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Effects of the Good Behavior Game On Preschoolers' Self-Regulation

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EFFECTS OF THE GOOD BEHAVIOR GAME ON PRESCHOOLERS' SELF-REGULATION

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ABSTRACT

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The purpose of this study was to evaluate whether after participation in the classroom management intervention (GBG), students would perform better in a behavioral measure of self-regulation than those who did not receive the intervention (business-as-usual group). In total, 48 preschool students across four classrooms were either assigned to a treatment or control group. The treatment groups completed a one-day behavioral intervention during circle time, whereas classes in the control groups were conducted business-as-usual. All participants completed a pre- and posttest measure of self-regulation (head toes knees shoulders). The analysis method was two-pronged, consisting of a two-way, mixed methods ANOVA performed to test the difference between pre- and posttest scores to ascertain whether participation in the intervention affected the results and a two-way repeated measures within-subjects ANCOVA to determine if any confounding variables had an impact on score differences between the pre- and posttest. Results indicated a significant, overall effect on pre- and posttest performance on HTKS scores, regardless of group assignment. The results of this study suggested that participation in the behavioral intervention did not result in a statistically significant change on the self-regulation measure. Furthermore, the main effects, covariates, or interactions between pre- and posttest differences and individual factors were not significant. Results indicated that participation in circle time may influence a child's ability to self-regulate but the occurrence of a practice effect may have affected these results due to the pre-test/posttest design of the study.

Keywords: self-regulation, preschool, Good Behavior Game, Head Toes Knees Shoulders

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CHAPTER I

INTRODUCTION

Preschool is a crucial time for children to develop skills necessary for success in their future academic years. Participation in preschool programs increases academic and behavioral skills and aids in the transition to the more formal environment of elementary school (Duncan et al., 2007). Preschool supports the development of necessary skills in children of all ability levels, especially children with disabilities or developmental delays directly or through their families (Bruder, 2010). One longitudinal study revealed that children who attended preschool went on to have higher education levels, academic achievement, incomes, socioeconomic status, and rates of health insurance coverage as adults (Anari, 2018; Melhuish, 2011; Reynolds et al., 2011). One particular behavioral skill that preschool fosters is self-regulation.

Self-regulation can be defined as the ability for an individual to control emotions, attention, and behaviors (Bronson, 2000). Blair and Diamond (2008) elaborated further on self-regulation, defining it as follows:

> Volitional cognitive and behavioral processes through which an individual maintains levels of emotional, motivational, and cognitive arousal that are conducive to positive adjustment and adaptation, as reflected in positive social relationships, productivity, achievement, and a positive sense of self. (p. 900)

According to Anzman-Frasca et al. (2015), self-regulation includes delay of gratification, inhibitory control, self-control, and emotion regulation. When defined using behavioral terms in research, self-regulation becomes more operationally defined, more easily understood, and

potentially more easily examined (Barkley, 2001). In early childhood classrooms, self-regulation is exhibited by asking the children to take turns, staying focused on an activity, and remembering directions (McClelland & Cameron, 2012). To use self-regulation effectively in the classroom, children must "seamlessly coordinate multiple aspects of top-down control (i.e., executive function) such as attention, working memory, and inhibitory control along with motor or verbal functions to produce overt behaviors such as remembering multi-step directions amidst distractions" (Montroy et al., 2016, p. 3). Self-regulation, as a foundational element for children, equips children entering kindergarten with the skills necessary to be academically and socially successful (McClelland & Cameron, 2012; Tominey & McClelland, 2011). Children who have not adequately developed self-regulation skills before entering kindergarten are at risk for not only negative social consequences but also low academic achievement (Blair, 2002). The consensus on the recent increase in research and literature on self-regulation is there is a need to implement effective interventions to promote the development of self-regulatory behaviors in preschool-aged children (Blair, 2002; Tominey & McClelland, 2011).

Purpose of the Study

The purpose of this study was to evaluate whether after participation in the classroom management intervention (GBG), students would perform better in a behavioral measure of self-regulation than those who did not receive the intervention (business-as-usual group).

Research Questions and Hypotheses

This research addressed the following research questions and hypotheses:

Q1 What is the pre-test difference between the control and the treatment groups growth on the Head Toes Knees Shoulders (HTKS) task?

H1 Participants in the treatment group will receive higher scores on the HTKS compared to the control group.

Q2 What is the difference in the growth from the pre-test/post-test between the

treatment group and the control group on the Head Toes Knees Shoulders task?

H2 Students in the treatment group will have higher growth on the HTKS task compared to the control group.

Q3 What is the difference in growth from the pre-test/post-test between the treatment and control group when confounding variables (i.e. race/ethnicity, sex, age, mother's education level, and years in daycare/school setting) are controlled for?

H3 A difference in scores between the groups may be affected when confounding variables are controlled for.

Significance of the Problem

Given the positive outcomes that both preschool and self-regulation can offer, high-quality interventions are needed to help preschoolers develop self-regulatory behaviors. Children who do not have access to high-quality preschool programs can enter kindergarten a year behind their classmates in academic and social-emotional outcomes (U.S. Department of Education, 2015). Across the United States, it is estimated that 83.2% of children attend early care and education programs before attending kindergarten (Tominey & McClelland, 2011); however, fewer than 59% of four-year-olds are enrolled in high-quality preschool programs (U.S. Department of Education, 2015). Children who participate in high-quality preschool programs have better health, social-emotional, and cognitive outcomes than those who do not (Barnett, 1995; Camilli et al., 2010; Connor et al., 2006; Diamond et al., 2007; Graue et al., 2004). Therefore, the question is how to design and implement high-quality programs and ensure that preschools can deliver these benefits.

The refinement of self-regulation skills can reduce problem behaviors in preschool children. Bulotsky-Shearer et al. (2012) reported that 8% to 22% of preschoolers exhibit significant problem behaviors such as aggression, inattention, noncompliance, and/or outbursts. Poor self-regulation has been associated with negative outcomes including attention deficit hyperactivity disorder, school failure, addiction/substance abuse, and anxiety and depression

(Razza et al., 2015). Early self-regulatory skills are predictive of children's successful adjustment in the longer term, and higher levels of regulation have been linked with positive developmental outcomes including greater self-esteem, professional attainment, and better health in later childhood and adolescence (Razza et al., 2015). Children with well-developed self-regulation skills have lower rates of behavior referrals, higher rates of achievement, success, and pro-social behaviors in school (Blair & Razza, 2007; Moffitt et al., 2011; Tangney et al., 2004). Adult feedback while developing these skills is also needed; adults who intentionally help children foster self-regulatory capacity early can help develop critical skills such as attentional control, problem-solving, and coping strategies (Murray & Rosanbalm, 2017). To gain these outcomes, more intervention and prevention strategies are needed that target self-regulation during early childhood when children are acquiring these foundational skills. High-quality, cost-effective interventions are needed to deliver these skills to children in all types of preschool programs.

The focus of the present study was whether the good behavior game (GBG), a cost-effective intervention, has an impact on preschool aged student's self-regulation skills. GBG is an intervention that has been found to have short-term, positive effects on children's self-regulatory behaviors. GBG has been primarily used to reduce the number of disruptive behaviors in the classroom setting including out of seat, talking out, off-task, and aggressive behaviors. Each time a student stays on task and follows the rules during the game, they are exercising their self-regulation skills (Johansson et al., 2020). Therefore, GBG helps students practice self-regulatory behaviors. In a review of 22 peer-reviewed journal articles, Flower et al. (2014) found that GBG was effective in reducing disruptive behaviors, with moderate to large effect sizes and immediate results. A search of available research revealed that although research on GBG and its

reduction of disruptive behaviors is abundant, studies focusing on the effects of GBG on self-regulation are lacking, suggesting a need to explore whether GBG has any impact on self-regulatory behaviors. The hypothesis tested in this study is that using GBG to reduce disruptive behaviors in the classroom would also increase students' self- regulatory behaviors. Therefore, GBG would increase self-regulatory behaviors and simultaneously reduce disruptive behaviors.

Targeting preschool-aged children's abilities to develop strong, short-term self-regulation skills is the most developmentally appropriate approach for this age group. Between age three and seven, children begin to shift their self-regulation; children progress from being reactive and having co-regulated behavior to displaying more advanced, cognitive behavioral forms of self-regulation (Montroy et al., 2016). Although children at this age group begin to express self-regulation, they are still unable to practice self-regulation skills over a long period. Preschool children are unable to regulate their behaviors to reach a long-term goal (e.g., saving money over a period to buy a bike) but they are able to use self-regulation skills for a period to be able to reach a short-term goal (e.g., follow classroom rules in circle time to "win" GBG and obtain the reward). Therefore, this developmental period is most aligned with the development of self-regulation if the goal of the intervention is to affect children's self-regulation in the short-term. Furthermore, intentional involvement from adults via feedback promotes self-regulation capacity early in the lives of children and can help them develop skills such as attentional control, problem-solving, and coping strategies for managing distressing environmental or emotional experiences (Murray & Rosanbalm, 2017). With adult feedback, the self-regulation built at this age will be refined and well developed to help children execute self-regulation skills more efficiently as they age.

Theoretical Basis

The theory driving the current study was Bandura's (1991, 1999) social cognitive theory of self-regulation. According to this theory, behavior is motivated and regulated by the constant exercising of self-influence (Bandura, 1991, 1999). Bandura believed people have self-agency and are not purely influenced by their environment alone; rather, a mix of the environment and individual characteristics drives behavior. This theory is developmentally sensitive, as it accounts for social relationships (both adult and peer) that influence self-regulatory abilities and indicates that the development of self-regulation skills is a process.

Whereas Bandura's (1991, 1999) theory addresses the development of self-regulation, another theory posited by Vygotsky (as cited in Bodrova et al., 2013) addresses the developmental aspects examined in the current study and how they relate to the emergence of skills in preschool-aged children. According to Vygotsky's developmental theory, psychological processes develop in social interactions (Bodrova et al., 2013). This theory was relevant to the current study because preschool, by nature, is a social environment for children. Therefore, children are better able to learn skills when in a social environment such as school. Vygotsky (as cited in Bodrova & Leong, 2015) believed in the power of play in child development and the influence of positive teacher-student interactions on developing skills in children. Play is one of the ways a child can begin to learn self-regulation because they are required to assume roles and follow rules to stay in the roles they have chosen (e.g., playing chef in a pretend kitchen; Bodrova et al., 2013). The combination of Bandura's (1991, 1999) social cognitive theory and Vygotsky's developmental theory (formally called sociocultural theory) was relevant to this research because the two theories include ideas on how self-regulation can be developed in young children. Children are able to learn self-

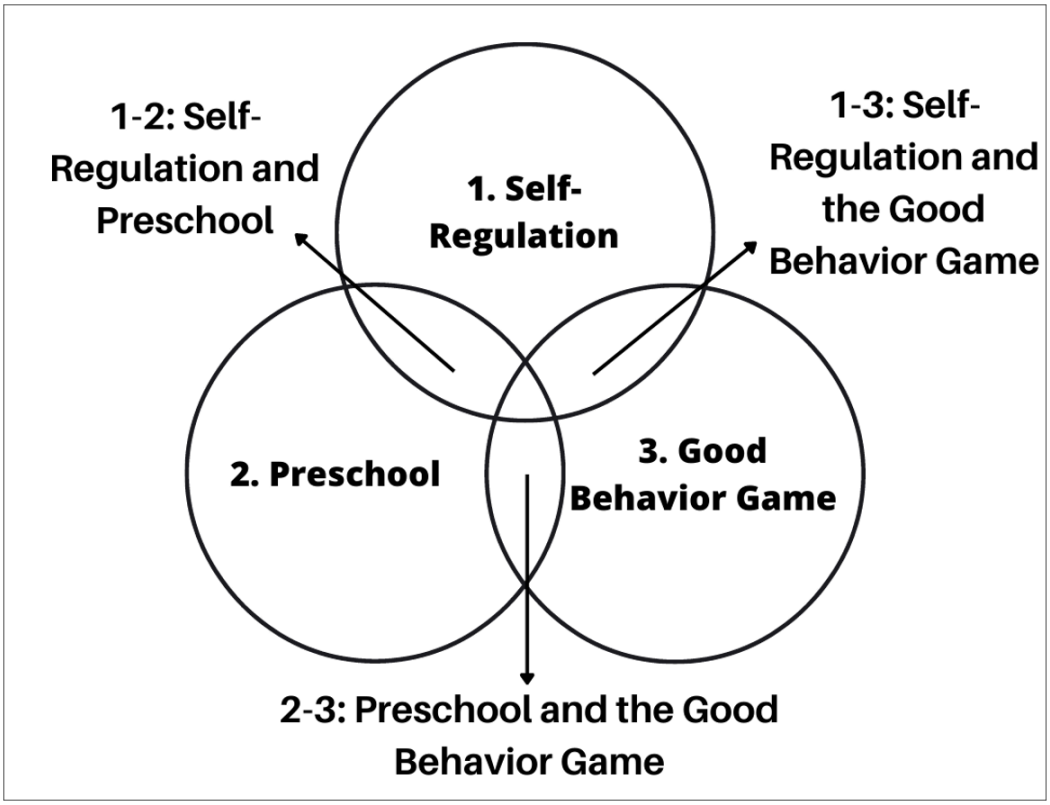
regulation through play and the social aspect of preschool can further enhance these skills. Because both theories focus on child development and include a proposition that the development of self-regulation happens in social environments, in this case the preschool classroom, they were appropriate as the theoretical framework for the current research study.

Relevant Literature

To support these theories, it was necessary to examine available literature regarding the development of self-regulation in learning contexts, especially in the preschool environment, and through interventions. The Venn diagram (see Figure 1) is a visual display of the variables of the current study and their relation to one another. Created by Duquesne University (2006), this diagram is a visual that guides doctoral students in writing their dissertations by helping them focus on background literature, relevant literature, and very relevant literature. Many researchers have investigated behavioral interventions and their effects on students' self-regulation skills but in older children, not preschool children. Furthermore, no available research has focused on how GBG affects preschool children's self-regulation. Research on each variable independently (preschool, self-regulation, and GBG) or various combinations of each variable is abundant, but studies on all of these variables together is lacking.

Figure 1

Venn Diagram of Variables



Researchers have found that preschooler's self-regulation can be improved through interventions. In a study by Tominey and McClelland (2011), preschoolers who participated in a game-like behavioral intervention during circle time had higher rates of self-regulation and made academic gains compared to those who did not receive the intervention. In this study, Tominey and McClelland examined the efficacy of the self-regulation intervention games during circle time in a preschool classroom and the effects of the intervention on behavioral aspects of children's self-regulation and early academics. Findings indicated that children who participated in these game-like interventions were able to make gains in their self-regulation skills. There were significant gains for the children who began the school year with low levels of self-regulation and participated in the intervention. McClelland et al. (2019) conducted a study using

one of the game-like behavioral interventions used in the above study (Red Light, Purple Light!) and found a 21% difference in self-regulation between the intervention group and the business-as-usual control group in preschool classrooms. Furthermore, in a year-long study by Razza et al. (2015), preschoolers who participated in a mindful yoga intervention improved their self-regulation skills. Findings indicated that children who participated in the study had significant improvements in three areas of self-regulation (attention, delay of gratification, and inhibitory control) on both parent questionnaires and direct measures. Children who saw the most gains in these studies were those who had low self-regulation skills to begin with and those from low-income families. These studies suggested that self-regulation is a malleable skill and not a fixed construct in young children.

Many interventions that target self-regulation focus on the immediate exercising of these skills. Developmentally, self-regulation is an appropriate intervention to use for the preschool population. From what is known about the development of self-regulation, between age three and seven, a shift in self-regulation occurs in children; they move from reactive or co-regulated behavior to more cognitive behavioral forms of self-regulation (Montroy et al., 2016). This shift occurs in the preschool age years and allows children to use self-regulatory behaviors in the immediate and short-term context. The understanding of time is thought to be a key element in self-regulation (Moilanen, 2007). Although adolescents can exercise self-regulation over a long period to obtain a goal (e.g., save income over several weeks or months to buy a bike), preschool children are only able to use these skills for a short period. The practice of inhibiting an action for a span of time allows children to think about the possible actions so that they can act in accordance with their experiences, beliefs, and goals (Moilanen, 2007). Young children are limited to events in the near, whereas adolescents are able to plan and prepare for events in the

present and future. The current research targeted preschool children's self-regulation skills in the short-term context. Adult feedback to children exercising self-regulation skills while they are still developing and fine-tuning these skills allows them to develop better-refined skills that they can use in the future. Therefore, as these children develop, they would be expected to have a strong foundation for higher levels and long-term self-regulation abilities.

Research has shown that preschool is a place where interventions can be used effectively. One of the interventions found to have positive effects in preschool is GBG; however, research using GBG in a preschool setting is limited. Wiskow et al. (2019) researched the effects of GBG on preschoolers' disruptive behaviors and found that different methods of the intervention significantly reduced unwanted behaviors in the classroom. In another related study, Foley et al. (2018) found that GBG was effective in reducing disruptive behaviors in the preschool classroom at both the group and individual levels. The consensus in research is that GBG can be implemented in the preschool environment, and it is effective in the reduction of disruptive behaviors.

GBG and its effects on self-regulation have not been directly investigated. The GBG was developed to target disruptive behaviors. Hughes et al. (2000) found that disruptive behaviors in preschoolers can be attributed to their deficits in inhibitory control. Self-regulation includes inhibitory control (Anzman-Frasca et al., 2015) and, therefore, increasing self-regulation will result in improved inhibitory control. By reinforcing desirable behaviors and inhibiting unwanted behaviors, children develop self-management strategies to regulate their behaviors and emotions toward the environment.

In a search of available research, specific studies on the effects of GBG and self-regulation were lacking; however, researchers have found that GBG reinforces good behaviors

and inhibits unwanted behaviors. This finding suggests that GBG helps children develop the self-agency to delay gratification and reduce impulsivity, which is the operational definition of self-regulation (Johansson et al., 2020). GBG is designed to provide daily experiences for children, allowing children to practice and, in turn, strengthen self-regulation because each time they stay on task during the game they are exercising their self-regulation skills (Johansson et al., 2020).

A gap exists in research regarding the effects of all of the discussed variables: preschool, self- regulation, and GBG. Preschool and its effects on self-regulation, GBG and the reduction of disruptive behaviors, and the use of GBG in preschool have been investigated, but the use of GBG impacting self-regulation in preschool children has not been examined. Some researchers have used GBG with preschool children; however, studies on whether the GBG influenced self-regulation in preschool are lacking, representing a research gap addressed in the current research.

Statement of the Problem

Self-regulation plays a critical role in the success of children's academic, behavioral, and social skills. However, whether GBG can promote and improve self-regulatory behaviors in preschool-aged children has not been examined. This research gap was the problem addressed in the current study.

CHAPTER II

REVIEW OF LITERATURE

Preschool is the first environment in which children are introduced to a formal educational setting. Early education in the United States includes a variety of options—part-day, full-school-day, and full-work-day programs (Kamerman & Gatenio-Gabel, 2007)—that are funded both privately and publicly. Preschool attendance has markedly increased since the beginning of the 1950s because preschool is a form of childcare for children who have not yet reached school-going age. The use of childcare services has increased in the United States due to the rise of women in the workforce. One way to address this need was through the establishment of day nurseries in the 1830s to care for children of working mothers (Kamerman & Gatenio-Gabel, 2007). This increase in not only the need for preschool but also the establishment of quality early childhood programs led to the emergence and popularity of preschool programs in the United States.

Historical Background of Preschool

Infant schools began to emerge in England and Europe around the mid-1700s due to a shift in thinking that childhood was an important part of development but these schools did not become popular until the 1820s and 1830s (Beatty, 1995). The reasons for establishing infant schools in the United States during this time varied. A driving force for the emergence of these schools was to allow women in poverty to become available to enter the workforce. An additional benefit these schools offered was the ability to socialize children who middle-class reformers feared were being reared without proper moral guidance. At the time, the United States

prioritized reducing poverty and welfare costs (Vinovskis, 1993). Early schooling was used to help prepare children from disadvantaged backgrounds to do better in public schools.

Key contributors in the emergence of early childhood education included Martin Luther, Jean-Jacques Rousseau, Johann Heinrich Pestalozzi, Robert Owen, Freidrich Froebel, and Maria Montessori (Beatty, 1995). Martin Luther (1483-1546) believed all children should be educated in a time that only offered quality education to the wealthy and those who could afford it. Luther also held the beliefs that learning to read is critical, parents are the first teachers, and the community plays a vital role in the education of children. Jean-Jacques Rousseau (1712-1778) proposed that all children should be treated differently from adults because they are in a separate developmental stage (Beatty, 1995). Rousseau (1979) said, "[t]he man must be considered in the man, and the child in the child" (p. 80). This assertion was novel thinking during his lifetime when most of society believed children were just miniature adults and should be held to the same expectations.

Johann Heinrich Pestalozzi (1746-1837) was the first European educator to develop pedagogical methods consciously derived from experimentation with real children. He believed the school environment should be home-like, loving, and emotionally supportive. He supported children using their senses, such as touch, to learn rather than being read to and told about them; children should not be lectured, but rather be allowed to experience learning on their own (Beatty, 1995). Robert Owen (1771-1858), along with his son, was one of the first individuals to establish an infant school in the United States, which is credited as beginning the reform of American primary schools during the early 1800s (Bloch & Choi, 1990). The need for childcare programs emerged during the early part of the 19th century. The earliest schools emerged in Great Britain to provide factory workers with childcare during the 1820s. These schools

emphasized outdoor play and games, singing and dancing, and activities that were novel of schools for young children. The infant school movement dissipated around the 1840s possibly due to the informality of programs and the belief that the proper place for children to spend time was at home (Bloch & Choi, 1990). Although Owen is known to establish the first infant school in the United States, Freidrich Froebel (1782-1852) is credited as the founder of kindergarten with his launch of early childhood education in Germany (Bloch & Choi, 1990). His kindergarten programs began to spread in the United States in the 1870s because at the turn of the 19th century, many families required women to work outside the home, thus increasing the need for childcare. Froebel formed a curriculum and methodology necessary for teaching children. Froebel considered play to be the highest level of child development and that children develop and learn through play (Bloch & Choi, 1990).

Maria Montessori (1870-1952) also heavily contributed to the importance of early learning. She developed a method that can be described as playful learning that is based on observing and supporting the development of children by allowing them to construct their own goals. These people are credited with being key contributors to the development of early education in the United States.

As stated earlier, the increased need for childcare became apparent as more and more women entered the workforce and were not available to look after their children at home during the day, leading to the exponential growth of day nurseries in the United States that began around 1878 (Cahan, 1989). The public was, however, slow to accept the dual ideas of maternal employment and childcare. During war times, (i.e., Civil War, World War I, and World War II), the need for and use of childcare and supervision increased but declined after the war. The Lanham Act of 1941 led to establishment of community centers in “war-impact areas,” but it was

not until 1943 that this shift translated to support for childcare (Michel, 2011). After World War II, early childhood was seen as an important first step in education; a need to promote programs that included the latest nursery school philosophes and child development knowledge began to be fostered (Bloch & Choi, 1990). The primary goal of late 19th and early 20th century education was the "Americanization"/socialization of young, low-income, ethnically "different" children. Therefore, many kindergartens for the urban poor included discipline and orderly behavior programs (Bloch & Choi, 1990).

Early education was intended to act as a supplement rather than replacement for familial child rearing (Beatty, 1995). Many early childhood programs were designed to aid the poor through quality, at-home early education, which was seen as somewhat of a luxury. Lyndon B. Johnson launched the Head Start program in 1964 to serve low-income families in providing their children an early education (Beatty, 1995). This program proposed that early education was an answer to improve the educational system. The initial goals of the infant school and Head Start programs were to eradicate poverty in American society. Due to Head Start's success, many middle-class Americans began to enroll their children in preschool programs so that their children would receive the benefits of early childhood education. In the 1960s and 1970s, kindergarten and nursery school attendance expanded when certain factors such as labor market policy, public (social) assistance policy, education policy, child welfare policy, and child development research encouraged the growth of both types of programs (Beatty, 1995). The main factors, however, were the dramatic rise in women in the work force and the rise in single-mother households. During the same time, research began to emerge that school achievement in elementary and middle school, emotional and social well-being, fewer grade retentions, and reduced instances of juvenile delinquency were all factors associated with adult wage earnings

and suggested that early childhood education was a worthy investment to society (Barnett, 1995; Berreuta-Clement et al., 1984; Kamerman & Gatenio-Gabel, 2007). Early childhood education became "increasingly viewed as a cost efficient and effective strategy whose benefits are reaped during the school careers of each child, in their later life, and in the future economy" (Kamerman & Gatenio-Gabel, 2007, p. 27).

Early childhood education is prosocial as it responds to changing work roles and family composition, helps equalize opportunities of low-income families, assists in assimilation of immigrants, and aids in enhancing child development and general child well-being (Kamerman & Gatenio-Gabel, 2007). Kindergarten and preschool programs provide more education than custodial care (Bloch & Choi, 1990). Education is mainly focused on childhood development beyond physical safeguarding. Nurseries were custodial in nature, focusing primarily on basic care and supervision of children. Kindergartens and nursery schools expanded slowly during the 19th century and experienced a significant increase during the 1920s as a form of enriched experience of middle-class children (Kamerman & Gatenio-Gabel, 2007). In the late 19th century, day nurseries expanded in response to pressures created by rapid industrialization and massive immigration (Kamerman, 2006).

Public support for kindergarten and nursery programs emerged during the mid-1960s and early 1970s due to a surge of the number of both program types. Legislation soon followed. Congress passed the first childcare legislation in 1971 through enacting a law that required the national government to contribute to childcare services for children under three and be responsible for their operation (Vinovskis, 1993). Again, as more women entered the workforce in the 1970s, this system of early childhood education provided care and catered to the adapting needs of working mothers/parents. In the 1980s, there was a revival of interest and support for

early childhood education (Vinovskis, 1993). In 1989 at the Education Summit Conference in Charlottesville, Virginia, the George H.W. Bush administration, and state governors announced that “by the year 2000 all children in America will start school ready to learn” (National Education Goals Panel, 1998, p. vi). Today, around 80% of children under age six spend part- or full-time in nonparental childcare settings (Elkin, 2016). More specifically, the National Center for Education Statistics (2019) reported in 2017 that 68% of four-year-olds and 40% of three-year-olds were enrolled in preprimary education.

Although the history of preschool suggests that it developed to aid society by providing childcare options for children not quite of school-going age, it has evolved into a key contributor in helping children prepare for formal education. The preschool environment teaches children critical skills to ensure success in formal schooling such as listening to, remembering, and following directions; paying attention; inhibiting inappropriate responses and actions; standing in line; sitting properly; activity transitions; and generally regulating their behaviors, emotions, and impulses (Degol & Bachman, 2015; Skibbe et al., 2011). All of these skills are associated with the overall concept of self-regulation.

Self-regulation is a crucial skill for children to succeed in school because it is associated with emerging math and literacy abilities, social adjustment, and lower rates of grade retention and special education placement (Blair & Razza, 2007; Duckworth & Carlson, 2013; Reynolds et al., 2003). The attainment of self-regulation skills is associated with school readiness, which is a primary goal of preschool. To fully understand the benefits of self- regulation, there is a need to understand why this concept is important in society.

Historical Background of Self-Regulation

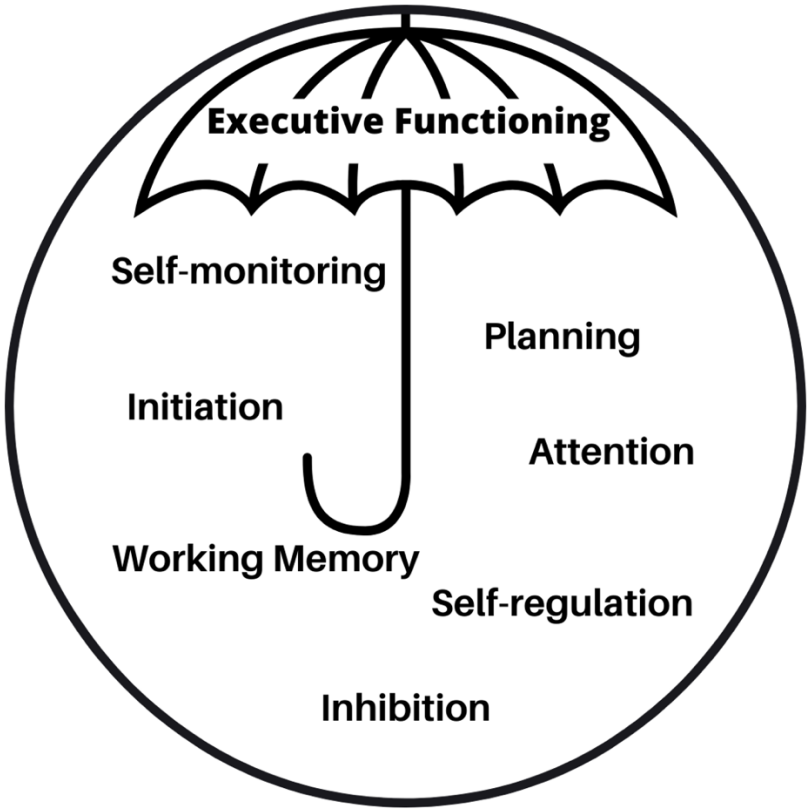
When defining self-regulation in terms of research purposes, behaviorally operational definitions are most often employed because the concepts are most easily understood if explained in an observable fashion (Barkley, 2001). The focus of the current research was on self-regulation in a school setting, which requires various demands on the behavioral aspects of self-regulation (McClelland & Cameron, 2012). McClelland et al. (2019) described self-regulation as a multidimensional concept that involves emotion, cognition, and behavior. Furthermore, the researchers suggested that self-regulation employs three aspects of executive functioning: working memory, cognitive flexibility, and inhibitory control. Behavioral impacts of using these executive functions for children's behavior are important for classroom success.

Executive functioning is an umbrella term that includes the cognitive processes of planning, working memory, attention, inhibition, self-monitoring, self-regulation, and initiation (Goldstein et al., 2014). In 1966, Alexander Luria (1980) suggested that higher cerebral functions involving executive functioning required interaction of normal neurological development and specific environmental stimuli of a cultural, historical, and social nature (Goldstein et al., 2014). Luria (1980) proposed the five stages of human development, hypothesizing that the brain differentiates and matures in the following sequence. Stage 1 begins in the first year of life and involves the development of the brain stem structures. Stage 2 includes the activation of primary sensory areas for vision, hearing and tactile perception, and the primary motor areas of gross motor development during the second year of life. Stage 3 includes the development of single modalities in the secondary association areas of the brain as children enter their preschool years. The child's mind recognizes and reproduces various symbolic materials and develops the ability to model physical movement. Stage 4 begins as the child

enters Grade 1 or 2 (age 7 to 8). During this stage, the child begins to make sense of sensory input and environmental stimulation, which is important for the development of complex mental abilities. In Stage 5, the final stage, the brain begins to involve the operation of the frontal lobe and areas critical to the development of complex mental abilities through abstract thinking, intentional memory, and the execution of the monitoring and evaluating of complex learning. Luria's model aids in the understanding of the development of executive function (see Figure 2).

Figure 2

Executive Functioning as an Umbrella Term



Note. This figure shows various high-order processes involved in executive functioning.

Luria's (1980) stages demonstrated that children can develop self-regulatory strategies and the brain aids in the manifestation of such behaviors through the acquisition and practice of such skills. The way children are taught these skills is what ultimately shapes their ability to

understand and utilize self-regulation strategies. Based on Luria's model, preschoolers are in the stage where they are able to copy physical movement , develop single modalities, and recognize and reproduce symbolic materials.

Although Luria (1980) looked at self-regulation and is neurological development, Albert Bandura (1991, 1999) studied how self-regulation manifested behaviorally. Bandura is known as the father of self-regulation and was the first psychologist to coin the term. Some of his famous research included the Bobo doll study, which demonstrated how much children use adults as a model when learning how to behave in certain environments. In 1965, he published the results of a study in which he investigated delayed versus immediate reward gratification and the impact it could have on a child. This study is as one of the pioneering studies in researching a child's self-motivation and regulation.

Theory Relevant to Research Questions and Hypotheses

The variables' historical backgrounds have been explored in the sections above. This section focuses on theories that support the development of these constructs. Theoretical background gives a system of ideas that apply to the construct rather than its practical application. The system of ideas helps support the practical application intended to derive from these constructs.

Self-Regulation

The theories discussed in their relation to the current research are Lev Vygotsky's developmental theory, Albert Bandura's Social Learning Theory, and Albert Bandura's Social Cognitive Theory of Self-regulation. Lev Vygotsky's developmental theory (Dan, 2016) is based around the idea that psychological processes are developed in the context of socially embedded interactions. The main concept of this theory is the zone of proximal development, which is the

symbolic area that exists between a child's present abilities and what a child can achieve with support (Dan, 2016). Vygotsky proposed that high-level cognitive processes emerge through student-teacher interactions (Camperell, 1981).

Vygotsky also placed great emphasis on the positive role that play has in child development. Engaging in self-regulation in play emerges in children due to the roles they adapt when engaging in play and the rules needed to follow to maintain these roles (Bodrova et al., 2013). Play is one of the first activities preschoolers are exposed to when they must suppress their immediate impulses due to having to inhibit behavior that may not be related to the role they are adopting. For Vygotsky, play at this age is focused on dramatic and make-believe play (Bodrova & Leong, 2015). Daniel Elkonin, who was one of Vygotsky's students and a primary school teacher, expanded on this idea by including inhibition of behaviors and planning due to the discussion that must take place regarding what should be expected from children when adopting certain roles in play. Vygotsky's developmental theory is relevant to the current research questions because this theory places importance on student-teacher interactions as well as addresses self-regulation in terms of play (Bodrova & Leong, 2015). Although Vygotsky covers the developmental aspects of self-regulation, in his theories, whereas Albert Bandura addresses how it manifests behaviorally.

According to Albert Bandura's social learning theory (SLT), an individual learns through observation and evaluation of behaviors and their value to society. Bandura famously demonstrated this theory through the Bobo doll study (Bandura et al., 1961) in which he exposed children age 37 to 69 months to adults engaging in hitting and kicking the inflatable doll, then left alone in the room with the doll, and observed to see whether they imitated the behaviors modeled by the adult or engaged in different behaviors. The majority of the children exposed to

adults acting aggressively toward the doll did exactly what they had observed the adults to do. This result demonstrated that children often learn how to react and behave in situations based on the models of behavior they observe. For a child to successfully participate in society, they must have a combination of innate abilities and the guidance of significant adults in their life who can provide the skills for the child to be able to mediate and reflect on their behavior (Dan, 2016). Children learn which behaviors are rewarded and punished in the environment through their own agency by observing the actions of others and evaluating the effects of those behaviors. In relation to this, Dan (2016) stated the "development of self-regulation is an internal differentiated graduated process, dependent on interaction between individual's observation and society" (p. 190). Overall, Bandura (1991), in his social cognitive theory, posited that people learn behaviors based on intrinsic characteristics and environmental experiences and factors. This theory is relevant to the current research because it demonstrates that children tend to mimic adult reactions and behaviors they have seen in similar situations; the theory emphasizes that individual characteristics also have influence into how a person is able to self- regulate.

Bandura's SLT morphed into the social cognitive theory (SCT; Bandura, 1991). Although the SLT focused on the aspect that a person can learn through observation of others, the SCT is more comprehensive, indicating people get information from the environment in a social setting. The main concept of Bandura's (1999) SCT was that there is a triangle of reciprocal determinism: behavior, environment, and person. The SCT conjectured that behavior is motivated and regulated by the constant exercising of self-influence (Bandura, 1991). Similarly, self-regulation is comprised of three processes: self-observation (or self-monitoring), self-judgment, and self-reaction (Schunk, 1995). These processes correlate to the triangle of reciprocal; self-observation is related to the person, self-judgment to the behavior, and self-

reaction to the environment. Because of these concepts, this theory is often referred to as the social cognitive theory of self-regulation (SCTSR). Bandura strayed from the popular behavior theories at the time by wanting to further explore what impacts human behavior. Bandura's theories, unlike those of behaviorists Skinner and Pavlov, included self-agency in its list of influencers of behavior. Bandura (1991) believed that people did not regulate their behavior purely based on external outcomes but rather stated that people are "regulated by an interplay of self-generated and external sources of influence" (p. 249). This theory is relevant to the current research because it addresses self-regulation and is developmentally sensitive in laying out the specific processes that encompass this trait. The theory also involves consideration for the role that important adult and peer models play in helping a child develop self-regulatory abilities.

Justification of Theoretical Foundation for Self-Regulation

The driving theories of this research study are Vygotsky's theory of development (Bodrova et al., 2013) and Bandura's (1991) theory of self-regulation. Vygotsky focused on social interaction and self-regulation in the first formal, social-educational setting a child is exposed to: preschool. Bandura's SCTSR is relevant because it specifically addresses self-regulation and involves environment, modeling, and personal characteristics.

Bandura's theory is based on the triangle of determinism: behavior, environment, and person. Individuals experience three processes of self-observation: self-observation, self-judgments, and self-monitoring. These processes all coincide with developmental trajectories of self- regulation in children. Bandura's SCTSR is based on reciprocal determinism, which states there are three factors that influence behavior: the environment, the person, and the behavior itself (Bandura, 1978). Bandura stated that his SCTSR theory differed from other cognitive theories (e.g., Piaget, behavioristic, and formation processing) because he believed cognitive

influences are controllable rather than controlling factors. It was important to consider the developmental theory Vygotsky proposed and Bandura's SCTSR in the current research because, in conjunction, they address the development of self-regulation in preschool-aged children.

A more contemporary theory that is relevant to the development of self-regulation is self-regulation theory (Baumeister et al., 2007; Muraven & Baumeister, 2000). A central aspect of this theory is self-regulation is a limited resource and acts like a muscle; after it has been fatigued, the ability to use it effectively is lessened (Hagger et al., 2010; Muraven et al., 1998, 1999, 2000, 2006; Vohs & Heatherton, 2000). This concept is otherwise known as ego depletion (Muraven & Baumeister, 2000). Ego depletion causes a person to temporarily be less able and less willing to manage behaviors and emotions at optimal or even normal levels (Baumeister & Vohs, 2007). Hagger et al. (2010) found significant effects of ego depletion on effort, perceived difficulty, negative affect, subjective fatigue, and blood glucose levels.

Ego depletion can be overcome in many different ways. To regenerate levels of self-regulation, one must rest (Muraven et al., 1998). Research has, however, indicated that the use of motivators and incentives can allow individuals, even when in a state of ego depletion, to regulate effectively (Muraven & Slessareva, 2003). Furthermore, positive mood and emotions have also been found to counteract ego depletion (Tice et al., 2007). Self-regulation tasks must be scaffolded in such a way where they are neither too easy nor too difficult. Just as a weightlifter would not gain muscle by just lifting 10 pounds, the individual may hurt themselves by lifting 1,000 pounds if they have not properly prepared themselves to do so. Therefore, learning tasks must be properly dosed and scaffolded in such a way so children can be successful. To enhance the level of self-regulation a person is able to exert, self-regulation tasks must be performed in temporary time frames because the "qualities of self-regulatory fatigue—

increasing the longer it is used, but rather quickly restored—make it more likely that self-regulation is deployed episodically and not chronically" (D. R. Evans et al., 2016, p. 19). This outcome is especially important in a classroom setting in which children are asked to employ self-regulation skills in episodic periods throughout their day in the classroom.

In this theoretical frame, four ingredients are needed for the self-regulation process to be successful: standards, monitoring, self-regulatory strength or willpower, and motivation (Baumeister & Vohs, 2007). The aspect of standards aligns with the guidelines and standards a person is required to change their behavior to be brought into some line with a standard. The strength model of self-control states that human beings regulate their behavior according to various rules and suggests facilitating group membership by garnering social acceptance (Baumeister et al., 2007); this can be especially relevant to the classroom setting. Furthermore, failure to self-regulate can be caused by the insufficient knowledge of behavior standards (Muraven & Baumeister, 2000). The second ingredient, monitoring, refers to the difficulty to regulate behavior without keeping track of it in some aspect. The third ingredient of willpower further promotes that self-regulation is a limited resource that acts like a strength or energy and becomes temporarily depleted afterwards (ego depletion). Based on the ego depletion model, self-control performance is related to how much was previously expended and the amount that is planned to be used in the near future (Muraven et al., 2006).

The fourth and final ingredient is motivation, which is needed to achieve a goal. Motivation is important because it can inspire a person to expend the remaining resources even when it is depleted. According to Barkley (2001), motivators first arise from external factors but over time, individuals develop a means to guide social behavior by internal motivators. Conclusively, it is easier for an individual to regulate emotions and behavior in settings where

standards are clear, they can monitor meeting these standards, they have the willpower to continue working to these standards, and are motivated to exert willpower.

Current Literature Relevant to Research Questions/Hypotheses

The preschool environment is most likely the first formal setting in which children are expected to practice many skills, such as self-regulation, for a sustained period. Self-regulation is defined as managing and monitoring of one's own behaviors and emotions. People tend to exhibit self-regulation strength when they follow rules or differ the way they may otherwise react (Barkley, 1997; Muraven & Baumeister, 2000). Kochanska et al. (2001) stated that the "ability to act in accord with social standards and regulate one's behavior is among the hallmarks of development and socialization during the early years of life" (p. 1091). Self-regulation is a critical skill to develop because higher self-regulation is related to a number of important developmental outcomes. Past research provides evidence that preschool is an ideal time to introduce interventions to target behavior self-regulation prior to kindergarten entry because these skills emerge at this stage of development as important predictors of academic success (Blair & Razza, 2007; Howse et al., 2003; McClelland et al., 2007).

Tominey and McClelland (2011) suggested three reasons why preschool years are important for the development of self-regulation. The first reason is the preschool environment is the first environment in which preschoolers are asked to perform self-regulation skills. Before entering the school environment, children are regulated by their caregivers and other external stimuli (i.e., pacifiers, rockers, etc.). When children enter later years of development, self-regulation moves from being regulated by external to more internal factors. In the school context, children are required to demonstrate behavioral self-regulation by paying attention, remembering, following directions, and acting appropriately even when impulsivity is present.

Second, the preschool years are when developmental changes in the brain occur. Due to brain maturation, children at this age can increase the amount of time they can pay attention and have the ability to plan and allocate attention to goals. Furthermore, studies have shown that with practice, these skills can also be improved (McClelland et al., 2019; Tominey & McClelland, 2011). Lastly, self-regulation in preschool years helps predict academic achievement in both preschool and kindergarten (Blair & Razza, 2007; Tominey & McClelland, 2011).

Self-regulation skills in childhood have been associated with several positive outcomes in school age years and beyond. Higher levels of self-regulation are associated with low levels of children's negative emotionality, compliance with adults' commands, higher empathy-related responding, and are positively related to children's adjustment and social competence (Eisenberg et al., 2004). In a long-term study, Moffitt et al. (2011) found that early childhood levels of self-control predicted health and psychiatric problems and financial security and criminality in adulthood. Additionally, a meta-analysis of research revealed that early self-regulation was positively related to academic achievement and negatively related to externalizing problems (i.e., aggressive and criminal behavior), depressive symptoms, obesity, cigarette smoking, and symptoms of physical illness in adulthood (Robson et al., 2020). Regarding academic and school success, self-regulation is associated with school liking and social adjustment, academic skills, and school achievement (Blair & Razza, 2007). Self-regulation has been consistently linked to academic achievement. Researchers have linked self-regulation with higher levels of achievement in elementary school (G. W. Evans & Rosenbaum, 2008; Howse et al., 2003; McClelland et al., 2007), high school (Blair & Diamond., 2008), and even college (McClelland et al., 2014). The results from the previously mentioned studies suggested the homogenization of behavioral aspects of self-regulation predicts academic success (Tominey & McClelland, 2011).

Due to the positive effects of self-regulation on academic and life outcomes, it is important to find developmentally appropriate and engaging ways to help children practice self-regulation skills, which is especially important for the children who have difficulty with the skill and/or those who enter preschool with lower levels of self-regulation. Studies have shown that behavioral self-regulation emerges by preschool, and with practice self-regulation skills, can be improved. Graziano et al. (2015) found children who received a self-regulation intervention in preschool had greater growth in the areas of academic achievement, emotion knowledge, emotion regulation, and executive functioning compared to the group that did not receive the intervention after a 6 month follow up. Considering these factors, it is important to investigate interventions that may increase self-regulation skills in preschool-aged children, especially for those who may have difficulties with these skills. Some interventions that have been found to improve self-regulation skills in preschool years include the Chicago School Readiness Project, PATHS program, Tools of the Mind, and other intervention programs.

Because self-regulation is such a valuable skill to have, a number of interventions have been developed with the goal of its improvement. The Chicago School Readiness Project (CSRP; Raver et al., 2013) is an emotionally and behaviorally focused, classroom-based intervention designed to support low-income preschoolers' school readiness. The CSRP, as it was originally designed, has been used in Head Start classrooms to help low-income children's self- regulation and increase opportunities to learn. The CSRP is intended to be done by building upon already existing community resources and extensive teacher training in strategies that could be used to provide classrooms with more effective regulatory support and better management. This intervention is designed to be comprehensive with a focus on training teachers to use strategies (i.e., effective classroom management) and use mental health consultants (Raver et al., 2013).

The mental health consultant's role is to support teachers while they learn and implement new strategies and provide stress reduction workshops. The program has been found to be effective in improving children's self-regulation (as measured by attention/impulse and executive functioning) and showed some positive effects on learning (Duckworth & Carlson, 2013; Raver et al., 2013).

The PATHS (Promoting Alternative Thinking Strategies) curriculum trains teachers to build children's socio-emotional competencies in self-control, recognizing and managing feelings, and interpersonal problem-solving (Diamond & Lee, 2011). The PATHS curriculum is a classroom-wide approach used with elementary school-aged children (preschool through fifth grade) and intertwines its curriculum with already existing curriculum to teach skills as well as create real-life opportunities to generalize skills for optimal internalization of concepts in effective skill application. The curriculum teaches individual skills and competencies and promotes a classroom atmosphere intended to increase empathy and openness in dealing with emotional needs. The curriculum consists of lessons focusing on skills such as self-control, emotions, and problem-solving (Kam et al., 2004). According to its website, PATHS is designed to be taught two or more times per week for 20 to 30 minutes per day. PATHS is made up of systematic, developmentally based lessons, materials, and instructions. The preschool/ kindergarten level assists educators for students age 3–6 in developing self-control, self-esteem, emotional awareness, basic problem solving, social skills, and friendship. This intervention has been found to be effective in improving children's social-emotional competence and self-regulation (Bierman et al., 2008). The PATHS curriculum asks children, when they get upset, to stop, take a deep breath, say what the problem is and how they feel, and construct an action plan (Diamond & Lee, 2011). This intervention includes instruction in many skill areas that are

delivered in a developmentally appropriate sequence and its core curriculum emphasizes awareness in oneself and others. What makes this intervention different from others is that it places less emphasis on traditional behavior modification and more on supporting the development of children's ability to self-regulate (Domitrovich et al., 2007). The research findings of this intervention revealed that it is effective in increasing preschool children's ability to self-regulate (Bierman et al., 2008; Diamond & Lee, 2011; Domitrovich et al., 2007).

Tools of the Mind is another intervention that is a curriculum for preschools and kindergarten developed by researchers Elena Bodrova and Deborah Leong (Bodrova et al., 2013). This intervention incorporates cognitive, social-emotional facets of development to help children build self- regulation in the classroom. The intervention is based on Luria's (1980) and Vygotsky's theories of cognitive development emphasizing the social context of learning, imaginative play, language, and other cognitive tools that play a critical role in the development of children. The curriculum has three parts: the teacher regulates the students, the students regulate each other, and then the students individually self-regulate (Baron et al., 2017). The program, Tools of the Mind, aims to improve self-regulation by providing frequent, structured opportunities to utilize cognitive tools in order to practice self-regulation in the social context. Teachers who have a clear self-regulatory component scaffold a set of activities. Children work with teachers to choose a character to be, draw a play plan on paper, and act in accordance with the plan, inhibiting the impulse to act out of character. Teachers refer children back to their play plan if their actions deviate from their role. In other activities, children are given pictorial cues to help take turns listening and talking (Solomon et al., 2018). The goal of this approach is to help children self-regulate their behavior by integrating self-regulation-oriented activities within academic instruction through activities such as buddy reading (Baron et al., 2017).

Diamond et al. (2007) described Tools of the Mind as using mature, dramatic play to increase executive functions in preschool-age children. As mentioned previously, dramatic/make-believe play, according to Vygotsky and Luria, helps a child practice self-regulation because children must inhibit acting out of character, remember their own and other's roles, and demonstrate flexibility by adjusting as their friends improvise. In a study, Barnett et al. (2008) found Tools of the Mind to be effective in improving children's classroom experiences, social development, and cognitive development, as well as in creating higher quality classrooms. Additionally, Barnett et al. found that children who were assigned to the Tools of the Mind group outperformed children in the control group on executive functioning tasks. Overall, the research showed that the intervention curriculum, Tools of the Mind, is effective in improving children's self-regulation.

Several smaller, less "program"-like interventions have targeted children's self-regulation. In a year-long study by Razza et al. (2015), preschool age children (age 3–5) engaged in a mindfulness-based yoga intervention. The results of this study indicated that the effects of the intervention on self-regulation are significant and revealed that children who were most at-risk of self-regulation deficits and dysfunction had the most gains. Tominey and McClelland (2011) used a playgroup intervention in which children led and/or participated in a number of games in in which they were required to use self-regulation skills (i.e., freeze tag; Red Light, Purple Light). The results of their study revealed that the children who participated in the playgroup had improved self-regulation skills. It was important to list these interventions because they demonstrate that self-regulation can be improved by providing efficient, yet explicit instruction on self-regulation as well as the opportunities to practice these skills. Whether it is a

comprehensive program or a lesson and activity guideline, self-regulation has been found to be positively impacted by the interventions discussed above.

Although many of the studies reviewed showed how the interventions discussed improved self- regulation skills, they have some limitations. Many of the interventions have been implemented in Head Start programs or in settings with children who primarily come from low-income households (Duckworth & Carlson, 2013). Therefore, it is unclear whether these interventions have the same impact on students who do not have a lower socioeconomic status. Additionally, many of the mentioned interventions require extensive resources (i.e., training, time, and monetary expenses) and may not be easily replicated in the absence of these resources. One of the main and most accessible preschool environments in which research is conducted is in Head Start centers. Although these programs have been shown to be effective learning environments, many of the children attending Head Start come from low-income families (Duckworth & Carlson, 2013). Due to this fact, the socioeconomic status of the participants and the families involved in the research may not be a good representation of the U.S. population. Furthermore, although the PATHS curriculum may have an impact on emotional competence (i.e., improving accuracy in recognition of emotional expressions and emotion knowledge), it does not have an effect on inhibitory control or sustained attention (Bierman et al., 2008). Tools of the Mind, though producing some positive results in self-regulation improvement, is not officially considered an evidence-based program, and therefore, should be used with caution when targeting to improve self-regulation skills.

Programs such as PATHS and Tools of the Mind require funding and training that can be thousands of dollars. Many school districts and/or privately funded preschool programs do not have the funding or resources to purchase these curricula to deliver to their students.

Additionally, although many educators recognize the importance of social-emotional learning (SEL), they must prioritize the funding they have to provide quality academics to their students. Most targeted interventions available comprise individualized sessions that include repeated practice and/or computerized training in laboratories rather than in a classroom. These interventions are not salient for classrooms and produce little to no evidence that their methods of measurement translate to changes in classroom behavior or academic achievement (Schmitt et al., 2015). All of the studies reviewed in this section contain aspects for consideration in the current research study.

Literature Relevant to Self-Regulation and Preschool

Self-regulation manifests differently in various stages of childhood development. In early childhood, an aspect of self-regulation most often discussed is behavioral self-regulation, or overt behaviors and characteristics, which includes delay of gratification, persistence, control of impulses, and goal-oriented behaviors. Self-regulation is demonstrated by a toddler through focusing attention for short period, adjusting behavior to achieve goals, tolerance of brief delays of gratification, turning to adults to help with strong feelings, and beginning to label feelings (Murray & Rosanbalm, 2017). In preschool years, however, children begin to enhance their self-regulation skills and develop skills such as recognizing a wider and growing array of feelings in self and others, identifying solutions to simple problems, using calm down strategies with support (i.e., taking deep breaths and/or using self-talk), focusing attention, persisting on difficult tasks for increased lengths of time, and displaying early skills of perspective taking and empathy (Murray & Rosanbalm, 2017). Children experience the most rapid gains in self-regulatory behaviors from age 3–5; however, to understand how to support the progression of self-regulation, one must first understand how it develops in a child (Murray & Rosanbalm, 2017).

Environments and caregivers are what shape the development of self-regulation in the first early years of childhood. Self-regulation is dependent on co-regulation provided by parents or other caregivers through support, coaching/scaffolding, and modeling that facilitates a child's ability to understand, express, and modulate feelings, thoughts, and behavior (Erdmann & Hertzel, 2019; Murray & Rosanbalm, 2017). In the preschool classroom, children's positive interactions with people (teachers, peers, etc.) and/or tasks in preschool classrooms are associated with development of self-regulation (Williford et al., 2013). In both home and school settings, key components of co-regulation in early childhood include interacting in warm and responsive ways, recognizing and responding to a child's cues, providing physical and emotional support in times of distress, modifying a child's environment to decrease demands and stress, providing consistent routines and structure, modeling self-calming, and using age-appropriate positive behavior management strategies (Murray & Rosanbalm, 2017). Often, caregivers can act as a buffer to children for the negative impact of adverse events.

In young children, the ability to cope with stress is often related to caregiver support. The "caregiver" referred to depends on the context in which the child is. For example, the child uses their parents as the models for self-regulation in early years of development but as a child moves into more school-aged years (or with early exposure to a school-like setting such as a daycare), teachers and other caregiving adults are additional role models. Within the classroom, positive student-teacher relationships and a positive behavior management plan provide caregiving support like that provided by parents; research shows that a child's positive relationship with and engagement with teachers is associated with positive gains in executive functioning. Positive relationships with teachers in the classroom led to a reduction in dysregulation (Williford et al., 2013). When children interact with teachers who they can develop positive emotional bonds with

and that meet their behavioral and regulatory needs, an environment supportive of fostering the development of self-regulation as well as positive classroom relationships is created. Children's positive interactions with teachers (i.e., high emotional connection, expressed positive emotions, and adaptive communication) are related to gains in executive control; more importantly, children who are actively and positively engaged in classroom tasks and activities make gains in regulation skills during preschool (Williford et al., 2013).

Additionally, the importance of relationships in gaining self-regulation skills extends into the peer network; children who have positive peer relationships (as evidenced by sharing, appropriate communication, play, and acceptance) are more likely to be successful in school. Emerging research indicates that specific interactions that occur between peers during play are associated with self-regulation; disruptive and disconnected play are associated with negative emotional behavioral adjustment (Fantuzzo et al., 2005; Williford et al., 2013). Overall, children who experience higher quality interactions show greater academic growth and social development in preschool, especially for those children who are beginning school with lower levels of self-regulation (Murray & Rosanbalm, 2017). Conclusively, a child's engagement with teachers, peers, and tasks in the preschool classroom are associated with the development of self- regulatory skills.

Preschool is an environment conducive to the development of self-regulation. In preschool, children are introduced to practices and taught skills that help promote and support the development of self-regulation including following adult directives and classroom routines, paying attention, standing in line, raising hands to talk, listening to others, and sitting properly; these skills are taught in more explicit ways in preschool years than in later grades (Skibbe et al., 2011). According to Murray and Rosanbalm (2017), the preschool environment also helps

develop self-regulation due to its warm, responsive environment; the structure it provides (schedule, routines); the teaching and coaching of skills through modeling; opportunities for practice, and reinforcement of successive approximations. Furthermore, the ways the development of self-regulation are fostered in preschool are the classroom environment (i.e., routine, well-organized structure), teacher-student relationships, and classroom rules (Murray & Rosanbalm, 2017; Savina, 2020; Williford et al., 2013). Currently, self-regulation skills are fostered in preschool but are not specifically taught. Although specific curricula and content promote the development of academic skills such as reading, writing, and math, curricula that specifically target the development of behavioral skills needed to be successful in school are few. Self-regulation is one of those skills. Although elements of the classroom can help promote the development of effective self-regulation skills in preschool, they do not explicitly teach the children how to properly engage in self-regulatory behaviors.

Up to this point, this literature review has focused on specific classroom practices that promote self-regulation. Whether an individual's self-regulation is a malleable or fixed trait is discussed next. Self-regulation theory and its strengths-based model state that self-regulation is malleable due to ego depletion (one's capacity to self-regulate is affected by the mental resources they have available to exert this behavior). Self-regulation can be strengthened through practice, much like a muscle can be strengthened through exercise. From the available research on self-regulation in preschool, it can be gathered that self-regulation is a malleable construct that can be changed in the short-term context. When preschoolers participated in a game-like intervention during their class time, they exhibited an increase in self-regulation in their self-regulation skills (McClelland et al., 2019; Tominey & McClelland, 2011). Furthermore, when preschoolers participated in a mindfulness yoga intervention, they showed changes in self-regulation from

pre- to posttest (Razza et al., 2015). The studies show that self- regulation is a factor that can be malleable in preschool-aged children.

In a study by Tominey and McClelland (2011), 65 preschool-aged children participated in various game-like activities (i.e., freeze game, “Red Light, Green Light,” “Simon Says”) during a circle time of 30 minutes over 8 weeks and in 16 play groups. To assess changes in self-regulation, the preschoolers participated in an observational self-regulatory measure for children age 4–6. The preschoolers participated in the assessment in the Fall before the intervention and then one time after the intervention was complete. The researchers assessed the children two times on two different days over a period of 4 weeks, starting in November and extending into December. The intervention lasted 4 weeks from January until March, with the children assessed for a final time from April until May. The variable time between when the pre and posttest took place to when the intervention occurred showed differences in self-regulation. The results of this study showed that short-term participation in game-like interventions to increase self- regulation can be successful with preschool-aged children. Research completed by McClelland et al. (2019) provided further evidence of this effect. In their study, 157 preschoolers participated in a game-like intervention twice a week for 15 to 20 minutes over a period of 8 weeks. Preschoolers who participated in the intervention had greater gains in their behavioral self-regulation skills when compared to a control group.

In both of the aforementioned studies, children who had the largest gains in self-regulation were boys who showed low levels of self-regulation to begin with. Another predictor of self-regulation scores was participation in a Head Start program; individuals who participated in a Head Start program had smaller gains in self-regulation due to having higher levels of self-regulation to begin with. In these studies, children who received the interventions were able to

show behavioral differences in self-regulation. Therefore, this research suggested the children were able to make gains in their self-regulatory abilities in preschool-age years. Further evidence that self- regulation is a construct that is malleable and responsive to intervention is from a study completed by Razza et al. (2015). In this study, 34 children participated and 18 received 40 hours of mindful yoga intervention over a period of 25 weeks. Razza et al. noted that the participants were female, older, of a different ethnic background, and their parents had slightly more college education. Students who received the mindful yoga intervention performe better on the behavioral self-regulation measure than the control group.

The interventions discussed above, as well as previously (i.e., PATHS, Tools of the Mind, etc.) demonstrate that self-regulation can be improved in children. There is, however, still a gap in research for cost-effective, classroom-salient interventions in which self-regulation skills are taught to preschool-aged children. These types of interventions are needed because of the benefits they potentially offer in fine-tuning self-regulation skills. Rimm-Kaufman et al. (2000) stated that 46% of American kindergarten teachers report at least half of their students routinely struggle with self-regulation.

Furthermore, children with executive/self- regulatory dysfunctions exhibit disorganization, inattentiveness, and impulsivity (Bronson, 2000). Self-regulation is thought to be vital for learning because it allows students to pay attention to important information, remember instructions, remain on task, and process necessary information (Savina, 2020). Promoting self-regulation in the classroom helps increase learning time and decrease time spent on managing students' behavior (Savina, 2020). Due to these benefits, developing and researching high-quality interventions that teach self-regulation in preschool age children to

develop these skills before entering the formal schooling environment is needed. Savina's (2020) study suggests the GBG could be an ideal intervention to bridge this gap.

Good Behavior Game

The GBG is a teacher-lead intervention developed in the mid-1960s that is effective in the reduction of disruptive and aggressive behaviors in the classroom. The use of the GBG is impactful as it socializes children to the student role and helps lead them to success in meeting early demands for authority acceptance, attention to task, and social participation (Ialongo et al., 2001; Kellam et al., 2008). The GBG, as originally designed, is to be played like a game in which students in a class are divided into two teams. When the game is in play, the teacher awards one point to the relative team for any inappropriate behavior displayed by an individual team member (points are typically displayed on a scoreboard). At the end of the game, the team with the fewest number of points, which represents the number of occurrences of disruptive behavior, wins a group reward. Using points and teacher comments, the GBG provides students feedback on desirable classroom behaviors during a structured task. Therefore, the game helps students increase their understanding of undesirable classroom behaviors through teacher feedback.

The GBG "helps children master the role of the student and meet the demands of the classroom" ("The Good Behavior Game at American Institutes for Research," 2022, p. 1) by promoting positive change in student behavior. In a review of data, Flower et al. (2014) found immediate, moderate to large effects on the reduction of challenging behaviors in the classroom; the GBG was most used to target disruptive behavior, off-task behavior, aggression, talking out, and out-of-seat behaviors. Researchers have found significant improvements for individuals who participated in the GBG in their first-grade classroom in the areas of reading, general academic achievement, high school graduation and college attendance rates, reduction of special education

services, and a lower likelihood to engage in later externalizing behavior (such as risky sexual behaviors and drug abuse) in early adulthood (Bradshaw et al., 2009; Kellam et al., 2014). Due to its effects, the GBG has previously been described as a behavioral vaccine (Embry, 2002) and in 2001, and the Surgeon General recommended it as a promising program for prevention of youth violence (U.S. Department of Health and Human Services, 2001). This intervention has been effectively used in the educational setting to promote positive behavior and has an immediate effect in the reduction of disruptive and aggressive behaviors in the classroom across various educational levels (Donaldson et al., 2011, 2015). The GBG has been found to not only be effective in reducing aggressive and disruptive behaviors in elementary classrooms, such as out-of-seat and talking behaviors (Barrish et al., 1969; Harris & Sherman, 1973; Kellam et al., 2008) but also in preschool classrooms (Wiskow et al., 2019). The effects of the GBG have been found to be lasting in the short- and long-term and proven to be effective across culturally, linguistically, and socioeconomically diverse students (Bradshaw et al., 2009; Dolan et al., 1993; Kellam et al., 1998, 2008, 2011, 2014; Nolan et al., 2014).

A driving researcher of the GBG and its effectiveness as an intervention is Sheppard Kellam. In his article published in 2008, he and colleagues detailed the findings of a longitudinal study investigating the lasting effects of the GBG intervention delivered to individuals in first and second grade (Kellam et al., 2008). Kellam et al. (2008) then followed up with these children once they reached they reached age 19 to 21. The findings of this study were that students who participated in the GBG intervention had lower levels of drug use/dependence disorders, regular smoking, and antisocial personality disorder and higher rates of high school graduation (Kellam et al., 2008). These findings were particularly true for male students, specifically those who were originally displaying higher levels of aggressive, disruptive behaviors during the baseline period.

The finding that GBG produced the most change in aggressive males is very impactful because this population tends to fall into the most deficits when in a formal educational environment in terms of grades, retention rates, special education, office referrals, and drug use (Kellam et al., 1998). Not only were these findings impactful, but they were also replicable. Kellam et al. (2011) replicated these findings with the next group of students despite diminished levels of mentoring and monitoring of the GBG intervention implementation. This longitudinal research suggests that the implementation of the GBG in elementary school classrooms can produce positive, lasting effects for the students who receive the intervention.

Although the GBG has been found effective in reducing disruptive classroom behaviors (i.e., out-of-seat, verbal off-task, etc.), very few studies have addressed the effects of it specifically on the construct of self-regulation. Researcher has, however, indicated that students who have higher rates of self-regulation have lower rates of disruptive behaviors and that the promotion of self-regulation strategies in children reduces disruptive behavior in the classroom (Bolstad & Johnson, 1972). In addition, Savina (2020) found that playing a game with rules increased self-regulation in preschool children and improved motor inhibition and academic skills. Therefore, based on this finding and the evidence that the GBG and self-regulation individually have a positive impact on behavior in the classroom, it is suspected that implementing the GBG in a preschool classroom will help promote the use of self-regulatory behaviors.

Florez (2011) suggested three critical teaching strategies for scaffolding a child's development of self-regulation: modeling (demonstrating appropriate behavior), using hints and cues (simple directions, gestures, touch; recognizing and naming emotions; directions like "look at me" gets children to cue to pay attention), and gradually withdrawing adult support. The GBG

reflects these strategies. The GBG models good behavior by demonstrating and identifying appropriate behaviors. The modeling and demonstration of behavior is important to the development of self-regulation; an aspect of SRT is that failure to self-regulate can be derived from a lack of knowledge of how to behave in accordance with standards (Muraven & Baumeister, 2000). The GBG can be used to explicitly model and teach children how to act in accordance with classroom standards. For the preschool population, this modeling is especially important because preschool is most likely the first formal educational environment to which the children have been exposed. Second, the rules of the game (typically displayed in a visual format in the classroom), scoreboard, and teacher feedback act as hints and cues. The rules of the game act as a visual reminder to cue the children to act according to certain standards. When a team receives a point, the class is then told which of the behavior observed was in violation with the rules of the game. This feedback acts as a hint for behaviors appropriate for the classroom. Finally, in the GBG, gradually withdrawing support naturally occurs because as children become more successful at the game, the less feedback they are provided. Therefore, the aim of the current research study was to investigate whether the GBG influences preschool children's self-regulation skills.

Theoretical Foundation of the Good Behavior Game

The theoretical basis of the GBG is Skinner's (1938, 1963) behavioral learning theory and operant conditioning using positive reinforcement. Operant conditioning is a method of learning that occurs through rewards and punishments of behavior. Through operant conditioning, an individual makes an association between a particular behavior and a consequence. According to this theory, the best way to understand behavior is to look at causes of an action and its consequences. According to this principle of operant conditioning, behaviors

that are followed by pleasant consequences are more likely to be repeated and behaviors followed by unpleasant consequences are less likely to be repeated. Skinner (1938) introduced the term *reinforcement*; he stated that behavior reinforced tends to be repeated or strengthened, whereas behavior that is not reinforced tends to die-out, be extinguished, or weakened.

Positive reinforcement, or when a favorable outcome, event, or reward is followed by a particular action, strengthens a behavior by providing a consequence an individual finds rewarding. A token economy is a system in which targeted behaviors are reinforced with tokens (or secondary reinforcers) and later exchanged for rewards (primary reinforcers). Teachers often use token economies in the classroom by giving children incentives (such as stickers) to reward good behavior. Additionally, group contingencies are also often used in the classroom as a behavior management protocol with the same behaviors, criteria, and consequences for all students. A single consequence (reward or aversive) is given based on either the behavior of an individual in a group (independent), the behavior of a particular set of people within the group (dependent), or the group as a whole (interdependent; Murphy et al., 2007). The consequences are delivered to the entire group. The GBG, in its original design, tallies each group's bad behaviors and rewards the students based on who has the fewest tallies. For the current research, the researcher modified the GBG to tally and record incidents of good behavior to provide clearer expectations and models of expected behavior that exemplifies self-regulation to the children. This modified version of the GBG uses operant conditioning using positive reinforcement and group contingencies through a token economy.

Justification of Theoretical Foundation for the Good Behavior Game

The theory most relevant to the GBG is Skinner's (1938) behavioral learning theory and operant conditioning using positive reinforcement and group contingencies through a token

economy. Group contingencies have been found to be effective in the reduction of disruptive behaviors (Gresham & Gresham, 1982; Theodore et al., 2004). Bandura (1991) stated that "[s]elf-regulatory control is achieved by creating incentives for one's owns actions and anticipative reactions to one's own behavior depending on how it measures up to an internal standard" (p. 256). Bandura believed these self-incentives could differentiate those who succeed in self-regulating and those who do not. Skinner and Bandura's respective theories interact for the purposes of this study in the use incentives to aid in the development of self-regulation in children. The incentives used in the GBG help children in the self-observation, self-judgment, and self-monitoring aspects of Bandura's SCTSR theory by motivating children to observe what behaviors are rewarded, judge if their current behavior is similar to that of which is being rewarded, and monitor/make changes to their behavior to match ones that are rewarded.

Furthermore, the implementation of the GBG aligns with the four ingredients needed to perform self-regulation as outlined in self-regulation theory (standards, monitoring, willpower, and motivation). As stated previously, it is easier for an individual to regulate emotions and behavior in settings where standards are clear, the individual can monitor meeting these standards, the individual has the willpower to continue working to these standards, and the individual is motivated to exert willpower. The GBG provides clear standards, has a system to monitor behaviors, is time-limited, and provides incentives to motivate the individual to exert willpower. The other critical aspect of self-regulation theory, ego depletion, is counterbalanced by time-limits of the GBG. The interplay of all of the above theories supports the hypothesis that the GBG can promote self-regulatory behaviors in the preschool population.

Measures of Self-Regulation

Whether an intervention has been effective in increasing children's self-regulation can be determined by evaluating self-regulation skills. How one is able to self-regulate can be measured in different ways, which fall into two categories: subjective and objective measures. Subjective measures include self-report and reports by other important parties in an individual's life. For preschoolers, these measures typically entail including the participant's parent and/or teacher. Subjective measures are typically rating forms that provide statements related to observable behaviors related to self-regulation and then asks the rater to indicate to what extent the individual engages in that behavior. These types of measures can be helpful for individuals in young populations because they offer an adult's perspective of the level to which the child is able to perform. One disadvantage is the inaccuracy of reporting or some of the limitations that can come from subjective measures. The other type of measures that can be used to evaluate self-regulation abilities in preschool-aged children is direct, observational measures. These measures are usually conducted by asking the child to perform a certain task and measuring the level of accuracy in which they can complete it. In a review of the type of measurement used, Raver et al. (2012) determined that high quality direct assessments are most likely to maximize the chance of statistically detecting impact to a child's self-regulation. For this reason, the researcher considered that a direct, observational measure would be the most appropriate for the current study.

Some direct, observational measures have been used to assess self-regulation in kindergarten and preschool-aged children: Day-Night Stroop task (Gerstadt et al., 1994), Comprehensive Assessment Battery for Children-Working Memory (Cabbage et al., 2017), Preschool Situational Self-Regulation Toolkit (PRSIST) assessment (Howard et al., 2018), and

the HTKS task (McClelland et al., 2014). The Day-Night Stroop task assesses for children's inhibitory control by presenting them with 16 cards with pictures of a sun or moon. The children are then asked to say the opposite of the card presented to them (i.e., "day" for a moon card and "night" for a sun card). The Auditory Working Memory Assessment is a computer-based assessment of working memory skills for children age 4 and older in which the children are asked to perform various working memory tasks such as repeating back a phrase they just heard. The PRSIST assessment is a structured observational rating form that can be used to capture real-world examples of self-regulation. A final measure is the HTKS Task—a task used to assess a child's self-regulation and requires them to use aspects of attention, working memory, and inhibition control. A review of relevant studies in which self-regulation has been investigated following a classroom intervention and the effect sizes reported is summarized in Table 1.

The HTKS task was developed as an observational self-regulatory measure for children age 4–8. This task is brief and does not require extensive training or specialized materials (Graziano et al., 2015). To succeed at the HTKS task, children must successfully apply three cognitive skills into their gross motor behaviors: (a) focus and pay attention to instructions and commands, (b) use working memory to remember and apply rules while processing commands, and (c) use inhibitory control to initiate the correct response (Ponitz et al., 2009). The HTKS task includes data to support that children who are preschool-aged can improve on their self-regulation skills as evidenced by increasing their performance on the HTKS after receiving an intervention in pre- to posttest measures (McClelland et al., 2019, 2021; Razza et al., 2015; Tominey & McClelland, 2011).

Table 1

Studies That Investigated Self-Regulation Following a Classroom Intervention and the Effect Sizes

Study	Sample size	Effect sizes	Time frame	Self-regulation measurement used	Outcome
Raver et al. (2013)	467 (treatment group of 238)	Self-regulation (in three categories): Executive Function: .37 Executive Control: .2 Attention/Impulsivity: .4	Intervention lasted one school year (Fall to Spring) ….children's self- regulation skills were assessed once during Fall of preschool year and then again 4 years later	Preschool Self-Regulation Assessment (PRSA)- including balance beam, pencil tap, toy wrap, toy wait, snack delay, and tongue task and PRSA assessor report	Significant positive effects found on one measure of inhibitory control (peg tapping) and one measure of self- regulation (balance beam). It was also noted that positive effects on academic skills were largely mediated by self- regulation
Razza et al. (2015)	29 (16 intervention)	.33 (p< .10)	School year	HTKS	Quasi-experimental design pre-test/post-test and control group; direct assessments found significant effects across three indices of self-regulation (attention, delay of gratification, and inhibitory control)

Table 1, *Continued*

Study	Sample size	Effect sizes	Time frame	Self-regulation measurement used	Outcome
Tominey and McClelland (2011)	65	A significant effect was not found for treatment group overall [t(59) = 0.49, *p*>.05] -Post-hoc analyses determined that treatment group participation significantly predicted HTKS gains over prekindergarten year for children who performed poorly on the initial HTKS task [t(26)= 2.23, *p*<.05, *β*- .34]	School year	HTKS	Children with low self-regulation at the beginning of the year gained 16 points on HTKS task, whereas children who scored above the 50th percentile at the beginning of the year only made average of 6.1 point gain -For children in the treatment group who started out with low self-regulation (as measured by the HTKS task, Head Start enrollment status accounted for 33% of explained variance, which suggests the intervention effect was greater than participation in Head Start alone for these children
McClelland et al. (2019)	157	.31 to .32 (depending on intervention version) .38 for math gains .31 for HTKS gains	School year	HTKS	Not statistically significant, but children who participated in the intervention gained more on HTKS task compared to control group…21% difference in self-regulation between the groups. Children who participated in the intervention earned significantly higher scores in math, but the same effects were not found in literacy

Note. HTKS: head toes knees shoulders

The HTKS task is a valid and reliable measure of self-regulation for preschool-age children (Graziano et al., 2015; McClelland et al., 2007; Ponitz et al., 2008). This measure has been validated with two diverse preschool samples drawn from separate locations in the United States (McClelland et al., 2007; Ponitz et al., 2008). The sample population included children from a Head Start program and a local preschool. The HTKS task has an inter-rater agreement of total score higher than would be expected by chance (κ = .90; Ponitz et al., 2009). The three-month test-retest reliability of the HTKS task was above .90 (Ponitz et al., 2008). The HTKS task demonstrated convergent validity with observer reports of behavioral self-regulation; children who had the highest scores on the task also had higher scores on a teacher rating report measure, while those who did worse had lower teacher rating scores (Ponitz et al., 2008). Furthermore, the HTKS task has demonstrated high concurrent validity with parent ratings of attention and inhibitory control (Ponitz et al., 2009). The HTKS task has not only demonstrated good reliability and validity but also the nature of the assessment allows the examiner to directly observe a child's self-regulatory skills, which is less subjective than teacher and parent reports.

For the current study, the researcher chose the HTKS task for a number of reasons. Some of the reasons were the nature of the assessment (a direct, observational measure) and the ease of accessibility (it was free, easily accessible, and did not require technology). The main reason this assessment was chosen against other measures, however, was because research suggested the HTKS is one of the strongest and most consistent predictors of math and literacy skills when accounting for performance on other measures as well as an individual's socio-demographic covariates (McClelland et al., 2021).

Conclusion

The preschool environment is often used to introduce children to the aspects and nature of a formal schooling environment. Children in preschool not only learn necessary academic skills to be successful in school but also behavioral skills (Degol & Bachman, 2015; Skibbe et al., 2011). Self-regulation is the ability to control one's own emotions, attention, and behaviors. Self-regulation is beneficial as it is associated with many positive outcomes such as higher academic achievement, less use of special education services, and less health and psychiatric problems (Blair & Razza, 2007; Duckworth & Carlson, 2013; Reynolds et al., 2003). Self-regulation is also thought to be an essential aspect of learning because it allows individuals to perform important tasks such as paying attention, inhibiting responses, and remembering and following classroom rules (Skibbe et al., 2011).

Although preschool explicitly teaches preacademic skills such as identifying numbers, letters, and shapes, it does not explicitly teach self-regulation. Evidence suggested that certain aspects of the preschool environment foster the natural development of self-regulation including the classroom structure, routines, student-teacher relationships, and classroom rules and expectations (Murray & Rosanbalm, 2017; Williford et al., 2013). Because self-regulation is such an essential skill to not only be a successful student but also an adult, it was important to investigate how one can foster and fine-tune the development of proper self-regulation skills in childhood. The GBG is a behavioral intervention that is used to reduce disruptive and aggressive classroom behaviors. Participation in the GBG and higher levels of self-regulation, respectively, has been associated with decreased disruptive behaviors (Bolstad & Johnson, 1972; Gresham & Gresham, 1982; Theodore et al., 2004). These concepts are, however, are yet to be studied in conjunction. Behavioral interventions, such as the GBG, are believed to provide the instruction

children need to improve their self-regulation skills. Researchers have found that recipients of the GBG intervention have long-term outcomes similar to longitudinal data found for individuals with higher-levels of self-regulation in preschool (Kellam et al., 2008; Moffitt et al., 2011). In a study, Donaldson et al. (2015) found that implementation of the GBG in five kindergarten classrooms had immediate effects in the reduction of disruptive behaviors during whole group instruction. As previously stated, studies have revealed that increases in self-regulation are associated with reductions in disruptive behavior. The question deriving from the theoretical research behind this study is whether the GBG has immediate effects on increasing self-regulatory behaviors in preschool-aged children as measured by the HTKS self-regulatory assessment.

Research Questions and Hypotheses

To measure the effect of the GBG on preschool-aged children's self-regulation skills, the researcher selected a quasi-experimental design. Children either participated in a structured activity (i.e., circle time) without the implementation of the intervention or acted as a control. Each participant, no matter their group assignment, engaged in a behavioral self-regulation task (HTKS) before and after circle time. The current study addressed the following research questions and hypotheses:

Q1 What is the pre-test difference between the control and the treatment groups growth on the Head Toes Knees Shoulders (HTKS) task?

H1 Participants in the treatment group will receive higher scores on the HTKS compared to the control group.

Q2 What is the difference in the growth from the pre-test/post-test between the treatment group and the control group on the Head Toes Knees Shoulders task?

H2 Students in the treatment group will have higher growth on the HTKS task compared to the control group.

Q3 What is the difference in growth from the pre-test/post-test between the treatment

and control group when confounding variables (i.e. race/ethnicity, sex, age, mother's education level, and years in daycare/school setting) are controlled for?

H3 A difference in scores between the groups may be affected when confounding variables are controlled for.

CHAPTER III

METHODOLOGY

The purpose of this study was to evaluate whether after participation in the classroom management intervention (GBG), students would perform better in a behavioral measure of self-regulation than those who did not receive the intervention (business-as-usual group). The research approach for the current study was a two-way, mixed model, repeated measures analysis of variance (ANOVA) procedure to determine if participation in the GBG in a preschool classroom increased the children's ability to demonstrate self-regulation behaviors. A total-score scale measured self-regulation at two levels: immediately before the intervention and at the completion of the intervention. The research design for this study was a quasi-experimental design with two groups of preschoolers completing a one-day GBG intervention, and another two groups acting as a control. The basis for this design of this study was the hypothesis that participation in GBG in a preschool classroom would increase children's ability to demonstrate self-regulation behaviors. The aim of this study was whether an evidence-based intervention, GBG, improves self-regulation in preschool-aged children. The dependent variable was self-regulation as measured by a task the children completed. Pre- and postoutcome measures helped determine the students' changes in self-regulation.

Participants and Setting

The participants in this study comprised a convenience sample of 48 preschool-aged (age three to five; average age for the sample was 4 years 8 months) students enrolled full-time located in a Southeastern state in the United States. Participants in this study represented a

convenience sample recruited from two preschools. The participants were from four classrooms; two of which served as the intervention classrooms and the other two as the control classrooms. The study included four sessions that occurred on four separate days (two consecutive days for each preschool) in the Spring semester of the school year, and each session lasted approximately 30-45 minutes. The interval between the first two sessions and the final two sessions was 3 weeks.

To recruit participants, the researcher sent an invitation to parents/guardians to the included classes at the participating preschools through a flyer (see Appendix C) that included the consent form (see Appendix D) and a demographic questionnaire (see Appendix E). According to the information included in the flyer, parents who did wish to participate did not need to return the consent form or demographic questionnaire. The reason for including these documents was to allow respective preschool teachers to send the children in their classroom home with the forms for the parents/guardians to fill out, sign, and return to their child's teacher. The only exclusion criterion for participants in the study was students with physical disabilities who would not be able to fully participate in the self-regulation (head toes knees shoulders [HTKS]) task.

To obtain the necessary minimum sample size, the researcher conducted a priori power analysis through G*power 3.1.9.4. The information entered into G*Power for the first analysis was as follows: the test family (*F* tests); the statistical test (ANOVA: repeated measures, between factors), the type of power analysis (a priori: compute required sample size—given α, power, and effect size), effect size, alpha level (.05), and power (.8). Table 2 shows the results of G*Power analyses with small, medium, and large effect sizes; and the resulting sample size that would be needed to determine if the differences among the HTKS raw scores were statistically significant

for the treatment versus the control group. The basis for choosing the effect sizes was the effect sizes calculated in previous studies (see Table 1). Previous researchers found that effect sizes typically fell in the .30 to .40 range. Therefore, the researcher used .3 for a medium effect size, .1 for small effect size, and .5 for large effect size. This researcher aimed for a medium effect size, suggesting a sample size of 68 total participants.

Table 2

*G*Power Analysis for Small, Medium, and Large Effect Sizes for 2x2 Analysis of Variance: Repeated Measures, Between Factors*

Effect size	*N*	*A*	Power
Small: .1	592	.05	.80
Medium: .3	68	.05	.80
Large: .5	26	.05	.80

The researcher conducted a second analysis in G*Power v. 3.1.9.4 to determine the sample size needed to show a significant effect between the growth score on the HTKS task between the treatment and control groups. The information entered into G*Power was as follows: the test family (*F* tests), the statistical test (ANOVA: repeated measures, within factors), the type of power analysis (a priori: compute required sample size—given α, power, and effect size), effect size, alpha level (.05), and power (.8). Table 3 shows running G*Power analyses results with small, medium, and large effect sizes (using the same effect size amounts listed above), and the resulting sample size that would be needed to determine the effects of the GBG on the growth score for the participants in the treatment group.

Table 3

*G*Power Analysis for Small, Medium, and Large Effect Sizes for 2x2 Analysis of Variance: Repeated Measures, Within Factors*

Effect size	*N*	*a*	Power
Small: .1	198	.05	.80
Medium: .3	24	.05	.80
Large: .5	12	.05	.80

With an alpha level of .05, power of the test of .80, and a medium effect size, the researcher sought to recruit approximately 68 participants, including at least 24 being in a treatment group that received the GBG intervention. The sample size of 68 participants (approximately two to three preschool classrooms) factored in both sample size estimates from both power analyses. Due to issues with recruitment, however, the final sample size was 48 participants, including 26 students in the treatment group and 22 participants in the control group. Therefore, this sample size met the minimum number of treatment participants as outlined by the G*Power analysis.

Instrumentation

Parent Demographic Questionnaire

The screening instrument used in this study was a parent demographic questionnaire. In the week before the study began, parents completed a background questionnaire in English regarding the child's age, sex, race, years spent in previous schooling or classroom-like experience, and mother's education level. As mentioned previously, the only exclusion criteria for participants were for individuals who could not physically participate in the HTKS task.

Dependent Variable

Head Toes Knees Shoulders

The evaluation of the progress of a child's ability to self-regulate occurred two times during the study through group administration of the HTKS task (Ponitz et al., 2008). As mentioned previously, the HTKS task is intended to serve as an observational self-regulatory measure for children age 4–8 years. This task is brief and does not require extensive training or specialized materials (Graziano et al., 2015). During the HTKS assessment, children played a game in which the examiner asked them to touch their head, toes, knees, or shoulders (the examiner for the purposes of this study was the researcher). A requirement in this game was for children to remember up to four rules, pay attention, and exhibit inhibitory control. The task comprised three parts, which comprised three stages: introduction, practice, and testing. During Part I, the examiner modeled the students' first practice the task and the desired behavior. For the practice stage of Part I, the examiner told the students to "be a little silly" and do the opposite of what the examiner instructed. To succeed, a child had to do the opposite of what the examiner instructed; for example, if the examiner said "touch your head," the participant had to remember to do the opposite and touch their toes and vice versa for knees and shoulders. The children received up to three additional explanations during this stage. After the practice stage, the student moved to Part I: testing phase in which they received instructions once at the beginning of the task, and the examiner asked them to do the opposite of what they told them 10 times.

To move to the next part, the student had to receive four or more points. The possible score for each item was 0, 1, or 2, with a score of 0 assigned for an incorrect response, 1 if the child self-corrects (child makes a motion toward incorrect response but then gives the correct response), and 2 points for a correct response without motioning toward the incorrect response.

For Part I: testing, scores ranged from 0 to 20 points. The scoring and item set were the same for the head and toes task (Part I) as for the knees and shoulders task (Part II). Part II also had a practice phase in which students had to respond correctly before moving to Part II: testing. The final and third part combined the head and toes task and the knees and shoulders task to make the full HTKS task; practice items were in place for this part and the scoring procedures remained the same. The calculation of the total score entailed combining the child's scores from all three parts. The higher the score, the more a child was able to display behavioral self-regulation as measured by this task. The assessment took about 5–7 minutes to administer (see Appendix A for the HTKS task protocol). To ensure fidelity of the administration of the HTKS, the researcher followed the standardized instructions and script as outlined in the HTKS protocols.

For the purposes of this research, the researcher administered the HTKS task before and after circle time for both the experimental and control groups as a group and videotaped the children to record their responses. While performing the HTKS, the students stood in one line facing the person delivering the instructions; this rationale was to help lessen any influence each child may have on one another. The researcher ensured the camera and children were in a proper position before administering the HTKS protocol so that all children were within the view of the camera. Although the HTKS is designed to be administered to children individually, for this research, the researcher administered the task to the children as a whole group both before and after circle time. This rationale was to ensure that a standard amount of time passed between the pretest and posttest measures for all groups to prevent the effect on an individual's scores of the time lapse between when the intervention (or lack thereof) occurred and when their self-regulatory behaviors were assessed. The control groups served as a measure to determine if

practicing self-regulation skills due to participating in a structured task (circle time) and maturation was not the reason for the change (if detected) in HTKS scores.

The researcher videotaped the children's responses and then accurately scored and coded them after the conclusion of the data collection days. To ensure accurate recording of scores, the researcher coded each child's scores three times and checked for consistency across in the recording of participants' performance. The parents, who were not comfortable with their child being videotaped, had an option for their child to participate in the study but not be videotaped. For these children, the researcher assessed them separately using paper-and-pencil protocols. Parents of only two children opted out of the videotaping. The researcher received permission to use the official HTKS task from the authors of the task (Dr. Claire Cameron and Dr. Megan McClelland). The procedure involved the researcher filling out a request from on Oregon State University's website (Oregon State University College of Health, 2022) and obtaining written permission to use the assessment (see Appendices B).

Independent Variable

Good Behavior Game

The design for this study was quasi-experimental. The goal of the present study was to determine if implementation of the GBG (independent variable) influenced preschool-aged children's self-regulation skills (dependent variable), as measured by the HTKS. To conduct the study, the researcher contacted preschool programs to inquire about their willingness to participate in implementing the GBG intervention. To complete the research study, the researcher recruited multiple classrooms, aiming for a total of 24 students in the intervention group. The next step was assigning classrooms to be the intervention classroom or the control classroom. The teacher selected to implement the GBG received training on how to implement the

intervention. The researcher instructed the teachers assigned to the control classrooms to run their circle time as it normally would occur. The teachers in the intervention classrooms who delivered the intervention (GBG) received a "coach card," which served to remind them of their role when the game is in play. The participants played the GBG game as designed, with the children separated into two teams. The winners were the team that received the least amount of tallies (which indicated disruptive behaviors).

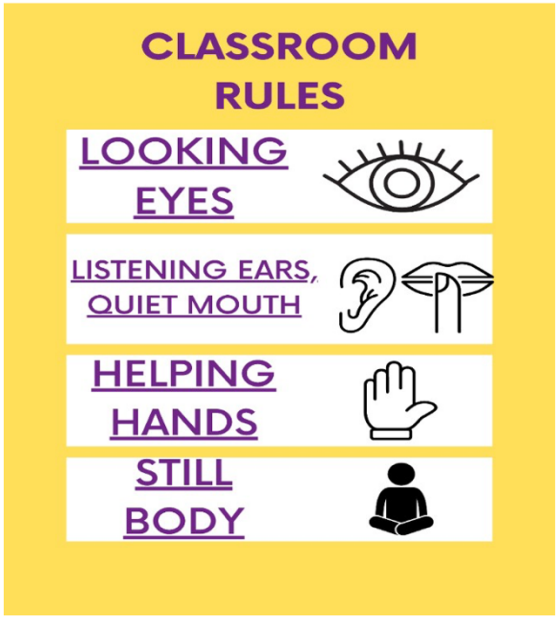
For winning the game, the students immediately received a reward selected by the teachers and the researcher. After discussing rewards with the teachers, the researcher decided that colorful, themed stickers would be an appropriate reward for the children to receive. The behaviors tracked during circle time included "looking eyes," "listening ears, quiet mouth," "helping hands," and "still body." These behaviors were the "rules of the game," which the researcher explained and demonstrated to the students at the beginning of the circle time. The researcher also posted a sign in the classroom during the intervention phases to offer a visual reminder to students to follow the rules (see Figure 3). The purpose of the visual poster served as a continuous communication tool for the rules to be followed during the GBG. The researcher anticipated that the students already had behavioral expectations set for them. In one of the classrooms, the teacher already had a visual set of expectations for children to follow when in their classrooms.

The new rules specific to the GBG differentiated from the general classroom rules by being phrased in different ways. The definition for "looking eyes" was the students having their body oriented toward the speaker, using their eyes to look at the teacher and lesson materials during circle time, and largely complying with adult directives. Disruptive behaviors that would violate this rule would include the child having their body facing away from the speaker and not

following directives of the teacher. Students were expected to look in the direction they were instructed to and not at other materials (outside the window, at their shoes, etc.). The definition for "listening ears, quiet mouth" was the students only talking out when they were intended to—whether because the teacher has called on them or is asking for a whole group response. Disruptive behaviors in violation of this rule would include talking without being permitted by the teacher, whistling, singing, yelling, mumbling, or making other sounds. The rule for "helping hands" included the students raising their hand before talking and only touching materials when instructed. Disruptive behaviors in violation of this rule would include physical contacts with another person such as hitting, pushing, kicking, hair pulling, throwing objects, and/or taking or destroying another person's property. The final rule of "still body" included the students staying in the spot they were asked to sit in and not getting up from that spot until instructed.

Figure 3

Rules of the Classroom



Training

The researcher trained all teachers who delivered the GBG. Checks for understanding occurred during the training and the researcher and teachers worked together to create a schedule for the game. The intervention teachers received a "coach card" that acted as a reminder of the teachers' role in the intervention (see Appendix F). The researcher supported the teachers in the classroom during deliverance of the intervention. The researcher checked for implementation fidelity using a checklist to ensure the delivery of all aspects of the GBG (see Appendix I). Additionally, the researcher and teachers designated a hand signal if the teacher felt she needed more support to implement the game.

Pre-Test/Baseline

The pretest phase occurred in the classrooms the morning during the delivery of the intervention. The delivery of the intervention occurred in the morning to avoid interfering with any nap or snack/mealtimes. During this time, the assessment of each classroom occurred separately through group administrations of the HTKS task to the children in the classroom who returned consent to participate in the research. The researcher adapted the HTKS for group administration by delivering instructions to the whole group and going through the entire protocol; the administration of the assessment did not stop for a child who did not meet criteria to move on to the next part.

Intervention Phase

For the intervention/treatment group classrooms, the intervention phase occurred during circle time with a literacy aspect for all participating classrooms. Each class participated in their morning circle time routine and then read the same book. In the intervention classroom, the students participated in the GBG during this time. The students whose parents gave permission

for them to participate in the study completed simple table tasks, such as coloring or playing with table toys. For the intervention group, the teachers began circle time by stating that the students would be playing a game during the day's lesson. The teachers used their coach card at this time to aid in implementation of the intervention implementation and phrasing when introducing and implementing the intervention. When the teachers noticed that students were not following the rules of the game, they reminded the student(s) of the rules by stating "let's remember to follow our rules" while pointing to the rules of the game poster. During implementation of the intervention, the role of the researcher was to keep tallies of disruptive behavior during the lessons for each respective teams. Furthermore, the researcher followed along on the checklist (see Appendix H) to ensure that each treatment group met all components of the intervention. After GBG was complete, the researcher informed the class the group that had "won" the game. Students who won immediately received the reward of a sticker of their choosing.

The overall role of the teacher during the implementation of GBG was to deliver the lesson and identify disruptive behaviors. While conducting circle time, the teacher's role also included managing the students as outlined by GBG. According to the instructions, when the teacher observed a disruptive behavior, they had to immediately call out the behavior being observed. For example, if Johnny was kicking Penny while the teacher was talking, the teacher was instructed to say, "Johnny, you are kicking Penny, which is not following the rule 'helping hands.'" Consequently, the group in which the student belonged would receive one mark on the board to indicate that a rule violation had occurred. As mentioned previously, the teacher had a "coach card" that served as a list of their expected duties during GBG intervention. The teacher was responsible for delivering the lesson and calling out disruptive behaviors. During the implementation of GBG, the researcher kept count of the disruptive behaviors that occurred in

each group, was there to assist the teacher with any issues that arose, collected additional data, and implemented fidelity using GBG intervention checklist (see Appendix G). Adherence to the GBG implementation checklist was 100% for both control classrooms.

To ensure the children were successful and motivated to behave in the expected manner in the GBG classroom, the researcher structured GBG in a way that ensured the students could be successful at self- regulating their behavior. The researcher measured the number of marks the respective groups were required to stay below in a format they could understand using tally marks. This format served as a visual representative to the children if they were being successful or not. The visual representation of the number of disruptive behaviors that occurred during the GBG served as another behavior management aid for the classroom. The idea was that as the class saw that they were receiving more marks on the board, they would recognize that they had been displaying a high number of disruptive behaviors and would then begin to employ more self- regulation skills to ensure they were individually assisting their team to win the game. For the children who lost the game, the teacher and researcher developed a protocol of how to respond. The researcher also reminded them that they could work with the teacher at another time to earn a sticker. The researcher left any unused stickers with the teachers to use at their discretion for the children to earn for good behavior.

Control

In the control classrooms, the class proceeded in business-as-usual manner, and nothing significantly varied from the other days of the week. The students participated in the same lesson and the same format as the GBG classroom—the teachers read the same book to them in all sessions and the researcher was present during each class's circle time. The difference with the GBG classroom was the GBG was not delivered, the teachers did not receive a "coach card" (see

Appendix F), a visual display of the rules (see Figure 3) was not present, rules were not explicitly explained or taught to the class, and the GBG implementation checklist (see Appendix G) was not completed. The researcher completed the checklist for study procedures (see Appendix H) for all sessions. A comparison of the completed checklists for both centers revealed 100% adherence to the checklist of study procedures for the first center 97% adherence for the second center. The only difference in adherence procedures is that the researcher reviewed the GBG protocol for the first center three times (as outlined in the checklist) and two times for the second center. For the control group, the students whose parents did not give permission to take place in the study attended their circle time as usual, but were not assessed using the HTKS task before or after circle time.

Posttest Phase

After circle time, the students in both classrooms participated in the HTKS task for a second time. The researcher conducted the HTKS task in the same format as in the pretest phase (group administration for the students who had consent to be videotaped) and ensured the same amount of time had passed between the pretest and procedures. All phases for the study occurred on the day of implementing the intervention (or lack thereof).

Pilot Study

To gather high-quality data, the researcher conducted a pilot study of the experimental design procedures to assist in the planning and modification of the study. The pilot study occurred before the true experiment to help the researcher assess whether experimental procedures need to be adjusted in any way. More specifically, the pilot study allowed the researcher to practice and determine the feasibility of the method for the main trial and gather necessary information regarding the teachers' understanding and adherence to the GBG protocol,

as explained by the researcher. Additionally, the pilot study provided necessary information on the logistics of having the children perform the HTKS task in a group setting. The preliminary data collection allowed the researcher to practice time sampling procedures in real time, improving data collection accuracy for the experimental trials. The researcher conducted the pilot study with one class of children similar in size to the sample size suggested by the G*Power analysis and at a site separate from the data collection sites. The researcher ensured no student or teacher who participated in the pilot study was a part of the true experimental or control group populations to prevent practice effect of the participants in the experimental study. The researcher destroyed the data collected during the pilot study procedures after the practice analysis of the procedure and excluded them from the final report.

Analysis

This research addressed the following research questions and hypotheses:

Q1 What is the pre-test difference between the control and the treatment groups growth on the Head Toes Knees Shoulders (HTKS) task?

H1 Participants in the treatment group will receive higher scores on the HTKS compared to the control group.

Q2 What is the difference in the growth from the pre-test/post-test between the treatment group and the control group on the Head Toes Knees Shoulders task?

H2 Students in the treatment group will have higher growth on the HTKS task compared to the control group.

Q3 What is the difference in growth from the pre-test/post-test between the treatment and control group when confounding variables (i.e. race/ethnicity, sex, age, mother's education level, and years in daycare/school setting) are controlled for?

H3 A difference in scores between the groups may be affected when confounding variables are controlled for.

The researcher statistically analyzed the primary research question and its relevant hypothesis that children who receive the GBG intervention would perform better on the HTKS

after playing the game using a quasi-experimental, between-subjects design to evaluate the effects of the GBG on preschooler's self-regulation skills. The collection of data, in aggregate, involved the administration of the HTKS task to the whole class in each condition. The exception was for the children whose parents did not give permission for their child to be videotaped; the assessment for these children involved paper-and-pencil tasks before assessing the other group during the pre-intervention phase and after the group administration of the post-intervention administration of the HTKS. The researcher assessed each participant on their performance on this task. To ensure consistency for the time lapse between the end of the GBG intervention and the administration of the HTKS for each child, the administration of the task occurred to the whole class with ample space in between each child. To ensure accurate reporting of each child's performance on the HTKS, the researcher videotaped each administration (pre and posttest). The researcher then reviewed the video and scored the performance of each child during the pre and posttest administration of the task. The researcher scored each child's performance on each administration of the task twice to ensure each child received the most accurate score reflecting their performance on the HTKS.

After measuring each student's pre and posttest HTKS score, the next step was calculating the score difference between each administration of the HTKS for each student. The hypothesis was that the students would perform better on the HTKS task after they have participated in the GBG intervention. To test this hypothesis, the researcher analyzed the difference between each person's raw score on pre and posttest measures. The method used to measure statistical significance of the change in scores was a between-subjects, repeated measures ANOVA for the first research question and a within-subjects, repeated measures ANOVA for the second research question. This statistic helped determine whether there was

difference in the growth score on the HTKS between the treatment and control groups. The researcher conducted a third analysis to identify any cofounding variables (i.e. race/ethnicity, sex, age, mother's education level, years spent in a daycare/school setting) that would account for the difference in scores between the two groups. The method used for this analysis was a within-subjects, repeated measures ANCOVA. These analyses helped the researcher determine whether GBG had an impact on preschoolers' self-regulation skills.

CHAPTER IV

RESULTS

This chapter contains a description of the findings of the study, including the demographic information about the participants and the results of the data analysis. The presented results of the analyses show whether a one-day intervention significantly increased preschoolers' scores on a behavioral self-regulation measure. The participants were preschool-aged (median age 4 years, 8 months) children enrolled full-time in preschools in a Southeastern state in the United States. Demographic information and the full results of the analysis are included in this chapter.

Demographic Information and Descriptive Statistics

Demographics

The setting for this study was four preschool classrooms in a Southeastern state in the United States. In total, 84 students received the invitation to participate in the study but only 48 students returned parental consent to participate in the study. Students retained in this study were those their parents returned the consent form and demographic questionnaire before data collection. The treatment group included 26 students, and the control group included 22 students. There were 16 males and 10 females in the treatment group and 15 males and 7 females in the control group. Students ranged from age 3 years, 10 months to 5 years, 7 months. Many students in the treatment group identified as two or more races/mixed and the majority of students from the control group were Caucasian/White. For both groups, the mother's education level was mainly in the college or university degree category. Regarding the number of years the student

had been attending a school/daycare setting, many participants in the treatment group fell either in 0 years of experience/the first-time attending this type of setting or 4 years in an childcare setting category. For the control group, the majority of participants had been enrolled in 3 years of a daycare/school setting. Table 4 shows the frequency and percentages for the demographic data of the treatment and control groups.

Table 4

Frequencies and Percentages of Student Participants

	Frequency		Percentage	
	Treatment *N = 26*	Control *N = 22*	Treatment *N = 26*	Control *N = 22*
Sex				
Male	16	15	61.5	68.2
Female	10	7	38.5	31.8
Age				
Below 4	2	0	7.7	0
4	23	8	88.5	36.4
5 and above	1	14	3.8	63.6
Race/ethnicity				
Arabic	1	1	3.8	4.5
Asian	1	1	3.8	4.5
Black/African American	4	3	15.4	13.6
Caucasian/White	5	13	19.2	59.1
Hispanic	3	1	11.5	4.5
Two or more races/mixed	11	3	42.3	13.6
Other	1	0	3.8	0
Mother's education level				
Did not complete high school	0	1	0	4.5
High school diploma or GED	3	1	11.5	4.5
Some college	4	1	15.4	18.2
Associate's degree	3	3	11.5	13.6
College or university degree	9	8	34.6	36.4
Vocational degree/trade school	1	0	3.8	0
Graduate degree	5	5	19.2	22.7
Other	1	0	3.8	0
Years in daycare/school setting				
0/first year	7	5	26.9	22.7
1	3	1	11.5	4.5
2	4	4	15.4	18.2
3	5	6	19.2	27.3
4	7	3	26.9	13.6
5	0	3	0	13.6

Note. GED: general education degree

Descriptive Statistics

The researcher calculated means and standard deviations to visually analyze for differences between the pre- and posttest scores between the treatment and control groups. Table 5 shows the means and standard deviations for the initial results of each test phase by group assignment (treatment or control). Visual inspections of the means suggested no significant differences across groups.

Table 5

Descriptive Data for the HTKS Score of Preschool Students in the Experimental and Control Groups

	Group	Mean	SD	*n*
HTKS score before circle time	Treatment	.62	1.17	26
	Control	.95	1.21	22
	Total	.77	1.19	48
HTKS score after circle time	Treatment	1.27	2.51	26
	Control	1.59	1.71	22
	Total	1.42	2.16	48

Note. HTKS: head toes knees shoulders

Assumption Testing

Several assumptions had to be met before using a mixed model ANOVA, a type of ANOVA used to compare the means of two factors, one between-subjects and one within-subjects, in this study. First, the assumption of independence needed to be met for each observation included in the data set independent of every other observation. Although the assignment of each group to the treatment or control group was random, the sampling of the participants in the study from the population was not random. Furthermore, because the study involved comparing each individual before and after the intervention (or lack thereof), independence could not be met. Overall, the assumption of independence was not truly met. The

second assumption that needed to be met was that the distribution of the response variable was normally distributed. Because the sample size for this study was relatively small, determining the distribution of the HTKS scores was important for choosing an appropriate statistical method. The researcher performed a Shapiro-Wilk test to show the distribution of HTKS scores for the pre and posttest for both groups. For the pretest, the distribution of scores departed significantly from normality for the treatment group ($W = .599$, $p < .001$) and the control group ($W = .801$, $p < .001$). Similarly, for the posttest, the distribution of scores departed significantly from normality for the treatment group ($W = .585$, $p < .001$) and the control group ($W = .840$, $p < .05$). ANOVA procedures are fairly robust against violations of normality as long as the ratio of the largest to smallest group is less than 1.5 (Blanca et al., 2018). The ratio for the groups in this research was 1.08, leading to the assumption that the F-test would not be seriously affected by the nonnormal distribution. Furthermore, although the researcher considered a nonparametric test to adjust for this violation, the computing software available for analyzing the data set (SPSS Statistics) lacked mixed-model approaches for nonparametric tests. Therefore, the researcher made no adjustments. The last assumption that needed to be met was sphericity, which implies that the variances between all combinations of related groups must be equal. Because the data set only included two time points, sphericity is not relevant.

The analysis method for the third research question was a two-way repeated measures, within subjects ANCOVA. Numerous assumptions needed to be met before analyzing the data set using this procedure. First, the assumption of independence needed to be met for each observation included in the data set independent of every other observation. As outlined before, this assumption was not met because the researcher selected the subjects from classrooms that were not randomly assigned. Therefore, the assumption of independence was not met. The

second assumption was that the dependent variable of HTKS scores needed to be normally distributed within each subpopulation. This assumption can only be met for small samples of less than 20 participants; however, for this research, the sample size was larger. This assumption applies to samples of larger than 20. The third assumption that needed to be met for this analysis was homogeneity. This assumption is intended for unequal sample sizes. Because the sample sizes for this research were relatively equal, this assumption was also not relevant. The final assumption specific to covariates is homogeneity of regression. According to this assumption, covariates should have the same relationship to the dependent variable across the different levels of each factor. For example, the relationship between age and scores of the head toes knees task was roughly the same across time points and groups. This assumption is commonly tested by creating interactions between each independent variable and covariate. The assumption is met if the interactions are not significant. None of the interactions between independent variables and covariates was significant, meeting the assumption of homogeneity of regression.

Research Questions

Q1 What is the pre-test difference between the control and the treatment groups growth on the Head Toes Knees Shoulders (HTKS) task?

Q2 What is the difference in the growth from the pre-test/post-test between the treatment group and the control group on the Head Toes Knees Shoulders task?

The analysis method used to address the first and second research questions was a two-way mixed methods ANOVA with one within subject factor (time) and one between factor (group) to examine the effect of the GBG over time on self-regulation as measured by HTKS scores before and after circle time. The effect was not statistically significant for group, $F(1, 46) = 0.55$, $p = .460$, $\eta^2_p = .012$, or the interaction between group assignment and time on HTKS scores, $F(1, 46) = 0.001$, $p = .972$, $\eta^2_p = .000$. The main effect of time, $F(1, 46) = 6.76$, $p = .012$,

η^2_p = .128, was significant. This effect suggests that controlling for the treatment group the child was assigned to, pre- and posttest score differences were significantly different. Because the effect was only significant on time, a post hoc analysis was not appropriate, as there were only two time points. Post hoc comparisons using an independent t-test, however, indicated the mean score for the treatment condition was not significantly different from the control condition in pre-test HTKS scores. There was not a significant difference in the scores for the treatment (M= .62, *SD* = 1.2) and control (M = .95, *SD* = 1.2) groups; $t(46) = .984$, $p = .330$. The Levene's test for equality of variances showed that the homogeneity of variance assumption was met for the pretest scores for the treatment and control groups ($p = 0.793$). The independent samples t-test for equality of means was not statistically significant, indicating no evidence supports that pretest mean HTKS score would be different between the two groups. Taken together, these results suggest that there is no statistically significant difference between the two groups in the HTKS scores in the pretest phase. Overall, the results of the within-subjects effects suggest a small to medium effect of time on HTKS scores, but this effect does not differ across the different groups in the study.

Furthermore, analysis occurred for between-subjects effects using a repeated-measures ANOVA with a between-subjects factor (group). The dependent variable was HTKS scores. None of the between-subjects effects was significant, including the effect of the group. This result means that differences in the mean values of HTKS scores between the two different groups were not statistically significant.

Table 6

Repeated Measures Analysis of Variance on HTKS Scores

	df	*F*	*p*	η^2_p
Within-subjects effects				
Time	1	6.76	.012*	.128
Group	1	0.55	.460	.012
Time*group	1	.001	.972	.000

Note. df: degrees of freedom; η^2_p: partial eta squared. *Interaction between independent variables; Time: This is related to the different periods of assessment (pre-test and post-test). *$p < .05$

Figure 4

Means Broken Down by Time and Condition

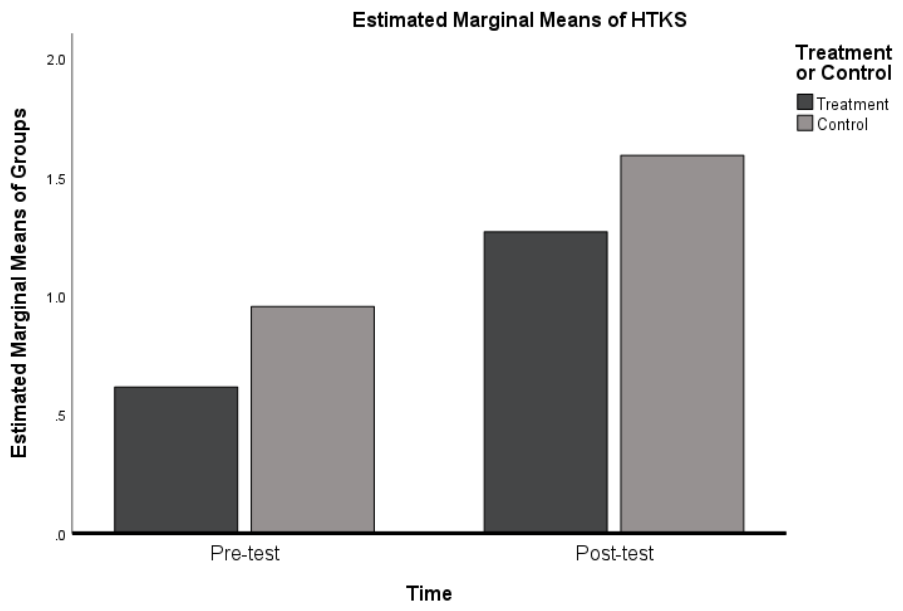


Table 7

Independent Samples t Test Table to Compare Means of Treatment and Control Groups in Pre-test Phase

		Levene's test for equality of variances							95% confidence interval of the difference	
		F	*p*	T	*df*	Sig. (2-tailed)	Mean difference	Std. error difference	Lower	Upper
Pre-test HTKS Scores	Equal variances assumed	.069	.793	-.984	46	.330	-.339	.345	-1.033	.355
	Equal variances not assumed			-.981	44.08	.332	-.339	.346	-1.036	.358

Note. HTKS = Head Toes Knees Shoulders

Q3 What is the difference in growth from the pre-test/post-test between the treatment and control group when confounding variables (i.e. race/ethnicity, sex, age, mother's education level, and years in daycare/school setting) are controlled for?

The analysis method used to address the third research question was a two-way, repeated measures within-subjects ANCOVA procedure. The results of the analysis indicated that none of the main effects, covariates, or interactions between time and the within-subjects factors was significant. This result means that the effect of time on HTKS scores is not moderated by age, race, mother's education, years in daycare, or sex. The time effect was not significant in this analysis, which may be due to the relatively small sample size and inclusion of numerous covariates. More research is needed to determine what factors are driving the effect of time on HTKS scores. Additionally, the effect size on the main effect of time was small; therefore, the magnitude of the difference in the mean values of HTKS scores across the different time points was not very large. Because the sample size was relatively small (n = 48), it is possible that some

statistically significant effects were missed due to lack of power. Additionally, the effect sizes of the contrast tests, though not statistically significant, require attention. Overall, the results of these contrast tests suggest that there is no strong evidence for a linear trend in the mean values of HTKS scores across the different time points. More research is, however, needed with a larger sample size to confirm these findings.

Table 8

Repeated Measures Analysis of Covariance on HTKS Scores

	df	*F*	*p*	η^2_p
Within-subjects effects				
Time	1	1.107	.299	.026
Group	1	0.019	.291	.000
Age	1	1.908	.175	.044
Race	1	0.064	.801	.002
Mother's education	1	0.045	.833	.001
Years in day care	1	0.159	.692	.004
Gender	1	1.145	.291	.027
Time*age	1	1.729	.196	.040
Time*race	1	0.360	.552	.009
Time*mother's education	1	0.569	.455	.014
Time*years in daycare	1	0.000	.995	.000
Time*sex	1	1.959	.169	.046
Time*group	1	.554	.461	.013
Error(time)	41			

Note. df: degrees of freedom; η^2_p: partial eta squared. *Interaction between variables; Time: This variable is related to the different periods of assessment (pre-test and post-test). Age: This variable is related to the participants' age. Race: This variable is related to the participants' reported race/ethnicity. Mother's Education: This variable is related to the highest level of education the participants' mother reported receiving. Years in Daycare: This variable is related to the participants' time spent in daycare. Sex: This variable is related to the participants' reported sex. Group: This variable is related to the participants' group assignment.

CHAPTER V

DISCUSSION

Preschool acts as an important building block for children to develop school readiness skills that will help them succeed as they progress through their educational careers. Research on school readiness often focuses on self-regulation as an important skill for young children to develop to enter elementary school with the necessary skills and abilities to regulate attention and emotion, an attribute that is conducive to facilitate teaching and optimize learning in the classroom (Blair & Raver, 2017). Self-regulation is an important skill to target, as individuals with higher levels of self-regulation have been associated with positive developmental outcomes, including higher levels of self-esteem, achievement, success, and prosocial behaviors and lower rates of behavioral referrals in school (Blair & Razza, 2007; Moffitt et al., 2011; Razza et al., 2015; Tangney et al., 2004).

Self-regulation is a skill that can be learned and improved with practice. Researchers examining self-regulation in preschoolers over short periods have found that improvements in self-regulation were found after participating in an intervention (McClelland et al., 2019; Razza et al., 2015; Tominey & McClelland, 2011). This study focused on short-term, as opposed to long-term, self-regulation as it was more developmentally appropriate for the population sample. Although adolescents and adults are more likely to employ self-regulation for an extended period of time to reach a long-term goal (such as studying effectively and completing assignments to receive high grades throughout a school year), preschoolers are not able to use these skills to meet a long-term goal. Preschoolers, however, can manage their behaviors to meet a short-term

goal, such as control their impulses and attention to listen to a story being read to them by a teacher or wait for their turn to go down a slide. The aim of this study was to examine the impact of a behavioral monitoring intervention (GBG) on preschoolers' short-term self-regulation. The hypothesis was that students who engaged in the intervention would experience higher levels of self-regulation after participating in GBG when compared to their performance on a self-regulation task before intervention participation. Therefore, students who received GBG intervention would exhibit improved self-regulation skills compared to the business-as-usual group for several reasons.

GBG requires students to pay attention to their own behavior and monitor compliance with the classroom rules to "win" the game. Second, GBG requires students to resist distractions and control their impulses to avoid breaking the rules and win the game. GBG helps students practice and strengthen behavioral inhibition, which is part of self-regulatory skills (Johansson et al., 2020). Additionally, GBG gives students a clear goal: winning the game for their team. This goal helps students learn how to set goals and work toward achieving them. Lastly, GBG is a team-based intervention that teaches students learn to cooperate with each other and support each other in achieving their own goal. Therefore, GBG helps students develop cooperation skills that are important for self-regulation within a classroom. Research has shown that students who participated in GBG showed significant improvements in on-task behavior and attentiveness (Flower et al., 2014) and behavioral inhibition (Johansson et al., 2020). The purpose of this study was to evaluate whether after participation in the classroom management intervention (GBG), students would perform better in a behavioral measure of self-regulation than those who did not receive the intervention (business-as-usual group). This chapter includes a discussion of the findings, implications, limitations, and areas of future research.

Summary of Findings

Impact of Circle Time on Self-Regulation

The purpose of this study was to evaluate whether after participation in the classroom management intervention (GBG), students would perform better in a behavioral measure of self-regulation than those who did not receive the intervention (business-as-usual group). This study encompassed two groups across four classrooms. Two intervention or experimental classrooms implemented the GBG during circle time and two classrooms conducted their circle time business-as-usual (control classrooms). Results indicated that for the entire sample, after students participated in circle time, they were able to perform better on a self-regulation task. This finding suggests that circle time tends to orient children to engage in an increased number of behavioral management skills. The effect size for this change was, however, small to medium. This result indicates that the change in scores from pre to posttest HTKS varied across individuals.

The HTKS being performed right after the circle time could have impacted children's abilities to behaviorally self-regulate due to several factors. One of the largest confounds to the present research study is the practice and learning effects that potentially occurred with the repeated administration of the HTKS. The APA Dictionary of Psychology defines practice effects as "any change or improvement that results from the practice or repetition of task items or activities" (American Psychological Association, n.d.). The practice effect is of particular concern for within-subjects designs as improvement of performance may simply come from repetition of the activity rather than from any study manipulation that occurred (Shadish et al., 2002).

The practice effect is a well-established phenomenon and can have a significant impact on the interpretation of test results. The repeated exposure to the task can lead to an

overestimation of true ability (Lee et al., 2021). If an individual repeats a task multiple times, they will likely perform better on each subsequent task even if their underlying ability has not changed. The reason for this outcome is that the person has become familiar with the test format, the types of questions asked, and the strategies needed to answer the questions correctly (Calamia et al., 2012). The practice effect can make it difficult to track change over time. If a person repeated a task multiple times, it is difficult to say whether improvement of their scores is due to genuine improvement of ability or simply due to the practice effect (van Gog & Sweller, 2015). This effect poses a particular problem to research studies with a pre /posttest design because the practice effect can inflate the observed effect of the intervention (Song & Ward, 2015). This result is due to the participants having had an opportunity to practice the test before the posttest, which could lead to an improvement in their performance regardless of the effect of the intervention. In research, this outcome can lead to inflated effect sizes and misleading conclusions about the effectiveness of interventions (Song & Ward, 2015). The significance of change in scores between the pretest and posttest for the whole sample in the current study was possibly due to practice effects related to the HTKS rather than the impact of circle time.

Regarding the potential influence of a practice effect, the overall samples' performance on the post-test HTKS measure showed some improvement. This increase could have been due to the simple replication of the task or the impact of circle time. In relation to how the intervention of circle time could impact overall performance, circle time involves set expectations that are followed and typically involves a routine structure. In a preschool classroom, circle time typically lasts between 15 and 20 minutes of engagement that occurs nearly daily in most classrooms. This duration equates to 45 hours (on the low end) of circle time over a full 180-day academic year (Bustamante et al., 2018). Circle time includes many

activities, which may include a review of classroom rules (Zaghlawan & Ostrosky, 2011). The nature of circle time activities is often repetitive and includes a prompting of regulated behaviors and children often receive feedback on expected and unexpected behaviors in a whole group setting. Furthermore, circle time is social in nature because children can act as models for and sit in close proximity to one another, prompting a need to control behavior.

The findings form the present study suggest that circle time may seem to have an overall effect on a child's ability to regulate their behavior. Specifically, the difference in means between the two groups at the pretest phase was not significant. This result suggests that the differences observed between the treatment and control group at the posttest phase were either due to a practice effect or participation in circle time but and not due to preexisting differences between the two groups. A reason for the impact in relation to circle time is that circle time seems to be a time that children and teachers can co-regulate. Murray and Rosanbalm (2017) defined co-regulation in the classroom as providing a warm, responsive relationship, structuring the environment, and teaching/coaching self-regulation skills. Circle time seems to help promote the features of co-regulation. Circle time allows the teacher to include the children in activities (such as talking about the weather and previous days' activities). During this time, children are often contributing to the discussion lead by the teacher and offering input, which allows teachers to give a responsive structure to not only the children individually but also in a whole group.

Circle time is a structured environment and requires children to follow expected behaviors (i.e. raising hand before talking, sitting still, attending to the discussion and activities presented, remaining in one area, etc.). Circle time supports teaching and coaching of self-regulation skills by allowing a space for teachers to give feedback to the children on expected behaviors to follow. Overall, it seems that a circle time activity allows children to practice self-

regulation skills and become oriented to learning, and it is often structured in way that children and teachers can co-regulate one another.

Although the overall difference in scores between the pre and posttest was significant, performance often varied by individual. During the administration of the HTKS, although the children were able to indicate verbally that they understood the task's rules and instructions, they struggled to behaviorally follow through. For example, during Part I or the practice phase of the HTKS, the children were asked, "what do you do if I say 'touch your head'?", almost all children were able to verbally indicate to the researcher by responding "touch your toes". Regarding behaviorally following through with this direction, however, the children, as a whole group, had a difficult time. This disconnect between the cognitive understanding of expected rules to follow and behavioral actions that match that understanding could be due to a number of factors, including social learning and influence. Social learning theory suggests that social behavior is learned by observing and imitating the behavior of others (Bandura et al., 1961). Social learning could have impacted the participants' performance on the HTKS task due to the group administration of the task. The participants could have been observing and modeling the performance of their peers on the task, rather than using their own agency to decide how they were going to respond to task demands.

Impact of Good Behavior Game Intervention on Self-Regulation

Although overall effect on children's performance between pre and posttest in the HTKS was significant, this change did not differ across treatment groups. This result indicated that the intervention of the GBG did not have a significant impact on preschoolers' performance on the behavioral self-regulation measure, as evidenced by the nonsignificant main effect for group or interaction between group assignment and score differences. Although participation in a

structured task, such as circle time, appeared to have a positive effect on preschoolers' ability to perform on a self-regulation measure, the GBG did not have an impact on these scores. An explanation for this result could be that the GBG was not significantly different in terms of orienting children to engage in self-regulation compared to just participating in circle time alone. Another possible explanation for the lack of a significant effect for the experimental group is that the GBG intervention was too short or less intensive to produce a measurable effect on self-regulation.

Previous researchers have successfully investigated the impact of the GBG on decreasing disruptive behaviors in preschool students over multiple time points (Foley et al., 2018; Wiskow et al., 2019). GBG was designed to reduce disruptive behaviors, but it does not specifically target self-regulation skills. Although higher self-regulation skills are attributed to a child's ability to engage in fewer amounts of disruptive behavior (Bolstad & Johnson, 1972), GBG, in its original design, does not target to increase children's self-regulatory abilities. Additionally, it is possible that the GBG intervention was not tailored enough to the individual needs of the participants. For example, the sticker reward being used as an incentive to perform well during GBG could have been a low motivating force for the intervention group. Furthermore, the participants could have not understood or been motivated by the "team" and competitiveness factor of GBG. Although earlier studies on GBG have been done with students in first grade, few studies have been completed with the preschool age group. Therefore, GBG, as designed to be implemented, could have not been a developmentally appropriate intervention for this age group. Finally, it is also possible that the HTKS was not a sensitive enough measure of self-regulation to detect the effects of a one-day GBG intervention.

Findings indicated that individual factors such as sex, race/ethnicity, age, and mother's education level, and years in daycare) could not explain differences between pre- and posttest performance on the HTKS. Factors other than the intervention and the previously mentioned factors, however, may have contributed to observed importance in self-regulation abilities over time. These factors include natural development or external influences on self-regulation skills in children (teacher effectiveness, an unfamiliar adult present in the classroom, etc.). It is possible that individual factors not investigated in the present study had an impact on individual children's abilities to perform better on a self-regulation measure after participating in circle time.

Implications

The findings of this study have a number of important implications for early childhood educators. First, that circle time may be a valuable activity for helping children develop self-regulation skills. Circle time ensures a structured environment in which children can practice self-regulation skills, such as sitting still, listening to instructions, and following rules. Additionally, circle time can provide an opportunity for teachers to co-regulate with children, which can help children to develop their own self-regulation skills (Murray & Rosanbalm, 2017; Murray et al., 2014;). Second, the findings suggest that providing children with opportunities to practice self-regulation skills in a variety of contexts while in preschool is important. The findings support that participation in circle time may enhance preschoolers' abilities to self-regulate. Available research also indicates that children who spend time engaging in unstructured, free play in their toddler and preschool years exhibited self-regulation abilities in a two-year follow-up study, which included the first years of elementary schools (Colliver et al., 2022).

Children in the sampled age group need an opportunity to participate not only in structured (i.e. circle time, table work, etc.) but also in unstructured (i.e. centers, coloring, playground time, etc.) activities. Preschool classrooms seem to need a balance of unstructured and structured activities to enhance children's abilities to self-regulate. Findings from other studies indicated that when children spend more time in structured activities, their abilities to work toward goals, make decisions, and regulate their behaviors decrease (Barker et al., 2014). In a study of six-year-olds, the researcher found equal value in the use of both unstructured play and adult instruction to optimize child outcomes (Colliver et al., 2022). Although adult-led activities help provide cues and reminders to children about expectations, unstructured activities should be used to develop self-control for young children (Barker et al., 2014). Preschool is an ideal environment for children to practice and fine-tune their self-regulation skills in adult-led activities and unstructured time.

Although GBG did not demonstrate a significant differential effect in the current study, it is important to consider potential reasons for this outcome. First, this result could be due to the duration of the intervention or characteristics of the participants (i.e., natural development, external influences, etc.). Potentially tailoring the needs of the intervention to the population, such as making it a whole group contingency, as it has been done in previous studies (Foley et al., 2018; Wiskow et al., 2019), could impact the effectiveness of the intervention on self-regulatory behaviors.

The HTKS task was possibly not a sensitive enough measure to detect a rapid change in HTKS scores with the brief intervention investigated in this current research. Although the HTKS has been found to be a strong measure of self-regulation (Tominey & McClelland, 2011), many of the past studies have not used the measure to determine such a quick shift in self-

regulatory abilities. Many previous researchers have detected a shift over a full school year when using this measure (McClelland et al., 2019; Razza et al., 2015; Tominey & McClelland, 2011). Furthermore, having the pre- and posttest measures occur so closely to one another could have instilled a practice effect of the measure in the children. The children could have been primed for the measure to occur again after circle time was complete and would have learned and able to recall the commands from the pretest.

Limitations and Future Directions

This study was not without limitations. In terms of the sample limitations, a random assignment of children to either the treatment or control group did not occur. Random assignment of individuals would have allowed for induction of independence between treatment status and potential outcomes. For the time constraints, the intervention took place over one day, which may have impacted the ability to make a measurable change in self-regulation skills for this population. The increased effectiveness of the intervention on self-regulatory behaviors could have been detected if the intervention had taken place over multiple time points. Furthermore, the time of year that the study took place may have also impacted the participants' self-regulation skills. The assessment of the students occurred toward the end of the Spring semester of their preschool year. Therefore, the children had time to develop self-regulatory skills that are typically attained when entering a structured preschool classroom. Natural development of self-regulatory behaviors during the school year may have affected the ability to detect a change in scores on the HTKS measure.

Other limitations related to the assessment of the children's self-regulatory behaviors and recording of the HTKS scores. The researcher did not assess the HTKS measure individually, but rather measured it for each class as a whole group. Group administration of the assessment could

have impacted the effectiveness of children to accurately engage in self-regulatory behaviors. Social influences could have impacted the children's abilities to properly understand and follow directions. Additionally, having the pre- and posttest occur so closely together could have led to a practice effect with all participants. The priming and learning that can occur when the exposure to the assessment occurred with a smaller time lapse could have been a problem, making it difficult to determine whether the overall significant change in scores from the pre- to the posttest was due to a true improvement in performance or simply to the practice of taking the test. In terms of coding and recording of scores, despite the HTKS scores having been coded multiple times for each individual, a large limitation to the present research was the use of only one rater to code scores of the HTKS task in both the pre- and posttest, which could have impacted reliability of the assessment. Reliability refers to the consistency of a measurement or the degree to which an assessment instrument produces consistent results over time and across different raters. One way to improve reliability of an assessment is to use multiple raters because they can provide different perspectives on the person being assessed, which can help reduce the impact of individual biases and errors. Using only one rater increases the risk of bias. Rater bias is described as the tendency of a rater to rate certain people or groups of people more or less favorably than others. Another limitation of only using one rater to code assessment outcomes is that it could have been difficult to identify and correct errors. Errors are more likely to be undetected if only one rater is used.

To mitigate the above-mentioned limitations, future researchers should adjust the current methodology and procedures. For the sample, future researchers can use random assignment to minimize the potential for confounding variables (e.g., classroom structure, teacher effectiveness, etc.) to influence the results. For the timing and time constraints of the intervention, a study

conducted over multiple time points should be considered to increase the effectiveness of the intervention on children's abilities to self-regulate. Although the delivery period for the intervention in the current study was over a single day, future researchers should examine the effects of longer intervention durations, such as multiple weeks or months. The longer period would allow a more robust assessment of the intervention's effectiveness on self-regulation skills. Future researchers should implement the intervention over a length of 8 weeks to truly determine the effectiveness of GBG on self-regulatory behaviors.

Future research should address the limitations identified in this assessment of children's self-regulatory behaviors by delaying the posttest and assessing the children's self-regulation at the beginning of the school year. To lessen the influence of practice effects, future researchers should consider using a delayed posttest to ensure participants forget the information learned in the pretest. This interval will help reduce the amount of learning that occurs because of taking the pretest. Future researchers should also consider assessing the children's self-regulation at different times of the year to control for potential effects of the participation in a preschool classroom alone on the ability of a child to develop self-regulation skills. By addressing these limitations, future researchers can develop and refine self-regulation interventions that may be effective in promoting the behavioral development of preschool children.

Conclusions

The aim of this study was to identify an intervention that enabled an increase in preschool-aged children's increase in self-regulation skills with minimal success. Findings from this study support that children are able to engage in increased behavioral self-regulation after participation in a structured task. Following circle time, overall, preschoolers performed better on a self-regulation measure. This difference, however, did not vary between the treatment and

control group, indicating that participation in a behavioral intervention (GBG) during circle time did not have a significant impact on a child's ability to increased performance on a self-regulation measure. Overall, findings from the current study suggest that participation in a structured task increases a child's ability to self-regulate but GBG does not increase a child's ability to engage in more self-regulatory behaviors.

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APPENDIX A

HEAD TOES KNEES SHOULDERS PROTOCOL (FORM A)

Child ID: _____

HEAD-TOES-KNEES-SHOULDERS (HTKS)

Parts I, II, and III

FORM A – Extended

REFERENCES:

McClelland, M. M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioral regulation and preschoolers' literacy, vocabulary, and math skills. *Developmental Psychology, 43*, 947-959.

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Directions: *After establishing positive rapport with the child, say or read the directions in bold type aloud. Words in CAPITAL LETTERS should be emphasized. Administer the task seated or standing; the child should stand, about 3 feet from you, during the task. Administer Part II if the number of points in the testing section totals to 4 or more. Administer Part III if the number of points in the testing section totals to 4 or more.*

The person symbol indicates that you should perform the motion to demonstrate the correct movement to the child. If the child produces the correct (opposite) response immediately, score the item "2". If they self-correct to the correct response, score the item "1". If they do not touch the correct part of their body at all or touch the named part, score the item "0".

A self-correct occurs if the child makes any discernible motion toward an incorrect response, but then changes his/her mind and makes the correct response. Pausing to think, not moving, and then responding correctly does not count as a self-correction – it would be scored as correct.

PART I: INTRODUCTION

Now we're going to play a game. The game has two parts. First, copy what I do. Touch your head.

Touch your head; wait for the child to touch his/her head.

Good! Now touch your toes.

Touch your toes; wait for the child to touch his/her toes.
Repeat the two commands with motions again, or until the child imitates you correctly.

PART I: PRACTICE

Now we're going to be a little silly and do the OPPOSITE of what I say. When I say touch your HEAD, INSTEAD of touching your head, you touch your TOES. When I say touch your TOES, you touch your HEAD. So you're doing something DIFFERENT from what I say.

If the child responds correctly: Provide positive feedback on each practice item where the child responds correctly.

***If the child responds incorrectly* at any point during the practice portion, provide additional explanations up to 3 times before beginning the test portion:

Remember, when I say to touch your ____, you touch your ____, so you are doing something DIFFERENT from what I say. Let's try another one.

→ Number of additional explanations given: 0 1 2 3

	Incorrect	*self-correct*	*correct*
A1. What do you do if I say "touch your head"?	0 (other than toes)	1	2 (toes)
A2. What do you do if I say "touch your toes"?	0 (other than head)	1	2 (head)

If the child responds verbally: "can you show me? "

Ok, let's practice a few more.

	Incorrect	*self-correct*	*correct*
B1. Touch your head	0 (other than toes)	1	2 (toes)
B2. Touch your toes	0 (other than head)	1	2 (head)
B3. Touch your head	0 (other than toes)	1	2 (toes)
B4. Touch your toes	0 (other than head)	1	2 (head)

Proceed to Part I test section. Do not explain any parts of the task again. Do not provide feedback during the test portion.

PART I: TESTING

We will keep playing this game, and you keep doing the OPPOSITE of what I say.

	Incorrect	*Self-Correct*	*Correct*
1. **Touch your head**	0 (other than toes)	1	2 (toes)
2. **Touch your toes**	0 (other than head)	1	2 (head)
3. **Touch your toes**	0 (other than head)	1	2 (head)
4. **Touch your head**	0 (other than toes)	1	2 (toes)
5. **Touch your toes**	0 (other than head)	1	2 (head)
6. **Touch your head**	0 (other than toes)	1	2 (toes)
7. **Touch your head**	0 (other than toes)	1	2 (toes)
8. **Touch your toes**	0 (other than head)	1	2 (head)
9. **Touch your head**	0 (other than toes)	1	2 (toes)
10. **Touch your toes**	0 (other than head)	1	2 (head)

TOTAL POINTS ⟶ [ ] **IF THE CHILD SCORED 4 OR *MORE* POINTS, CONTINUE TO PART II**

IF THE CHILD SCORED *LESS THAN* 4 POINTS: Thank you for playing this game with me today!

Child ID: _____

PART II: INTRODUCTION

Ok, now that you've got that part, we're going to add a part. Now, you're going to touch your shoulders and your knees. First, touch your shoulders.

Touch your shoulders; wait for the child to touch his/her shoulders.

Now, touch your knees.

Touch your knees; wait for the child to touch his/her knees.
Repeat the two commands with motions again, or until the child imitates you correctly.

PART II PRACTICE:

Ok, now we're going to be silly again. You keep doing the opposite of what I say like before. But this time, touch your knees and shoulders. When I say to touch your KNEES, you touch your SHOULDERS, and when I say to touch your SHOULDERS, you touch your KNEES.

If the child responds correctly: Provide positive feedback on each practice item where the child responds correctly.

***If the child responds incorrectly* at any point during the practice portion, provide additional explanations up to 2 times before beginning the test portion:

Remember, when I say to touch your ____, instead of touching your ____, you touch your ____. Do the OPPOSITE of what I say.

→ Number of additional explanations given: 0 1 2

	Incorrect	*self-correct*	*correct*
C1. What do you do if I say "touch your knees"?	0 (other than shoulders)	1	2 (shoulders)

If the child responds verbally: "can you show me? "

	Incorrect	*self-correct*	*correct*
D1. Touch your knees	0 (other than shoulders)	1	2 (shoulders)
D2. Touch your shoulders	0 (other than knees)	1	2 (knees)
D3. Touch your knees	0 (other than shoulders)	1	2 (shoulders)
D4. Touch your shoulders	0 (other than knees)	1	2 (knees)

Proceed to Part II test section. Do not explain any parts of the task again. Do not provide feedback during the test portion.

Child ID: _____

Now that you know all the parts, we're going to put them together. You're going to keep doing the opposite of what I say to do, but you won't know what I'm going to say.

There are four things I could say:

If I say touch your HEAD, you touch your TOES.
If I say touch your TOES, you touch your HEAD.
If I say touch your KNEES, you touch your SHOULDERS.
If I say touch your SHOULDERS, you touch your KNEES.

Are you ready? Let's try it.

PART II TESTING:

	Incorrect	*Self-Correct*	*Correct*
11. Touch your head	0 (other than toes)	1	2 (toes)
12. Touch your toes	0 (other than head)	1	2 (head)
13. Touch your knees	0 (other than shoulders)	1	2 (shoulders)
14. Touch your toes	0 (other than head)	1	2 (head
15. Touch your shoulders	0 (other than knees)	1	2 (knees)
16. Touch your head	0 (other than toes)	1	2 (toes)
17. Touch your knees	0 (other than shoulders)	1	2 (shoulders)
18. Touch your knees	0 (other than shoulders)	1	2 (shoulders)
19. Touch your shoulders	0 (other than knees)	1	2 (knees)
20. Touch your toes	0 (other than head)	1	2 (head)

TOTAL POINTS ⟶ [ ] IF THE CHILD SCORED 4 OR *MORE* POINTS, CONTINUE TO PART III

IF THE CHILD SCORED *LESS THAN* 4 POINTS: Thank you for playing this game with me today!

Child ID: _____

PART III INTRODUCTION

You are doing so well we just have one more part! Now we are going to change the rules of the game.

When I say to touch your HEAD, you touch your KNEES.
When I say touch your KNEES, you touch your HEAD.
When I say touch your SHOULDERS, you touch your TOES.
And when I say touch your TOES, you touch your SHOULDERS.

Ok? Let's practice!

If the child responds correctly: Provide positive feedback on each practice item where the child responds correctly.

***If the child responds incorrectly* at any point during the practice portion, provide additional explanations up to 2 times before beginning the test portion:

Remember, we changed the rules. "Touch your head" means touch your KNEES – head goes with knees now. "Touch your shoulders" means touch your TOES – shoulders goes with toes.

→ Number of additional explanations given: 0 1 2

PART III PRACTICE:

	Incorrect	*self-correct*	*correct*
E1. What do you do if I say "touch your head"?	0 (other than knees)	1	2 knees)
E2. What do you do if I say "touch your shoulders"?	0 (other than toes)	1	2 (toes)

If the child responds verbally: "can you show me? "

	Incorrect	*self-correct*	*correct*
F1. Touch your head	0 (other than knees)	1	2 (knees)
F2. Touch your shoulders	0 (other than toes)	1	2 (toes)
F3. Touch your toes	0 (other than shoulders)	1	2 (shoulders)
F4. Touch your knees	0 (other than head)	1	2 (head)

You're doing great! Let's do a few more.

Proceed to Part III test section. Do not explain any parts of the task again. Do not provide feedback during the test portion.

Child ID: _____

PART III TESTING:

	Incorrect	Self-Correct	Correct
21. Touch your shoulders	0 (other than toes)	1	2 (toes)
22. Touch your head	0 (other than knees)	1	2 (knees)
23. Touch your knees	0 (other than head)	1	2 (head)
24. Touch your toes	0 (other than shoulders)	1	2 (shoulders)
25. Touch your toes	0 (other than shoulders)	1	2 (shoulders)
26. Touch your knees	0 (other than head)	1	2 (head)
27. Touch your shoulders	0 (other than toes)	1	2 (toes)
28. Touch your head	0 (other than knees)	1	2 (knees)
29. Touch your head	0 (other than knees)	1	2 (knees)
30. Touch your shoulders	0 (other than toes)	1	2 (toes)

TOTAL POINTS → [ ]

Thank you for playing this game with me today!

To calculate Total Score: Sum "TOTAL POINTS" from each testing section. Score is out of 60.

TOTAL SCORE: _____

APPENDIX B

PERMISSION TO USE HEAD TOES KNEES SHOULDERS

HTKS: Materials & Training [Baxter]

Tracy, Alexis

Tue 12/8/2020 12:32 PM

To: Baxter, Megan B.
Cc: McClelland, Megan

3 attachments (2 MB) htksb_english.pdf; htks-trainingpacket_updated april20.pdf; htksa_english.pdf;

Dear **Megan**,
Thank you for completing the HTKS request & registration form. Attached are the updated versions of the task in English (Form A & Form B), as well as the HTKS Training Packet. The current task has 3 parts to enable longitudinal measurement up to ages 7 or 8 and takes about 5 minutes to administer. We suggest including the practice items in your overall score to increase variability. Here is the most recent article describing the 3-part version.
To complete the Online HTKS Training, please print and review the attached training packet. At the end of the online training, you will receive a link and password to our HTKS training video bank. The video bank contains four practice videos and answer keys (in English & Spanish) that can be used for additional practice and/or training purposes.
Please do not share the HTKS Training Website without first requesting permission. Your research agreement covers HTKS training for the project documented (The Effects of the Good Behavior Game on Preschool Children's Self-Regulation). You may share the training website with members of your research team who are conducting research for this project. We recommend first completing the training website and then providing an additional in- person training with practice opportunities for your research team.
For the most up-to-date information on our research, please visit The Kindergarten Readiness Research Program Website. I am also including a link to a few other papers we've published using the task in the US and in other countries (HTKS: Research Article Bank). The latest papers have 3 parts to the task and earlier papers describe the same task but with 1 or 2 parts.
I hope this is helpful. Please let us know how the measure works for you.
-Megan McClelland

Megan McClelland, Ph.D.
Hallie E. Ford Center for Healthy Children & Families
Endowed Director Katherine E. Smith Healthy Children
and Families Professor
125 Hallie E Ford Center, 2631
SW Campus Way Oregon State
University
Corvallis
Phone:
E-mail:
Faculty Link Website

APPENDIX C

RECRUITMENT FLYER

UNIVERSITY OF
NORTHERN COLORADO

Dear Parents,

My name is Megan Baxter and I am a doctoral student at the University of Northern Colorado (Greeley, CO). I am a Jacksonville native and moved back to Jacksonville in the summer of 2020 to complete my dissertation and internship hours. I previously worked for Duval County Public Schools and am currently an intern with Mandala Family Wellness (Ponte Vedra Beach, FL) as a School Psychologist in-training under the supervision of Dr. Katie Falwell (Licensed Psychologist) and Meghan Ambrose (School Psychologist).

This letter is to invite you and your child to participate in a research study about how a game-like intervention, the Good Behavior Game, can increase children's self-regulation. Self-regulation is defined as the ability to monitor, and manage one's behaviors, thoughts, and emotions in order to obtain a goal. Higher levels of self-regulation are related to positive outcomes, such as, greater academic achievement, less behavior referrals, less referrals to special education, and more pro-social skills.

An Institutional Review Board responsible for human subjects research at the University of Northern Colorado reviewed this research project and found it to be acceptable, according to applicable state and federal regulations and University policies designed to protect the rights and welfare of participants in research.

For additional information, call 610-4636 or email baxter@mandalafamilywellness.com. I think that your child's participation in this research will be beneficial to not only me, but your child as well!

If you are interested in having your child participate, please fill out the attached forms. If you chose to have your child not participate, you do not need to fill out the form. The children without returned consent forms will have a separate activity to participate in with the teacher.

Sincerely,

Megan Baxter, Bachelor of Science in Psychology, Concentration: Child Psychology

School Psychology Doctoral Candidate and Principal Investigator

APPENDIX D

PARENTAL CONSENT FORM

UNIVERSITY OF NORTHERN COLORADO

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH

UNIVERSITY OF NORTHERN COLORADO

Project Title: Effects of the Good Behavior Game on Preschoolers' Self-Regulation

Researcher: Megan Baxter. B.S., School Psychology Doctoral Students

Phone Number:

Advisor: Dr. David Hulac

This form will give you the information you need to understand this study. It will describe the purpose, the benefits, and known risks, inconveniences, or discomforts that you may have while participating. I encourage you to ask questions at any time they arise. If you decide for your child to participate, you will be asked to sign this form and can be provided a copy for your personal records.

Who is eligible to participate? Children aged 3 to 5 years old.

What is the purpose of the study? To examine how a classroom management intervention effects children's self-regulation skills.

What will I be asked to do? This study requires for your child to play a game (that is very similar to Simon Says) before and after circle time/morning meeting. Your child may also be selected to be a part of a classroom in which circle time is made into a game in which children are divided into teams to see who has the best behavior. You, as the parent/guardian, will be asked to sign a consent form and fill out a basic questionnaire.

What are my/my child's benefit of being in the study? The research will not benefit you personally, but we do hope that your child enjoys the games they are asked to play. You/your child's participation in this study will contribute to a better understanding of the relationship between how children are taught self-regulation in preschool.

What are the risks of being in this study? There are no known risks beyond those that are normally encountered when playing games. Your child's participation will not be solicited during snack, lunch, or rest times. The games are simple and the only feedback your child will be getting will be either a reminder to follow classroom expectations and/or positive comments (i.e. "You're playing well", "You did just fine", etc.). This study is not designed to improve your child's memory, but it is believed your child will likely enjoy the games, rewards, and positive attention received.

How will my child's responses be recorded? We will videotape the activities to be reviewed by the researchers. The videos will be recorded on a laptop with no access to the internet and will be saved on a password-protected USB drive.

How will be my personal information be protected? Researchers will keep inventories, consent forms, and other materials in a locked office in the principal investigator's home. Videotapes will be destroyed by August 5, when the principal investigator's degree is finalized. You and your child's identify will always remain confidential. If you have any questions about data handling procedures, please reach out to me.

Is participation voluntary? Yes, participation is voluntary and there are no penalties for deciding not to participate or withdrawing your child's participation. You may choose not to participate in this research without negatively impacting your relationship with your child's school.

What if I have questions? If you have any questions about the research, please contact me at baxter@mandalafamilywellness.com or my advisor, Dr. David Hulac at David.hulac@unco.edu. A copy of this form will be with your child's teacher and you can retain a copy at any time. Furthermore, please contact me if you want an additional copy for your records or if you lose your copy.
If you have questions about you or your child's rights as a research participant or if you would like to contact someone about a research-related injury, please contact the chair of the UNC Institutional Review Board by calling Nicole Morse, Office of Research & Sponsored Programs, University of Northern Colorado, Greeley, CO; 970-351-1910 or Nicole.morse@unco.edu.

Thank you for assisting me with my research.

Sincerely,

Megan Baxter

I _____ (print

parent/guardian name) give permission for my child

_____ (print child's name) to take part in this

research study.

_____ _____
Parent/Guardian's Signature Date

If you wish for your child to participate, but do NOT want your child to be videotaped, please sign below. Your signature will be an indication that I will need to record your child's responses in-the-moment in a paper-and-pencil format.

_____ _____
Parent/Guardian's Signature Date

APPENDIX E

DEMOGRAPHIC QUESTIONNAIRE

UNIVERSITY OF
NORTHERN COLORADO

Demographics Form

1. **Child's Name**: _____
2. **Child's Date of Birth (include just the month and year):**

_____

3. **Child's Gender:**

____Male

____Female

____Different Gender Identity

4. Which of the following best describes your child's race or ethnicity?:

___Arabic

___Asian

___Black/African American

___Caucasian/White

___Hispanic

___Native Hawaiian or Other Pacific Islander

___Native American Indian or Alaska Native

___Two or more of the above races/Mixed

___Other

5. Child's Mother's Highest Completed Level of Education:

____Did not finish High School

____High School Diploma or GED

____Some College

____Associate's Degree (2-year degree)

____College or University Degree

____Vocational Degree/Trade School (HVAC, Welding, Mechanics, etc.)

____Graduate Degree (Masters, Ph.D., JD, MD, etc.)

____Other (Please specify): _____

6. Number of years your child has participated in a daycare/school setting:

____0 (this is the first year)

____1

____2

____3

____4

____5 or more

APPENDIX F

GOOD BEHAVIOR GAME TEACHER "COACH" CARD

Teacher "Coach" Card

- Get the children's attention and announce circle time is about to start
- Give clear instructions for circle time
    - Say: "We will be doing circle time and reading a story today"
- Teacher introduces the game by saying "During circle time, we will be playing a game today! We will be playing the game for 15 minutes."
    - Point to the "Rules of the Game" poster
    - Explain and demonstrate rules: Looking Eyes; Listening Ears, Quiet Mouth;
      Helping Hands; and Still Body
  - Say: "You are all on the same team for this game"
  - Tell the class how they will be scored and how score is kept
    - Say: "In order to win the game, the students need to follow the rules"
    - If the children follow the rules X number of times, they will win the game
    - The tally marks will be displayed on a white board that will be next to Ms. Baxter
  - Tell the students what the reward will be when they win the game: "If you win the game,
    everyone gets to choose a sticker!"
  - Teacher sets a visual timer (can be a phone timer) and says "The Game starts *now*" to make it
    clear to the students that the game has started
  - If students start to misbehave, say: "Remember the rules of the game!"
  - Randomly point out instances of good behavior in students (for example, saying "I see Johnny using his listening ears" or "Sally thank you for having a still body")
  - At the end of circle time/the game, point to the white board to show the students how many tallies of good behavior that they got
      - Gives the students feedback on their performance during the game (if the students do well, saying "I liked how everyone followed the rules of the game and worked as a team to show good behavior!" or if they do poorly, saying "We
        really struggled to follow the rules of the game during circle time! But it is our
        first time playing the game, so maybe we can keep practicing!")
  - WIN: state when they will be given the reward by saying, "You all won the Good Behavior Game! This means everyone will get a

sticker! Ms. Baxter is going to play one more game with you and then everyone can have a sticker"

- LOOSE: state that they lost the game and have the students state what they could do better. Explain to the students they will not be getting a reward, but that you still had fun playing the game.

APPENDIX G

GOOD BEHAVIOR GAME IMPLEMENTATION CHECKLIST

Checklist for the Teacher's Role in Implementing the Good Behavior Game

- ○ Teacher gets the children's attention before starting the game by telling the children they will be starting circle time soon

- ○ Teacher gives clear, concise instructions for the activity
    - ○ Explains that they will be doing their circle time routine and reading a story

- ○ Teacher introduces the game by saying "During circle time, we will be playing a game today!"

- ○ Researcher explains the rules of the game and demonstrates what each rule should look like
    - ○ Looking Eyes
    - ○ Listening Ears, Quiet Mouth
    - ○ Helping Hands
    - ○ Still Body

- ○ Researcher shows the students the "Rules of the Game" poster and tells the students to look at it if they forget the rules of the game

- ○ The researcher divides the class into two teams based on their location on the carpet (Team A will sit on one side of the carpet and Team B will sit on the other side). Researcher asked students in each team to group together.

- ○ Researcher the class how they will be scored
    - ○ Researcher will state that in order to win the game, the students need to follow the rules
    - ○ The team that is able to follow the rules the most and has the least amount of reprimands wins the game

- Tells the students what the reward will be when they win the game

- The teacher will remind students of the rules by pointing to the poster and saying “Remember the rules of the game!” if the students start displaying unexpected behaviors

- Teacher periodically points out instances of good behavior in students (for example, saying “I see Johnny using his listening ears” or “Sally thank you for having a still body”)

- At the end of circle time/the game, the researcher will tell each team how many points each team earned and indicate which team won the game

    - The researcher will give the students feedback on their performance during the game (if the students do well, saying “I liked how everyone followed the rules of the game and worked as a team to show good behavior!” or if they do poorly, saying “We really struggled to follow the rules of the game during circle time. But it is our first time playing the game.”)

- For the students who won the game, state when they will be given the reward by saying, “You all won the Good Behavior Game! This means the team that won will get a sticker! Ms. Baxter is going to play one more game with you and then the students who won the game can have a sticker”

- For the students who lost the game, state that they lost the game and have the students state what they could do better. Explain to the students they will not be getting a reward, but that the teacher still had fun playing the game and that they may have a chance to earn a reward at a later time

APPENDIX H

CHECKLIST FOR STUDY PROCEDURES

Checklist for Study Procedures

2 weeks before the intervention:

- On the Friday two weeks before the study is to take place, give flyer and consent form packets to the preschool center so they can distribute them to parents at the beginning of the following week
- Designate a place in a locked filing cabinet at the center where the returned, signed consent forms will be placed
- Talk to the parties that may be involved in collecting the consent forms about the procedures for handling them.
    - If the researcher is not around and a classroom teacher or other preschool staff besides the director collects them, have them hand the forms directly to the director of the program or designated teacher so she may promptly place them in the locked filing cabinet.
    - Consent forms should never be left out or leave the hands of the person it was handed to until it is placed in the locked filing cabinet

Week before the intervention is to be implanted:

- The researcher should be ready and willing to address parent concerns via multiple points of contact (phone, email, etc.)
- At the end of the week (on Friday) in which the consent forms are handed out, pick up the consent forms from the preschool center, place them in a zippered bag, place them in the researcher's car, the researcher will then drive to her house and remove them from her bag when she gets into her home office and is able to place them in a filing cabinet that can be locked. This is the place where the consent forms should remain until they are destroyed.
- Set up a time to talk with the preschool teachers and determine which classroom teacher will be most appropriate and/or willing to implement the intervention.
- Once it is decided who will run the intervention, the researcher will choose an age-appropriate, engaging story that will be read during circle time and work to align circle time to be run in a similar manner between the two classes (i.e. if there is a specific curriculum they follow, follow the same lesson for that day and read the same story and decide how they will interact with the children when reading the story).
    - It will also need to be established at what time each classroom's circle time to occur
    - We want to ensure the HTKS tasks are delivered at similar time

lapses before and after circle time for each class.

- For example, it will be best if the researcher could give the first HTKS task, then have the children engage in free play for 30 minutes, then do their circle time, and then do the HTKS task one final time immediately after circle time.
- Work with the GBG implementation teacher to decide upon the reward the children will receive.

- For the teacher who is to run the intervention, set up at least three times to talk with them about how the Good Behavior Game (GBG) should be implemented. In the first meeting, the GBG should be described and outlined. Make sure to mention some of the research findings that the GBG has been associated with because this may create more teacher buy-in as to why this intervention is beneficial. Discuss what each involved party's roles and expectations will be when the GBG is being implemented.
- In the second meeting with the teacher, show her how the GBG should look when it is implemented successfully. This could be by watching a video or role playing.
- Have the teacher role play how she will deliver the intervention and have the researcher give any feedback on what is going well and what could be improved.

Intervention Week:

- Check in with the teachers in both classrooms once each day and ask if there is anything they may need from the researcher in the days leading up to the intervention implementation.
- Collect necessary materials that will be needed to complete the study
  - HTKS packets (need at least 4 for the researcher and other personnel; need the designated amount for the students who are not going to be filmed)
  - GBG Reward
  - If the researcher is providing the literature for circle time, bring in the chosen book
  - Laminated Coach Card for teacher who is to deliver the GBG
  - Files to place documents in
  - Pens and pencils
  - A smile and attitude that says "this is going to go smoothly!"
- Ensure all the relevant documents (consent and demographics) for each participant have been collected

Day Before the Study:

- Spend at least 30 minutes in each classroom so that the children can become familiar with the researcher

- Ensure you have a clear list of which children are to be involved in the study and which children are not.
- Check in with both teachers to ensure they feel comfortable about how circle time will go in their classroom today.
- Remind and communicate with each teacher about the times that the HTKS tasks will be delivered and when circle time will take place.
- Record the start and stop time of each HTKS task and circle time. This will help to determine how similar each class was run in regards to the HTKS tasks and lessons.
- Give HTKS task to classroom 1 and record their responses
    - Ensure the children who are not to be videotaped are not videotaped and are placed in an area of the room that is not visible to the camera
- For videotaping
    - Ensure the laptop's wifi is OFF so that it is not connected to the internet
    - Ensure the camera and audio are working before recording the video by doing a 10 second test clip before starting the recording
    - Start the video recording
    - Implement the HTKS
    - Stop recording
    - Save file directly to USB drive with lanyard
    - Safely remove the USB drive from the laptop
    - The researcher should wear the USB drive around her neck until the end of the day when she can place it in her locked filing cabinet in her home office
- For the intervention classroom, have the teacher implement the GBG and run circle time
- Follow the GBG implementation checklist
- After circle time, the researcher will tell the children which team has earned the reward
- For the students have won the reward, have the teacher tell the students "OK, team XX won the game!!! That means this team will get a prize, BUT everyone has to play one more game with Ms. Baxter before we get the prize!"
- For the students who didn't win the game, have the researcher talk with the students about how she was so happy to be in their class today and that they did a good job. If any of the children are feeling very distressed, work with the teacher and preschool staff about how to resolve these feelings. Have a social story about winning and losing on hand to be able to read to the children and process about how we can be gracious losers of games.

- The researcher will then deliver the final HTKS task
    - Deliver the HTKS task, record start and stop times, and videotape responses
- The following day, the researcher will then go to classroom 2 (control) and follow the same procedure for classroom 1
    - HTKS task
    - Circle time
    - Final HTKS task
- Wait around in each of the classrooms for an extra 30 minutes after the final HTKS task is complete to determine if any children were feeling upset or overly excited from the resulting win or loss of the game. Make sure to ask the teacher if there was anything else they needed assistance with.
- Check in with the center director or main teacher so that the researcher's, her advisor's, and University's IRB contact information is clearly displayed to the teachers and other staff in case they feel the need to contact them regarding the study
- Collect all data and materials from each classroom and the school. Ensure that documents are placed in files in the researcher's zippered bag. Ensure that all USB drives have been collected and are password-protected.
- Once the materials and files have been collected, the researcher should place them in her car.
- The researcher will then drive to her home and place the files in her home office's filing cabinet and lock it.
- Pat yourself on the back for doing it!