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# Teachers' beliefs and practices related to student self-regulation in the classroom

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TEACHERS' BELIEFS AND PRACTICES RELATED TO STUDENT SELF-  
REGULATION IN THE CLASSROOM

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## ABSTRACT

Self-regulation serves as a pivotal skill for children to acquire early in life. Mastery of the skill leads to high academic achievement and increased sense of self-efficacy. Teachers play a major role in developing self-regulation in children. Consequently, the beliefs and practices that teachers hold regarding poor self-regulation (i.e. inattention and impulsivity) are to be understood and taken into account. The Self-Regulation Survey was created to capture teachers' attributions for inattention and impulsivity along with subsequent chosen interventions in 52 participants. The results indicated that teachers attribute impulsivity to organic factors and family origin to a greater degree than classroom environment, instructional style, and motivation within the child. Inattention was attributed to the child's family and intrinsic motivation. When intervening on the behavior, teachers most often chose to move the child closer to the teacher and contact the parent. Participants' responses suggest differences amongst recommendations made for inattention versus those to impulsivity. Significant correlations existed between teachers' attributions of inattentiveness and impulsivity and interventions. More specifically, teachers who attribute inattentiveness to biological factors are likely to choose medication as an intervention. Those who attribute inattention to inappropriate instruction were likely to prefer adjusting the method of instruction. Similarly, teachers who attributed impulsivity to biological factors were likely to choose medication as a preferred recommendation. Attribution of impulsivity to the child's family was also correlated with teachers choosing to contact to parents. Results will inform future teacher trainings related to self-regulation.

## CHAPTER 1. INTRODUCTION

Self-regulation is a skill that allows individuals to thrive in life. The skill is developed during the early years of life and is predictive of academic achievement, well-being, and life success. Once children enter formal schooling, the demands on self-regulation increase (McClelland & Cameron, 2012). However, not all children exhibit adaptive self-regulation skills. When children have poor regulation, problems in behavior and school performance ensue. Self-regulation needs to be cultivated and understood by parents and educators early in the life of a child. Well-developed self-regulation is positively with increased achievement and self-efficacy (Connor et. al., 2010; Dembo & Eaton, 2000). Moreover, academic success induced by self-regulation persists through 6<sup>th</sup> grade if established by kindergarten (Rimm-Kaufman et. al., 2009). Therefore, it is imperative that children gain self-regulatory skills.

Beneath the surface of self-regulation lies executive functioning, which encompasses working memory, behavioral inhibition, and attention shifting (Hofmann, Schmeichel, & Baddeley, 2012). As attention and impulse control serve as two of the primary bases for self-regulation, it is important to understand how teachers perceive deficits in these areas as found in students in their classrooms. Children with inattention may have difficulty listening even when spoken to directly, avoid tasks requiring sustained attention, are distracted easily, and have a forgetful nature. In the classroom, teachers may recognize these students as those who may not initiate tasks immediately, need directions repeated, or turn in incomplete assignments. Children with inattentive features may also have lower grades, miss assignments, appear disengaged, and make more errors of omission when compared to typically developing children (U.S.

Department of Education, 2009; Bezdjian, Baker, Lozano, & Raine, 2009). Children who struggle to control their impulses are typically less engaged academically and are off-task (Junod, DuPaul, Jitendra, Volpe, & Cleary, 2006). In the classroom, these students may blurt out answers, make seemingly careless errors of commission on assignments, or struggle in social interactions with peers (U.S. Department of Education, 2009; Bezdjian et. al., 2009).

Teachers play an integral role in developing self-regulation in their students by how they instruct, structure the classroom, and the relationship they form between the students (Cameron & Morrison, 2011; Lambert, Cartledge, Heward, & Ya-yu Lo, 2006; Nowacek, McKinney, & Hallahan, 1990; Archer & Hughes, 2011; Marzano & Pickering, 2011; Bandura, 1991). Both national and state certification bodies for teachers encourage standards of teaching that support self-regulation. The National Board of Professional Teaching Standards (2002) describes “accomplished” teachers in part as those who recognize that behavior occurs within the context of the child’s environment. Specifically, the standard holds that teachers are able to effectively use class time, instruct in a manner that sustains the attention of students, create a classroom environment that encourages learning rather than “controlling behavior,” and consider the child, context, and prior teaching experience to choose the appropriate management strategies. According to the National Association for the Education of Young Children (2009), teachers are responsible for implementing curricula that assists children in regulating their emotions, managing impulses, and minimizing frustration and anxiety. Within the state of Virginia, Standards of Teaching encourage teachers to use engaging

instructional practices and to create a learning environment that supports social interaction, active learning, and intrinsic motivation (Virginia Board of Education, 2012).

In spite of having mandates shaping the academic training for teachers, self-regulation interventions will ultimately be chosen and implemented based upon the teachers' attributions regarding children's difficulties with self-regulation. Attributions are causal beliefs influenced by the locus of cause, values, stability of the cause, and expectancy (Weiner, 2010). Similar to schema, attributions contribute to an individual's understanding of the world and the actions he or she takes. Research suggests that teachers' attributional style influences how they interact with children, how they organize instruction and the classroom environment, and their acceptance of behavioral treatments (Kulinna, 2008; Andreou & Rapti, 2010; Bibou-Nakou, Kiosseoglou, & Stogiannidou, 2000).

Previous studies indicated that teachers attribute children's difficulties with self-regulation to factors external to the school environment, i.e. genetics, child's motivation, and the family (Havey, Olson, McCormick, & Cates, 2005; Ho, 2004; Kulinna, 2008; Lovejoy, 1996; Poulou & Norwich, 2000; Ding, Li, Li, & Kulm, 2010; Bibou-Nakou, Kiosseoglou, & Stogiannidou, 2000). Furthermore, cross-cultural studies demonstrate that Chinese teachers attribute poor behavior to the child's low motivation (Ding, Li, Li, & Kulm, 2010); while Russian teachers, school psychologists, and parents believe that poor self-regulation is caused in part by social factors, i.e. poor parenting and the relationship with the teacher (Savina, Moskovtseva, Naumenko & Zilberberg, 2014). The attributions teachers make about the causes of a child's behavior are associated with intervention choice. For example, it was shown that that teachers who attribute

inattention and impulsivity to biochemical factors within the child largely (90%) recommended using medication and behavior modification (Havey et. al., 2005). When disruptive behavior is attributed to school factors, educational interventions are typically recommended (Andreou and Rapti, 2010). Further, teachers recommended speaking to the child as a primary intervention in response to the poorly regulated behavior (Kulinna, 2008). Teachers who attributed behaviors related to Attention Deficit Hyperactivity Disorder to biological factors, consequently recommend the use of medication (Havey et. al., 2005). A review of the literature demonstrates that though many previous studies addressed causal beliefs and interventions, few explored the correlation between the two factors and none have sought to inform teacher training.

### **Purpose of the Research**

The current study's purpose is to add to the body of literature regarding teacher attributional styles and subsequent interventions. Furthermore, the data collected is intended to inform the training of future teachers. It will provide more information on the ways elementary school teachers' beliefs influence the development of self-regulation in their students. The current study will answer the following research questions:

*1. What causal attributions do teachers make regarding inattention and impulsivity?*

It is expected that teachers will attribute both inattentive and impulsive behaviors to factors not related to school (organic/biological low motivation, and family environment) to a greater degree than the variables in the educational environment (structure of classroom environment and appropriateness of instruction).

*2. Are there any differences in causal attribution of inattentiveness vs. impulsivity?*

It is expected that inattention will be attributed to environmental factors (classroom organization and instruction) to a greater degree than impulsivity. While impulsivity will be attributed to biological/organic factors to a greater degree than attentiveness.

*3. What interventions do teachers prefer to use in response to inattentive and impulsive behavior?*

a) Given the previous research, teachers will prefer environmental changes (reorganizing the classroom, modifying instruction, and changing the classroom seating arrangement) more than consulting with other school professionals or recommending medication (Curtis, Pisecco, Hamilton, & Moore, 2006; Andreou & Rapti (2010); Algozzine, Ysseldyke, Christenson, & Thurlow, 1983; Johnson & Pugach, 1990).

b) It is expected that for inattentive behavior, teachers will have stronger preference for environmental interventions (adjusting the child's seating, adapting the instruction to engage the child more, and limiting the distractions in the classroom environment) than for impulsive behavior. On the other hand, for impulsive behavior teachers will prefer to recommend medication to greater degree than for inattentiveness.

*4. Are there any associations between causal attribution of inattentiveness and impulsivity and intervention choice?*

It is expected that the type of attribution will influence teachers' choice of subsequent interventions. Specifically, teachers who hold environmental types of attribution (inappropriate instruction or distracting classroom environment) will likely prefer interventions related to changing the environment (making instruction more

engaging and reorganizing the classroom environment). On the other hand, teachers who attribute problem behavior to biological factors will favor medication.

## CHAPTER 2. LITERATURE REVIEW

One of the key variables associated with school success is students' ability to self-regulate their behavior, emotions, and learning (McClelland & Cameron, 2012).

Developmentally, self-regulation relates to one's ability to begin and end activities, comply with a request, control impulses to fit the demands of certain social contexts, delay gratification of accessing a goal, and monitor verbal and motor responses in the absence of an external mediator (Kopp, 1982). Self-regulation affects internal processes such as cognition and emotion. When compared to typically-developing peers, children with poor self-regulation have poor self-concepts, a diminished sense of self-efficacy, and ineffective academic attributional patterns (Tabassam & Grainger, 2002). Furthermore children with poor self-regulation skills, as seen in Attention Deficit Hyperactivity Disorder (ADHD), are increasingly susceptible to depression, attributing their disruptive behavior to an innate deficit (McQuade, Hoza, Waschbusch, Murray-Close, & Owens (2010).

Self-regulation becomes especially important as children enter school (McClelland & Cameron, 2012). Children with better self-regulation functioning typically perform well academically and take more responsibility for their own learning (Connor, Ponitz, Phillips, Travis, Glasney, & Morris, 2010; Dembo & Eaton, 2000). The academic success fostered through self-regulation persists through the sixth grade if first established in the kindergarten classroom (Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). The impact of self-regulation goes beyond that of the child and permeates the environment in which the child learns as well. Children in classrooms

where their peers have poor self-regulatory skills perform worse on reading comprehensions tasks (Skibbe, Phillips, Day, Brophy-Herb & Connor, 2012).

### **Behavioral and Instructional Strategies and Interventions to Support Self-Regulation in the Classroom**

Successful learning requires self-regulation skills, and teachers play an important role in creating environments conducive to this process. Self-regulation skills can be promoted in the classroom in several ways including organization of the classroom environment, the instruction provided to students, explicit teaching of self-regulatory skills and metacognition, encouraging private speech, and facilitating strategic use of working memory. The role of teachers is imperative in supporting children's ability to regulate themselves through planning, initiating, and executing tasks.

#### *Organization of Classroom Environment*

Psychological processes of regulation develop from external stimuli being integrated within the person through the process of internalization (Vygotsky, 1978); therefore, organization of the classroom environment is essential in order to foster students' self-regulation. Rimm-Kaufman and colleagues (2009) found that classroom quality (the degree of emotional and instructional support and classroom management) is associated with higher ratings of cognitive self-control and academic engagement and reduced off-task behavior in kindergarten children. Teachers who emotionally support their students, provide effective instruction, and manage their class well, have children who exhibit more pro-social behavior and better impulse control.

A classroom environment supportive of self-regulation should have well-established routines. Setting up routines can create expectations that can be internalized

by children so that they may move from adult-directed interactions to peer- and self-directed interactions (Rimm-Kaufman et.al., 2009). Well-established classroom routines increase classroom efficiency by freeing up valuable instructional time often used to manage student behavior (Trussell, 2008). Furthermore, a clear routine, including transitions, a defined beginning and end, steady pacing, assigned independent seatwork, and a scaffolded presentation of new information, supports sustained attention in the students (Marzano & Pickering, 2011). In fact, more experienced teachers do more to create and maintain routines in their classrooms than less experienced teachers (Bohn, Roehrig, & Pressley, 2004; Leinhardt, Weidman, & Hammond, 1987). Bohn et al. (2004) found that in many cases, the management systems of effective teachers are almost unnoticeable because they are so salient. In these classrooms, teachers spent time at the outset of the school year teaching routines and practicing them with their students. Meaningful routines that clearly set the expectations for students' decrease inappropriate behavior by encouraging appropriate classroom behavior (Capizzi, 2009). Children in classrooms where teachers create a routine for the students that provide predictability, have more processing capacity available, ultimately enhancing the opportunity for a child to learn (LaParo, Pianta, & Stuhlman, 2004; Morrow, Tracey, Woo, & Pressley, 1999).

Rules are another element of classroom organization that support the development of self-regulation. Stating the desired behavior in rules can help students regulate and discipline themselves, increasing independent work and problem solving (Malone & Tietjens, 2000). Involving children in the creation of rules fosters ownership of the rules, creating a sense of community, making the rules meaningful, and increasing the students' respect for the rules. The most effective rules are established by teacher and students and

involve an average of 5.6 guidelines related to speaking, interpersonal interaction, movement, supplies, and lesson assignments (Malone & Tietjens, 2000).

Along with well-formulated rules, students' seating arrangement in the classroom can be important in promoting self-regulated behavior. A meta-analysis of nine studies indicated that 7 arranging seats in rows rather than in clusters or groups increases on-task behavior and either maintains or dramatically increases the quality of students' work (Wannarka & Ruhl, 2008).

One prominent model of self-regulated learning in action is the Responsive Classroom (RC) model (Rimm-Kaufman, Fan, Chiu, & You, 2007). The Responsive Classroom approach is grounded in four main concepts: Engaging academics, social interaction, effective behavior management, and attention in students. In combining these four pillars, teachers create an optimal learning environment where social learning theory meets developmentally appropriate academic goals. Many of the practices used, such as providing clear directions, collaborating with children to create clear expectations for behavior, structuring the physical space of the room to meet developmental needs, and establishing a regular routine, have been supported by previous research to foster self-regulation in the students (Center for Responsive Classroom, 2015). Created in 1981, the RC model has become an empirically-based practice for classrooms and is effective in improving the academic performance of children in low socio-economic status and increasing students' math performance (Rimm-Kaufman et. al., 2007). Rimm-Kaufmann and Chiu (2007) found that teachers using the RC practice demonstrated greater perceived closeness to their students, more assertion in teaching the students, and reported improved pro-social behavior amongst the students in the class. The use of the

Responsive Classroom approach mitigated past negative behavior experiences of children and is thought to likely close the achievement gap between majority and minority students as family risk status did not negatively impact the progress of students in the RC cohort (Rimm-Kaufmann & Chiu, 2007).

### *Organization of the Instruction to Promote Self-Regulation*

Instructional methods significantly affect a child's self-regulation. Instruction is defined as any direct or indirect action taken to increase the students' ability to master the curriculum (Cameron, Connor, & Morrison, 2005). The organizing component of instruction refers to clear explanation of the objectives for an activity, preparation of students for future tasks, and intentional scaffolding of information so that children may practice various skills related to the task (Gaskins & Pressley, 2007). Teachers who organize their instruction well tend to have stronger classroom management skills, which are associated with increased independent work and improved reading achievement in children (Cameron, Connor, Morrison, & Jewkes, 2008). Alternatively, in the classrooms where teachers spend more time on non-instructional activities such as transitioning, gathering materials or organizing a lesson in vivo, students demonstrate lower achievement performance (Arlin, 1979). Research indicates that teachers who are effective in organizing their instruction have certain characteristics and behaviors. For instance, these teachers maximize academic learning time, set high expectations for their students, maintain a swift and steady pace, and present information in a clear way (Nowacek, McKinney, & Hallahan, 1990). The explicit instruction framework provides guidelines for organization of the introduction of new academic lessons or curriculum. It emphasizes such strategies as providing a concise focus on critical information,

sequencing, organizing the lesson, clearly stating lesson goals, reviewing and previewing, modeling, and giving opportunities for teacher supported practice (Archer & Hughes, 2011).

When teachers plan their lesson in advance to fit the individual needs of their students, teachers tend to be more efficient in the classroom and further build students' expertise (Connor, Ponitz, Phillips, Travis, Glasney, & Morrison 2010). Children with low self-regulation receiving instruction in classes where teachers planned lesson as constructed by the Assessment-to-instruction (A2i) computer program made gains in self-regulation and academic skills. The A2i software generated recommended individualized strategies for each teacher specific to the teacher's unique instruction. Teachers using the A2i organized their classrooms in a way that allowed children to be aware of the timing of tasks in the class (preview of the agenda), reduced distractions through regular routines, used differentiated instruction, and engaged children in independent work with peers. Children with low self-regulation demonstrated the greatest gains in behavioral self-regulation measured by the test of motor inhibition Head-Toes-Knees-Shoulders. Those who began with relatively high levels of self-regulation maintained those levels and demonstrated gains in reading achievement measured by the Woodcock Johnson III Tests of Achievement (WJ III). Teachers in the intervention group also had fewer classroom disruptions requiring behavior management and increased instructional time (Connor et. al., 2010).

Another aspect of instructional organization is orientation to the activity. Cameron and Morrison (2011) studied the association between of activity orienting strategy on students' self-and regulation and academic skills. Orienting the act of a

teacher providing a preview of upcoming activities, explaining an activity, providing center locations along with demonstrating what is to be done for each task. The results indicated that children in classrooms where teachers spent more time on orienting activity tended to score higher on measures of behavioral self-regulation (measured by Head-to-Toes Task) and overall achievement. Teachers were more effective when they presented information in a structured manner, preparing children for what is to come in the day (Cameron & Morrison, 2011).

In addition to the effective use of orienting for the classroom environment, strategies for the individual child may also be implemented to enhance self-regulation. For instance, response cards may be used by the child to reduce impulsive behavior (Armendariz & Umbreit, 1999; Lambert, Cartledge, Heward, & Lo, 2006). The premise behind this strategy is that asking students to pause and write down their responses actively engages students in instruction and inhibits their impulsive behavior. When using this approach with fourth-grade students, disruptive behavior decreased and anticipation, opportunities to respond to an academic question, and correct responses to math instruction increased (Lambert et.al., 2006).

#### *Promoting Self-Regulated Learning and Metacognition through Instructional Interventions*

Self-regulated learning is a child's ability to work independently to plan, implement, and evaluate a process wherein decision-making is ongoing and intertwined with motivation (Wirth & Leutner, 2008). In particular, self-regulated learners are driven by self-imposed goals and continuously monitor their progress toward those goals,

adjusting their time, physical space, and methods to attain those goals (Wirth & Leutner, 2008).

A child's efficacy and intrinsic motivation further influence self-regulated learning (Zimmerman, 2002). Zimmerman (2002) identified three phases of self-regulated learning: Forethought, performance, and self-reflection. It involves the progression from planning to focusing attention and implementing various strategies, to making causal attributions about the product. During the performance phase, metacognition arises as a vital component of self-regulated learning. Metacognition involves a child being aware of his thoughts throughout the learning process, employing specific strategies to fit the needs of particular problems (Zimmerman, 2002; Gaskins & Pressley, 2007). Metacognition serves an essential role in children's academic success as it leads to children being able to assess their strengths and weaknesses, while setting attainable goals (Gaskins & Pressley, 2007; Flavell, 1979).

Metacognitive skills include awareness of various learning strategies, knowledge of appropriate use of particular strategies, recognition of potential for growth in skills, intrinsic motivation, planned execution of strategies, and automatic access to prior knowledge (Borkowski & Burke, 1996). One metacognitive strategy, thinking aloud, has produced success in reading comprehension tasks. Using thinks-alouds, teachers encourage students to give reasons for their responses on reading comprehension tasks (Ward & Traweek, 1993). Students are further challenged through "interpretive processing," evaluating whether an answer makes sense given the context of the text. In particular, this strategy induces self-monitoring that may not yet be automatic in children. Additionally this method forces children to attend to the passage while read and reduces

the likelihood of guessing when answering comprehension questions. The use of think-alouds improves children's in-the-moment processing of information and reading comprehension. However, it may not strongly affect knowledge of metacognitive reading strategies to be used in the future after direct instruction or external mediator of the think-aloud method is no longer present. Children identified as "good readers" use comprehension and monitoring automatically until they meet a challenge, requiring implementation of a new intervention (Ward & Traweek, 1993).

As demonstrated through the research on reading, self-regulation is pertinent in a variety of academic subjects, including writing. Harris and Graham (1992) determined that a certain "metascript" might be used to foster use of metacognitive strategy in writing composition through active collaboration between the teacher and student. Seven stages of instruction were found to help students gain more metaknowledge for strategy use: 1) pre-skill development, 2) goal-setting, 3) exploration of writing strategies, 4) modeling of the strategy by the teacher and subsequent self-instruction by the student, 5) demonstration of strategy mastery, 6) collaborative monitoring of goal setting and achievement with the teacher and student, and 7) student plans and writes independently. Children who used metacognitive strategies exhibited improved writing skills and short-term generalization of the skills across settings, teachers, and modes of writing, typed or handwritten (Harris & Graham, 1992).

Along with reading and writing, metacognitive strategies are important to mathematics. Children who use metacognitive monitoring to solve a problem are more likely to get the correct solution. Carr, Alexander, & Folds-Bennett (1994) used the Intellectual Achievement Responsibility (IAR) to measure children's use of external aids,

i.e. using counters, counting on hands, internalized strategies, counting in the head as described by the child, or automatic retrieval (no strategy, “I just knew it”) to solve math problems. The purpose of the research was to determine children’s use of metacognitive strategies. Children who learned strategies and knew how to correctly apply them exhibited greater metacognitive knowledge in relation to mathematics.

Self-evaluation is an important component of self-regulated learning. Labuhn, Zimmerman, and Hassellhorn (2010) found that the feedback teachers provide to their students can promote metacognition when the feedback is clear and based on standards known by the children. Children receiving both socially comparative and individual feedback increased the accuracy of self-evaluation. Furthermore, the children in this study increased their ability to self-monitor when using multiple sources of feedback, including a visual chart by which they could assess themselves (Labuhn et.al., 2010). Incorporating self-evaluation into a curriculum enhances metacognition by providing children an opportunity to set goals and monitor themselves, further gaining an awareness of their unique strengths and weaknesses (Zimmerman, 2000).

Gaskins and Pressley (2007) stated that students who mastered metacognitive skills have knowledge of strategies (use and appropriateness), put emphasis on effort to attain goal, and use flexible self-monitoring and implementation of strategies. These children also have a good understanding of the lesson content, are knowledgeable of the workings of the mind and how this affects learning. Further, they are willing to work to overcome “perceived deficits,” actively involve themselves in the process of learning through goal setting and reflection, and are familiar with their own style of learning and use strategies based on that knowledge. Gaskins and Pressley (2007) designed an

instructional model that supports the learning of metacognitive strategies. The model has six components: Explanation of the strategy, utilization of explicit instruction to familiarize students with mechanisms of the brain, promotion of self-monitoring via self-talk, facilitation of goal identification, education on the impact of inattention and impulsivity on learning, and control of learning situations through self-evaluation.

There are several reasons why students should be taught self-regulation strategies, including the need to instruct students on how to learn, to promote autonomous learning and flexible thinking, to aid students in identifying and moving beyond weaknesses, and to hone in on the process of learning. Teaching metacognitive or executive processes should be embedded in the curriculum and taught explicitly in a structured and systematic way (Meltzer, Pollica, and Barzillai, 2007; Ward & Traweek, 1993). Motivation and effort should be promoted through explaining the benefit of deliberate use of metacognitive strategies to students. Meltzer and colleagues (2007) designed an intervention program, Drive to Thrive, which helps to create the aforementioned strategic classroom. Drive to Thrive has the following elements: planning and setting goals (organizing materials and time to initiate a task, essential in reading, writing, and completion of large projects), organizing and prioritizing (arranging information categorically and in order of importance, used in composition, note-taking, and studying), shifting flexibility (fluidly moving from one cognitive mindset to the next), self-monitoring and self-checking (track one's own progress and identifying strengths and weaknesses).

Another area of teaching students metacognitive skills, is applying those skills to cognitive processes, for example, teaching students metamemory skills. Dehn (2008)

posits that metamemory is essential to acquiring memory strategies. This skill allows one to become aware of one's own strengths and weaknesses in regards to memory. Research indicates that students in high mnemonic classrooms outperform same-age peers in low mnemonic classes on math and language arts tasks (Ornstein, Grammer, & Coffman, 2010). High mnemonic classrooms were characterized by teachers who suggested memory strategies such as clustering, repetition, visual organizers, and metacognitive questioning, while providing explicit instruction on memory within learning tasks. Furthermore, teachers in high mnemonic classrooms prompted the children to use certain memory tools within a lesson and placed deliberate demands on the use of memory strategies. Ornstein, Grammer, and Coffman's (2010) work demonstrated that in elementary children, explicit teaching of metamemory strategies enhances the effectiveness of memory strategies on academic tasks. Specifically, children in the high mnemonic classrooms demonstrated improvement in their academic achievement and maintenance of the strategic memory devices learned in the class.

#### *Private Speech in the Classroom*

Internal speech is a fundamental self-regulation tool (Luria, 1960). It develops from external speech with private speech being an intermediate step towards the inner speech (Winsler, 2009). Research on teachers' awareness of and beliefs about private speech indicates that teachers do not have full understanding of the role of private speech in child's task performance: while many teachers have observed children using private speech, they had difficulties identifying its purpose (Deniz, 2009). Furthermore, teachers attribute private speech to being a result of frustration, the need to problem solve, an attempt to avoid a task, or simply a distraction for both the teacher and other students in

the area. With this vast array of beliefs about private speech, it comes as no surprise that teachers' practices in relation to private speech differ depending on the context in which it is seen, with some being more accepting of it when they deem it typical or a means of coping for the child. In the case of identifying the private speech as a coping style, teachers either ignored, discouraged, or encouraged private speech (Deniz, 2009).

### *Facilitating Working Memory in the Classroom*

From the neuro-cognitive perspective, working memory serves an essential role in self-regulation. This mechanism aids in the person's ability to mentally sequence information and shift from one task to the next (Banfield, Wyland, Macrae, Munte, & Heatherton, 2004). Working memory is most important at early stages of learning. As children mature, basic skills that are mastered are cemented in long-term memory, requiring less working memory. However, children may continue to benefit from further honing their working memory skills beyond the early formative development years. Direct teaching of memory strategies (chunking, repetition, routine, mnemonics, etc.) is important because it enhances executive use of working memory, allowing children to build skills in accessing strategies, inhibiting irrelevant information, and managing their resources to solve a problem (Dehn, 2008). Since working memory has limited capacity, automaticity in task performance is essential because it releases space in the brain for children to learn new information. When automaticity is achieved for basic skills, even children with working memory deficits can rely less on their capacity for working memory and make academic progress (Dehn, 2008). Making information meaningful to children increases the likelihood of it being kept in working memory and learned. One mode of adding meaning is dual encoding wherein combining visuospatial and verbal

processing involves higher level working memory skills, proving more effective than isolated use of visual or verbal strategies. When more than one retrieval route is created, retention of the info is more likely and long lasting (Dehn, 2008). Brain imaging also supports the use of integrated or dually encoded information. The prefrontal cortex is activated more when verbal and spatial information is combined rather than when presented alone (Prabhakaran, Narayanan, Zhao, & Gabrieli, 2000).

#### *Teachers Attributions and Interventions Regarding Problem Behavior in the Classroom*

Though the research indicates particular interventions that are effective for improving self-regulation, teachers have their own preferences to counteract inattention and impulsivity. Teachers historically have preferred to address disruptive behavior by understanding the problem a child has and taking action in the classroom to promote change prior to referring the child for specialist services or medication (Algozzine, Ysseldyke, Christenson, & Thurlow, 1983). Furthermore, teachers are least likely to use an intervention if it will seemingly exacerbate the child's behavior problem or the rules of the school discourage use of a certain intervention (Johnson & Pugach, 1990). In Johnson and Pugach's 1990 study, the top 5 of 52 preferred interventions were: to consult other teachers regarding the student's problematic behavior, emphasize the student's positive behaviors, discuss academic problems with the parents, consult with other teachers on ways to improve academic problems, and adjust performance expectations to increase the probability of student success.

In comparing teachers from the United States ( $N=159$ ) and teachers from New Zealand ( $N=261$ ), researchers found that U.S. teachers prefer to use medication to address inattention more than their New Zealand counterparts (Curtis, Pisecco, Hamilton, &

Moore, 2006). Teachers were provided scenarios about children with inattentive behaviors and then given the option of four interventions: daily response card, response cost, medication, and classroom lottery. American teachers perceived response cost to be more acceptable in intervening for disruptive behavior than did teachers in New Zealand (Curtis et. al., 2006).

While teachers have preferences in the interventions they use, they also have attributions that indelibly influence the way they teach, manage classroom behavior, and shape the experiences of their students (Ames & Ames, 1984). According to Weiner (2010), attributions are causal beliefs influenced by the locus of cause, values, stability of the cause, and expectancy. Attribution styles of teachers has been researched in relation to management of anti-social and pro-social behavior (Arbeau & Coplan, 2007), behavioral symptoms of ADHD (Havey, Olson, McCormick, & Cates, 2005), learning styles (Ross, Bierbrauer, & Polly, 1974), internalized and externalized behaviors (Savina, Moskovtseva, Naumenko & Zilberberg, 2014) and disruptive behavior (Ho, 2004; Lovejoy, 1996; Poulou & Norwich, 2000). Within the literature, various types of causal attributions have been studied including biological factors, family environment, community environment, organization of the classroom, teacher characteristics, motivation of the child, and locus of control (Havey et. al., 2005; Ho, 2004; Kulinna, 2008; Lovejoy, 1996; Poulou & Norwich, 2000; Ding, Li, Li, & Kulm, 2010; Bibou-Nakou, Kiosseoglou, & Stogiannidou, 2000).

Attributions of teachers appear to vary cross-culturally. Teachers in Australia and China attribute disruptive behavior to the child and family more so than to school-related factors (Ho, 2004). Teachers from both countries attributed poor behavior in students

most to lacking effort on the part of the student, with the least amount of causal attribution noted for teachers. However, the study also exemplified cultural differences Chinese teachers placed more attribution on the student's family while Australian teachers focused on the student's ability (Ho, 2004). In another study, Greek teachers ( $N=391$ ) surveyed using an Attribution Inventory provided insight on causal attributions made regarding six scenarios of disruptive behavior (Poulou & Norwich, 2000). Disruptive behavior was attributed to the school environment and the teachers themselves. These professionals expressed significant levels of sympathy for the children with disruptive behavior and chose more positive reinforcement strategies to increase desired behavior (Poulou & Norwich, 2000).

When comparing professional teachers and undergraduate students, Ross, Bierbrauer, and Polly (1974) found that both groups tend to attribute success to a child's ability and see failures as more related to their efforts as teachers. The participants consisted of 32 schoolteachers and 32 Stanford University undergrads. Participants in both groups individually taught an 11-year old how to spell 25 commonly misspelled words, while being observed. Subjects were given pre- and post-test questionnaires to capture their attributional patterns and expectations of the student. In comparison to undergraduate students, professional teachers were more likely to attribute failure of the child to themselves as teachers.

It appears that attributional styles for teachers develop during the teacher training years. Lovejoy (1996) surveyed 227 undergraduate students from introductory psychology classes and education courses. The participants attributed inattentive and hyperactive behavior to stable causes, innate to the child and aggressive behavior to the

child's environment. The participants most preferred to place the aggressive child in time out as an intervention for the behavior. For inattention, the participants preferred calmly using inductive reasoning with the child to intervene on the behavior. These results are an early indication of the impact that attributions for poor self-regulatory behavior have on subsequent intervention.

In addressing the self-regulation needs of children, teachers have a number of beliefs regarding the impact of the behavior on the student and classroom as a whole. Lessened sustained attention of the child engaging in disruptive behavior, disturbance of the progress of other students, and the potential for aggression after reprimand are all attributed to poor self-regulatory behavior (Arbuckle & Little, 2004). The 96 teachers in the study had higher levels of concern for male students who engaged in disruptive behaviors than they did for female students. Though half of the teachers surveyed expressed confidence in managing disruptive behavior, approximately one-third of the teachers did not answer the question. The teachers were more likely to refer male students for support services and noted using staff meetings and in-services as methods of support to address concerning behavior (Arbuckle & Little, 2004).

When surveying 199 physical education teachers, Kulinna (2008) found that across elementary, middle, and high school, teachers attribute disruptive behavior (inattention, hyperactivity, and impulsivity) to parenting and home environment factors. Teachers perceived themselves and the school factors (class size, management, and services) as the least responsible for poor behavior. There were 27 possible strategies to choose in order to manage the hypothetical behavior, including catching the child being good, talking with the child directly, contacting the classroom teacher, calling the parents,

and consulting an outside expert. The physical education teachers in this study most often chose to directly talk to the child as an intervention for the disruptive behavior (Kulinna, 2008). Similarly, 56 elementary and middle school teachers surveyed attributed ADHD behavior to biological factors and recommended medication for the intervention. Each of the teachers completed a survey created for the study querying the cause of the ADHD (biological, environmental, extreme normal behavior, and combination) and appropriate treatment (medication, behavior modification, medication and modification together, or other). Teachers attributed ADHD behavior to biochemical factors within the child and a large percentage of the teachers (90%) recommended using medication and behavior modification (Havey, Olson, McCormick, & Cates, 2005).

Researchers surveyed 244 Chinese teachers of grades 1-12 regarding the cause of disruptive behavior, they found that teachers attributed it most to “laziness” on the part of the child, poor learning habits, and low interest in learning (Ding, Li, Li, & Kulm, 2010). The Chinese teachers chose rewarding the positive behavior of students and talking to misbehaving students after class most often for coping strategies (Ding et. al., 2010).

In exploring the attributions of not only teachers, but of school psychologist and parents as well, researchers found that Russian teachers tend to attribute internalizing and externalizing behavior less to themselves and more to social factors (Savina, Moskovtseva, Naumenko & Zilberberg, 2014). Each of the participants in this study was given two vignettes, one related to internalizing behavior and the other to externalizing. They were subsequently surveyed regarding causal attributions, the gravity of the problem, and recommended interventions. Teachers, parents, and psychologists agreed

that externalizing problems, more than internalizing behaviors, were related to poor parenting and poor relationships with teachers (Savina et al., 2014).

As demonstrated in several of the aforementioned studies, research suggests that the attributional style of the teacher influences the intervention chosen to address disruptive behavior. Two hundred teachers surveyed by Bibou-Nakou, Kiosseoglou, and Stogiannidou (2000) provided insight into the connection between the psychological process of attributions and the choice of behavioral interventions. It was found that the most agreed-upon factors for causing misbehavior were related to the child's character and family's influence. While factors related to the teacher were the least agreed-upon causal attributions. With regard to interventions, teachers were more likely to choose tactics such as ignoring the child's behavior than using punishment. When teachers attributed behavior to external student factors, they chose to either interrupt the child's behavior or ignore the behavior. In the case where behavior was attributed to internal factors for the child, teachers most often chose to ignore the behavior (Bibou-Nakou et al., 2000).

Andreou and Rapti (2010) provided 249 primary teachers a vignette depicting a male student misbehaving, along with a list of attributions, and a list of possible interventions, to determine teachers' attributions and preferred interventions. The causal attribution included factors related to the school, concerns related to the students, and factors related to the child's family. Subsequent interventions included assigning rewards, punishing the child, recommending counseling, explaining school rules, individualizing the child's instruction, engaging the child in class activities, pointing out the problematic behavior, and gaining the child's trust. Teachers who attributed poor behavior to the

school related factors were likely to recommend educational behavioral interventions, specifically pointing out the misbehavior and reminding the student of expected behavior while in school. Furthermore, teachers who attributed misbehavior to the child's family were likely to recommend counseling for the student (Andreou & Rapti, 2010).

## CHAPTER 3. METHOD

### Participants and Data Collection

First through fourth grade teachers ( $N=200$ ) in Prince George's County Public Schools (PGCPS) in Maryland were invited to participate in the survey. Each recipient was provided with an electronic link to the online survey, which took 7 minutes on average to complete.

Sixty-six teachers responded to the survey; 52 (female=50; male=2) completed the 27-item survey in its entirety. Regarding teachers' grade taught, there were 15 first grade teachers, 13 second grade teachers, 13 third grade teachers, 8 fourth grade teachers, and 3 teachers who omitted grade information. The mean age of the participating teachers was  $M = 40.2$  years old,  $SD = 14.2$  and the average years of teaching experience was  $M = 13.2$  years,  $SD = 11.0$ .

### Measures and Procedures

Quantitative data was collected from participating teachers in the form of a survey. The use of a structured questionnaire is a more effective means of collecting data on teacher's perceptions of students' behaviors than using open questions (Kieling, Kieling, Aguiar, Costa, Dorneles, & Rohde, 2014).

A 27-item survey was designed specifically for this study. The survey has four parts: the first part measures teachers' causal attributions of inattentiveness including organic/biological factors, family, classroom environment, appropriateness of instruction, and poor motivation of the child. Teachers were asked rate their agreement with the likelihood of organic/biological factors, family, classroom environment, instruction, and lack of interest/motivation causing inattention. A 10-point Likert-scale was used with 0

meaning very unlikely and 9 meaning very likely. In the second part, the teachers were presented with the following scenario: *“You noticed that one student in your classroom is often inattentive. He/she looks at the windows or talks to his/her peers. He/she often misses verbal instructions given by you and because of that, he does not complete his work.”*

Imagining that they were the teacher in the classroom with this student, teachers were asked to select the most appropriate intervention including: a) moving the child closer to the teacher to supervise the child more often, b) revise how the classroom is organized, c) modify instruction to make it more interesting and engaging, d) discuss the problem with the student’s parents, or discuss the problem with the school psychologist; and e) medication. A 10-point Likert scale was used to capture teachers’ imagined responses with 0 meaning very unlikely and 9 meaning very likely to use that intervention. The perceived difficulty of having a child with inattentive behavior in the classroom was captured using a 10-point Likert scale. Teachers were also queried as to whether the described behavior is more typical for a boy, girl, or gender does not matter.

The third part measured teachers’ causal attributions for impulsivity. The same causal attributions offered for inattention, including, organic/biological factors, family, classroom environment, inappropriate instruction, and poor motivation were provided for impulsivity. In the fourth portion of the survey, teachers were provided the following scenario: *“You noticed that one student in your classroom is often inattentive. He/she looks at the windows or talks to his/her peers. He/she often misses verbal instructions given by you and because of that, he does not complete his work.”* Using similar interventions (move the child, reorganize the classroom, etc.) listed for the inattentive

behavior scenario, teachers were asked to indicate how likely they would respond given each suggested intervention. The perceived gender of the child and difficulty in managing impulsivity in the child were also queried at the end of this portion of the survey.

Demographic information including age, number of years taught, current grade being taught, and the gender of the teacher was collected at the beginning of the questionnaire. The full survey can be found in Appendix A.

### **Data Analysis**

Paired *t*-tests were run to compare teachers' attributions of inattentiveness with attributions of impulsivity. Five variables were compared including attributions of child inattentiveness and impulsivity to organic causes, family, classroom environment, appropriateness of instruction, and motivation. Paired *t*-tests were also used to compare teachers' preferred interventions for inattentiveness with interventions for impulsivity. Such interventions included moving the child's seating position in the classroom, changing the classroom environment, consulting a school psychologist, calling the parents, or recommending medication). Cohen's *d* was computed for the each paired *t*-test to determine the effect size. Finally, Pearson's *r* was calculated to explore the associations between attributions and interventions.

## CHAPTER 4. RESULTS

Distributions of the participants' gender, grade taught, and years of teaching experience are presented in Table 1. A larger proportion of females than males participated in the study.

Table 1

*Participants' Characteristics*

	Teacher Sample
Gender	
Female	50 (96.2%)
Male	2 (3.8%)
Current Grade Level	
First	15 (28.8%)
Second	12 (23.1%)
Third	13 (25.0%)
Fourth	8 (15.4%)
Other (teaching multiple grade levels or Missing information)	3 (5.8%)

### Research Question 1

*What causal attributions do teachers make regarding inattention and impulsivity?*

Descriptive statistics regarding causal attributions are provided in Table 2. The inspection of the means revealed that the most popular attribution of inattention was child's family and child's lack of motivation, followed by the appropriateness of

instruction, classroom environment, and biological factors. However, as one can see, the differences between means are rather small. With regard to impulsive behavior, teachers' attributions demonstrate a similar pattern found with inattention. The most popular attribution for impulsivity was family, followed by organic factors, and child's motivation. For inattention and impulsivity, instruction and classroom environment, were rated as less probable cause of child behavior. The results confirm the hypothesis that teachers will favor attributing inattention and impulsivity to the family, biological factors, and motivation to a greater degree than factors related to the school.

Table 2

*Causal Attributions of Teachers by Type of Behavior*

	Inattentiveness M (SD)	Impulsivity M (SD)
Attributions		
Organic/Biological Factors	6.00 (2.13)	6.37 (1.95)
Family	7.06 (2.01)	7.27 (1.87)
Classroom Environment	6.08 (1.94)	5.62 (1.65)
Instruction	6.50 (1.96)	5.52 (2.00)
Child's Motivation	6.60(1.89)	5.77 (2.03)

*\*Responses based on Likert Scale of 0-9, with 9 being very likely*

**Research Question 2**

*Are there any differences in causal attribution of inattentiveness vs. impulsivity?*

Paired samples *t*-tests were conducted to determine whether there were statistically significant differences between the causal attributions made for inattentive behavior compared to attributions made for impulsivity. It was found that participants

attributed inattention to the child's motivation and the appropriateness of instruction to a greater degree than they attributed impulsivity,  $t(51) = 4.55, p < .000, d = 0.42$  and  $t(51) = 3.45, p < .001, d = 0.49$ , respectively. There were no significant differences between the two behaviors being attributed to biological factors, family, or classroom environment,  $t(51) = -1.66, p = .102, t(51) = -.834, p = .408, t(51) = 1.44, p = .155$ , respectively.

Furthermore, there was no significant difference in the perceived level of difficulty in managing inattention compared to impulsivity,  $t(51) = .677, p = .501$ .

Contrary to the hypothesis, the results suggest that teachers notice no difference in how challenged they are by inattention or impulsivity in children.

### Research Question 3

*What interventions do teachers prefer to use in response to inattentive and impulsive behavior?*

Table 3

#### *Interventions Chosen by Teachers by Type of Behavior*

	M (SD) for Inattentiveness	M (SD) for Impulsivity
<b>Interventions- Inattention</b>		
Move Child Closer	7.96 (1.58)	6.40 (2.46)
Change Classroom Environment	6.63 (2.25)	5.73 (2.41)
<b>Environment</b>		
Change Method of Teaching	7.19 (1.75)	5.69 (2.33)
Parent Conference	7.75 (1.68)	7.54 (2.01)
Consult School Psychologist	5.88 (2.26)	5.48 (2.65)
Medication Referral	5.21 (2.06)	4.96 (2.44)

*\*Responses based on Likert Scale of 0-9, with 9 being very helpful*

Descriptive statistics regarding interventions are provided in Table 3. The inspection of the means revealed that the most recommended intervention for inattention was moving the child closer to the teacher and contacting the child's parents for a conference, followed by the adjusting the method of instruction, changing the classroom environment, consulting the school psychologist, and referring the child for medication. With regard to impulsive behavior, teachers' chosen interventions demonstrate a relatively similar pattern found with inattention. The most common intervention for impulsivity was calling a parent conference, followed by moving the child closer to the teacher, changing the classroom environment, and adjusting the method of instruction. For both inattention and impulsivity, consulting with the school psychologist and referring the child for medication were the least recommended interventions.

*Are there differences in preferences for interventions for inattentiveness versus impulsivity?*

With regard to interventions, teachers prefer to move children closer to them, reorganize the classroom environment, and change their method of teaching more for children with inattentive behaviors than those with impulsive behavior,  $t(51)=5.28$ ,  $p<.000$ ,  $d=0.75$ ,  $t(51)=2.46$ ,  $p=.017$ ,  $d=0.39$ , and  $t(51)=5.08$ ,  $p<.000$ ,  $d=0.73$ , respectively. There was no significant difference for contacting the parent,  $t(51)=1.00$ ,  $p=.322$ , consulting the school psychologist,  $t(51)=1.82$ ,  $p=.075$ , or recommending medication,  $t(51)=.925$ ,  $p=.359$ . Therefore, teachers are more likely to make modifications in the classroom for children with inattentive behaviors than for children with poor impulse control. However, consulting parents and specialists, and recommending medication were just as likely for both inattention and impulsivity.

#### Research Question 4

*Are there any associations between causal attribution of inattentiveness and impulsivity and intervention choice?*

Table 4

*Correlations between Causal Attribution and Recommended Intervention for Inattention*

	Move Closer	Change Environment	Change Method	Contact Parent	School Psychologist	Medication
Organic/Biological	.255	.114	.121	.110	.049	.392**
Family						
Classroom Environment	.124	-.030	.119	.074	-.067	.205
Instruction Appropriateness	.014	.155	.302*	-.024	-.047	.192
Child's Motivation	.120	.341*	.642***	.272	.195	-.041
	-.012	.181	.160	.264	.163	.138

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

Table 4 displays the correlations between causal attribution and chosen behavior practice for inattention. With regard to inattentive behaviors, there was a significant positive correlation between teachers attribution of inattentiveness to the appropriateness of instruction and recommendation to change the method of teaching and change the classroom environment,  $r = .642, p < .000$  and  $r = .341, p = .013$ , respectively. When teachers believe that the environment of the classroom causes inattention, there is a stronger desire to adjust the method of instruction,  $r = .302, p = .030$ . Teachers' attribution of inattentive behavior to organic/biological factors positively correlated with the recommendation of

medication,  $r = .392$ ,  $p = .004$ . As anticipated, when teachers attribute inattention to biological/organic factors, they are likely to suggest medication; however, when the behavior is attributed to environmental factors, teachers recommend changes to the classroom environment and instruction.

Table 5

*Correlations between Causal Attribution and Recommended Intervention for Impulsivity*

	Move Closer	Change Environment	Change Method	Contact Parent	School Psychologist	Medication
Organic/Biological	.226	.359**	.413**	.298	.223	.497***
Family	.040	-.031	-.012	.508***	.056	.161
Classroom Environment	.034	.240	.270	.105	.173	.113
Instruction Appropriateness	-.255	.140	.296	.012	-.048	-.165
Child's Motivation	-.197	-.017	.304*	.271	.058	-.030

\*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

As captured in Table 5, attribution of impulsivity to organic/biological factors was positively associated with a desire to change the method of instruction, adjust the classroom environment, and recommend medication,  $r = .413$ ,  $p = .002$ ,  $r = .359$ ,  $p = .009$ , and  $r = .497$ ,  $p < .000$ , respectively. These results confirm the hypothesis in part, as teachers who attributed impulsivity to biological factors recommended medication. However, the positive correlation between attributing impulsivity to organic factors and recommending changes to the classroom and instruction was not expected. Teachers' attribution of

impulsivity to child's family positively correlated with teachers 's desire to contact parents,  $r = .508, p < .000$ . Furthermore, there was an unexpected positive correlation between attributing impulsivity to the child's motivation and recommending modifying the method of classroom instruction,  $r = .304, p < .05$ .

### *Gender Differences*

Teachers also indicated if the behavior described in each scenario was more common for a boy or girl. Regarding inattention, 57.7% of teachers believed the child to be a boy, 1.9%, girl, and 40.4% indicated that the behavior could be a child of either gender. When assessing likely gender for impulsive behaviors, 61.5% of teachers believed the child in the scenario could be of either gender, 32.7% thought it may be a boy, and 5.8% indicated a girl.

## CHAPTER 5. DISCUSSION

The purpose of this study was to determine the attributions teachers make regarding inattention and impulsivity, along with the consequent interventions chosen. The current research contributes to a small, yet growing body of research related to the beliefs, values, and practices of elementary school teachers as related to self-regulatory behavior in students.

### *Results for Causal Attributions*

Results from this study suggest that teachers attribute both inattention and impulsivity most to the family, biological factors, and the child's intrinsic motivation. Factors related to the classroom, i.e. appropriateness of instruction and the organization of the classroom were least perceived by teachers as causing inattention and impulsivity. The teachers' distancing of themselves from behavioral problems in students corroborated results from previous research (Savina et al., 2014; Ho, 2004; Bibou-Nakou et al., 2000; Kulinna, 2008). The finding suggests that teachers may identify themselves as less efficacious in imparting change for students with poor self-regulation as they believe the causes are outside school environment and internal. However, research states otherwise. The manner in which instruction is presented and the environment of the classroom has a significant impact on the child's sustained attention and control of impulsive behavior (Cameron & Morrison, 2011; Lambert, Cartledge, Heward, & Ya-yu Lo, 2006; Nowacek, McKinney, & Hallahan, 1990; Archer & Hughes, 2011; Marzano & Pickering, 2011).

The results of paired *t*-tests indicated that teachers attributed inattention to the child's motivation and the appropriateness of instruction more than they attributed

impulsivity to motivation. At the same time, they attributed impulsivity to organic/biological factors and the family to a greater degree than inattention. Confirming the hypothesis, this finding suggests that teachers believe that inattention can be influenced by instructional practices to a greater degree than impulsivity. The discrepancy between attributions for inattention versus impulsivity may be due to teachers' experiences with and understanding of the two behaviors. Historically, teachers have demonstrated deficits in their understanding of the causes of and comprehensive treatment of inattention and impulsivity as manifested in ADHD (Arcia, Frank, Sanchez-LaCay, & Fernandez, 2000).

There was no significant difference in the perceptions of the difficulty managing the problematic behavior, whether it was inattention or impulsivity. Although, according to the participating teachers, inattentive behavior is more likely observed in male students, while impulsivity may be found in either gender. It is surprising that teachers differentiate gender when regarding inattention, yet not in impulsivity. Historically, teachers have demonstrated a referral bias, recommending that boys receive services for hyperactive, inattentive, and hyperactive-aggressive behaviors more than girls (Sciutto, 2004).

#### *Results for Preferred Interventions*

When provided a fictional scenario of a child with inattention or impulsivity, teachers chose two interventions most commonly. For the child with difficulty attending, teachers recommended moving the child closer to the teacher; while, in the case of impulsive behavior, teachers were more likely to recommend contacting the child's parents. Herein there is an implication that teachers differentiate impulsivity from

inattention in some way. The results suggest that teachers believe that proximity to them can influence the behavior of an inattentive child. However, children with impulsive behaviors are perhaps thought to respond less to changes in the classroom, requiring input from the child's parents.

Other interventions provided as options including changing the classroom environment, adjusting the method of instruction, consulting the school psychologist and recommending a referral for medication were the practices less likely to be used. It is surprising that contacting the school psychologist is one of the least likely chosen interventions. As indicated by the results, teachers' may prefer tiered approach wherein interventions begin in the classroom and may progress to more specialized responses as deemed necessary.

#### *Beliefs-Practice Correlations*

In the area of inattention, the obtained results indicated that teachers who attributed inattention to inappropriate instruction favored educational interventions such as changing the environment and modifying the method of teaching to a greater degree than contacting parents or recommending medication. Data further indicates a positive correlation between the attribution of inattention to the classroom environment and a desire to change the method of instruction. In addition, teachers who attributed inattention to organic/biological factors recommended medication to a greater degree. Previous studies corroborate the results finding that teachers who attribute inattention to factors related to the school recommend modifying the classroom environment and curriculum (Andreou & Rapti, 2010). However, teachers in this study recommended therapy for children when they attributed inattention to biological factors.

Regarding impulsivity, the data indicated a positive correlation between teachers attributing impulsivity to the family environment and contacting the parent as an intervention. Furthermore, there was a significant positive correlation between attributing impulsivity to the child's poor motivation and changing the method of teaching as an intervention. In this regard, teachers may be considering shaping the child's internal motivation via more engaging and more appropriate instruction. There were, however, unexpected positive correlations. Teachers who attributed impulsivity to biological factors in the child, not only suggested medication but also recommended adjusting the classroom environment and modifying the method of instruction. This finding may indicate that teachers recognize that in the case of impulsivity, not only medication, but also changing the classroom environment would be appropriate interventions.

Overall, the teachers' responses suggest a higher level of agreement in attribution and choice of intervention for inattention rather than impulsivity. This may be due to more familiarity with inattention in students or more training with that particular disruptive behavior. With each of the target behaviors, teachers are most likely to contact parents, move the child, and change the classroom environment to address the behavior. However, they are least likely to contact the school psychologist or recommend medication. Teachers may not feel comfortable suggesting medication to parents as they are not medical professionals and the scenarios did not specify a particular diagnosis. Recent research provides evidence that teachers have limited knowledge of the use of stimulant medication to address symptoms of ADHD (Snider, Busch, & Arrowood, 2003). Given the limited knowledge of and training teachers have regarding medication, it is positive that the results indicate teachers do not favor medication as an intervention

for disruptive behavior. With regard to the school psychologist, there seems to be an impediment limiting how teachers consult with psychologists. This instance may be related to teachers past experiences with school psychologists. Some teachers believe that school psychologists are not accessible due to the number of students they have to serve, may be dismissive of teachers' perspectives, serve in a reactive versus proactive manner, are difficult to form a relationship with due to their transient nature, and are less active in helping students (Roth, Leavey, & Best, 2008).

### *Limitations*

An apparent limitation of the current study is the small number of participants. Future research may benefit from additional recruitment efforts. Furthermore, soliciting participation of teachers from a greater number of school systems may add to the generalizability of the results.

Both the causal attributions and interventions were pre-selected. It may have been helpful to allow teachers to write in other attributions or interventions. Additionally, the use of hypothetical student scenarios may not fully capture the actual interventions teacher employ to address poor self-regulation.

### *Implications for Practice*

Given the current results, the following recommendations are being made with regard to the beliefs and practices teachers hold for poor self-regulation:

1. Teacher training programs may benefit from exploring the development of self-regulatory behavior along with discussing the impact teachers' beliefs regarding the cause of inattention and impulsivity have on classroom management. Though participants in the current research were less likely to attribute disruptive behavior

to factors in the classroom, they did endorse changing the instruction to address the behavior concerns of students as one of the top three interventions when ranked. The choice to change classroom factors indicates that teachers may benefit from further training in impact of class and school factors on shaping self-regulation.

2. The likelihood that teachers would consult a school psychologist was lower than the use of other suggested interventions. It may be beneficial for psychologists to be aware of these data and engage in outreach with teachers to perhaps advertise their skills and accessibility.

### *Future Research*

As little research has been done in this area, the current findings can be used to inform future interventions for teachers as well as to inform pre-service teachers training. Future research may explore the correlation between poor self-regulatory skills, specifically inattention and impulsivity, and family environment. Additionally, clarification on teachers' operative definition of inattention and impulsivity would be imperative to understanding their causal attributions and preferred interventions for disruptive behavior.

The actual practices of teachers in relation to impulsive and inattentive behavior could be explored further as well. Additional research could be conducted to explore sources of and influences on teacher beliefs. In particular, it would be of interest to explore the impact of training courses and pre-service experiences on teachers' causal attributions.

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## Appendix A

*Self-Regulation Survey*

**We would like to ask your opinion about students' inattentive and impulsive behaviors. There are no correct or incorrect answers to those questions. Please, answer how you think. Before filling out this survey, please provide the following information:**

Gender:        F        M

Age \_\_\_\_\_

Years of experience: \_\_\_\_\_

Grade you are teaching: \_\_\_\_\_

**Some students have difficulty with focusing and staying on task. In your opinion, what are probable causes for inattention in students? Please circle your answer.**

*Organic/biological causes (Brain malfunction, genetics, etc.)*

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

*Family environment (chaotic family, poor parenting)*

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

*Classroom environment (i.e. far distance from teacher, background noise, visual/auditory distracters, etc.)*

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

***Instruction is not appropriate for the student (Pace of instruction is too fast/too slow;***

***Learning material is too easy/too difficult for child's)***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

***Student's lack of Interest/motivation***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

---

**Do you experience difficulty working with inattentive students?**

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Not at all*

*Very often*

**Please read the following passage. Imagining that this is your classroom, how would you respond to each situation?**

**Scenario 1.** *You noticed that one student in your classroom is often inattentive. He/she looks at the windows or talks to his/her peers. He/she often misses verbal instructions given by you and because of that, he does not complete his work. What would you do in this situation? (Please, circle the number that corresponds to your opinion):*

**1. Move the student A closer to you and supervise him/her more often**

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very*

*likely*

**2. Revise how you organize your classroom (remove potential auditory and visual distracters)**

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very*

*likely*

**3. Modify your instruction to make it more interesting and engaging**

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

**4. Discuss this problem with the student's parents**

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

**5. Discuss this problem with school psychologist**

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

---

***In your opinion, would medication be helpful for this student?***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Not helpful at all*

*Very helpful*

***In your opinion, is the behavior in Scenario 1 more typical for?***

*Boys      girls      gender does not matter      (circle your answer)*

**Some students are very impulsive, they have difficulty inhibiting their reactions, regulation their emotions and act without thinking. In your opinion, what are some causes for impulsive behavior in students? Please circle your answer.**

***Organic/biological causes (Brain malfunction, genetics, etc.)***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

***Family environment (chaotic family, poor parenting)***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

***Classroom environment (i.e. far distance from teacher, background noise, visual/auditory distracters, etc.)***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

***Instruction is not appropriate for the student (Pace of instruction is too fast/too slow;***

***Learning material is too easy/too difficult for child's)***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

***Student's lack of Interest/motivation***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

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**Do you experience difficulty working with impulsive students?**

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Not at all*

*Very often*

**Please read the following passage. Imagining that this is your classroom, how would you respond to each situation?**

**Scenario 2.** *You noticed that one student in your classroom is very impulsive. He/she shouts his/her answers before your finish a question and often interrupts you. What would you do in this situation? (Please, circle the number that corresponds to your opinion):*

**1. *Move the student A closer to you and supervise him/her more often***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very*

*likely*

**2. *Revise how you organize your classroom (remove potential auditory and visual distracters)***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very*

*likely*

**3. *Modify your instruction to make it more interesting and engaging***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

**4. *Discuss this problem with the student's parents***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

**5. *Discuss this problem with school psychologist***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Very unlikely*

*Very likely*

---

***In your opinion, would medication be helpful for this student?***

0 \_\_\_ 1 \_\_\_ 2 \_\_\_ 3 \_\_\_ 4 \_\_\_ 5 \_\_\_ 6 \_\_\_ 7 \_\_\_ 8 \_\_\_ 9

*Not helpful at all*

*Very helpful*

***In your opinion, is the behavior in Scenario 2 more typical for?***

*Boys      girls      gender does not matter      (circle your answer)*