the number of incident reports. Gains in scores, and thus executive function skills, are reported using + while surveys that reported less levels of executive dysfunction are reported using -. The Incident Report column records increases or decreases in report frequency from the beginning of the semester to the end.

Table 5: Individual Student Changes Across Different Measures

Student	Student Report	Teacher Report	Incident Reports
A	+12	-6	0
B	+20	+17	+1
C	-4	+3	0
D	+12	+5	0
E	+8	+20	+1
F	-23	-4	0
G	-52	+17	-2
H	+4	+28	0

No students demonstrated gains in executive function as evidenced by scores on both questionnaires coupled with a decrease in incident reports, however two students and their teachers reported greater frequency of executive function behavior coupled with no increases or decreases in incident referrals.

Discussion

The data collected provides a mixed view of the effectiveness of the small group intervention. Some individuals demonstrated gains in executive function skills as evidenced by less classroom misbehavior, others reported more difficulties in executive functioning as the semester continued. Five students reported increases in their behavior indicating executive function. Six teacher reports observe positive changes in student behavior over the course of the semester. An analysis of incident reports submitted to the office found that five of the eight students maintained the same level of incidents reported, one improved and two students demonstrated one additional incident during the collection periods.

These results suggest that there has been some measurable change between students executive functioning before and after a targeted small group intervention. These results indicate incremental change within the individual level. Students gained some skills that are necessary and expected in the classroom, (i.e. more organization, better at waiting their turn, more perseverance on difficult assignments) yet still show room for considerable growth in the area of executive function. Analyzing students individually reveals little consistency across the three measures. Only two students showed consistent negative results from the three measures.

Many of these students received supplementary interventions. Student A, for example was also participating in the school's check in/ check out program in which he works towards mastering specific goals. Every day he checks in with a counselor or teacher to go over his goals and what he would like to work towards as an incentive, every afternoon he discusses his performance with a teacher or counselor. This directly relates to content involving self-monitoring discussed during the intervention. While his teacher reported decreases in executive functioning skills, he reported that gains in that area and maintained the same frequency of incident reports filed to the front office.

Student B and her teacher both reported exhibiting greater EF skills after the intervention took place, yet she received one more incident report at the end of the semester than she did at the beginning. She is a general education student not receiving as extensive supports and who expressed gratefulness and enjoyment of the intervention program.

Student C was receiving several other tier 2 interventions over the course of the semester. He described himself as demonstrating slightly less behaviors of executive function at the end of the semester while his teacher described him as exhibiting slightly more. He maintained the same level of incident reports at the end of the semester as he did at the beginning.

Student D and her teacher reported slight gains in executive function skills from the beginning of the semester to the end. Additionally, she did not have any incident reports during the first or second time sample.

Student E and his teacher reported gains in executive function, but he also received one more incident report at the end of the semester compared to the beginning.

Student F reported having greater difficulty with executive function after the program completed compared to the beginning of the semester. He did not have any incident reports throughout the entirety of the program.

Most interestingly, Student G felt he had lost many executive functioning skills. His teacher described him as exhibiting more behaviors indicative of executive function towards the end of the year and he demonstrated better behavior by receiving two less incident reports in the last three weeks of school compared to the first. Student G also receives academic and emotional support from school staff as a student in special education. His behavior took a sharp decline as the year went on. He was suspended twice, and ultimately the decision was made that his needs were not being met within his general education classroom. However, this struggle is not reflected in the official incident reports filed with the front office suggesting a mismatch between what is actually happening in the classroom and what is reported to the office for internal record keeping purposes.

Student G also reported the most extreme change within his pre-post score, dropping 52 points over the course of the semester. On his pre-survey, Student G also rated himself the highest by nearly 40 points. This may reflect a lack of self-awareness in his own skills and behavior. His post-test score may reflect a greater understanding of what behavior requiring executive function entails and a stronger awareness of his own behavior.

Student H reported slight gains in executive function skills whereas his teacher described more substantial gains in that area. He did not receive an incident report during either the first three weeks or the last three weeks of the semester.

The incident reports were pulled from two time samples. It could be possible that the mood and behavior of both the teachers and the students were different at those times. For example, students may be more compliant after winter break and become increasingly excited as summer break nears. Or teachers may be more relaxed or strict towards the end of the year as the to do list and stress level increases. However, the number of incident reports filed to the office was roughly similar during those two time periods. It could be possible that more reports were made and given to the office for disciplinary action, but the reports were never filed into the system for tracking purposes.

Regarding the student reported survey results, some gains reported by the measure could be related to an increased awareness of the student's own behavior and a better understanding of the concepts being discussed. Many of the item questions, such as "I have trouble planning for big assignments" or "It's hard for me to deal with changes in plans or routines", directly relate to the concepts of goal setting and flexibility that were explicitly discussed through the program. In conjunction, the pre-survey results could be affected by a lack of understanding of those concepts.

Limitations

In the current design, the researcher used behavior specific measures (both self-report and a frequency count of incident reports) to measure change. This allows for the question of whether the students learned any skills through the course of this program. Perhaps a pre-post test concentrating on content knowledge would have been a more accurate measure. This would have allowed the researcher to rule out a failure to learn skills as a reason for the limited growth measured by the behavior rating scales. If they did not learn the content, was it due to a lack of appropriate instruction on part of the

instructor, or was there simply not enough time? In previous studies listed above, students were administered a more extensive program. These students received 300 minutes overall, 260 of which pertained to content instruction. This is a liberal estimate, not taking out the time used to walk students from class or complete session routines.

The amount of time given to this program could be a reflection of the focus given to tier 2 small group interventions by special educators. Often the facilitator's time with these students would need to be shifted to address the needs of students at a tier 3 intervention. These students were often shifted to the bottom of the priority list to deal with student crisis that required our immediate attention. It seemed as a staff we were forced to spend more time on interventions rather than on administering the preventative services that could contribute to a decrease in the crises we are constantly pulled away to address.

In addition to variables in school dynamics during this time period, the students were also dealing with stressors at home. Five of the eight students were experiencing significant changes within their family structure. Student D was receiving academic and emotional support from the school in addition to participating in this group. She had been struggling with changes in her family and friend group. Due to her responses on her goal setting worksheet she was administered a suicide assessment. This assessment discovered there was no to minimal threat, but reflects the external factors at play that have an affect on a student's performance in school.

The field of research involving executive function is still relatively young. This intervention attempted to move that knowledge forward, however, more research is needed at a foundational level to better inform interventions and measurement tools. A

major limitation of this study is the assumption that executive function skills can be accurately measured by behavior scales. Additionally, the instruction intended may have been too broad to be covered in the amount of time given. This intervention program attempted to expose students to a range of techniques and circle back routinely to build upon the mastery of those skills. It is worth further analysis to determine if this is the best teaching strategy. Results may have been more observable if the program concentrated on one skill at a time, ensured students could understand and apply the concept, before moving onto the next skill.

In future groups it may prove more beneficial to students, researcher and teachers to narrow the focus of the pre and post questionnaires to specific executive skills the student is lacking. This may require more individualized pre-post surveys, but would also provide better information on what specific areas students are struggling with and to differentiate instruction accordingly. In the same vein, more and more frequent check-ins with teacher could provide more detailed and targeted qualitative and quantitative information regarding student success in the classroom. By using an open platform to allow teachers and planets to know the topics discussed in group could allow them to follow up with those skills and reinforce them at home and in class.

Reference

Anderson, P. (2002) Assessment and Development of Executive Function (EF) During

Childhood, Child Neuropsychology, 8:2, 71-82, DOI: 10.1076/chin.8.2.71.8724

Baddeley, A. (1996). Exploring the central executive. *The Quarterly Journal of*

Experimental Psychology: Section A, *49*(1), 5-28.

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and

empirical review. *Clinical psychology: Science and practice*,*10*(2), 125-143.

Barkley, R. (2001). The Executive Functions and Self-Regulation: An Evolutionary

Neuropsychological Perspective. *Neuropsychology Review, 11*(1).

Best, J. R. (2010). Effects of physical activity on children's executive function:

Contributions of experimental research on aerobic exercise. *Developmental*

Review, *30*(4), 331-351.

Best, J. R., & Miller, P. H. (2010). A developmental perspective on executive

function. *Child development*, *81*(6), 1641-1660.

Best, J. R., Miller, P. H., & Naglieri, J. A. (2011). Relations between executive function

and academic achievement from ages 5 to 17 in a large, representative national

sample. *Learning and Individual Differences, 21*(4), 327-336.

doi:10.1016/j.lindif.2011.01.007

Bierman, K. L., & Torres, M. (2016). Promoting the development of executive functions

through early education and prevention programs. *Executive function in preschool*

age children: Integrating measurement, neurodevelopment and translational

research. Washington, DC: American Psychological Association, *10*, 14797-014.

Brady, M. (2011, November 1). The complete list of problems with high-stakes standardized tests. *The Washington Post*.

Bull, R., & Scerif, G. (2001). Executive functioning as a predictor of children's mathematical ability: Inhibition, switching, and working memory. Developmental Neuropsychology, 19, 273–293.

Brocki, K. C., Eninger, L., Thorell, L. B., & Bohlin, G. (2009). Interrelations Between Executive Function and Symptoms of Hyperactivity/Impulsivity and Inattention in Preschoolers: A Two Year Longitudinal Study. *Journal of Abnormal Child Psychology J Abnorm Child Psychol, 38*(2), 163-171. doi:10.1007/s10802-009 9354-9

Cannon, L. (2011). *Unstuck and on target!: An executive function curriculum to improve flexibility for children with autism spectrum disorders*. Baltimore: Paul H. Brookes Pub.

Cole, P. M., Usher, B. A., & Cargo, A. P. (1993). Cognitive risk and its association with risk for disruptive behavior disorders in preschoolers. Journal of Clinical Child Psychology, 22, 154–164.

Coolidge, F. L., Denboer, J. W., & Segal, D. L. (2004). Personality and neuropsychological correlates of bullying behavior. *Personality and Individual Differences, 36*(7), 1559 1569. doi:10.1016/j.paid.2003.06.005

Davis, C. L., Tomporowski, P. D., McDowell, J. E., Austin, B. P., Miller, P. H., Yanasak, N. E., ... & Naglieri, J. A. (2011). Exercise improves executive function and achievement and alters brain activation in overweight children: a randomized, controlled trial. *Health Psychology*, *30*(1), 91.

Dawson, P., & Guare, R. (2009). *Smart but scattered: The revolutionary" executive skills" approach to helping kids reach their potential*. Guilford Press. Diamond, A. (2012). Activities and Programs That Improve Children's Executive Functions. *Current Directions in Psychological Science, 21*(5), 335-341. doi:10.1177/0963721412453722

Dawson, P., & Guare, R. (2004). *Executive skills in children and adolescents: A practical guide to assessment and intervention*. New York: Guilford Press.

Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science*, *333*(6045), 959-964.

Duckworth, A. L., & Seligman, M. E. (2005). Self-discipline outdoes IQ in predicting academic performance of adolescents. *Psychological science*,*16*(12), 939-944.

Duncan, J., & Owen, A. M. (2000). Common regions of the human frontal lobe recruited by diverse cognitive demands. *Trends in Neurosciences, 23*(10), 475-483. doi:10.1016/s0166-2236(00)01633-7

Ellis, M. L., Weiss, B., & Lochman, J. E. (2009). Executive Functions in Children: Associations with Aggressive Behavior and Appraisal Processing. *Journal of Abnormal Child Psychology J Abnorm Child Psychol, 37*(7), 945-956. doi:10.1007/s10802-009-9321-5

Fedewa, A. L., & Ahn, S. (2011). The effects of physical activity and physical fitness on children's achievement and cognitive outcomes: a meta-analysis. *Research quarterly for exercise and sport*, *82*(3), 521-535.

Friedman, D., Nessler, D., Johnson, R., Ritter, W., & Bersick, M. (2007). Age-Related Changes in Executive Function: An Event-Related Potential (ERP) Investigation

of Task Switching. *Aging, Neuropsychology, and Cognition, 15*(1), 95-128. doi:10.1080/13825580701533769

Garrett, M. A. (2015). The Frequency and Competency of Executive Function Assessment and Intervention Among Practicing School Psychologists. (Doctoral dissertation)

Gioia, G. A., Isquith, P. K., Guy, S. C., & Kenworthy, L. (2000). Test review behavior rating inventory of executive function. *Child Neuropsychology*, *6*(3), 235-238.

Hobson, C. W., Scott, S., & Rubia, K. (2011). Investigation of cool and hot executive function in ODD/CD independently of ADHD. *Journal of Child Psychology and Psychiatry, 52*(10), 1035-1043. doi:10.1111/j.1469-7610.2011.02454.x with ADHD-a randomized, controlled trial. *Journal of the American Academy of Child & Adolescent Psychiatry*, *44*(2), 177-186.

Johnson, E. (n.d.). How to Develop an Effective Tier 2 System. Retrieved from http://www.rtinetwork.org/essential/tieredinstruction/tier2/how-to-develop-an effective tier-2 system

Johnston, H. (2012). The Spiral Curriculum [Pamphlet]. FL: University of South Florida.

Klingberg, T., Fernell, E., Olesen, P. J., Johnson, M., Gustafsson, P., Dahlström, K., ... & Westerberg, H. (2005). Computerized training of working memory in children

Lakes, K. D., Bryars, T., Sirisinahal, S., Salim, N., Arastoo, S., Emmerson, N., ... & Kang, C. J. (2013). The healthy for life taekwondo pilot study: a preliminary valuation of effects on executive function and BMI, feasibility, and acceptability. *Mental health and physical activity*, *6*(3), 181-188.

Lakes, K. D., & Hoyt, W. T. (2004). Promoting self-regulation through school-based

    martial arts training. *Journal of Applied Developmental Psychology*,*25*(3), 283

    302.

Lehto, J. E., Juujärvi, P., Kooistra, L., & Pulkkinen, L. (2003). Dimensions of executive

    functioning: Evidence from children. *British Journal of Developmental*

    Psychology,   21(1), 59-80. doi:10.1348/026151003321164627

Long, A.C., McIver, E.C., & Olinger, R.M. (2015). Communıqué.

McNamara, D. S., & Scott, J. L. (2001). Working memory capacity and strategy use.

    Memory & cognition, 29(1), 10-17.

McCloskey, G., Perkins, L. A., & Van Divner, B. (2009). Assessment and intervention

    for executive function difficulties. New York, NY: Routledge.

Melby-Lervåg, M., & Hulme, C. (2013). Is working memory training effective? A meta

    analytic review. Developmental psychology, 49(2), 270.

Meltzer, L. (Ed.). (2011). *Executive function in education: From theory to practice*.

    Guilford Press.

Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T.

    D. (2000). The unity and diversity of executive functions and their contributions

    to complex "frontal lobe" tasks: A latent variable analysis. Cognitive Psychology,

    41, 49-100. doi: 10.1006/cogp.1999.0734

Moffit, T. E., Areseneault, L., Belsky, D., Dickson, N., & Hancox, R. (2011). A gradient

    of childhood self-control predicts health, wealth, and public safety. *Proceedings*

    of the National Academy of Sciences, 108(7), 2693-2698.

Monette, S., Bigras, M., & Guay, M. (2011). The role of the executive functions in school achievement at the end of Grade 1. *Journal of Experimental Child Psychology, 109*(2), 158-173. doi:10.1016/j.jecp.2011.01.008

Moore, A., & Malinowski, P. (2009). Meditation, mindfulness and cognitive flexibility. *Consciousness and cognition*, *18*(1), 176-186.

Moyes, R. A. (2014). *Executive function "dysfunction": Strategies for educators and parents*. Philedelphia, PA: Jessica Kingsley.

Oberle, E., Schonert-Reichl, K. A., Lawlor, M. S., & Thomson, K. C. (2011). Mindfulness and inhibitory control in early adolescence. The Journal of Early Adolescence, 0272431611403741.

Poulose, M. S. (2012). Program evaluation of an executive functions intervention at a middle school setting. (Doctoral dissertation)

Rhoades, B. L., Greenberg, M. T., & Domitrovich, C. E. (2009). The contribution of inhibitory control to preschoolers' social–emotional competence. *Journal of Applied Developmental Psychology, 30*(3), 310-320. doi:10.1016/j.appdev.2008.12.012

Riggs, N. R., Jahromi, L. B., Razza, R. P., Dillworth-Bart, J. E., & Mueller, U. (2006). Executive function and the promotion of social–emotional competence. *Journal of Applied Developmental Psychology*, *27*(4), 300-309.

Röthlisberger, M., Neuenschwander, R., Cimeli, P., Michel, E., & Roebers, C. M. (2012). Improving executive functions in 5-and 6-year-olds: Evaluation of a small group intervention in prekindergarten and kindergarten children.*Infant and Child Development*, *21*(4), 411-429.

Rueda, M. R., Rothbart, M. K., McCandliss, B. D., Saccomanno, L., & Posner, M. I. (2005). Training, maturation, and genetic influences on the development of executive attention. *Proceedings of the national Academy of Sciences of the United States of America*, *102*(41), 14931-14936.

Self Monitoring. (n.d.). Retrieved May 12, 2016, from http://www.pbisworld.com/tier 2/self-monitoring/

Schoemaker, K., Mulder, H., Deković, M., & Matthys, W. (2012). Executive Functions in Preschool Children with Externalizing Behavior Problems: A Meta-Analysis. *Journal of Abnormal Child Psychology J Abnorm Child Psychol, 41*(3), 457-471. doi:10.1007/s10802-012-9684-x

Thorell, L. B., Lindqvist, S., Nutley, S. B., Bohlin, G., & Klingberg, T. (2009). Training and transfer effects of executive functions in preschool children. *Developmental Science, 12*(1), 106-113. doi:10.1111/j.1467-7687.2008.00745.x

Turley-Ames, K. J., & Whitfield, M. M. (2003). Strategy training and working memory task performance. Journal of Memory and Language, 49(4), 446-468.

Welsh, M. C., Pennington, B. F., & Groisser, D. B. (1991). A normative-developmental study of executive function: A window on prefrontal function in children. *Developmental Neuropsychology, 7*(2), 131-149. doi:10.1080/87565649109540483

Appendices

Parent/Guardian Informed Consent

Identification of Investigators & Purpose of Study

Your child is being asked to participate in a research study conducted by Michelle Whitham from James Madison University. The purpose of this study is to analyze effectiveness of small group interventions for executive function. This study will contribute to the researcher's completion of her thesis.

Research Procedures

Should you decide to allow your child to participate in this research study, you will be asked to sign this consent form once all your questions have been answered to your satisfaction. This study consists of a small group intervention that will be administered to individual participants at Clayton Elementary School. Your child will be asked to provide answers to a series of questions related to executive function and be asked to participate in activities that may build up those abilities..

Time Required

Participation in this study will require the student to participate in the small group for 30 minutes a week for 10 weeks for a total of 300 minutes.

Risks

The investigator does not perceive more than minimal risks from your child's involvement in this study (that is, no risks beyond the risks associated with everyday life).

Benefits

Potential benefits from participation in this study include an increase in their executive skills which can promote higher classroom achievement and behavioral outcomes. They will also be gaining pro-social skills from a small group environment where they will be exposed to positive peer and adult relationships. As a field, this study will provide information regarding the efficacy of small group interventions to increase executive skills and their relation to classroom behavior.

Payment for participation

There is no payment for participation in this study.

Confidentiality

The results of this research will be presented at a graduate symposium. Your child will be identified in the research records by a code name or number. The researcher retains the right to use and publish non-identifiable data. When the results of this research are published or discussed in conferences, no information will be included that would reveal

your child's identity. All data will be stored in a secure location accessible only to the researcher. Upon completion of the study, all information that matches up individual respondents with their answers will be destroyed.

There is one exception to confidentiality we need to make you aware of. In certain research studies, it is our ethical responsibility to report situations of child abuse, child neglect, or any life-threatening situation to appropriate authorities. However, we are not seeking this type of information in our study nor will you be asked questions about these issues.

Participation & Withdrawal

Your child's participation is entirely voluntary. He/she is free to choose not to participate. Should you and your child choose to participate, he/she can withdraw at any time without consequences of any kind.

Questions about the Study

If you have questions or concerns during the time of your child's participation in this study, or after its completion or you would like to receive a copy of the final aggregate results of this study, please contact:

Michelle Whitham   Debi Kipps-Vaughan
School Psychology   School Psychology
James Madison University   James Madison University
whithaml@dukes.jmu.edu   Telephone: (540)568-4557
                                     kippsvdx@jmu.edu

Questions about Your Rights as a Research Subject

Dr. David Cockley
Chair, Institutional Review Board
James Madison University
(540) 568-2834
cocklede@jmu.edu

Giving of Consent

I have read this consent form and I understand what is being requested of my child as a participant in this study. I freely consent for my child to participate. I have been given satisfactory answers to my questions. The investigator provided me with a copy of this form. I certify that I am at least 18 years of age.

_____
Name of Child (Printed)

_____
Name of Parent/Guardian (Printed)

_____   _____

Name of Parent/Guardian (Signed)   Date

_____ _____

Name of Researcher (Signed)   Date

Executive Skills Questionnaire for Students

Adopted from Peg Dawson and Richard Guare

Key: Always= 1

Often= 2

Sometimes= 3

Rarely= 4

Never= 5

1. I act on Impulse   ___

2. I get in trouble for talking too much in class.   ___

3. I say things without thinking.   ___

4. I say, "I'll do it later" and then forget about it.   ___

5. I forget homework, or forget to bring home my books.   ___

6. I lose or misplace my belongings (coats, notebooks, sports stuff)   ___

7. I get annoyed when homework is too hard.   ___

8. I get mad easily.   ___

9. I get upset easily hen things don't go as planned.   ___

10. I am easily distracted.   ___

11. I get tired before finishing my homework.   ___

12. I have problems sticking with chores until they are done.   ___

13. I put off homework or chores until the last minute.   ___

14. It's hard for me to put aside fun activities in order to start homework.   ___

15. I need many reminders to start my chores.   ___

16. I have trouble planning for big assignments.   ___

17. It's hard for me to pick what's most important when I have a lot to do.   ___

18. I become overwhelmed by big assignments.   ___

19. My backpack and notebooks are disorganized.   ___

20. My desk is a mess.   ___

21. I have trouble keeping my bedroom tidy.   ___

22. I have a hard time guessing how long it takes to do something, like my

Homework.   ___

23. I often don't finish my homework at night and rush to get it done in school

    Before class.   ___

24. I'm slow getting ready for things.   ___

25. If the first solution to a problem doesn't work, I have trouble thinking of

    A different one.   ___

26. It's hard for me to deal with changes in plans.   ___

27. I have problems with open-ended homework assignments.   ___

28. I don't have very good study strategies.   ___

29. I don't check my work for mistakes.   ___

30. I don't evaluate my performance and make changes to improve.   ___

31. I have trouble saving my money.   ___

32. I don't see a reason to earn good grade.   ___

33. It's hard for me to make myself study if something fun comes up.   ___

Executive Skills Survey Teacher Version
Read each item below and rate that item based on the exten to which the beahavior occurs
in the classroom

Key: Always= 1
Often = 2
Sometimes= 3
Rarely= 4
Never= 5

1. Interrupts ___

2. Doesn't think before he/she speaks ___

3. Shows no self-restraint when provoked. ___

4. Forgets to bring materials to and from school. ___

5. Forgets things he/she has committed to do. ___

6. Needs reminders to complete tasks. ___

7. Emotions get in the way when doing assigned tasks. ___

8. Little things affect him/her emotionally. ___

9. Struggles to recover promptly from disappointment or changes in plans. ___

10. Struggles to start tasks independently. ___

11. Procrastination is a problem. ___

12. Tasks are left to the last minute. ___

13. Does not stay focused on work. ___

14. Does not sustain attention until tasks are completed. ___

15. When interrupted, Is not able to return to work without reminders. ___

16. Unable to identify priorities for a task. ___

17. Is unfocused on the most important tasks. ___

18. Struggles to follow multi-step tasks. ___

19. Backpack/ notebooks are unorganized. ___

20. Desk/ work area is messy and unorganized. ___

21. Misplaces homework, permission slips, lunch money, etc. ___

22. Unable to finish task within allotted time. ___

23. Struggles to estimate how long it takes to do something. ___

24. Dawdles over work or daily routines. ___

25. Get's "Stuck" on things. ___

26. Struggles to shift gears when plans have to change. ___

27. Struggles to complete open-ended tasks. ___

28. Struggles to monitor and evaluate own performance. ___

29. Can't think of more than one solution to a problem. ___

30. Struggles to adjust behavior based on the reaction of others. ___

31. Struggles to set and complete goals. ___

32. Unable to give up immediate pleasures to work on longer-term goals. ___

33. Unable to persist with effortful work. ___