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The Development of Intrinsic Motivation in Children With Attention-Deficit/Hyperactivity Disorder

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Running Head: INTRINSIC MOTIVATION AND ADHD

The Development of Intrinsic Motivation in Children
With Attention-Deficit/Hyperactivity Disorder

by

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DISSERTATION

Submitted in partial fulfillment for the degree of
Doctor of Psychology in the Department of Clinical Psychology
at Antioch University New England

Keene, New Hampshire



Department of Clinical Psychology

DISSERTATION COMMITTEE PAGE

The undersigned have examined the dissertation entitled:

**THE DEVELOPMENT OF INTRINSIC MOTIVATION IN CHILDREN
WITH ATTENTION-DEFICIT/HYPERACTIVITY DISORDER**

presented on March 30, 2017

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Dedication

I dedicate this research to my nephew, Brandon James, who has inspired me to pursue this work and to try to make a difference wherever I can in the lives of whomever I can. You have shown me that love can be the biggest motivator for success and that struggles can result in paramount growth. You are wise beyond your years.

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Abstract

Attention-Deficit/Hyperactivity Disorder (ADHD) has become a common diagnosis among children today. The numbers have grown exponentially in the last several decades and, despite extensive research and various treatment modalities, many children continue to struggle with its disruptive symptoms. Current research reports a poor prognosis for this population with difficulties continuing into adulthood. One of the difficulties noted is in their ability to develop intrinsic motivation when their behaviors have been managed by extrinsic rewards. Self-Determination Theory (SDT) was used to conceptualize the difficulties around developing intrinsic motivation when an individual experiences symptoms of ADHD which impact several areas of functioning. SDT asserts that autonomy, competence, and relatedness are needed in order to develop intrinsic motivation. As such, it was hypothesized that ADHD symptoms and their treatment may be related to motivational difficulties in children with ADHD. The General Scale of the Children's Academic Intrinsic Motivation Inventory was used to measure the intrinsic motivation of fourth and fifth graders, with and without ADHD, to explore possible differences in intrinsic motivation between groups. A total of 366 recruitment packets were sent home to families and resulted in 61 participants between the ages of 9-11. Test administration occurred within several elementary schools with the support of school principals and guidance counselors. The results of this research yielded only one statistically significant finding which illuminated a relationship of medium significance between age and intrinsic motivation. The lack of results in all other analyses indicate that there is no difference between the development of intrinsic motivation in children with ADHD when compared to their same-age peers. However, due to a small sample size, uneven diagnostic group distribution and the use of a subscale instead of a full measure, this study holds a low power of effect and the results should not be generalized

to the population. In considering the numerous limitations of this study, the primary recommendations for future research are replication with a larger sample size and use of the entire CAIMI measure for a more comprehensive data set.

Keywords: Attention-Deficit/Hyperactivity Disorder (ADHD), Self-Determination Theory (SDT), autonomy, competence, relatedness, children, intrinsic motivation, CAIMI

The Development of Intrinsic Motivation in Children with Attention-Deficit/Hyperactivity Disorder

In the last several decades, the number of diagnoses of Attention-Deficit/Hyperactivity Disorder (ADHD) has significantly increased. From 1997 to 2006, the number of children diagnosed with ADHD increased by approximately 3% each year, and by about 5% each year from 2003 until 2011 (Center for Disease Control and Prevention, 2013). While the DSM-5 states that about 5% of children have a diagnosis of ADHD, recent surveys have shown that in 2011, closer to 11% of children have been diagnosed with ADHD between the ages of 4-17 (Center for Disease Control and Prevention, 2017). This is a surprisingly large number of children who, because of their disorder, are often expected to perform poorly, behave badly, and maintain a poor prognosis (Hechtman, 1991; Mannuzza & Klein, 2000; Wilmshurst, Peele, & Wilmshurst, 2011). This negative image is due to the tendency of children with ADHD to be more volatile, belligerent, inflexible, and disruptive (Modesto-Lowe, Yelunina, & Hanjan, 2011). Due to these disruptive behaviors, adults may be hesitant to provide these children with opportunities to develop independence. The symptoms can also impact the population's ability to complete school work and to create and maintain positive relationships. This study conceptualizes this population's development within Self-Determination Theory to consider the possible impact of their diagnosis on intrinsic motivation which may be used to identify areas for additional intervention.

Diagnostic Criteria and Impairments

According to the DSM-5, ADHD includes three diagnostic types: (a) inattentive type, (b) hyperactive/impulsive type, and (c) combined type (American Psychiatric Association, 2013). ADHD-Inattentive (ADHD-I) type is characterized by behaviors such as being unable to sustain

attention to a task and having difficulty organizing activities. A child with ADHD-Hyperactive/Impulsive (ADHD-H/I) type is described as being restless and often interrupting others. ADHD-Combined (ADHD-C) type has some characteristics of both inattention and hyperactivity/impulsivity. The DSM-5 has brought with it the ability to specify the severity of a child's symptoms which can be helpful in treatment decisions. Diagnosing a child with ADHD requires six or more symptoms to be present for at least six months before the age of 12 (American Psychiatric Association, 2013). The symptoms must be developmentally inappropriate and have a negative impact on the child's daily functioning. They also must occur in at least two different settings, for example, at home and at school.

Longitudinal studies have shown that most children with ADHD continue to have significant impairments related to their diagnosis in both adolescence and adulthood (Hechtman, 1991; Mannuzza & Klein, 2000). This population tends to struggle academically, socially, emotionally, and behaviorally. ADHD is a pervasive and rapidly growing disorder. Many classroom teachers have experienced the difficulties of trying to teach a child with ADHD and have found it to be frustrating. School is, by far, "the most challenging setting" for students with ADHD (Bartlett, Rowe, & Shattell, 2010, p. 228). Parents, teachers, and clinicians must work together in an attempt to change the trajectories for this at-risk population.

Theories of Origin and Limitations to Prognosis

The behaviors associated with a diagnosis of ADHD have been observed in children for centuries. The behaviors have previously been attributed to societal disadvantage, personality disorders, brain damage, disease outbreaks, and emotional and psychological dysfunction (Taylor, 2009, 2011). The publication of the DSM-III, in 1980, included the first diagnostic label of Attention Deficit Disorder, though similar symptoms had previously been identified as a

hyperkentic disorder in the ninth revision of the ICD. Since then, DSM criteria have been slightly modified in the areas of age of onset and expression of the behaviors for varying subtypes and sexes. While there have been changes in diagnostic criteria, treatment approaches, and understanding the origins of ADHD, it is imperative to acknowledge that biological and environmental factors influence the expression of the disorder and may inhibit progress in some areas of functioning for some individuals.

Biological Predisposition

Research has shown that there is a biological component to ADHD which can include genetics, differences in brain structure, and a faulty dopamine reward pathway (Holroyd, Baker, Kerns, & Muller, 2008; Krain & Castellanos, 2006; Taylor, 2009). Familial and longitudinal studies have found a strong genetic component of the disorder. Although some genes have been considered as the cause, there has not been enough research to confirm their role (Taylor, 2009; Vogel, 2014).

As previously mentioned, it was once thought that brain damage was the cause of hyperactivity, aggression, and inattention. With the advancement of structural neuroimaging machines such as functional Magnetic Resonance Imaging machines, it has been discovered that although there may not be structural damage, there may be structural differences between the brains of individuals with and without ADHD. Studies have found significant discrepancies in total brain volume, especially in the frontal lobes, and some noted size differences in all lobes (Konrad & Eickhoff, 2010; Krain & Castellanos, 2006; Seidman, Valera, & Makris, 2005; Seig, Gaffney, Preston, & Hellings, 1995). In a study by Castellanos et al. (2002), the average total volume of the brains of children with ADHD was 3.2% smaller than the control group's average volume. Additionally, there have been inconsistent findings in the differences of the volume or

asymmetry of the caudate nucleus, putamen, cerebellum, white and gray matter, corpus callosum, and connectivity impacting activation levels (Bush et al., 1999; Castellanos et al., 2002; Hale, Bookheimer, McGough, Phillips, & McCracken, 2007; Konrad & Eickhoff, 2010).

Another biological difference under consideration is a dysfunction of the midbrain dopamine system which impacts reward preferences and motivation. Dopamine is believed to influence *cognitive control* such as responses to behavior shaping with reinforcements and rewards, in addition to attention and impulsivity (Holroyd et al., 2008; Volkow et al., 2011). Research has shown that there are differences in the dopamine pathway of youths with ADHD, which can influence their behavioral responses to rewards. These response mediators include the significance (big or small) of the reward, the wait time (immediate or delayed) until they can receive the reward, and their motivation (high or low) to act in response to a reward. These mediators may explain why some rewards are not motivating for these children.

Holroyd et al. (2008) found that the dopamine transporter is more active in children with ADHD than in their nonADHD counterparts; this results in less dopamine buildup in their synaptic clefts because it is constantly being removed. Less dopamine in the clefts can lead to less cognitive control and, therefore, more inattention and impulsivity. Adults with ADHD were also found to have a hypofunctional dopamine reward pathway, due to the overactive dopamine transporter, which seems to correlate with poor motivation and attentional difficulties (Volkow et al., 2011). Researchers have proposed that children with ADHD have a higher reward threshold because of this reduced amount of dopamine, requiring a significant reward to motivate action. It was also discovered that youth with ADHD consistently chose immediate rewards, even if they were smaller, as opposed to waiting longer for a larger reward (Sagvolden, Aase, Zeiner, & Berger, 1998). The researchers found that these children focused on minimizing the delay more

than maximizing their reward like their typically developing counterparts. Holroyd et al. reported that children with ADHD are highly sensitive to reinforcements, which means that they are more likely to act if a reward is offered, and therefore, can become more upset than their nonADHD peers when a reward is not earned. These strong responses to external motivators may make it more difficult for this population to be intrinsically motivated to complete a task that does not provide a tangible reward.

Additionally, one study found that the responses to a task by children with ADHD were much higher and more variable than those of the comparison (nonADHD) group (Sagvolden et al., 1998). As the children earned rewards for task completion, the ADHD group appeared to become increasingly hyperactive (more responses) and impulsive (inconsistent responses). Sagvolden et al. interpreted these findings as indicative of increased motivation when a reward was present, and especially when it was presented immediately after a task was completed. Unfortunately, the increased motivation resulted in a reduced quality of the performance in an effort to increase quantity and receive more rewards. The differences in the functioning of the dopamine reward pathways between children with ADHD and their nonADHD peers should be considered further when reflecting on the successful and unsuccessful use of behavior plans for children with ADHD.

Environmental Influences

Lufi and Parish-Plass (1995) completed research examining personality traits of children with ADHD. The results indicated that this population has a strong external locus of control which may be due to frequent academic and social challenges that seem out of their control. It was noted that medication use may contribute to assuming a lack of responsibility for one's conduct (Lufi & Parish-Plass, 1995; Whalen & Henker, 1976). In addition to this, Labauve

(2003) argues that a child's attachment to his or her caregiver also plays a large role in his or her emotional and behavioral development.

Bartlett et al. (2010) interviewed college students with ADHD to provide an opportunity for them to share what they identified as being protective factors and risk factors to their success. Students reported that firm boundaries, supportive behaviors, and structured environments facilitated their positive succession through school. Parents and teachers who provided them with specific learning strategies were identified as being very helpful and necessary as well. Alternatively, these students stated that they felt discouraged when others became frustrated with them and invalidated their struggle because they did not understand the students' disorder. In a study completed in the UK, researchers found that children directly associated a diagnosis of ADHD with anger and lack of control (Singh, 2011). Some children with ADHD even reported that peers treated their diagnosis as a game and would tease them to see how long it took for them to become angry. The study also discovered that some children without ADHD lied about having ADHD to instill fear in others. This phenomenon in the UK has not been reported in the United States, however, a general negative association with the diagnosis is evident.

Treating ADHD

In an attempt to manage ADHD behaviors, many types of treatment are used including cognitive behavioral therapy (Braswell & Bloomquist, 1991; Brock, Jimerson, & Hansen, 2009), collaborative approaches (Labauve, 2003), pharmacological intervention (Brock et al., 2009), and neurofeedback therapy (Steiner, Frenette, Rene, Brennan, & Perrin, 2014). Alternative approaches such as dietary restrictions and body-based treatment have also been explored (Brock et al., 2009; Gronlund & Renck, 2011). Research, as well as clinical practice, supports a multi modal approach to treating ADHD, most often a combination of psychotherapy and medication

(Barkley & Associates, 2000). Although many of the following treatments can be helpful, a lot of children continue to struggle in school and at home, suggesting that further research may be beneficial for this population.

Cognitive Behavior Therapy

One of the most common treatments for children with ADHD is Cognitive Behavior Therapy (CBT) which can be presented in many different forms. Common cognitive interventions include problem-solving training and attribution retraining (Braswell & Bloomquist, 1991). Problem-solving training focuses on helping the child learn to identify a problem, possible solutions and consequences to those solutions. Attribution retraining seeks to assist the child in reappraising his or her explanations for an event to incorporate his or her effort and influence on that outcome (Braswell & Bloomquist, 1991). In conjunction with cognitive restructuring, behavioral interventions are used to help children manage their responses through another medium.

Children with ADHD “typically need an external measure of success and a pay-off for increased performance” (Brock et al., 2009, p. 101). Most often, this takes the form of a chart that tracks on-task behaviors with a cumulative reward. The chart acts as an external reminder of the child’s successes with the goal of increasing self-awareness and, ultimately, self-regulation. Behavioral interventions have been empirically proven to be successful along with being the primary nonmedical treatment method for children with ADHD (Brock et al., 2009).

Collaborative Approach

This approach to treatment uses John Bowlby’s theory of attachment as a framework. Labaue states that attachment is a “complex psychological organization used by the child to maintain a relationship with a parent or other attachment figure” (p. 46). Based on this theory, it

is suspected that when children with ADHD act out, they are seeking attention from an attachment figure. If a child experiences a disruption in his or her attachment relationships, it will impact how he or she interacts with, and responds to, others in the future. When this is considered, treatment transforms from an individual focus, to one of “circularity,” or a systemic approach (Labauve, 2003, p. 47). All members of the child’s system, which could include parents, teachers, coaches, social workers and any other care providers, need to collaborate on the youth’s treatment to provide a holistic, consistent, and highly supportive environment for success.

Labauve (2003) stresses five key approaches to treating a child with ADHD which include the following: “medications/pharmacotherapy, teacher education, behavior and education management, parent education and counseling, and parent skills training” (p. 48). Like most clinicians who work with children with ADHD, Labauve acknowledges the need for a multimodal treatment approach. Family therapy is also suggested to aid in conceptualizing the child’s behavior to ensure that the diagnosis is accurate and not solely due to an environmental factor such as poor attachments. A child with insecure attachment styles can have difficulties experiencing, expressing and regulating negative emotions and can present with poor self concept, risky behaviors, academic struggles, depression, anxiety and relationship issues (Cooper & Shaver, 1998). As such, it is possible that a child with poor attachments may appear to have ADHD and could be misdiagnosed resulting in inappropriate treatment modalities. When the child’s behavior is considered in a systemic context using terms of attachment and security, it reframes how the parent understands his or her child. This new perspective lends to a more responsive parenting approach which can end a pattern of poor interactions between parent and child and foster more supportive relationships.

Pharmacological

Many children with ADHD find that taking medication can help them focus, act less impulsively, and self-regulate. Stimulants have gone through many trial variations in both side effects and symptom relief and have been “repeatedly found to be effective in up to 85% of children with ADHD” (Brock et al., 2009, p. 104). With the development of extended release formulas, patients can experience symptom relief for 8-12 hours which has eliminated “the need for children to take medication at school under the supervision of school personnel, increased confidentiality and decreased misuse” (Brock et al., 2009, p. 104).

The National Institute of Mental Health performed the largest controlled study with children with ADHD in the late 1990s publishing their first results in 1999. The Multimodal Treatment of ADHD compared participants’ response to medication and behavioral therapy. It included four groups which were identified as receiving (a) no treatment, (b) medication, (c) medication and therapy, or (d) just therapy. This study found that the two groups of children who received medication as part of their treatment had significant improvements in their behavior compared to the children who were receiving only behavior therapy (Barkley & Associates, 2000). However, the group that received medication and behavior therapy was “virtually always superior to” those who received only medication “in absolute levels of functioning” (Barkley & Associates, 2000, p. 10). These findings propose that ADHD is best treated with a combination of medication and therapy.

Neurofeedback

Biofeedback is a method used to monitor bodily changes which are normally outside of personal awareness. When an Electroencephalographic (EEG) is used to examine the brain waves during an activity to improve the client’s awareness of brain activity, it is called

neurofeedback. The goal of neurofeedback is to increase awareness of changes in the brain and to improve self-regulation skills and reduce activity in overactive areas of the brain. As of 2009, “the research [was] confounded by methodological concerns regarding lack of adequate controls, confounding related to multiple interventions, and inconsistent use of clinically relevant dependent outcome measures” (Brock et al., 2009, p. 113). There were also concerns that neurofeedback may negatively impact the effectiveness of stimulant medications. However, in 2014, research results indicated that neurofeedback provided a strong and lasting effect on the symptoms of ADHD in youths with and without medication regimens (Steiner et al., 2014). A six month check-in revealed consistent effects and maintained medication dosage, whereas participants who did not receive neurofeedback began to increase their medication with physical growth. The results of this study suggest an additional treatment that, as of right now, has no known negative side effects. The neurofeedback treatment appears to modify activation of different areas in the brain. It remains unknown if the resulting improvements are long lasting or if the participants will need maintenance treatments over their lifespan (Steiner et al., 2014).

Alternative Treatments

Dietary restrictions. Some parents experiment with making alterations to their child’s diet. However, there is “no strong evidence to support claims of dietary restrictions or supplements to help with the core symptoms of ADHD” (Brock et al., 2009, p. 111). Only when children with ADHD have food allergies, has there been any evidence of success.

Ten percent of children with ADHD demonstrated allergies to food dyes and 2% who were put on the Feingold Diet showed consistent behavioral improvement when food dyes were removed (Reiff & Tippins, 2004). In general, for most children with ADHD who do not have food sensitivities, as well as for some who do, elimination diets are not

effective treatments for ADHD itself, are hard to maintain and monitor, and may waste important time without more effective treatments. (Brock et al., 2009, p. 112)

Therefore, dietary restrictions should only be implemented if there is a diagnosed food allergy.

Body-based treatment. “ADHD is a disorder that manifests itself strongly in the body through hypermotoric and impulsive action” (Gronlund & Renck, 2011, p. 225). These clients can benefit from increased physical activity to satisfy their neurological cravings. Children with this disorder “usually have problems with bodily tension, disturbed body image, and fragmented movement patterns, as well as poor coordination and balance. Therefore, it may be beneficial to consider addressing the problems through the body by working with breathing, rhythm, and movement” (p. 227). Braswell and Bloomquist (1991) reviewed literature on the use of relaxation techniques with children with ADHD and found it to be relevant and useful when combined with other treatment methods. The goals of body-based treatment are to help the children recognize their strengths and weaknesses in areas other than academics, and to build their self-esteem and resilience through practice and mastery. For example, these children might find it easier to control their breaths than to solve a math problem.

Several of the treatments reviewed above can provide useful information and support for this population. As previously explained, a multimodal approach, using medication and therapy, is considered to be the most effective method for treatment. Since many children with ADHD continue to find school to be difficult, mental health professionals should maintain a curiosity about alternative approaches to understanding and working with these students. Self Determination Theory is an option for treatment that may be helpful in cultivating the intrinsic motivation of this population, thus improving their personal drive for success and general prognosis.

ADHD, Resilience and Intrinsic Motivation

ADHD is the most common “neurobehavioral disorder in children and adolescents...two thirds (about 66%) of children with ADHD will continue to have problems attributable to the disorder into adulthood” (Gronlund & Renck, 2011, p. 223). Unfortunately, children with poor self-regulation and weak executive functioning skills, such as those with ADHD, are considered to be a vulnerable population and may find it difficult to develop resilience (Greenberg, 2006; Wachs, 2006). Resilience can be defined as a general resistance to, and positive adaptation in spite of, severe life adversities; it is believed to be necessary to persevere and accomplish long-term goals (Rutter, 2006; Sameroff & Rosenblum, 2006). As with all children, society hopes that youth with ADHD will become resilient adults who can overcome hardship and create happy and successful futures for themselves. Unfortunately, the general prognosis reported in the research has described less success for this population and, as such, particular attention should be paid to the obstacles which these youth inherently face. Research has arrived at several possible conclusions for the origins of resilience. It may develop from controlled exposures to risk over time, personality and environmental interactions, coping and self-regulation processes, or biology (Conway & McDonough, 2006; Dishion & Connell, 2006; Ghimbulut, Ratiu, & Opre, 2012; Greenberg, 2006; Rutter, 2006).

Many children with ADHD experience social, emotional, and behavioral difficulties which may be associated with weaker self-regulation, more external regulation, and poorer self-esteem than their peers (Lufi & Parish-Plass, 1995). Conversely, studies have shown that “resilient children appear to have a greater sense of autonomy, internal locus of control, and more positive self-esteem” (Hechtman, 1991, p. 418). Unfortunately for children with ADHD, these factors are also necessary for fostering the growth of intrinsic motivation. Given the

relationships among the constructs of resilience and intrinsic motivation, it may be beneficial to consider a novel theoretical approach and intervention style which directly addresses intrinsic motivation with children with ADHD. Of specific concern is the extensive use of behavioral interventions with children with ADHD which may interfere with the development of autonomy, internal locus of control, and positive self-esteem, making it difficult to develop resilience and intrinsic motivation. In addition to behavioral interventions, medication may also play a role in fostering an external locus of causality which leads children to attribute their behaviors to constructs outside of their control. Self-Determination Theory considers some of these factors and may provide a framework to better understand the population's needs, as well as suggest interventions to support the growth of their intrinsic motivation for an improved prognosis.

Self-Determination Theory

Self-Determination Theory (SDT) was developed approximately 40 years ago by Edward L. Deci and Richard M. Ryan. This model has since become “a major theory of human motivation” (Gagne & Deci, 2014, p. 1). SDT maintains its roots in positive psychology and can be used to understand how people can function at their most optimal level. Ryan and Deci (2000) describe SDT as “an organismic metatheory that highlights the importance of humans’ evolved inner resources for personality development and behavioral self-regulation” (p. 68). This means that SDT focuses on the internal factors that may support the growth of healthy personality traits and self-regulation in the areas of autonomy, competence, and relatedness. An organismic integration perspective emphasizes the importance of being adaptive to natural human experiences and integrating those experiences into a single, unified being (Deci & Ryan, 2000; Gagne & Deci, 2014; Wehmeyer & Little, 2009). This refers to the relationship between internal and external factors, specifically, biological predisposition and social context.

Psychological Needs

Similar to drive theories, SDT proposes that humans have innate needs that must be fulfilled. Ryan and Deci (2000) explain that behaviors occur in order to replenish a deficiency and satisfy a need. They proposed that there are three primary psychological needs that must be satisfied for healthy development: autonomy, competence, and relatedness. The first need, autonomy, refers to volition or the ability to organize and regulate oneself to act in a way that is congruent with one's values (Deci & Ryan, 2000; Ryan & Deci, 2000; Weinstein & Ryan, 2010). The second need, competence, is satisfied when an individual feels that he or she has mastered something in the environment (Gagne & Deci, 2014; Wehmeyer & Little, 2009). The third need, relatedness, is the desire to be connected with others, "to love and care, and to be loved and cared for" (Deci & Ryan, 2000, p. 231).

When these three needs are satisfied, intrinsic (self-determined; autonomous) motivation is cultivated, which enables individuals to perform effectively and achieve psychological health. Intrinsically motivated people tend to have long-term goals such as earning a college degree for personal growth. When autonomy, competence, and relatedness are not satisfied, extrinsic (controlled) motivation arises. This type of motivation functions on rewards and punishments so extrinsically motivated people may, for example, choose to attend college because their parents made it a condition of living at home (Ryan & Deci, 2000). Intrinsic motivation is the most internally driven and autonomous style of self-regulation. It is described as "the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacities, to explore, and to learn" (Ryan & Deci, 2000, p. 70). According to SDT, truly intrinsically motivated behavior requires volition (autonomy), mastery of the environment (competence), and a sense of security (relatedness). It is hypothesized that a lack of autonomy, competence, and relatedness,

due to the interactions between their symptoms and their environment, may play a role in the continued difficulties of children with ADHD.

Possible Impact of Behavioral Approaches on Intrinsic Motivation

When a reward is offered for completing a task, the implication is that the task is not worth doing for its own sake which results in a loss of interest in the task; studies have suggested that “people tend to feel controlled by the reward” (Deci & Ryan, 2000, p. 234). By creating a social context in which children expect external rewards for their positive behaviors, children then act only to receive a reward and then become dependent upon that reward to place value on their accomplishment (Kohn, 2001). This inhibits children from acting out of their own volition and participating voluntarily, which indicates that they are lacking autonomy; this restricts their ability to develop intrinsic motivation and to act in a self-determined manner.

Ryan and Connell (1989) performed a study which examined the influence of external motivation on performance. They found that “the more students were externally regulated the less they showed interest, value, and effort toward achievement and the more they tended to disown responsibility for negative outcomes, blaming others such as the teacher” (Ryan and Deci, 2000, p. 73). Grolnick & Ryan (1987) found that children were more interested in tasks that were noncontrolled (self-directed) and they gained a deeper understanding of conceptual ideas instead of relying on only rote memory for learning. Similarly, Kohn (1998) explained that as rewards increase, interest in a task decreases and participants will become more focused on producing quantity to achieve the reward instead of quality to improve oneself. In a test of creativity, Amabile (1982) found that participants who were informed that their work would be judged reported lower “intrinsic interest” in the project and also earned lower scores when evaluated (p. 1010). Lastly, McGraw & McCullers (1979) discovered that rewards negatively

impacted participants' ability to solve complex problems. Given the frequency of use of controlled, external motivators with youth with ADHD, it is concerning that this short-term management system may be interfering with their ability to develop intrinsic motivation.

Statement of the Problem

The growing prevalence of ADHD combined with the continued difficulties in managing its symptoms, despite a variety of treatment methods and extensive research, has propelled this research forward with the hope of illuminating a new area of intervention for youth with ADHD. Self-Determination Theory states that a person needs to feel fulfilled in the areas of autonomy, competence, and relatedness to be intrinsically motivated. Autonomy and self-regulation are also associated with resilience and are necessary for the growth of intrinsic motivation. As such, it may be possible that enhancing resilience and intrinsic motivation could improve the general prognosis for this population. Treatment that aims to increase these three areas may be effective for achieving long-term success. However, before alternative interventions can be considered, differences in intrinsic motivation must first be determined. As such, the current study examined the academic intrinsic motivation of youth with and without ADHD to explore possible differences between groups.

Method

The purpose of this research study was to gain a clearer understanding of the intrinsic motivation toward academic success in children with ADHD as compared to their same age, nonADHD peers. It was hypothesized that children with ADHD might have a more difficult time developing their intrinsic motivation due to their symptoms and frequent use of interventions that use external rewards and punishments. While this comparison was the primary focus of the research study, additional statistical analyses were completed to further explore other

relationships between demographic variables and academic intrinsic motivation. These findings may provide a first step in considering the applicability of SDT to understanding the difficulties of children with ADHD, and may indicate that treatment for youth with ADHD should include a focus on fostering intrinsic motivation.

Research Questions

1. Do children with ADHD have lower academic intrinsic motivation than those without ADHD?
2. Are demographic factors such as sex or age associated with academic intrinsic motivation in any of the participant groups?
3. Do treatment methods such as the use of psychotropic medication or therapy impact academic intrinsic motivation in any of the participant groups?

Participants

The participants of this study included English speaking children between the ages of 9 and 11 from elementary schools in the New England region. Children with ADHD diagnoses were specifically requested to participate to develop the experimental group for the primary research question. Recruitment included gaining authorization from several elementary school principals, and their superintendent, to distribute packets to all fourth and fifth-grade students. The recruitment packets contained an introductory letter (see Appendix A), consent form (see Appendix B) and brief health survey (see Appendix C) to collect diagnostic and treatment information about each child. Guardians were provided with an envelope in which to seal their child's identifying information for return to school. Participants were entered into a raffle for one of four \$25 Amazon gift cards. A total of 366 packets were dispersed across five schools and 68 consent forms were returned. Of those, three guardians denied consent, two packets were

returned after the administration date, one child did not fit the age criteria and one child was absent on the day of administration. This resulted in 61 research participants who consisted of an almost equal number male ($n = 28$, 46%) to female ($n = 33$, 54%) students whose data were separated into four comparison groups: formal ADHD diagnosis ($n = 11$, 18%); suspected ADHD diagnosis ($n = 5$, 8%); other diagnoses ($n = 9$, 15%); and no diagnoses ($n = 36$, 59%). All demographics were based on the information provided by guardians on the brief health survey and consent form.

Children with a formal ADHD diagnosis were reported by their guardians to have received the identification by a qualified mental health professional; however, proof of diagnosis was not requested. Children who were suspected of having an ADHD diagnosis were identified as such by their guardians who indicated either future testing to clarify diagnosis or symptoms of inattention, hyperactivity or impulsivity. Guardians of children who were identified as having other diagnoses reported mental health symptoms which included the following: (a) depression; (b) anxiety; (c) nonverbal learning disorder; (d) auditory processing disorder; (e) insecure attachment style; or (f) exposure to trauma, in addition to two medical diagnoses. Descriptive statistics for the identified four diagnostic groups are displayed in Table 1 with calculations for sex, age, treatment with psychotropic medication, treatment with therapy and intrinsic motivation scores.

Measure

The Children's Academic Intrinsic Motivation Inventory (CAIMI) was developed by Adele Eskeles Gottfried in 1986 to evaluate the intrinsic motivation of children, from grades 4 through 8, in the areas of reading, math, science, and social studies, as well as an overall score of general motivation toward learning (Gottfried, 1986). The need for differentiating motivation

into subject areas and a general orientation toward academics was supported by “scientific evidence” and “school curriculum” as explained by Gottfried (1986, p. 11). The CAIMI is comprised of 44 questions, 42 of which use a 5-point Likert scale ranging from strongly agree to strongly disagree, as well as two forced-choice questions (Gottfried, 1986). The content scales include 24 scaled items and the two forced-choice items, while the General Scale consists of 18 Likert scale questions. The ratings carry values from either 1-5 or 5-1 depending on the question as some are written to confirm experiences where others are written to deny experiences. Therefore, a rating of strongly agree could be worth either one point or five points depending on the question. Due to the length of the CAIMI, the time available for administration in the schools, and the target population being recruited, it was decided that the full CAIMI was too long for this study. Alternatively, the General Scale was used as an individual measure.

As determined by the three studies completed to develop the CAIMI, it has moderately high test-retest reliability ranging from .66 to .76 and strong internal consistency varying between .80 and .93 (Gottfried, 1985). Comparison studies found good convergent and discriminant validity while correlational analyses discovered that as children had higher motivation, they had lower anxiety, which could also vary among academic subjects (Gottfried, 1985). When examined individually, the General Scale produced high coefficient alphas of .80 and .83 when testing for internal consistency in the last two studies indicating “substantial item homogeneity within the subscales” (Gottfried, 1985, p. 634). The CAIMI was used in several studies to establish construct validity and criterion-related validity. While the validity of the General Scale alone was not reported, it was “significantly and positively correlated across all measures” when compared to teacher grades, and correlated with “all but one measure of achievement” (Gottfried, 1986, p. 16). Given the research on the CAIMI as a whole and its

individual subscales, the General Scale appears to be a reliable and valid measure of children's overall academic intrinsic motivation.

The questions from the General Scale were extracted from the full CAIMI test booklet for ease of administration. This was necessary as the questions were incorporated throughout the CAIMI which would have been confusing and possibly overwhelming for the children to complete. To promote standardization where possible, the words and formats of the title page, introduction, sample questions and test questions were exact replicas of the full measure. One sample question was excluded from the introduction as its format was not present on any of the General Scale questions. Additionally, students were required to circle their answers instead of filling in a circle next to their answer as it is designed in the CAIMI booklet. Given the ethical standards and expectations of research and measure utilization, full CAIMI measures were purchased accordingly and were appropriately destroyed upon completion of the study. The General Scale was scored by hand as instructed in the manual, with some participants randomly selected for scoring replication to ensure accuracy. The raw scores were converted into t-scores, as explained in the manual, for use in comparison statistics.

Procedure

Prior to beginning data collection, the researcher attended a district meeting with the guidance counselors of several elementary schools to provide information about the research study and request their support in conducting the research within their schools. From this, six counselors agreed to schedule meetings with their principals to discuss the research further. Five of those principals gave permission to complete the study with their students, pending approval from the superintendent of the school district. Once the authorization from the superintendent was received, the recruitment packets were dispersed with the help of the guidance counselor in

each school. The counselors and principals identified a locked location at each of their schools for the returned consent forms to ensure confidentiality of the children's personal health information. The returned packets were picked up by the researcher on arranged dates and sorted according to school and proper completion of the consent form and brief health survey. Principals and counselors were informed of the students who needed to be removed from class to participate in the study. Assent forms were prepared for the participants and administration dates were scheduled for each school. Administration at all schools occurred within two weeks.

On administration day, the children whose guardians completed the consent forms were brought to a predetermined testing space as a group. Most testing occurred during nonacademic periods to prevent impeding on the students' core education. The average time needed to provide an introduction, gain assent (see Appendix D), and administer the assessment was 20-30 minutes. The students were verified by using the consent forms; they were notified that their guardians had given them permission and that they could still refuse to participate without consequences. The assent forms were reviewed ensuring understanding of the study while emphasizing that their participation was voluntary, their personal information would not be reported and that they could stop at any time. Few students asked clarifying questions about the study and all students agreed to participate in the study. Once assent was obtained, the children followed the prompts provided by the researcher as outlined by the measure.

I collected the measures from participants as they were completed. Participants remained in their seats while the measures were reviewed to ensure no missing data. Once all measures were obtained, participants were thanked for volunteering and surprised with a small treat for their time and effort. Completed measures were stored in a locked filing drawer where only the researcher had access. Measures, consent forms, assent forms and brief health surveys were

destroyed appropriately at the termination of this research project.

Results

Descriptive Statistics

Several types of statistical analyses were used to illuminate possible relationships between intrinsic motivation and the demographic and psychiatric variables of the children. An alpha level of $p = .05$ was used to determine significance for all analyses. The dependent variable in all analyses is academic intrinsic motivation which was measured by the CAIMI General Scale and yielded a t-score for each participant ($M = 43.26, SD = 10.796$). It was noted that while scores ranging between the second lowest value of 31 and the maximum score in the sample of 63 had a relatively normal distribution, there were 7 children with a score of 20, which is the floor of the CAIMI (see appendix E). It is possible that a more sensitive measure may have shown a wider distribution of the scores at the lower range.

Table 1: Descriptive Statistics by Diagnostic Group

	Total (n = 61)	ADHD (n = 11)	Suspected ADHD (n = 5)	Other Diagnoses (n = 9)	No Diagnosis (n = 36)
Sex					
n (%) Male	28 (46%)	6 (55%)	2 (40%)	5 (56%)	15 (42%)
n (%) Female	33 (54%)	5 (45%)	3 (60%)	4 (44%)	21 (58%)
Age <i>M</i> (<i>SD</i>)					
n (%) 9 year olds	14 (23%)	4 (36%)	1 (20%)	2 (22%)	7 (19%)
n (%) 10 year olds	27 (44%)	4 (36%)	2 (40%)	4 (44%)	17 (47%)
n (%) 11 year olds	19 (31%)	2 (18%)	2 (40%)	3 (33%)	12 (33%)
n (%) missing		1 (9%)			
Psychotropic medication					
n (%) Yes	12 (20%)	11 (100%)	1 (20%)	0	0
n (%) No	49 (80%)	0	4 (80%)	9 (100%)	36 (100%)
Therapy					
n (%) Yes	11 (18%)	8 (73%)	0	3 (33%)	0
n (%) No	50 (82%)	3 (27%)	5 (100%)	6 (66%)	36 (100%)
Intrinsic motivation <i>M</i> (<i>SD</i>)					
	43.26 (10.80)	39.45 (8.07)	44.00 (6.96)	40.89 (12.86)	44.92 (11.36)

Note. Percentages within the diagnostic groups are column percentages. Percentages may not add to 100% due to rounding.

Research Questions Analyzed

Differences between diagnostic groups. A one-way analysis of variance (ANOVA) was used to test for differences between the four diagnostic groups in their mean level of intrinsic motivation (t-scores). Overall, there was no significant difference by diagnosis group, $F(3, 57) = .886, p = .454$. This said, the Suspected ADHD and Other Diagnoses groups were included in that analysis and they are both small in size and, conceptually, less definitive. Differences between the intrinsic motivation t-score means of the ADHD and No Diagnoses groups were the primary comparison of interest at the start of this research. As such, an independent samples t test was used to compare just these two groups and the mean difference (5.46 lower for the ADHD group) was not statistically significant, $t(45) = -1.480, p = .146$. Assumptions of

homogeneity of variance for the t-test, using Levene's test of equality of variance, were met for this test and all other t-tests reported.

Differences between demographic groups. When comparing possible differences between the means of intrinsic motivation in boys and girls, the mean difference (3.39 lower for boys) was not statistically significant, $t(59) = -1.227, p = .225$. Alternatively, a correlation of medium significance ($r = .261, p = .044$) was discovered between the age of the participants and their intrinsic motivation. Treating these three ages as levels, a one-way ANOVA test was run and showed a significant difference in intrinsic motivation by age, $F(2, 57) = 4.019, p = .023$. Post hoc tests using Tukey's HSD indicated that academic intrinsic motivation between 10- and 11-year-olds was significantly different ($p = .02$). Interestingly, 9-year-olds were not significantly differently from 10- or 11-year-olds, but 10-year-olds had the lowest t-scores while 11-year-olds had the highest t-scores of academic intrinsic motivation. Given this new information, an ANOVA was used to look for a relationship between the age of the children and the diagnostic group in which they were classified. The largest gap occurred between the mean ages of the ADHD and No Diagnoses groups, however, the difference was not significant, $F(3,56) = .584, p = .628$.

Differences between treatment methods. As previously explained, this study had a primary comparison question with the intent to explore all data received for factors that may be associated with the development of intrinsic motivation. Consequently, additional group analyses were completed using independent samples t-tests. When the mean intrinsic motivation of children who use psychiatric medications was compared to that of children who do not use medications, the mean difference was not statistically significant, $t(59) = -1.325, p = .190$. In addition, children who had attended therapy for treatment of ADHD symptoms did not have a

meaningful difference in their intrinsic motivation when compared to those who had not received therapy, $t(59) = -1.428, p = .159$.

Discussion

Research on ADHD has been widespread and comprehensive for decades, providing rich information about its origins, presentation, treatment and prognosis. Despite extensive research, children with ADHD continue to struggle at home, in school and in relationships suggesting the need for further research and development. This study used Self-Determination Theory to conceptualize the experiences of youth with ADHD and proposed a new lens through which to view the potentially unmet needs of this population. However, a deficit must first be established before one can propose areas of intervention and, as such, this study compared the academic intrinsic motivation of children with and without ADHD. Contrary to expectations, no significant differences were found between children with and without ADHD in this study. While it appears that children with ADHD do not have a lower level of intrinsic motivation than their peers, it is possible that the lack of findings may have been due to the small sample size and other limitations, which will be explored below.

Findings and Implications

The findings from this study indicated that there was not a difference in the general academic intrinsic motivation of children with ADHD when compared to their same age peers. As previously explained, the literature describes a poor prognosis for this population and, after reviewing research on resilience and intrinsic motivation, it was hypothesized that low intrinsic motivation might be a factor in this discouraging trajectory. The lack of differences found in this study suggests that children with ADHD are not developing differently from their peers in terms of intrinsic motivation or self-determination. This could mean that their prognosis is either more

promising than originally reported, or that intrinsic motivation does not play as significant of a role in their development as suspected. As a result, one might propose that the literature on their prognosis is outdated and the field may benefit from an updated longitudinal study of children with ADHD. If, in fact, these results are representative of a changing trajectory for youth with ADHD, it may be implied that the interventions currently being used, as outlined in the literature review, are beneficial. However, an assertion about the effectiveness of behavioral interventions would discount the reviewed research on the negative impacts of frequent rewards and external motivators. Alternatively, one cannot deny the research on behavioral interventions which proposes a strong argument for their effectiveness in treating ADHD. In an attempt to understand why youth with ADHD may benefit from rewards more than their peers who participated in the research studies on the effects of rewards, one might consider the findings that children with ADHD have stronger responses to rewards, so they may not incur the same long-term consequences as others reported (Amabile, 1982; Deci & Ryan, 1985; Holroyd et al., 2008; Kohn, 2001; Ryan and Connell, 1989; Sagvolden et al., 1998). Ultimately, this study cannot claim a causal relationship between intrinsic motivation and prognosis so one may also consider that the behavioral interventions being used are simply not hurting the development of intrinsic motivation.

Only one statistically significant relationship was found in this research, which was between intrinsic motivation and age. Gottfried (1985) found that intrinsic motivation increased with advancing grade, though at different rates in different subject areas. However, as described in the results section, this study found that the general motivation was highest in 11-year-olds and lowest in 10-year-olds, with 9-year-olds not displaying a significant difference from either of their older peer groups. The surprising aspect of the current finding on age is that motivation did

not increase with age in a linear pattern as one might expect. It is important to clarify here that all students were included in this analysis and, while children with ADHD were hypothesized to have lower motivation, their group size was disproportionate to the others and an overall linear progression was still expected. The distribution of ADHD youth, along with differences in group sizes and the small sample size may be the cause of this finding.

Other factors that may explain the significant difference in intrinsic motivation between 10- and 11-year-olds are the changes in academic demands from 4th to 5th grade, and the timing of the administration. Research occurred in May and it is possible that the students were beginning to prepare for transitioning into the middle school. The 11-year-old participants would have been completing their last year of elementary school and it is conceivable that they were engaging in new and exciting tasks or conversations to prepare for that change. Since many questions on the General Scale asked about feelings toward trying new things, learning, and persisting, the 11-year-olds may have been influenced by their current situations. Future research may benefit from exploring external factors further to determine what may impact current intrinsic motivation. All possibilities considered, there are no clear data or hypotheses to suggest why the 10-year-olds had lower intrinsic motivation than the 9-year-olds.

The other comparisons completed in this study yielded no significant results which indicate that there is not a substantial relationship between intrinsic motivation and sex, receiving medication or attending therapy. This implies that boys and girls develop intrinsic motivation at approximately the same rate with any differences being minute and due to chance. Children who received psychotropic medication did not perform any better or worse than those who did not take medication and youth who attended therapy for symptom management were no different than those who did not attend therapy. These findings could mean that diagnosis, some

demographics, and treatment utilization are not significantly associated with intrinsic motivation.

Limitations

No significant differences in intrinsic motivation were found between diagnostic groups. The differences, while not substantial, were in the direction of supporting the original hypothesis. Academic intrinsic motivation was lower in the ADHD group, in boys, in children who took psychotropic medication, and in children who received therapy. These results may suggest a relationship between the variables and intrinsic motivation, although the differences were not found to reach significant levels in this study and are assumed to have occurred due to chance. With the following limitations addressed, future research may find more meaningful information.

This research contained several notable limitations that may have impacted the results. First, the timing of the administration was inconveniently close to state-wide testing dates, which resulted in two schools choosing not to participate due to concerns that their students would become overwhelmed. This decision decreased the sample size and also raises the possibility of individual schools approaching tasks differently. As such, some schools may acknowledge effort in ways that could promote higher intrinsic motivation than others. Second, the recruitment method was not face-to-face which may have discouraged some parents from consenting for their child to participate, despite being provided with contact information to speak with the researcher for clarification. Had the other two schools participated and if parents had the opportunity to meet with the researcher in person, more children may have participated. With a larger sample, the four diagnostic groups could have been larger, increasing the statistical power of the study. Since the groups were small and uneven, the statistical power of the analysis was low and the findings may not generalize beyond this sample. Third, the full CAIMI could not be administered as it was deemed to be too long for an administration during school. Had the

schools approved of more time for the study, the CAIMI might have provided meaningful information about differences in motivation among academic subjects. These data would have been more specific than just the General Scale, and might have yielded differences among diagnostic groups. Additionally, the CAIMI contains stronger validity and reliability as a whole than by using its scales individually. Lastly, willingness to participate may have been a factor; the current study reached out to 366 families and received a response rate of 19% with 17% eligible for participation.

Directions for Future Research

Although this research produced only one statistically significant finding, it was not due to a difference in diagnostic presentation as expected. While children with ADHD were slightly lower in their intrinsic motivation, this cannot be better explained by anything other than chance. Future research may find more meaningful information from a replication with a larger sample of children with confirmed diagnoses and a more sensitive measure. Additionally, a more equal group distribution and representation would be beneficial as well as completing the whole CAIMI measure for additional areas of examination. The content scales of the CAIMI measure intrinsic motivation in specific academic subjects and it might be fruitful to explore, in more depth, similarities and differences among academic subjects in children with and without ADHD. Alternatively, a larger measure which examines overall intrinsic motivation outside of academics, like the general scale, may produce different results. Lastly, as described in the research implications, the results of this study may suggest a more promising future for children with ADHD than the prognosis currently outlined by the literature. To explore this possibility further, a more recent and comprehensive longitudinal study of children with ADHD is recommended. This may include protective factors, risk factors, treatment modalities and success

in the areas of academic, social and emotional functioning.

In considering the use of Self-Determination Theory to understand and treat ADHD, it may be more useful to assess the three specific components of intrinsic motivation (i.e., autonomy, competence and relatedness) separately for a more definitive assessment of these areas. The General Scale that was used was part of a larger measure which was geared toward academics and, while some questions likely measured aspects of autonomy and competence, it is highly unlikely that relatedness was evaluated. Unfortunately, age appropriate measures could not be located for all three separate components of intrinsic motivation resulting in the use of the CAIMI as the closest measure of intrinsic motivation for children.

Conclusion

This study proposed a new perspective with which to conceptualize the development of intrinsic motivation in children with ADHD, which was thought to be hindered by their symptomology and negatively impact their long-term success. Self-Determination Theory posits specific requirements for developing intrinsic motivation including autonomy, competence and relatedness. All were believed to be negatively associated with ADHD symptoms and their treatment. It was hypothesized that children with ADHD would exhibit lower intrinsic motivation than children without ADHD. The General Scale on the CAIMI was used to measure the overall academic intrinsic motivation of children in fourth and fifth grades to compare scores between children with and without ADHD. Other areas explored were differences in intrinsic motivation on the demographic variables of sex and age, in addition to treatment methods including receiving medication or therapy. The only analysis which yielded significant results was the relationship between the age of the participants and their intrinsic motivation, and this nonlinear finding was inconsistent with prior research that showed an increase in intrinsic

motivation with age. It remains unclear why this statistically significant difference occurred. It should be emphasized that the small sample size combined with uneven group distributions resulted in a low statistical power and the results may not be generalizable to the broader population. While the results indicate that there is no difference of intrinsic motivation between children with and without ADHD, it is important to note the limitations of the study and that firm conclusions cannot be drawn from this study alone. Future research options should be explored, as suggested above, for a better understanding of the developmental needs of children with ADHD, as many of these children continue to have difficulties at home, in the community, and at school. This said, the current research suggests that they do not differ from their peers in intrinsic motivation, and unless more powerful studies find otherwise, interventions to enhance intrinsic motivation are not indicated by this study's results.

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Appendix A: Introductory Letter

April 29, 2016

Hello Parent/Guardian,

My name is Carissa Krapf and I am a doctoral student in the Clinical Psychology program at Antioch University New England. I am completing my dissertation research by looking at differences in academic motivation between children with ADHD and children without ADHD. The results of my study might inform how to better help children with ADHD feel more positively toward school and, as a result, do well in school.

I am recruiting children **between the ages of 9- and 11-years-old** for this study, and need **children with and children without an ADHD diagnosis** to participate. All participants will be entered into a raffle for an opportunity to win a \$25 Amazon gift card. Please read the attached consent form for further details about the study and circumstances in which it will take place. Please complete the consent form and brief health survey and return to your child's school, in the enclosed envelope, **by Friday, May 6th**.

If you have questions after reviewing the information in this packet, please contact me at XXX@antioch.edu or XXX-XXX-XXXX.

Thank you in advance for you and your child's participation!

Sincerely,

Carissa Krapf, M.S.
Doctoral Candidate
Antioch University New England

Appendix B: Consent Form

Child's Name: _____

Child's School: _____

Dear Parent,

I am a doctoral student at Antioch University New England in Keene, New Hampshire. I am asking permission for your child to be in a research study about motivation for the completion of my dissertation.

What is the study about?

The purpose of my study is to learn more about children's motivation toward learning. Participants need to be between the ages of 9- and 11-years-old. I am looking for **children with ADHD and children without ADHD** to participate. I will be looking for differences in their amounts of motivation. If there is a big difference, it could mean that children with ADHD need different kinds of supports.

What will I ask your child to do?

With your permission, your child will be asked to answer 18 questions about how he/she feels toward learning. This will take about 30 minutes and will be done at his/her school with the support of the guidance counselor. The time and location will be worked out with the guidance counselor.

What are the benefits of participating?

For participating in this research, you and your child will be adding to the understanding of children's motivation in school. This information may inform different interventions to better support children with ADHD. There are no direct benefits for participation other than the possibility of payment as described below.

Is there a payment for participation?

You and your child will be entered into a raffle for a chance to win one of several \$25 Amazon gift cards.

Are there any risks for participation?

While no risks are expected, it is possible that some questions might remind your child of challenging school experiences. The guidance counselor will be present to help support your child if needed. I do not anticipate any other risks.

Your child's information will remain confidential.

No reports about the study will contain information that could identify you or your child. Once all information is collected, your child's name will be converted into a number. The key for this information will be stored on an external hard drive not accessible by the internet. All hard copies of materials will be stored in a locked drawer. At the completion of the study, materials will be appropriately destroyed to protect the participants.

Taking part is voluntary.

There are no consequences for you or your child if you choose not to participate. I will also ask your child if he/she wants to participate. Only children who want to will take part in the study. Your child may choose to stop at any time.

If you would like your child to participate, here is what you must do:

- Read and sign this form.
- Complete the 4-question health survey attached.
- Place this form and the health survey into the envelope provided. Seal the envelope and return the envelope to your child's teacher.

If you have any questions, you may contact me, Carissa Krapf, at XXX@antioch.edu or XXX-XXX-XXXX. If you have any questions or concerns regarding your or your child's rights as a participant in this study, you may contact Kevin Lyness, Chair of the Antioch University New England Institutional Review Board, at 603-283-2149 or access the website at <http://www.antiochne.edu/institutional-review-board/>. The Vice President for Academic Affairs, Melinda Treadwell, may also be contacted at 603-283-2444.

Please indicate below whether or not you would like your child be in the study. Have him/her return the form to school within one week, sealed in the envelope provided. To protect your child's information, teachers will be collecting the sealed envelopes.

I have read and understood the information provided to me about the research study on children's motivation toward learning. I understand that it will be conducted at my child's school by Carissa Krapf, a student researcher from Antioch University New England. (Please check one of the following.)

_____ I **give** permission for my child to be included in the study.

_____ I **do not give** permission for my child to be included in the study.

Your Name (printed) _____

Your Signature _____ Date _____

Child's Name (printed) _____

Child's Month/Year of Birth (to verify meeting criterion for study) _____

Phone Number (to contact you if you win a \$25 gift card) _____

Name of person obtaining consent _____ Carissa Krapf, M.S. _____

Appendix C: Brief Health Survey

Please complete this brief survey about your child’s health.

1. Has your child ever been diagnosed with, or suspected of having Attention-Deficit/Hyperactivity Disorder?

(Circle one) Formal Diagnosis Suspected No

2. Does your child have any other mental or physical health diagnoses or challenges?

a. Please list: _____

3. Please list medications currently prescribed to your child. Please include name, amount, and frequency (For example: Adderall, 10mg, 2x per day):

4. Has your child ever received psychotherapy, counseling, or special skills training to address ADHD or symptoms of inattention, impulsivity, or hyperactivity?

(Circle one) Yes No N/A

- a. If yes, please list age and duration:

(For example: 4y/o for 6 months; Currently receiving therapy since May 2015)

Appendix D: Assent Form

Child's Name: _____

Child's School: _____

A couple weeks ago you brought home some papers asking your parents for permission to work with me. I'm going to ask for your permission now too.

I want to know more about how kids feel about learning. I am asking you and a lot of other kids to help me. If you would like to help, I will ask you to answer 18 questions. These questions will ask you how you feel about learning new things.

This is not a test like you usually have in school. You won't be graded on anything you do and your answers will not affect your school grade. All you have to do is try as hard as you can to answer all the questions. If you get stuck, your guidance counselor and I will be there to help you.

Your teachers, parents and the other children will not see your answers. It will be between just you and me. You don't have to do this if you don't want to, even if your parents gave their permission. You can also tell me if you want to stop after we begin, that's okay too.

Do you have any questions?

Again, this will not affect your grades even if you choose not to participate. If you agree to do this, I would like you to sign this paper.

This study on learning was explained to me and all of my questions were answered. I want to be a part of the study.

I, _____, want to be in this research study.
(Sign your name here)

_____ (Date)

Appendix E: Distribution of Scores

