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A Strength Based Investigation into the Role of Parent and Child Intelligence Theories and Achievement Goals on Sense of Mastery in Children with Attention-Deficit/Hyperactivity Disorder

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A Strength Based Investigation into the Role of Parent and Child Intelligence Theories
and Achievement Goals on Sense of Mastery in Children with Attention-Deficit/Hyperactivity
Disorder

by

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A THESIS

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Abstract

Children with Attention-Deficit/Hyperactivity Disorder (AD/HD) are at risk for negative outcomes in many domains. While past research has focused on deficits faced by these children, a recent branch of research focuses on their strengths and resilience, wherein positive parenting influences are commonly viewed as protective factors that help children to experience positive well-being. Some evidence suggests that parents can influence a child's beliefs about their intelligence and their goals for learning by exhibiting views of their own intelligence as either fixed or malleable and whether they approach tasks with the goal of learning something new or demonstrating competence. The relationship between parent and child intelligence beliefs and achievement goals has been demonstrated in typical populations but had not yet been investigated in an AD/HD population, thus, this study aimed to explore these relationships between children with AD/HD and their parents. A second area of focus examined how both parent and child intelligence beliefs and achievement goals may predict a child's sense of mastery (i.e. one's sense of optimism and control in managing one's environment). As a malleable view of intelligence and a learning approach to tasks have previously been identified as important indicators of an individual's ability to adapt and cope with setbacks it was hypothesized that these beliefs would predict a higher sense of mastery. Participants were 25 children between the ages of 8 and 11 years with a diagnosis of AD/HD and their parents. The proposed correlations and the model predicting child sense of mastery were not found to be statistically significant, suggesting that the relationship between parent and child intelligence beliefs and achievement goals may be different for children with AD/HD and a different predictive model for sense of mastery may be warranted. However, small sample size was a notable limitation and may have been a factor in the lack of significant results. A revised model for the relationship between parent and child intelligence beliefs and achievement goals, potential implications (including parent-focused, strength-based interventions) for promoting resilience in children with AD/HD, and considerations for continued investigations of resilience in AD/HD are discussed.

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and child implicit beliefs. Encouragingly, families where the parents saw their AD/HD child's characteristics as positive had fewer negative interactions (Lench, Levine, & Whalen, 2013). Additionally, parental support for their child's autonomy reduced the association between AD/HD symptoms and poor task persistence (Thomassin and Suveg, 2012), which is a key characteristic in the manifestation of intelligence beliefs and achievement goals. However, this relationship in regard to intelligence beliefs and achievement goal orientations has not yet been examined. Given the potential negative outcomes associated with AD/HD, in particular, the known deficits in self-regulation of motivation, an examination of the relationship between parent and child implicit beliefs within an AD/HD population may provide insight into how the relationship between these beliefs may or may not differ, so that parents of children with AD/HD may be further educated in how they may foster this aspect of their child's resilience.

Sense of mastery is a widely researched concept that is believed to contribute to long-term positive outcomes for children (Surjadi, Lorenz, Wickrama, & Conger, 2011). Prince-Embury (2013) described a *sense of mastery* as a core attribute of personal resiliency which reflects one's self-perception of their competence and abilities. Individuals with a high sense of mastery believe they have a certain degree of influence over their environment and engage in purposeful behaviour to achieve their goals (Prince-Embury, 2013). In addition to positive outcomes for the general population, a well-developed sense of mastery has been demonstrated to have protective effects on a wide sample of children with psychiatric diagnoses (Roberts et al., 2009) and is an important component of mental health throughout the lifespan in general (Conger et al., 2009; Prince-Embury, 2008). Sense of mastery is conceptualized by Prince-Embury (2007; 2008) as comprising the constructs of perceived self-efficacy, optimism, and adaptability (see Figure 1 in Chapter 2 for a model of sense of mastery).

Self-efficacy, or the belief in one's ability to complete a novel or challenging task (Bandura, 1997) is a particularly compelling component of sense of mastery in terms of relating it to achievement goal orientations and intelligence beliefs. Specifically, children with a strong sense of academic self-efficacy tend to view new tasks as an opportunity for learning rather than a potential for failure (Baird, Scott, Dearing, & Hamill, 2009), demonstrating the tenets of a learning goal orientation. Further, Conger, Williams, Little, Masyn, and Shebloski (2009) found that effective parent-child problem solving predicted a greater sense of mastery in adolescents. Given that previous research has identified a relationship between characteristics comparable to a learning goal orientation, it is suggested that sense of mastery is related to the intelligence beliefs and the achievement goals one holds. Some existing research has examined similar constructs, but the relationship between sense of mastery, intelligence beliefs, and achievement goal orientations have not specifically been examined. There is some previous research which suggests that adolescents with AD/HD have a lower sense of mastery (Prince-Embury, 2013). If it can be demonstrated that implicit beliefs are predictive of an individual's sense of mastery, interventions targeted at increasing incremental intelligence beliefs and learning goal achievement orientations in this population may also lead to increased sense of mastery.

In sum, children with AD/HD are at risk for a multitude of negative outcomes, and there has been a growing demand for strength-based investigations within this population. One possible protective factor to target is sense of mastery, with past research demonstrating a correlation with a number of positive outcomes. Given that parents are a consistent and important influence in shaping their children's beliefs and motivations, it is logical to examine the relationship between parents' and children's belief systems and motivations, and ultimately the impact of these factors on other indicators of resiliency in children with AD/HD. As such, the

goal of the current study is to expand on existing research to investigate a potential correlation between parent and child intelligence beliefs and achievement goal orientations, as well as the predictive impact of these factors on sense of mastery in children with AD/HD. Although there is a wealth of research outlining intelligence beliefs and achievement goals in individuals, as well as the capacity for such beliefs to be manipulated in experimental settings, little research has specifically examined the relationship between parent and child achievement goal motivations and intelligence beliefs (see Bennett, 2010; Dweck & Hamovitz, 2016; Major, 2013, 2016), and these relationships have not yet been studied within the AD/HD population.

In order to better understand the nature and impact of AD/HD, Chapter 2 begins with a review of the relevant literature, including diagnostic considerations, etiology, and a theoretical model of AD/HD. Following the review of AD/HD is an overview of the strength-based approach to AD/HD; a review of the construct of resilience; protective factors; parent-child interactions; intelligence beliefs and achievement motivations; sense of mastery; and finally, the influence of parents on the formation of children's beliefs, motivations, and sense of mastery. Chapter 3 presents the methodology, research questions, and proposed data analyses for this study. Chapter 4 then describes the results of the data analysis. Finally, Chapter 5 includes a discussion of the results, including interpretations of the results, implications, strengths and limitations, and directions for future research.

CHAPTER 2: LITERATURE REVIEW

Attention-Deficit/Hyperactivity Disorder (AD/HD) has been identified as a broad risk factor, leading to many potential adverse outcomes for children with this diagnosis. The following literature review begins with an examination of the key characteristics of AD/HD to provide a foundational framework through which this population may be understood. Following the introduction to AD/HD is a discussion of strength-based and resilience models, including the application of a strength-based framework to AD/HD and an overview of protective factors. In the remaining sections, parent and child achievement goal orientations and beliefs about the malleability of intelligence are discussed, and finally, a sense of mastery is reviewed as a resiliency factor and the previously outlined aspects are discussed in relation to their potential ties to sense of mastery. The chapter will conclude with a summary and hypotheses for the current research.

Attention-Deficit/Hyperactivity Disorder

AD/HD is a highly prevalent and pervasive neurodevelopmental disorder characterized by symptoms of hyperactivity, impulsivity, and inattention (Barkley, 1997; Barkley, 2014; Goldstein & Naglieri, 2008). The following review will include an in-depth examination of AD/HD, including diagnostic framework, etiology, theoretical model, and various treatment efficacies.

Diagnostic framework.

The current version of the *Diagnostic and Statistical Manual of Mental Disorders* is the *Fifth Edition* (DSM-5; APA, 2013). The DSM-5 has updated its diagnostic criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision* (DSM-IV-TR) to reflect more appropriate examples and guidelines for clinicians to better diagnose

adolescents and adults with AD/HD. Additionally, the criteria for age of symptom onset (i.e., at least six symptoms must be present, with some of them having been present prior to the age of seven) was changed from 7 years to 12 years due to ample research support that there is no clinical difference in course, severity, outcome or treatment response with age of identification (APA, 2013). Due to the time period during which the study data was collected, the DSM-IV-TR diagnostic criteria were used in the current study. The core criteria for diagnosing children with AD/HD in the DSM-5 are unchanged from the DSM-IV-TR, and therefore remain appropriate in terms of identifying the group of children diagnosed with AD/HD for the purposes of the current study.

According to the DSM-IV-TR, AD/HD is diagnosed as one of three main subtypes based on distinctions between the types of behaviours that are displayed (American Psychiatric Association [APA], 2000). The *predominantly inattentive presentation* (AD/HD-I) is characterized by symptoms of inattention, such as distractibility and difficulties with selective and sustained attention. The *predominantly hyperactive-impulsive presentation* (AD/HD-HI) is characterized by symptoms of hyperactivity and impulsivity, such as excessive fidgeting and motor activity, interruptions, and impatience. Finally, the *combined presentation* (AD/HD-C) results from a clinical presentation of symptoms from both AD/HD-HI and AD/HD-I. A fourth distinction, AD/HD Not Otherwise Specified (AD/HD-NOS), is reserved for situations in which the age of onset or pervasiveness criteria may not be met, but significant impairment in functioning has been demonstrated (APA, 2000).

Prevalence and pervasiveness.

Most prevalence estimates for AD/HD diagnoses in school aged children range from 3-7% in North America (American Psychiatric Association [APA], 2000; Barkley, 2014; CDC,

2013), and approximately 8-12% of children worldwide (Biederman & Faraone, 2005; Polanczyk, de Lima, Horta, Biederman, & Rhode, 2007). Based on data collected from 2005-2011, the CDC report in 2013 identified AD/HD as the most commonly diagnosed mental health disorder in children ages 3-17 years (6.8%). AD/HD has been found to occur in males versus females at ratios of approximately 3:1 to 5:1, and as high as 10:1 in clinical populations (Barkley, 2014; Staller & Faraone, 2006). It is a highly persistent disorder, as 50%-80% of those diagnosed in childhood continue to experience symptoms into adolescence and 30-50% still into adulthood (Barkley, 1997; Mayes, Bagwell, & Erkulwater, 2008).

Etiology.

There is no known “cause” of AD/HD. Rather, it is a widely accepted understanding that the interactions between various biological and environmental factors contribute to the onset and presentation of AD/HD symptoms (Goldstein & Naglieri, 2008; Harvey & Delfabbro, 2004; Wermter et al., 2010). This nature-nurture interaction can be conceptualized through reference to Urie Bronfenbrenner’s (1986) ecological systems theory in which the individual is at the center of “nested” interacting systems. These systems include both external (i.e., family, peer, school, community, and societal) and internal (i.e., biological, genetic) influences.

Environmental factors such as low birth weight, maternal smoking, other pre- and perinatal trauma, and various psychosocial adversities have been demonstrated to impact the individual expression of AD/HD (Thapar et al., 2013; Wermter et al., 2010). While environmental factors may play a role in the expression of AD/HD symptoms, there is a strong case for neurobiological and genetic origins of the disorder. Recent genetic studies have estimated that up to 80% of behavioural variance in AD/HD is accounted for by genetic factors (Barkley, 2014; Wermter et al., 2010), with heritability estimates commonly ranging from 70-

74% (Barkley, 2014). For example, the involvement of specific genes, such as DRD4 and DRD5 (dopamine receptors, which are targeted by stimulant medications) have been widely investigated and found to have small but significant contributions to the manifestation of AD/HD (Biederman & Faraone, 2005; Wermter et al., 2010).

Neuropsychological foundations.

As previously stated, AD/HD is considered to be a neurodevelopmental disorder, emerging during the early developmental period. This perspective is highlighted by numerous brain imaging studies which provide evidence of both structural and functional abnormalities associated with the disorder. In fact, magnetic resonance imaging (MRI) studies of the brain have identified a 1-3-year lag in the development of the prefrontal cortex of children aged 6-11 years when compared to their non-AD/HD peers (Berger, Slobodin, Aboud, Melamed, & Cassuto, 2013), and Shaw et al. (2013) demonstrated that this lag remains to some extent in adulthood.

In particular, the prefrontal cortex is thought to be involved in the manifestation of AD/HD symptoms (Rowland, Lesesne, & Abramowitz, 2002; Tripp, Ryan, & Peace, 2002). The involvement of the prefrontal cortex has been demonstrated by the poor performance of children with AD/HD on tests of executive functioning such as working memory, attention, response inhibition, and behaviour sequencing tasks that have been used in assessment of frontal lobe functioning (Tripp et al., 2002). As such, difficulties associated specifically with inhibitory processes, which are central to the disorder, have been associated with prefrontal lesions in adults (Shallice, Marzocchi, Del Savio, Meuter, & Rumiati, 2002). Lesions of the prefrontal cortex have also frequently been associated with symptoms of inattention, hyperactivity, and impulsivity (Tripp et al., 2002). Additional support for the role of the prefrontal cortex is evident through research comparing both the cognitive and behavioural deficits in children diagnosed

with AD/HD to adults with frontal lobe damage, which has found similarities in the pattern of emerging symptoms (Tripp et al., 2002).

While AD/HD is diagnosed based on behavioural characteristics, a significant body of evidence indicates that the underlying mechanisms of AD/HD are largely neuropsychological. The neurotransmitters, networks, and areas of the brain thought to be involved with the expression of AD/HD are indicated in the deficits in executive function that are frequently present with this diagnosis. Barkley's (1997) model of AD/HD provides a comprehensive framework to understand the relationship between these executive function deficits and the symptoms of AD/HD.

Theoretical model of AD/HD.

Barkley's (1997) model of AD/HD is the most prominently cited and widely accepted theory in the field. Past research has well-established that the prefrontal cortex is largely involved in the development of executive functions, such as self-regulation (Barkley, 1997; 2014; Shaw et al., 2007). According to Barkley, many of the core symptoms of AD/HD can be attributed to delayed development of such executive functions, particularly response inhibition.

Barkley's model is intended to primarily address symptoms related to AD/HD-HI and AD/HD-C. Barkley has theorized that AD/HD-I may represent a more distinct group of symptoms with cognitive underpinnings that are less clearly identified than those which contribute to the symptoms of AD/HD-C (Barkley, 2001; Barkley, 2013; Roberts, Milich, & Barkley, 2014). There is also a growing body of literature in support of a cluster of symptoms referred to as "sluggish cognitive tempo," first described by the ADD working group in *DSM-III* (as cited in Milich, Balentine, & Lynam, 2001), which has been suggested to comprise a unique disorder that has frequent overlap with AD/HD, although in some cases individuals with these

symptoms do display a profile similar to AD/HD-C (Roberts et al., 2014). Of note, Barkley (2014) has suggested a name change for this proposed condition to Concentration Deficit Disorder.

Barkley's model postulates that the central deficit of AD/HD is a deficiency with behavioural inhibition, which is conceptualized to involve three key deficits relating to AD/HD: inhibition of the desire to act on impulse; inhibition of an ineffective response; and inhibition of responses to irrelevant stimuli (i.e., distractions; Barkley 1997; Barkley, 2014). The overarching deficit in behavioural inhibition involves difficulties related to four main categories of executive function (as defined by Barkley): non-verbal working memory, internalization of speech, self-regulation (of affect, motivation, and arousal), and reconstitution (planning, analysis and synthesis of behaviour). Deficits in these defined areas of executive function are present in individuals with AD/HD and manifest as developmentally inappropriate levels of inattention, hyperactivity, and impulsivity (Barkley, 2014).

While individuals with AD/HD may have underlying deficits in self-regulation and behavioural inhibition, it is important to note that these individuals do not have a fundamental inability to learn (or lack of skill) or a desire to behave inappropriately (Barkley, 2014; Barron et al., 2006; Goldstein & Naglieri, 2008). Rather, the underlying deficit in inhibition results in difficulties with planning, engaging in goal-directed behaviour, re-engaging in tasks, and paying attention to relevant information, leading to struggles with utilizing and demonstrating their knowledge appropriately. For these reasons, Barkley refers to AD/HD as a “disorder of *performance*” (Barkley, 2014). As previously discussed, these symptoms can contribute to a variety of negative outcomes.

Comorbidity and outcomes.

Children with AD/HD may experience a range of adverse long-term outcomes, including academic difficulties (Gupta & Kar, 2010; Modesto-Lowe et al., 2011), problems with peers, family conflicts (Modesto-Lowe et al., 2011), behaviour problems, substance abuse, symptoms of anxiety, depression, low self-esteem (Barkley, 2014; Gupta & Kar, 2010), and mental illness (Barkley, 2014; Goldstein & Naglieri, 2008; Modesto-Lowe, Yelunina, & Hanjan, 2011). More specifically, there are many psychiatric conditions that may co-exist alongside AD/HD. Most commonly, children with AD/HD meet criteria for Oppositional Defiant Disorder or Conduct Disorder (30-50%), an Anxiety Disorder (25-35%), Major Depressive Disorder (25-30%), and/or Specific Learning Disorders (approximately 20-25%; Barkley, 2014; Spencer, Biederman, & Mick, 2007). Other less common comorbidities can include Tic Disorder, Obsessive-Compulsive Disorder, and Bipolar I Disorder (Barkley, 2014; Spencer et al., 2007). Further to the difficulties these children may experience, youth with AD/HD are over-represented in the foster care system, residential treatment centres, and juvenile detention centres (Litner & Mann-Feder, 2009), with indications that 30-70% of young offenders in Canada have a diagnosis of AD/HD (Learning Disabilities Association of Canada [LDAC], 2001). Given the wide range and pervasiveness of symptoms they may experience, children with AD/HD are at risk for adverse developmental outcomes and poor adaptability (Brown, Howcroft, & Muthen, 2010; Deault, 2010; Mautone, Lefler, & Power, 2011; Modesto-Lowe et al., 2011). However, there are a multitude of interventions available that can help to improve certain areas of functioning for these individuals.

Interventions.

As AD/HD is a multifaceted disorder, effective intervention should target both the biological and the environmental aspects of the disorder (i.e., a combination of medication and behavioural interventions at home and at school; Vance & Luk, 2000; Barkley, 2014; DuPaul, Weyandt, & Janusis, 2011). Pharmacological and behaviour management interventions are typically first-line treatment solutions for AD/HD and have been well researched (Barkley, 2014). Research consistently supports the common clinical recommendation that both types of intervention be offered in conjunction with one another (Barkley, 2014; MTA Cooperative Group, 2004; Thapar & Cooper, 2016).

The stimulant medication, methylphenidate (e.g., Ritalin, Concerta), is the most commonly utilized drug in the medical treatment of AD/HD, along with dextroamphetamine and other amphetamines (e.g., Dexedrine, Adderall, Vyvanse), together comprising the majority of medication used in treating the disorder (Connor, 2014; MTA Cooperative Group, 2004). In addition to stimulant medications, other classes of drugs have been used in the treatment of AD/HD. For example, atomoxetine (Strattera), a selective norepinephrine re-uptake inhibitor has increased in popularity as a non-stimulant medication option (Pfiffner, Mikami, Huang-Pollock, Easterlin, Zalecki, & McBurnett, 2007). Over time, stimulants have remained the most effective and most prevalent AD/HD medication and are prescribed to 62% of children in the United States between the ages of 2 and 17 years who are diagnosed with AD/HD (Danielson, Visser, Chronis-Tuscano, & Dupaul, 2018). According to other sources, AD/HD medications are prescribed to approximately 5% of school-aged children in Canada (Brault & Lacourse, 2012). Connor (2014) reported that 65-75% of children experience symptom improvement for any single medication, while 25-30% of children and adolescents either do not tolerate or do not

respond to stimulant medication. However, response rates tend to increase to 80-90% when a second stimulant medication is tried (Connor, 2014).

It is pertinent to highlight that there are a number of non-responders to any one particular AD/HD intervention (psychosocial interventions included), as Smith and Shapiro (2014) estimated up to one-third of youth do not respond to stimulant or other “first line” medication. The reasons for ineffectiveness vary and may include factors such as incorrect diagnosis, inconsistent use, incompatible medication (adverse side effects outweigh the benefits), or incorrect dosages (Rowland et al., 2002). One clear downside to medication use is the potential for side-effects such as loss of appetite, growth restriction, gastrointestinal symptoms, sleep disturbances, irritability or mood changes, and headaches (Thapar & Cooper, 2016). Due to personal beliefs and/or the potential for adverse impacts, parents sometimes choose to decline medication as an option for their children or discontinue medication. Further, and perhaps most relevant to this discussion, several questions remain as to the ability of medication to improve long-term outcomes (Modesto-Lowe et al., 2011).

Given the aforementioned considerations in relation to medical treatment of AD/HD, alternate intervention strategies have also been developed and used with this population. In particular, numerous psychosocial intervention strategies have been implemented over the years, including parent training programs and behavioural interventions, both in isolation and in conjunction with medication (MTA Cooperative Group, 2004). Strong empirical support exists for protective effects and positive outcomes from positive parenting practices in children with AD/HD (Deault, 2010; Dvorsky & Langberg, 2016). However, one criticism that has been levied against many parenting programs and behavioural interventions is that they serve to maintain the focus on risk factors due to the main goals of decreasing negative behaviours and reducing

symptomatology (Dvorsky & Langberg, 2016). Further, the intensity of the successful combined treatment methods used in the MTA study are not always realistic for use outside of a research setting, in addition to considerations for the expense and sometimes limited availability of some psychosocial treatments (Smith & Shapiro, 2014). Although these interventions do serve to improve certain outcomes for children with AD/HD, drawing upon resilience factors and coping strategies that can be implemented in addition to other interventions may allow for more success and positive long-term outcomes (Climie et al., 2013).

Strengths-based Framework for AD/HD

Within the traditional deficit-focused approach to mental health, the key goals are to identify deficits, diagnose disorders, and determine eligibility for specialized services or treatment programs (Climie & Mastoras, 2015; Clonan, Chafouleas, McDougal, & Riley-Tillman, 2004; Dvorsky & Langberg, 2016). Adhering to such a model has provided the mental health field with a valuable perspective on the experiences of children with AD/HD and other disorders and has contributed to the development of intervention strategies that have been successful in reducing symptom severity (Climie et al., 2013; Dvorsky & Langberg, 2016; Rhee, Furlong, Turner, & Harari, 2001). However, deficit-focused models have been less successful in addressing difficulties related to comorbidities and other associated challenges or maintaining positive outcomes in the long term (Climie et al., 2013). For instance, the neurocognitive nature of the deficits of AD/HD means that most individuals will experience symptoms throughout their lifespan, as evidenced by data that approximately 70% of individuals remain affected into late adolescence and adulthood (Barkley, 2014).

Increasingly, professionals in the field of psychology are recognizing the need for alternatives to the traditional deficit-focused model when addressing assessment, intervention,

and research (Esquivel, Doll, & Oades-Sese, 2011; Rhee et al., 2001). An alternative that is growing in both popularity and use is a strengths-based approach in which focus is given to identifying the strengths and protective factors, which may be of particular benefit to children with AD/HD. Rather than focusing solely on the negative aspects of AD/HD, an emphasis on the identification of positive elements may result in more resilient outcomes and increased success for these children (Climie & Mastoras, 2015). Such approaches do not aim to eliminate the assessment and diagnostic practices of the traditional models, but rather aim to include more ability-focused interpretations and focus on interventions geared towards building positive behaviours in addition to eliminating negative behaviours.

Additionally, a strength-based approach may also be more desirable from the perspective of parents, who are much more likely to engage in collaborative efforts with schools and mental health professionals when there is an opportunity to discuss their child's strengths (LeBuffe & Shapiro, 2004). In sum, the main principle within strength-based models in psychology is a shift from focusing on an individual's deficits towards identifying areas of positive functioning to help prevent and cope with difficulties (Modesto-Lowe et al., 2011; Naglieri et al., 2010). Given the many documented difficulties associated with a diagnosis of AD/HD, the use of a strength-based framework with children with AD/HD may help to provide a basis for more positive outcomes.

A substantial literature base exists in regard to the extensive range of deficits experienced by children with AD/HD (Barkley, 2014; LeBuffe & Shapiro, 2004; Modesto-Lowe et al., 2011); and the symptoms and related impairments can be identified as risk factors for individuals with the disorder (Climie et al., 2013; Dvorsky & Langberg, 2016; Regalla, Guilherme, Aguilera, Serra-Pinheiro, & Mattos, 2015). The core deficits and comorbidities of AD/HD put children at

risk for further negative outcomes and poor adaptation. However, despite the potential long-term negative effects of AD/HD, many individuals with AD/HD, including those with added risk factors, have been known to persevere and demonstrate positive outcomes and success in their lives (Brown et al., 2010; Deault, 2010; Dvorsky & Langberg, 2016; Modesto-Lowe et al., 2011). For example, Spencer et al. (2007) found that approximately 20% of teenagers with AD/HD are able to perform well in multiple domains and an additional 60% present with intermediate outcomes. These promising results highlight the importance of identifying factors that may help to protect against adverse outcomes and contribute to positive ones.

A strengths-based approach results in a more comprehensive understanding of the abilities children with AD/HD possess (Dvorsky & Langberg, 2016; Merrell, Cohn, & Tom, 2011; Modesto-Lowe et al., 2011). To date there is limited empirical evidence reflecting the benefits of a strengths-based approach with children who have AD/HD, and such research is particularly lacking for those children who experience multiple environmental risks (Deault, 2010; Modesto-Lowe et al., 2011). Further, as research has historically emphasized risk factors, the current literature base provides little information regarding resilient versus non-resilient trajectories for individuals with AD/HD (Dvorsky & Langberg, 2016). Encouragingly, recent investigations have begun to identify potential positive factors, some of which include internal strengths and positive relationships (Litner & Mann-Feder, 2009; Modesto-Lowe, 2011). Given the heterogeneity of outcomes within this and other populations, as well as indications of adaptability across individuals with AD/HD, it is reasonable to suggest that some children with AD/HD are more resilient than others (Climie et al., 2013).

The growing recognition of and focus on strengths inherently necessitates an understanding and integration of the construct of resilience and discussion of key protective factors that have been identified to date.

Resilience

Resilience as a construct has been defined in several ways by prominent researchers in the field over the years. For example, Rutter (1985) previously defined resilience as a positive quality displayed by people facing adverse situations, and further added that it must involve an active process rather than simply the avoidance of a negative situation. Resilience has also been described as the ability to exercise adaptive coping skills, resulting in positive psychosocial outcomes when faced with adversity (Dweck, 2000). Similarly, Masten (2001) and Masten and Tellegen (2012) described it as a capacity for successful adaptation.

In general, there is collective agreement among researchers that resilience is a dynamic process which requires evidence of two conditions: 1) the presence of risk or adversity and 2) positive outcomes despite adversity (Climie et al., 2013; Dvorsky & Langberg, 2016; Masten, 2014; Prince-Embury & Saklofske, 2014; Yeager & Dweck, 2012). Thus, while many individuals display competent functioning in their everyday lives, the presence of adverse circumstances or risk factors is required to characterize such adaptive functioning as resilience (Rhee et al., 2001).

Research into resilience has shifted over the past several decades; these shifts are often referred to as the *four waves of resilience science* (Masten, 2014). The first wave was descriptive in nature, as researchers sought to define the construct and identify predictors of resilience. The second wave shifted to answer questions about the processes involved, such as *how* protective influences work and *how* positive development could be promoted. The third wave continued to

test theories from the first two waves, while at the same time promoting resilience through interventions. Finally, the fourth wave of resilience research gave rise to systems-oriented approaches which concentrated on gene by environment interactions that stemmed from several advances in technology and scientific knowledge (Masten, 2014).

Informed by the fourth wave, current resilience models endorse a systemic approach with a focus on the interactions between an individual and his or her environment; positing that resilience can be shaped and promoted through factors such as parenting practices, community support, and education (Dvorsky & Langberg, 2016; Dweck, 2000; Masten, 2014).

Bronfenbrenner's (1986) ecological systems model offers an often-referenced framework from which to understand the individual at the center of a system of interacting influences, which include those listed above as well as individual characteristics to the child (Bronfenbrenner, 1986).

In contrast to earlier beliefs that resilience is an inborn trait, there is now general acknowledgement that parenting and various other external influences are important factors which contribute to the development of resilience in children and youth (Harvey & Delfabbro, 2004; Masten, 2008; Rutter, 2012). As such, there is a need for families, schools, and communities to work together to address risk and protective factors and promote developmental successes (Esquivel et al., 2011).

Protective Factors

Protective factors are those attributes, experiences, and environments which promote positive adaptation (Masten, 2014). In other words, they are factors that “compensate for and offset risk” and contribute to the capacity for resilience (Masten, 2014). Protective factors are integral to a strength-based approach in that a strength-based approach entails the identification

of key protective factors within children and their environments (Masten, 2014). Many such factors are associated with positive development in general and are protective of human development across many contexts (Masten, 2014). A number of researchers working in this area have identified several key protective factors for children, but this review will focus on parent-child interactions and sense of mastery.

For example, Dvorsky and Langberg (2016) identified positive parenting and positive self-perceptions of competence as key factors that promote resilience and the Project Competence Longitudinal Study (PCLS; Masten & Tellegen, 2012) further confirmed that general intellectual capacity and quality of parenting were the two most important protective factors in situations of high adversity. The Kuaia longitudinal study (Werner & Smith, 1982) also recognized similar key protective factors such as higher quality care-giving in early childhood, greater self-efficacy, optimism, motivation to succeed, positive relationships with parents, teachers, and other adults, greater cognitive skill, and appealing personalities.

Behavioural studies of resilience have also focused on competence in “age-salient developmental tasks” as a key measure of a child’s adaptation and functioning in life (Luthar & Brown, 2007; Masten et al., 2008; Masten, 2014). For example, *sense of competence* is identified as one such psychological construct which is widely accepted as significant for success in daily life and educational settings (Marsh, Martin, Yeung, & Craven, 2017; Masten, 2014). Marsh et al. (2017) point to the fact that across researchers and areas of study there are many ways to conceptualize and operationalize various factors falling under the umbrella of “sense of competence” (e.g. self-efficacy, self-esteem, competency, etc.). Within this purview, Prince-Embury (2007, 2008) conceptualized her construct of *sense of mastery* as deriving from the broader concept of competence, and summarized that sense of mastery and self-efficacy, among

other factors, are important protective factors that have consistently been identified in the resilience and developmental literature. Additionally, perceived competencies are often conceptualized as a central component of most models of achievement motivation and are frequently identified as a major characteristic to be fostered across many areas of study. As such, sense of mastery is an identified protective factor (Prince-Embury, 2008, 2013), and is hypothesized in the current study to arise from higher ratings of incremental intelligence beliefs and learning goal achievement orientation.

Parent-child interactions and sense of mastery were chosen as topics of particular interest due to their appropriateness as targets for intervention, the high degree of influence parenting factors have on child outcomes, and the potential predictive relationship between specific parent-child interactions and sense of mastery. As mentioned in Chapter 1, the following discussion of the importance of parenting factors and parent-child interactions provide a contextual background in which to more broadly consider the relationship between parent and child beliefs, although parent-child interactions are not directly assessed in the current study. The following sections will provide a more in-depth review of the literature pertaining to these areas.

Parenting Factors.

As discussed in the previous section, parenting practices are consistently listed as one of several key protective factors that exert a positive influence across a wide range of individual risk factors (Dvorsky & Langberg, 2016; Johnston & Chronis-Tuscano, 2014; Masten, 2014). Much research in the field has examined the correlation between resilient children and the behaviors and practices of their parents, as parent-child interactions have been long understood to have an impact on child behaviour (Deault, 2010; Johnston & Chronis-Tuscano, 2014; Murray, Wooglar, Martins, Christaki, Hipwell, & Cooper, 2006).

In a review which highlighted 21 studies where resilient outcomes were identified in children with AD/HD, Dvorsky and Langberg (2016) summarized that the “strongest evidence for promotive and protective factors in the context of AD/HD was found across social and family systems” (p. 383). The evidence for the promotive effects (defined as demonstrating a main effect rather than an interactive process) of positive parenting is particularly compelling. For example, aspects of positive parenting were found to protect against symptom severity (Kawabata et al., 2012) and a longitudinal study of positive parenting behaviours found a reduction in the development of co-occurring conduct problems (Chronis et al., 2007). Parenting skills are additionally associated with the development of children’s executive functioning and self-regulation skills (Masten, 2014).

As mentioned earlier, a key project that has informed what we know about resilience factors in children is the Project Competence Longitudinal Study (PCLS; Masten & Tellegen, 2012). The PCLS is a longitudinal study spearheaded by Norman Garmezy which followed a cohort of children ages 8-12 years through to adulthood, and which had an overarching goal to “understand the observable phenomenon of variation in the adaptation of individuals at risk for maladaptation” with a focus on the construct of competence (Masten, 2014, p. 56). Masten and Tellegen (2012) reported that competence in developmental tasks and adjustment for children and adolescents who faced elevated levels of adversity was predicted by two strong factors: parenting quality and cognitive skills. Further, Masten (2014) suggested that parent-child interactions are a factor in almost every study of resilience in children and highlighted that many interventions which target malleable aspects of parent-child interactions and relationships have been associated with positive child outcomes.

Parent-child interactions have been identified as particularly important in the context of children with AD/HD (Johnston & Chronis-Tuscano, 2014). There are numerous and varying family factors that may serve as either risk or protective factors, but parent-child interactions are considered to act as the central link within this framework (Johnston & Chronis-Tuscano). It is important to note that just as parent-child relations can have a positive impact, conflicted parent-child relationships and difficulties in communication and problem solving have been consistently found to result in a number of functional impairments in families with a child who has AD/HD (Deault, 2010; Foley, 2010). Some of these difficulties may be exacerbated by either undiagnosed or unmanaged parental AD/HD as well. Given the difficulties in parent-child relationships that are often present with AD/HD and the potential positive impact that parents can have on child outcomes, it is important to identify practices that parents can implement in order to build strengths and promote resiliency in their children.

Intelligence belief systems.

One such scenario where parents may be able to exert positive influence over their children is through the transmission of implicit beliefs about ability and learning. While the transmission of beliefs is not directly observed in the current study, the background literature provides an underlying theoretical assumption regarding the relationship between parent and child beliefs, which are explored here. Carol Dweck (2000) proposed a number of theories, grounded in the social cognition literature, pertaining to the way that people apply meaning to their experiences. One branch of social cognition deals with “meaning systems” where such meaning systems affect the way in which people develop different coping abilities when faced with challenging situations. These meaning systems are sets of beliefs formed by interactions with family, community, educators, and peers.

Dweck (2000) discussed two *implicit belief systems*, or *mind-sets*, that may influence an individual's motivation and achievement. She asserted that beliefs about intelligence or ability can be classified into two theories: the *entity theory* (or *fixed mind set*) and the *incremental theory* (or *growth mind-set*). Dweck suggests that these belief systems portray the underlying reasons that some students are motivated to work harder whereas others develop helpless patterns of behavior. Dweck (2000) found that an individual's belief that intelligence is either fixed or malleable has a direct effect on the attitudes and behaviours that an individual will implement when faced with challenges or risks. An individual maintaining an *entity theory of intelligence* believes that one's intelligence or ability cannot be changed or improved through effort (Dweck, 2000; Haimovitz & Dweck, 2016). In contrast, the basis of an *incremental theory of intelligence* is that intelligence or ability is malleable and can be changed or improved with effort (Dweck, 2000; Haimovitz & Dweck, 2016).

The key difference between the two theories, or belief systems, relates to the individual's perception of failure and how failure or challenge is approached. Individuals with an entity theory are more likely to be discouraged following a failure and may question their ability or give up, adopting a helpless response pattern. These individuals will likely attribute a failure to personality or lack of innate ability. They tend to believe that people can learn new things, but that their underlying intelligence or ability will remain the same. In contrast, those with an incremental theory tend to approach challenges with the belief that they can improve their abilities and therefore put forth increased effort in response to negative feedback or "failure" (Dweck, 2000).

In relation to the above approaches to frustration and challenge, intelligence beliefs are associated with the type of achievement goal orientation that an individual is likely to adopt

(Dweck, 2000). Achievement goals describe the quality, or nature, of an individual's motivation for a given task (Barron et al., 2006). The literature describes two primary types of achievement goals an individual may adhere to: *performance goals* and *learning goals* (Baird et al., 2009; Barron et al., 2006). Dweck (2000) proposed that individuals who hold an entity belief tend to adopt performance goals, whereas individuals with an incremental theory tend to gravitate towards learning goals, and many researchers have confirmed this relationship to hold true (Baird et al., 2009; Barron et al., 2006).

Performance goals are characterized by a focus on performance in relation to others as well as attempts to obtain positive or avoid negative judgements on one's competence or ability (Baird et al., 2009; Grant & Dweck, 2003). Performance goals are also correlated with ineffective strategy use and decreased task effort, as individuals who hold these goals tend to have a helpless pattern of responding and give up when faced with frustration. On the other hand, learning goals are characterized by a focus on developing skills and increasing competence. Individuals with an incremental theory are likely to adopt a "mastery learning response" by seeking out more adaptive responses, such as increased persistence and effective use of strategies, to challenges and poor performance (Baird et al., 2009). Figure 1 provides an overview of the relationships between these factors within Dweck's (2000) model, where an individual's theory of intelligence is associated with their achievement goal orientation and with their likely response style (i.e. a mastery/learning oriented response versus a helpless response) when faced with challenge or frustration. Children's beliefs and goals have been shown to correlate with those of their parents and have also been shown to be malleable. These associations are discussed in the following sections.

Intelligence Belief	Achievement Goal Orientation	Response to Challenge/Frustration
Incremental	Learning	Mastery (e.g. seeking new strategies for learning)
Entity	Performance	Helpless (e.g. giving up because of one's own judgement of lack of ability)

Figure 1. Dweck's model of Intelligence Beliefs and Achievement Goals

Intelligence beliefs and achievement goals of parents and children.

Children's intelligence beliefs and achievement goals have been shown to correlate with parent intelligence beliefs and achievement goals (Bennett, 2010; Haimovitz & Dweck, 2016; Hodoka and Fincham, 1995; Moorman & Pomerantz, 2010; Pomerantz et al., 2006). As such, it is useful to examine these relationships as a potential context in which parents may be able to encourage their children to modify their thoughts and motivations in a way that may result in a higher level of resilience and more positive outcomes.

As an example of the relationship between parent and child achievement goal orientation, Hodoka and Fincham (1995) measured the responses of helpless versus mastery orientated mothers and the responses of their children. Specifically, mother-child dyads were given a solvable task, followed by two unsolvable tasks, and finished with another solvable task. These tasks were timed, and the mother was told that she could help or instruct their child but could not touch or manipulate the materials. In situations where the child seemed challenged by a puzzle, mothers of children who were mastery-orientated (i.e. learning orientated) tended to encourage the child and guide them towards figuring out the puzzle, whereas mothers of children who were identified as helpless responders tended to encourage the child to move on to the next puzzle. This same study also demonstrated that mothers who made performance goal statements tended

to have children who made similar performance goal statements. For example, one mother's "performance goal" comment was "you got 3 out of 5 right" and a corresponding "performance goal" comment from a child was "how much time do I have left?". While this study demonstrated a relationship between mother and child intelligence theories and achievement orientations, the results were correlational in nature, meaning that causation or directionality could not be established.

In relation to intelligence beliefs, Moorman and Pomerantz (2010) demonstrated that mother's beliefs about ability have an impact on their quality of involvement in children's learning. Specifically, they discovered that mothers' mindsets about the malleability of their children's abilities were related to the types of behaviours they employed in their interactions with their children on a challenging task. For example, mothers who held entity theories engaged in more "unconstructive involvement" (performance-oriented teaching, display of negative affect, and more exertion of control). Mothers with an entity mindset also responded to their children's helplessness in an unconstructive manner more often than did mothers with an incremental mindset. Interestingly, constructive involvement was not impacted significantly by the mothers' ability mindset. While Moorman and Pomerantz (2010) didn't measure the resulting mindsets of the children in their study, this study is important in demonstrating that the way in which certain tasks are framed to parents can have an impact on the quality of parent's involvement in said task.

Other studies have gone one step further to demonstrate that external sources can predict the type of belief that a child will adopt. For example, Bennett (2010) discovered that high parental endorsement of incremental intelligence beliefs and endorsement of learning goals predicted children's advocacy of the same beliefs. Bennet (2010) also concluded that in the

context of homework help, in addition to parent intelligence theory, parent communication and modeling about ability were the best predictors of children's theories of intelligence. Similarly, parent achievement goal theory and parent person/product focus were the best predictors of children's achievement goal theory.

Haimovitz and Dweck (2016) took a slightly different approach by examining "intelligence mindsets" (the belief that intelligence is either fixed or malleable) in addition to "failure mindsets" (the belief that failure is either enhancing or debilitating). They found that parent's "failure mindsets" were predictive of children's intelligence mindsets, and similar to Moorman and Pomerantz (2010), that parents' failure mindsets were also predictive of their responses to their children's hypothetical failure. Even more specifically, it was found that parents' failure mindsets but not their intelligence mindsets predicted children's intelligence mindsets, in that parent belief that failure is debilitating was related to child belief in an entity view of intelligence. Additionally, children's perceptions of their parents' failure mindsets also had a significant impact on their own intelligence mindsets. The authors suggested that this may have been due to the parents' focusing on the child's performance or ability rather than their learning when reacting to the child's failure (Haimovitz & Dweck, 2016).

While the research overview presented above serves to solidify that parents' beliefs and reactions to failure are related to their child's intelligence beliefs and achievement goal orientations, some past research also highlights the potential for such beliefs to be explicitly "taught" to children. For example, Erdley, Loomis, Cain, Dumas-Hines and Dweck (1997) demonstrated how achievement goals can be imposed or "taught" in two experiments in which they observed children's abilities to deal with a social challenge. A group of elementary students were presented with the opportunity to be involved in a pen pal club. One group of children was

presented with a performance goal, where the group was told that the objective of the pen pal club was to find out how good they are at making friends. Alternatively, the objective of the second (learning goal) group was presented as an opportunity to work on and learn new strategies for making friends. After their initial letter was rejected, the children who were given a performance goal tended to provide less personal information and effort in subsequent letter writing, whereas the children in the learning goal group enhanced their efforts. They found that children implemented aspects of performance versus learning goals depending on the imposed task objectives.

The impact of the imposed goals on the children's responses to social failure in this study could potentially have value in terms of coaching children to value learning goal approaches in an attempt to encourage implementation of such goals in their daily lives. In fact, a later mindset intervention implemented by Yeager et al. (2016) in which adolescents were educated on the malleability of intelligence and taught a learning goal perspective and were asked to write a letter to future students who were facing challenges, resulted in an increase in challenge-seeking, increases in student's academic achievement, and decreased performance-avoidance behaviour and fixed mindsets.

Several studies have also previously examined the relationship between intelligence beliefs and achievement goal orientation, both in scenarios where beliefs are measured and where beliefs are taught. For example, Cury et al. (2006) previously identified that an entity theory was related to increased endorsement of performance-approach (goal of demonstrating competence) and performance-avoidance (goal of avoiding demonstration of incompetence) goals, as well as decreased endorsement of mastery (i.e. learning) goals. Kinlaw and Kurtz-Costes (2007) found a significant correlation between entity beliefs and performance goal

endorsement (but not between incremental beliefs and learning goals) in elementary school students, while Baird et al. (2009) did discover an association between incremental theories of intelligence and a preference for learning goals in youth. As such, there is some evidence to suggest that intelligence belief systems are linked to the types of achievement goals that individuals develop (Baird et al., 2009; Dweck, 2000; Kinlaw & Kurtz-Costes, 2007). Hamovitz and Dweck (2016) also later summarized that research over the past two decades has continued to support the assertion that children's intelligence beliefs (or mind-sets) have a robust influence on their motivation and learning. Further research, discussed in the following review, goes on to demonstrate that a child's goal orientations and motivations can be influenced. Figure 2 outlines the hypothesized relationship between parent and child intelligence beliefs and achievement goals.

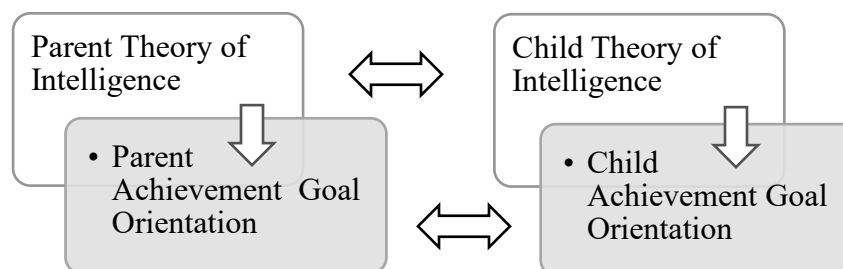


Figure 2. Relationship between parent and child intelligence beliefs and achievement goal orientation.

Achievement goals and children with AD/HD.

Importantly, students with AD/HD are described as having performance deficits rather than skill deficits, meaning that they often have the necessary skills to successfully complete a task but fail to demonstrate those skills due to executive functioning deficits, and they tend to

experience frustration and give up on tasks more easily than their peers without AD/HD (Barkley, 2014; Barron et al., 2006). Aside from this general understanding of how individuals with AD/HD may approach and persevere on tasks, there are few studies that have specifically examined achievement goals in children with AD/HD. The limited research completed in this area suggest children with AD/HD favour performance goals more than children in control groups.

In one study, Dunn and Shapiro (1999) provided a forced choice scenario where children were asked to choose between a performance goal-oriented task or a learning goal-oriented task. Specifically, the children were asked to select one of two boxes containing tasks similar to one they had performed earlier and received negative feedback on. The description for the *performance box* indicated that the tasks were of different levels of difficulty and encouraged the children to try to not make mistakes and to try to solve more problems than anyone else. Conversely, the description of the *learning box* indicated that the children might make a lot of mistakes but that they would eventually learn a lot of new things and that the importance was in how hard they tried to solve the problems. The results indicated that students with AD/HD preferred the performance-oriented tasks more than the control group (children without AD/HD). Interestingly, girls with AD/HD were less consistent in their task choice following a failure (i.e. the girls displayed a preference for performance tasks prior to a failure experience but chose learning goals following a failure experience). This finding suggests that for girls with AD/HD, goal orientation may be more task specific. Additionally, the tendency to alter their orientation following a failure may actually be an indication of adaption and resilience.

Carlson et al., (2002) also discovered that children with AD/HD demonstrated characteristics consistent with performance goals (e.g., less persistent, more easily discouraged,

had lower expectations, and preferred less challenging work) to a greater extent than a control group of children without AD/HD, based on parent, teacher, and self-reports. These differences remained stable after controlling for IQ, and highlighted that motivational deficits associated with AD/HD contribute to academic difficulties experienced by this population.

Finally, Barron et al. (2006) unexpectedly found that students with AD/HD were more likely to endorse mastery (learning) goal orientations and were less likely to endorse performance-approach goals. A *performance approach goal* is indicated when an individual's goal is to demonstrate competence during a learning activity, as opposed to avoiding demonstration of incompetence (a *performance-avoidance goal*). However, the students still struggled to do well in school despite the proposed protective effects of learning goals. Barron et al. postulated that this was due to the high level of endorsement of performance-avoidance goals. When compared to a normative sample, the AD/HD group did not differ in mastery goal orientation but were more performance-avoidance oriented than the normative sample. These results indicate that performance-avoidance goals may be more important than learning goals when considering protective effects for success in academics for children with AD/HD. However, the literature on achievement goals in children with AD/HD is sparse and findings are inconsistent; thus, further research is needed to examine the implications of learning and performance goals for this group.

Importantly, as demonstrated by some of the associations pointed out in Conger et al. (2009), Pomerantz et al. (2006), and Schwarzer and Warner (2013), achievement goals appear to be important in predicting an individual's well-being, particularly one's sense of mastery.

Sense of mastery.

A second factor that has been consistently identified by many researchers as a central tenet of resilience is a sense of mastery (Prince-Embury, 2008, 2013). It appears that many of the underlying characteristics of an incremental theory of intelligence and learning goal achievement orientation may be related to aspects of a sense of mastery. In fact, Marsh, Martin, Yeung, & Craven (2017) posit that perceived competencies are often a central component of most models of achievement motivation. For example, Cury et al. (2006) claimed that achievement motivation as a broad construct was comprised of implicit theories of ability (or intelligence), achievement goals, and perceived competence. In the following section, sense of mastery is discussed as an important aspect of resiliency.

Prince-Embury (2008) has developed a model of resiliency in which sense of mastery is identified as one of three core developmental systems (see Figure 3 for a full breakdown of the three areas). Prince-Embury's conceptualization focuses on sense of mastery as an attribute of personal resiliency which assumes that the personal experience of the child "mediates between external protective factors and positive behavioural outcomes" (Prince-Embury, 2013, p. 20). Prince-Embury defines sense of mastery as a sense of competence in one's ability to solve problems and has theorized that the construct is comprised of adaptability, optimism, and self-efficacy (2007, 2008). These three components which are described below have been shown to demonstrate protective effects, such as an increased likelihood of success in school and decreased likelihood of developing pathological symptoms (Prince-Embury, 2013).

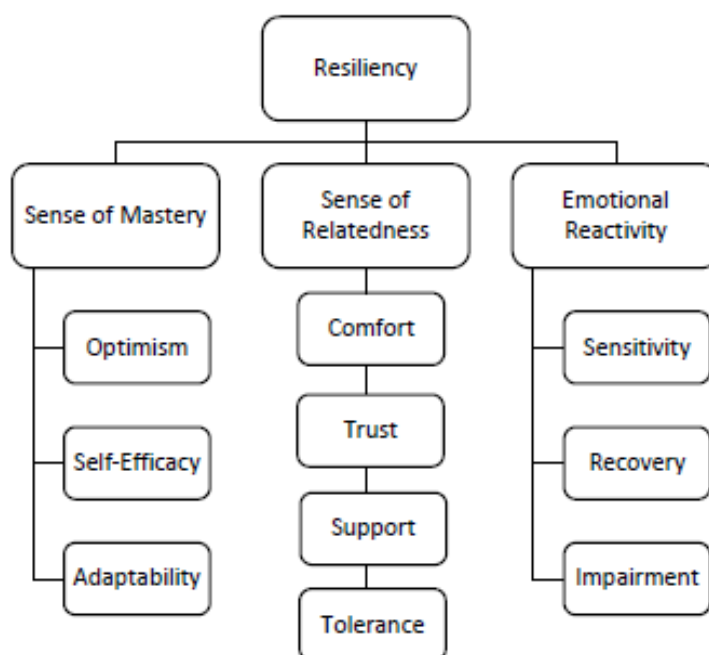


Figure 3. Sense of Mastery within Prince-Embury's model of resiliency.

Optimism.

Optimism refers to a positive outlook regarding one's life and one's competence (Prince-Embury & Courville, 2008; Prince-Embury, 2013). Optimism is conceptualized as a similar but unique construct to self-efficacy. Where self-efficacy pertains more to an individual's belief in their own control over an outcome, optimism refers to a more general and broadly applied positive outlook (Schwarzer & Warner, 2013). A positive outlook is a key attribute involved in gaining the confidence and motivation to persevere in the pursuit of mastery. Positive future expectations have been found to predict higher school achievement, improved classroom behaviour, and lower anxiety (Prince-Embury, 2012).

Self-efficacy.

Of the three components of Sense of Mastery, self-efficacy has likely been the most extensively and longest studied. Albert Bandura described perceived self-efficacy as "the belief

that one can perform novel and difficult tasks and attain desired outcomes.” In his social learning theory, Bandura postulated that children learn self-efficacy from their interactions with and observations of their environment (Bandura, 1993). Prince-Embury (2013) describes self-efficacy as one’s attitude or approach towards problem-solving and developing problem-solving strategies, as well as one’s expectation or confidence in one’s ability to perform specific behaviours. Individuals with high self-efficacy have been found to demonstrate more effort and persistence when faced with difficulty and thus create more opportunities to experience mastery (Schwarzer & Warner, 2013). In their research, Schwarzer and Warner (2013) postulated that mastery experiences are the most effective foundation of self-efficacy beliefs. These mastery experiences, in turn, increase self-efficacy beliefs, exhibiting a reciprocal relationship. Individuals with low self-efficacy tend to get caught in a similar cycle in that they give up easily when faced with difficulty and are likely to be more negatively affected by failure (Schwarzer & Warner, 2013).

Adaptability.

Adaptability refers to one’s ability to be receptive to feedback, learn from mistakes, ask for help, and adjust to new and novel situations (Prince-Embury & Courville, 2008; Prince-Embury, 2013). Adaptability has proven to be a common indicator of resilience, as demonstrated by its inclusion in the *RSCA* and the Connor-Davidson Resilience Scale (Connor & Davidson, 2003), as well as the fact that Masten (2008) also considers adaptability (i.e. adaptive systems) to be a central tenet of resilience.

Previous studies have identified that individuals who had beliefs similar to a sense of mastery (i.e. competence and self-esteem, etc.) had lower levels of anxiety, better behavioral control, and improved academic outcomes, illustrating the resilient nature of the characteristics

in the realm of perceived competencies (Masten, 2014; Turner & Johnson, 2003). Thus, by improving children's sense of mastery, functioning in many other domains such as academic achievement, peer relationships, and parent-child relationships are likely to improve as well (Phillipson & McFarland, 2016; Prince-Embury, 2008).

In order to further highlight the protective effects of sense of mastery, we also look to past research in the earlier developed construct of mastery motivation, as self-efficacy is a key element shared between sense of mastery and mastery motivation. Within Masten's "ordinary magic" framework, she identified several protective systems, including factors such as intelligence and problem-solving ability, self-regulation skills, mastery motivation, self-efficacy, and meaning making (Masten, 2008). Mastery motivation is an adaptive system which is defined by the desire to master one's environment and has been identified as one of the "leading indicators of change" in cases where struggling adolescents were able to turn things around and demonstrate resilience (Masten, 2014).

Sense of mastery in AD/HD.

Research has suggested that children with AD/HD may have a lowered sense of mastery, which is notable, given that mastery is a known protective factor for children in general, including those with psychiatric disorders (Roberts et al., 2009). For example, children and adolescents with AD/HD experience difficulties with executive function and self-regulation, as well as a lowered sense of "self-efficacy for self-regulated learning" (SESRL) which refers to an individual's belief about their ability to use self-regulated learning strategies (Major, Martinussen, & Wiener, 2013). Given these difficulties, in conjunction with the strong relationship between self-efficacy and sense of mastery, initial research in this area suggests that students with AD/HD may possess a lowered sense of mastery. Overall, there has been limited

study in this area, but the few studies that do touch on areas related to sense of mastery in AD/HD suggest that children with AD/HD may experience lowered self-efficacy and low mastery.

In a study which analysed the incidence of psychiatric disorders in adolescents, Roberts et al. (2009) examined several risk and protective factors for specific diagnostic groups (e.g., anxiety disorders, AD/HD, etc.) and found that an AD/HD diagnosis was significantly correlated with low mastery. In addition, Major (2011) discovered that female adolescents with AD/HD had lower levels of self-efficacy for learning beliefs (i.e. their beliefs about their own ability to engage in specific self-regulated learning processes to cope with difficult learning conditions) than their non-AD/HD peers and that symptoms of inattention were found to uniquely predict low self-efficacy for learning for both genders. Major (2011) also discovered that females and individuals with more severe ratings of inattention tended to have lower perceptions of their ability to complete tasks requiring self-regulation, indicating that severity of symptoms may play an important role in an individual's self-efficacy. Similarly, Major (2016) later discovered that adolescents with AD/HD reported fewer mastery experiences than their non-AD/HD peers, as well as lower self-efficacy beliefs and less positive encouragement from others. Additionally, Major reported that self-efficacy beliefs mediated the relationship between inattention and student engagement, indicating that self-efficacy beliefs may be a contributing factor to motivation in adolescents with AD/HD.

While the above research suggests that children with AD/HD have lower self-efficacy than their typically-developing peers and that mastery may be correlated with AD/HD incidence, none of these studies directly assessed sense of mastery in children with AD/HD. Further, while both parenting factors and sense of mastery are key protective factors that appear to have some

reciprocally beneficial relationship, the exact nature of that relationship is not yet clearly known within an AD/HD population.

Linking implicit beliefs with sense of mastery.

Prince-Embury (2008; 2013) frames her development of the concept of sense of mastery in the existing literature on positive outcomes associated with sense of competence and self-efficacy. Sense of mastery also relies heavily on an individual's self-efficacy and self-efficacy is also demonstrated in individuals with an incremental belief of intelligence and learning goal orientation (Poortvliet & Darnon, 2014). Additionally, Elliott and Hulleman (2017) summarized that some interventions targeted at achievement goals have resulted in many positive outcomes, including higher rates of self-efficacy. As such, sense of mastery appears to be a linking factor between implicit belief systems and an individual's *sense of mastery* and can be conceptualized as an outcome predicted by achievement motivation.

Bandura's (1997) social cognitive theory suggests that the desire to achieve competence is "socially and cognitively constructed through interactions with the environment" (Masten, 2014, p.160), and advocates for the role of teachers and parents/caregivers in the development of such motivation. Prince-Embury (2013) also summarized Bandura, stating that "people with a positive view of their own efficacy will exert more effort to succeed and persist in the face of adversity" (p. 229), a statement which reflects the underlying concepts of incremental intelligence beliefs and learning goal achievement orientations.

Masten (2014) further emphasized the importance of parents (and teachers) as contributors in providing the opportunity for mastery experiences. Thus, mastery motivation is viewed as a malleable trait that can be impacted by parents, making it a desirable resilience factor to target for intervention. Self-efficacy is a key factor in mastery motivation as well as a

key component of sense of mastery, highlighting the commonality shared by these two important constructs within the purview of competence.

As highlighted earlier, it is hypothesized that children with AD/HD may have a lowered sense of mastery when compared to their non-AD/HD peers. One of the ways in which parents may be able to impact children's sense of mastery is through the hypothesized relationship between parent and child intelligence beliefs and achievement goals, which may ultimately lead to increased sense of mastery.

Summary

The symptoms and comorbidities of AD/HD often act as risk factors for the children (and adults) who experience them (Modesto-Lowe et al., 2011). While decades of research have focused on a wide range of deficits experienced by these children, a need to emphasize potential areas of strength has come to the forefront. A strength-based approach focuses on the development of positive qualities and protective environments. In considering protective factors for children within a strength-based framework, two key indicators of resilience are identified and explored: sense of mastery and parent and child implicit belief systems.

Parent-child interactions have been identified as a key point of influence in that parents may be able to influence children's intelligence beliefs and achievement goals. These associations are important, as Dweck (2000) has asserted that implicit beliefs such as intelligence beliefs and achievement goal orientations represent a set of parent-child interactions that influence a child's resilience. Although parent-child interactions are not examined within the present study, such interactions provide the broader context in which to understand contemporary views regarding the relationship between parent and child intelligence beliefs and achievement goals.

While the existing research has identified that children with AD/HD are more likely than neuro-typical children to endorse entity beliefs and performance goals, the assumption is that children with AD/HD who endorse incremental beliefs and learning goals could be protected against certain adversities. In alignment with this, past research has consistently identified incremental intelligence beliefs and learning-oriented achievement goals as salient indicators of resilience (Dweck, 2000; Dweck, 2008; Yeager & Dweck, 2012). An initial first step is to better understand the relationship between parent and child achievement goals and intelligence beliefs within the AD/HD population. The goal of examining such links is to ultimately inform intervention efforts that target increased resilience in children with AD/HD.

The key elements within the construct of *sense of mastery*: self-efficacy, optimism, and adaptability, are similar to the defining characteristics of individuals who believe that intelligence is malleable (*incremental theory*) and whose achievement goals are geared towards increasing competence and improving their skills (*learning goal orientation*). Thus, sense of mastery is hypothesized to relate to the intelligence beliefs (incremental/entity) and the achievement goals (performance/learning) one holds.

While there appear to be many theoretical interconnections between Dweck's implicit belief systems and an individual's sense of mastery, the relationships between sense of mastery, intelligence beliefs, and goal orientations have not been directly examined. Further, previous investigations have demonstrated that parent and child intelligence beliefs and achievement goal orientations are related and that parents can transmit their beliefs to their children (Bennett, 2010; Dweck, 2000), but no studies have specifically looked at such relationships in children with AD/HD. Therefore, one of the goals of this study is to examine the relationship between

parent and child beliefs in an AD/DH population, as well as the relationship of these factors to sense of mastery.

Present Study

The goal of the current study is to gain an understanding of specific protective factors that may contribute to increased resilience in children with AD/HD. Of particular interest, are the relationships between parent and child intelligence beliefs and achievement goal orientations within an AD/HD population. Additionally, this study also aims to discover how these factors may have a positive impact in their prediction of sense of mastery for children with AD/HD. This study examined the hypotheses that parent intelligence theories and achievement goals would correlate to child intelligence theories and achievement goals, and that these factors would together influence child sense of mastery, as depicted in Figure 4. The three research questions examined in this study are as follows.

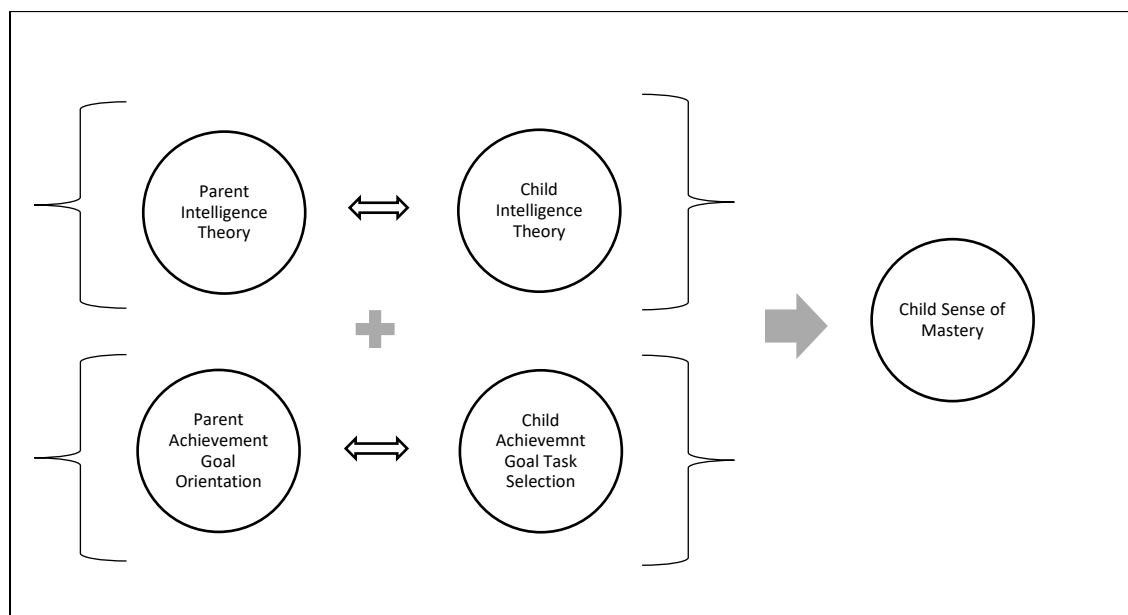


Figure 4. Proposed Model of interrelationships of parent and child intelligence beliefs, parent and child achievement goals, and sense of mastery in children with AD/HD.

Research Questions

Research Question 1: *Are parent intelligence beliefs related to the intelligence beliefs of their children with AD/HD?*

Parental implicit beliefs about intelligence have been found to relate to child implicit beliefs about intelligence in non-AD/HD populations. In particular, Bennet (2010) and Haimovitz and Dweck (2016) both found that parent beliefs predicted children's intelligence beliefs, although Bennet focused on the endorsement of incremental beliefs and learning goals, while Haimovitz and Dweck's results were in the context of parents' failure mind-sets (i.e. whether they view failure as enhancing or debilitating). While these relationships have not been examined in an AD/HD population, it is anticipated that there will be a positive correlation between parent and child intelligence beliefs. Although the research is sparse, given the research on transmission of beliefs, it is likely that parent and child intelligence beliefs would be correlated.

Research Question 2: *Are parent achievement goal orientations related to child achievement goal orientations within the AD/HD population?*

Parent and child achievement goal orientations have been positively associated within non-AD/HD child populations in past research. Specifically, mothers' mastery-oriented homework help predicted increased mastery orientation in children who had a negative self perception of their academic competence (Pomerantz et al., 2006). Previously, Hodoka and Fincham (1995) also found that children demonstrated the same achievement goal orientations as those indicated by their mothers. Further, Bennet (2010) found that parent endorsement of learning goals was a predictor of children's endorsement of learning goals. While these

relationships have not been examined in an AD/HD population, it is anticipated that there will be a positive correlation between parent and child achievement goal orientations.

Research Question 3: *Do parent and child intelligence beliefs and achievement goal orientations predict a child's sense of mastery?*

Past research has not directly examined the relationship between Dweck's social cognitive factors (intelligence beliefs and achievement goal orientations) and Prince-Embury's sense of mastery. More broadly, Yeager and Dweck (2012) postulated that implicit beliefs such as beliefs about intelligence have the potential to impact individual resilience. Additionally, there is some evidence that these factors contribute to self-efficacy, which is a component of *Sense of Mastery*. For example, Komarraju and Nadler (2013) discovered a positive correlation between self-efficacy and incremental beliefs in college students. Specific to the AD/HD population, Major (2016) suggested that mastery experiences are a source of self-efficacy, and that self-efficacy is closely related to motivation in adolescents with AD/HD, particularly that motivation deficits associated with AD/HD such as high levels of frustration, low persistence and effort, and preference for easier work may, in part, contribute to lower self-efficacy in adolescents with AD/HD. Given the relationships between theories of intelligence and achievement goal orientation, and self-efficacy (which is a comprising element of *Sense of Mastery*), it is predicted that these same factors will predict *Sense of Mastery* in children with AD/HD.

CHAPTER 3: METHODS

This study took place as part of a larger collaborative research project intended to examine strengths in children with AD/HD, *Strengths in AD/HD*. As such, the procedures described below are consistent with the procedures approved for all studies involved in this project. While there are many research measures being utilized within the larger study, only those being utilized in the current study are outlined here.

Participants

Inclusionary criteria.

Participants in this study were children between the ages of 8 and 11 years with a diagnosis of AD/HD and their parents. One parent (either mother or father) completed all key measures for the study. There were also a number of inclusionary criteria that must have been met, which are outlined below. All measures used are described later in this chapter in the “measures” section.

To be included in the study, participants were required to have a previous diagnosis of AD/HD from a psychologist or medical professional such as a psychiatrist, pediatrician or general practitioner, as well as be rated in the clinically significant range on the DSM-IV-TR AD/HD symptom scale of the *Conners-3*. Previous research regarding differences across AD/HD subtypes on the key measures used in the current study is very limited. For example, some studies limited their scope to only include ADHD-C (Olivier & Steenkamp, 2004) or examined only inattentive symptoms (Major, 2011, 2016), while others included all subtypes or did not distinguish subtypes (Barron et al., 2006; Dunn & Shapiro, 1999; Roberts et al., 2009). Carlson et al. (2002) was one study which determined that participants with ADHD-C and ADHD-I demonstrated differing motivational patterns, but small sample size was identified as a limitation.

Based on inconsistent information regarding differences across subtypes on the key measures of this study, and due to the already small sample size within this study, the decision was made to include all AD/HD subtypes.

Participants with specific co-morbidities such as Learning Disorders (LDs), Oppositional Defiant Disorder (ODD), Conduct Disorder (CD), anxiety disorders, and mood disorders that had been previously diagnosed were permitted to participate due to the high co-occurrence of these disorders within the AD/HD population (Pliszka, 2014). Children with Autism Spectrum Disorders, psychosis, epilepsy, gross motor impairments, or major vision or hearing impairments were not eligible to participate in the study. Participating children were required to demonstrate, at minimum, average cognitive abilities, indicated by a Full-Scale Intelligence Quotient (FSIQ) $\geq$ 85 (Average range of functioning) as determined by an individually-administered Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999). This requirement was to ensure that participants were able to understand the questions and that results were more likely attributed to symptoms of AD/HD than to lower cognitive functioning.

A total of 21 participants were excluded from the initial AD/HD sample due to failure to meet either AD/HD symptomatology or IQ inclusionary requirements or declining to continue participation. Due to time constraints, as well as informed consent allowing participants to decline completion of any given measure, not all measures were completed consistently across participants. Finally, only participants who completed all of the key measures (both parent and child measures) outlined in the current study were retained. This resulted in the final sample of 25 participants with an AD/HD diagnosis. Given the small sample size, the current study should be considered exploratory in nature.

Sample characteristics.

The final sample of 25 children (and their families) who were reported by their parent(s) to have a previous diagnosis of AD/HD were between the ages of 8 years, 0 months and 11 years, 11 months with a mean age of 9.40 years. Twenty-two children were male (88%) and three were female (12%), comprising a gender ratio of male to female that is slightly higher than that typically found in the general AD/HD population (Owens, Cardoos, & Hinshaw, 2014). AD/HD-C made up the majority (80%, $n = 20$) of reported subtypes, while AD/HD-I comprised 16% ($n = 4$) of the AD/HD sample, and AD/HD-HI accounted for 4% ($n = 1$). The average FSIQ of this group, according to the WASI, was 110 ($SD = 13.4$), which is in the high average range of cognitive ability.

Comorbid disorders were reported to have been previously diagnosed in 37.5% ($n = 10$) of participants, which is within the range normally found within an AD/HD population in this age range. Specifically, 25% ($n = 6$) had a diagnosed learning disability, 4% ($n = 1$) were diagnosed with Oppositional Defiant Disorder, 4% ($n = 1$) had a diagnosed anxiety disorder and another 4% ($n = 1$) was diagnosed with both a learning disability and an anxiety disorder.

Measures

Measures used to determine inclusion.

The Wechsler Abbreviated Scale of Intelligence (WASI). The *WASI* (Wechsler, 1999) is a brief standardized measure of cognitive abilities suitable for children and adults ages 6.0 to 89.11 years. Scores from four subtests yield a Verbal IQ, Performance IQ, and Full-Scale IQ (FSIQ). The FSIQ was used to determine eligibility for inclusion in the study. The *WASI* was standardized on a sample of 2,245 individuals in the United States. However, Saklofske, Caravan, and Schwartz (2000) examined the validity of the *WASI* for use in a Canadian sample

and concluded that the *WASI* is an appropriate brief measure of intelligence for use with Canadian children. The *WASI* was chosen over more commonly utilized intelligence measures for the sake of brevity, and in order to reduce interference with recent or future psychological assessments. The *WASI* IQ scores report high internal consistency, ranging from .92 to .98, with an average reliability of .96 for children's FSIQ-4 (Wechsler, 1999).

It is worth noting that the *WASI-II* (Wechsler, 2011) was introduced after participant testing for the current study had already commenced using the *WASI*. The *WASI-II* introduced updated norms, extended floors and ceilings for the four subtests, and improved comparability to the other Wechsler intelligence instruments, the *WISC-IV* and *WAIS-IV* (Irby & Floyd, 2013). Information regarding Canadian norms were not available at this time. The reliability for the FSIQ on *WASI-II* remained .96 for the child sample. The *WASI* FSIQ-4 correlated at .91 with the *WASI-II* FSIQ-4, indicating that the *WASI* remains a valid brief measure of child intellectual ability, although the norms may be dated.

Conners, Third Edition. The *Conners-3* (Conners, 2008) is a standardized rating scale used to assess symptoms of inattention, hyperactivity/impulsivity, executive functioning, learning problems, and peer relations in children ages 6-18 years. Some items were designed to map onto the DSM-IV-TR diagnostic criteria for the subtypes of AD/HD, although only the AD/HD-I and AD/HD-H/I scales were used for this study. Parents rated their children on 108 behaviours using a 4-point Likert scale ranging from 0 (not true at all/never) to 3 (very much true/very frequently). The *Conners-3* technical manual (Conners, 2008) reports excellent internal consistencies of 0.90 for both parent and teacher reports on the DSM-IV-TR Symptom Scales; and test-retest reliabilities of 0.89 for parent rating scales and 0.90 for teacher rating scales (Conners, 2008; Kao & Thomas, 2010).

Measures utilized in the current study.

Parent Measures.

Theories of Intelligence Scale-Others Form for Adults (TIS-A). The *TIS-A* (Dweck, 2000) is a self-report questionnaire designed to identify how parents conceptualize intelligence, and specifically whether parents hold an *incremental* or *entity theory* of intelligence. The *TIS-A* (Appendix A) includes 4 items which use a 6-point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree), where lower scores indicate adherence to an entity theory and higher scores indicate an incremental theory. There is no “cut-off” score for determining an entity versus an incremental theory, therefore it is treated as a continuum. The referenced scale consisted of eight items, but the authors indicate that four specified items (the original version of the TIS) may be used alone and is in some cases preferred due to the experience that items with “incremental” wording tended to be “too appealing” and to result in high rates of agreement (Dweck, 2000). The *TIS-A* consists of the following statements:

1. “People have a certain amount of intelligence and you can’t really do much to change it”.
2. “Someone’s intelligence is something about them that they can’t change very much”.
3. “To be honest, someone can’t really change how intelligent they are”.
4. “People can learn new things, but they can’t really change their basic intelligence level”.

Internal consistency of the *TIS* has previously been reported at α values ranging from .85 to .94 for adults (Bennett, 2010; Dweck et al., 1995). In addition, Dweck et al. (1995) examined the validity of the *TIS* through factor analysis and indicated that it is a valid measure. For example, the *TIS* was completed by 134 subjects along with a newly developed measure of implicit theories where the questions were worded differently and offered both incremental and entity views. The correlation between the two measures was 0.88, with 91.8% of people

identified as “entity theorists” on the old measure also entity theorists on the new measure (reported in Dweck et al., 1995).

Questionnaire Goal Choice (QGC). The *Questionnaire Goal Choice* (Dweck, 2000) is a 5-item scale completed by parents to assess achievement goal orientation (learning goals and performance goals) pertaining to themselves in hypothetical academic contexts. See appendix A for the *QGC*. Parents responded to the following statements using a 6-point Likert scale, again ranging from 1 (strongly agree) to 6 (strongly disagree):

1. “If I knew I wasn’t going to do well at a task, I probably wouldn’t do it even if I might learn a lot from it”.
2. “Although I hate to admit it, I sometimes would rather do well in a class than learn a lot”.
3. “It is much more important for me to learn new things in my classes than it is to get the best grades”.
4. “If I had to choose between getting a good grade and being challenged in class, I would choose to get a good grade”.
5. “If I had to choose between getting a good grade and being challenged in class, I would choose to be challenged”.

Higher scores indicate a learning goal orientation and lower scores indicate a performance goal orientation. Similar to the *TIS*, there is no score cut-off or defined range of scores for either goal orientation. The original version of this questionnaire was only four items but Bennett (2010) modified the final item, which was a forced choice between a learning goal and a performance goal, into two separate Likert scale questions. This allowed for consistency in the scoring of items on the questionnaire and simplified the score calculation. Items 3 and 5 were reverse scored. Reliability was reported at 0.78 using Cronbach’s Coefficient Alpha (Bennett, 2010).

Child Measures

Implicit Theories of Intelligence Scale for Children-Self Form (TIS-C). The *TIS-C* (Dweck, 2000) measures beliefs about intelligence in children where higher scores indicate an incremental belief of intelligence and lower scores indicate an entity belief. As with the *TIS-A*, there is no designated range of scores which would indicate an entity versus an incremental belief, although a score of 18 or lower would indicate that a respondent at least “mostly agrees” with an entity belief while a score of 24 or higher indicated that the respondent “mostly agrees” with an incremental belief. The *TIS-C* (see Appendix B) contains six items similar to those on the *TIS-A* which are responded to on the same 6-point Likert scale ranging from 1 (strongly agree) to 6 (strongly disagree). Items 4, 5, and 6 were reverse scored. Internal consistency has previously been reported at an α value of .89 for the child measure (Bennett, 2010). The child scale contains the following statements:

1. “You have a certain amount of intelligence, and you really can’t do much to change it”.
2. “Your intelligence is something about you that you can’t change very much”.
3. “You can learn new things, but you can’t really change your basic intelligence”.
4. “No matter who you are, you can change your intelligence a lot”.
5. “You can always greatly change how intelligent you are”.
6. No matter how much intelligence you have, you can always change it quite a bit”.

Task-Choice Goal Measure (TCGM). The *TCGM* (Dweck, 2000) was used to measure children’s expressed achievement goals. This single-item question (“We may have more time later on. If we do, which kind of task would you like to work on most? Mark only one answer”) was presented as a choice of one of four possible types of tasks, including options of tasks that would allow the child to demonstrate their knowledge (performance goal) or to learn something new and be challenged (learning goal). Following an explanation that different children prefer different types of activities and that there were no right or wrong answers, the participant was

asked to select the type of task that he or she would prefer to engage in if time permitted at the end of the session. See Appendix B for the *TCGM*. In order to reduce social desirability, three performance goal items were included against one learning goal item (Dweck, 2000). Shaffer (2014) provided further guidance that the performance goal items map onto performance-avoidance and performance-approach categories. The items were as follows:

1. “Problems that aren’t too hard, so I don’t get many wrong”. (Performance-avoidance goal).
2. “Problems that I’ll learn a lot from, even if I don’t look so smart”. (Learning goal).
3. “Problems that are pretty easy, so I’ll do well”. (Performance-avoidance goal).
4. “Problems that I’m pretty good at, so I can show off that I’m smart. (Performance-approach goal).

The *TCGM* is intended for children aged 10 years and older. Previous studies which used variants of this task-choice measure and assessed the same categories of goal preference have found these types of questions to relate to reported achievement goal preferences on other measures (Dweck, 2000).

The Resiliency Scales for Children and Adolescents (RSCA). The *RSCA* (Prince-Embury, 2007) is a 64-item standardized (age and gender norms) self-report questionnaire completed by child participants. The *RSCA* measures resilience through three main sub-scales: Sense of Mastery (20 items; *optimism* (7), *self-efficacy* (10), and *adaptability* (3) subscales); Sense of Relatedness (24 items; *comfort*, *trust*, *support*, and *tolerance* subscales); and Emotional Reactivity (20 items; *sensitivity*, *recovery*, and *impairment* subscales). The entire scale was used for the larger Strengths in AD/HD project, but only the Sense of Mastery sub-scale was used in the current study.

Items were responded to on a 5-point Likert scale ranging from 0 (*never*) to 4 (*almost always*). Age adjusted *T*-scores are calculated for each of the three *RSCA* scales, which also contribute to the composite Resource Index and Vulnerability Index scores. The Resource Index

is comprised of the Sense of Mastery and Sense of Relatedness scales and reports excellent internal consistency of .93 for ages 9-11 years as well as test-retest reliability of .90 for ages 9-14 years (Prince-Embury, 2007). The Vulnerability Index is calculated as the difference between the Resource Index *T*-score and the Emotional Reactivity *T*-score. The Vulnerability Index yields excellent internal consistency of .93 for ages 9-11 years and good test-retest reliability of .83 for ages 9-14 years (Prince-Embury, 2007).

The *Sense of Mastery* scale consists of three subscales assessing *optimism* about life and one's competence, *self-efficacy* for problem solving, and *adaptability* defined in terms of learning from mistakes and accepting criticism (Prince-Embury, 2008). Good internal consistency for the *Sense of Mastery scale (MAS)* was reported at .85 for children and youth aged 9-11 years (Prince-Embury, 2007). Test-retest reliability was reported at .79 for ages 9-14 years (Prince-Embury, 2007). The alpha values reported for the subscales of the *MAS* were questionable for *Optimism* (.69), acceptable for *Self-Efficacy* (.77), and poor for *Adaptability* (.56) within the 9-11-year-old age range. Canadian studies also yielded excellent internal consistency on the Sense of Mastery scale, with alpha values of .90 and .92 (Prince-Embury, 2013).

Confirmatory factor analysis (CFA) studies have confirmed the three-factor structure (Prince-Embury, 2007, 2013; Prince-Embury & Courville, 2008) as well as validity of the ten-subscale structure (Prince-Embury & Courville, 2008). High correlations are found between the *Sense of Mastery* and *Sense of Relatedness* scales; however, this is expected as both are considered protective factors within the construct of resilience and are combined to create the Resource Index score (Prince-Embury, 2013; Prince-Embury & Courville, 2008). Overall,

research suggests the *RSCA* is a reliable and valid measure of the underlying constructs (Prince-Embury, 2007; 2013).

Procedure

Children with AD/HD were recruited between 2011 and 2013 in a mid-sized urban centre in Canada from schools, advertisements in newsletters and magazines, television news programs, advertisements placed in local psychoeducational assessment and intervention clinics, and through local AD/HD and learning disability agencies and pediatricians' offices. See Appendix C for recruitment advertisements.

Families interested in participation were pre-screened through a telephone interview (see Appendix D) to determine if they met the initial criteria for the study. The pre-screening interview included questions regarding the nature of the child's AD/HD diagnosis, AD/HD subtype, medication status, comorbid psychiatric diagnoses, and demographic data such as age and gender. This information was later confirmed through completion of the demographic questionnaire during the first research session, where parents also provided additional relevant background and family information.

Eligible families attended two three-hour sessions. Parents were provided with a parking pass upon arrival for each session. Parents and children were provided with refreshments during the research sessions. Each participating child was provided with the opportunity to choose a small prize of minimal monetary value at the conclusion of each session. In addition, participating families were provided with a \$25 gift card to a family-oriented vendor (e.g., restaurants, book stores, movie theatres) as remuneration for their participation. Through the process of informed consent (both written and verbal), parents were made cognizant that no diagnoses or interventions would be provided based on their child's results. If any significant

concerns were made apparent as a result of their child's participation, families would be referred to appropriate resources.

All testing sessions were completed by either a Master's or Doctoral student with graduate level training in the administration of standardized tests. At the beginning of the first session, a researcher completed the informed consent (Appendix E) process with the family by having the parent(s) read and sign all relevant consent forms, as well as verbally highlighting the key points of the consent form and answering any questions from the parent or child. Following discussion of the process with the researcher and their parents, participating children provided verbal assent to participate in addition to signing the consent form.

During the testing sessions, child participants completed direct assessment measures and rating scales with a researcher while parents completed a series of rating scales in a separate room. Breaks were provided when requested by the child or when the researcher determined the child might benefit from a break. The *WASI* and the *Conners-3* were always completed during the first research session so that eligibility requirements could be determined prior to the family returning for the second session. The remaining assessment measures were administered in a pseudo-random order, with direct assessment and rating scales evenly distributed across both sessions. Standardized administration procedures were followed for all assessment measures. For all child self-report rating scales, items were read by the researcher to the child unless the child had an appropriate reading level and requested to read independently.

AD/HD inclusionary criteria. The DSM-IV-TR AD/HD symptom criteria was confirmed via completion of the *Conners-3* (Conners, 2008). Although the DSM-5 (APA, 2013) is the most current version of the diagnostic manual, the core criteria for diagnosing children with AD/HD were not changed and therefore the DSM-IV-TR diagnostic parameters remain appropriate for

use in this study. In order to establish the presence and severity of current AD/HD symptoms, participants must have received a *T*-score greater than or equal to 70 on the Hyperactivity/Impulsivity and/or Inattentive symptom scales of the *Conners-3* from at least one rater (parent or teacher), in addition to meeting a symptom count of at least 5. The second rater (either parent or teacher) must have provided responses that contributed to a *T*-score of 65 or higher on the *Conners-3* symptom scales in order to confirm the presence of behavioural symptoms in two settings. In some cases, parent reports indicated scores below the threshold for severity, potentially due to medication or intervention effects. In such situations, parents were asked to complete an additional *Conners-3* form to give a retrospective evaluation of their child's symptoms prior to implementation of any interventions. Any child meeting inclusionary criteria based on the retrospective report was included in the study. Parents were sometimes not informed or not aware of the AD/HD subtype designated to their child at diagnosis. Where subtype was reported as unknown, the *Conners-3* AD/HD-Hyperactive/Impulsive and AD/HD-Inattentive scales were used to determine the participant's subtype.

Plan for Data Analysis

As previously mentioned, this correlational study is considered to be exploratory due to the small sample size. Descriptive analyses, including mean score, range, and standard deviation were reported for all key measures, as well as a frequency analysis for the *Task Choice Goal Measure*.

Preliminary analyses were conducted to determine the reliability of the *Theories of Intelligence Scales*, the *Questionnaire Goal Choice*, and the *RSCA Sense of Mastery* scale and subscales within the current sample and to evaluate demographic characteristics of the sample. Reliability data regarding the use of the *Theories of Intelligence Scale-Adult (TIS-A)*, *Theories of*

Intelligence-Child (TIS-C), and *Questionnaire Goal Choice* (parent; *QGC*) scales within an AD/HD population were not available prior to the current study. Additionally, the *RSCA* was originally normed for use with individuals from 9-18 years of age, thus it was necessary to determine whether the *Sense of Mastery* scale was a reliable measure when the age of the population is extended to include 8-year olds. Further, while reliability of the *RSCA* has previously been tested with a clinical sample (Prince-Embury, 2010) and the measure was determined to be appropriate for use with children who have a clinical diagnosis, reliability information for individual diagnostic categories such as AD/HD was not provided. Internal consistencies for the above measures within the current sample are reported in Chapter 4, using Cronbach's alpha.

The first research question measured the relationship between parent and child theory of intelligence within the AD/HD group, a Pearson's correlation was selected to assess the relationship between the *TIS-A* and the *TIS-C*.

The second research question investigated the relationship between parent and child achievement goal orientations. As the *TCGM* is a categorical variable, a Spearman's rank order correlation was chosen to assess the relationship between the *Questionnaire Goal Choice* and *TCGM* within the AD/HD group.

The third research question addressed the hypothesis that parent and child intelligence beliefs and achievement goals would predict child sense of mastery in children with AD/HD. A multiple regression was selected to investigate this prediction.

CHAPTER 4: RESULTS

Preliminary Analyses

Descriptive statistics.

Descriptive analyses of the primary measures to be examined were conducted (see Tables 1, 2, and 3). An overall examination of the data revealed that there were no significant outliers in any of the intelligence beliefs or achievement orientation scales. One outlier was identified on the *Sense of Mastery* scale. This data point was determined to be a genuine outlier and was retained in the sample for further analyses. No significant issues with skewness or kurtosis were identified, as all values fell within the acceptable range (± 2), with all but one value within the excellent range (± 1). An alpha level of .05 was predetermined and only analyses that resulted in an alpha level at or below .05 were considered to be significant. An alpha value lower than .05 may have been too conservative given the small sample size and consequently may have increased the possibility of incorrectly accepting the null hypothesis (Type II error) while reducing Type I error (rejecting the null hypothesis when it is true). Exact *p* values are reported for all results. Due to the small sample size, all results should be interpreted with caution.

Table 1

Descriptive Statistics for Measures of Intelligence Beliefs, Adult Achievement Goals, and Child Sense of Mastery.

	<i>N</i>	Mean	Range	SD	Skewness	Kurtosis
Theories of Intelligence Scale-Child	25	22.28	11-36	5.83	.335	.116
Theories of Intelligence Scale -Adult	25	15.84	8-24	4.75	-.209	-1.162

Questionnaire Goal Choice (Adult)	25	21.08	13-26	3.48	-.714	.046
Sense of Mastery (T- Score)	25	51.32	32-73	9.28	.090	.541
Optimism*	25	11.32	6-16	2.75	-.102	-.639
Self-Efficacy*	25	10.24	5-17	3.09	-.310	-.055
Adaptability*	25	9.60	4-14	2.94	-.104	-.857

Note. The child Task Choice Goal Measure is not included here as it was a categorical measure. See Table 2 for frequencies of the TCGM.

* Scaled Scores were reported for sub-scales with and asterisk.

Primary Analyses

Research Question 1: Are parent intelligence beliefs related to child intelligence beliefs within the AD/HD population?

Internal consistency for the *TIS-A* was found to be excellent ($\alpha = .93$, $n = 25$) and was determined to be an acceptable measure for use within the current study. Internal consistency for the *Theories of Intelligence Scale-Child (TIS-C)* was found to be questionable for children with AD/HD ($\alpha = .64$, $n = 25$). Reliability for the *TIS-C* has previously been reported at good to excellent levels for non-AD/HD children (Bennett, 2010; Dweck et al., 1995), so the decision was made to include the measure in the analyses for the current study. However, results of analyses using the *TIS-C* should be interpreted with caution due to the questionable reliability demonstrated here within the sample of children with AD/HD.

The *mean* intelligence beliefs score of parents on the *TIS-A* was 15.8 (see Table 1) which indicates a slight preference towards incremental beliefs, while the average child score on the *TIS-C* was 22.3 (Table 1), again slightly towards the incremental end of the scale. A Pearson's

correlation was initially selected to assess the relationship between parent theory of intelligence (*TIS-A*) and child theory of intelligence (*TIS-C*) within the AD/HD population. However, the data did not meet the assumption of a linear relationship, so a Spearman's correlation was selected instead. There was no statistically significant relationship between adult theory of intelligence and child theory of intelligence, $r_s = .14$, $p = .50$ ($n = 25$), a small effect size according to Cohen (1988). The absence of correlation between parent and child theory of intelligence indicates that children with AD/HD who hold an incremental intelligence belief were no more or less likely to have a parent with incremental beliefs.

Research Question 2: Are parent achievement goal orientations related to child achievement goal orientations within the AD/HD population?

A point biserial correlation was selected to assess the relationship between parent achievement goal choice and child goal choice within an AD/HD population. There were no outliers, and the assumptions of homogeneity of variance and normal distribution were met. The mean achievement goal score of parents on the *Questionnaire Goal Choice* was 21.1 (See Table 1) which indicates a slight preference towards the learning goal end of the scale. Performance avoidance goals (avoiding demonstrating incompetence) were selected by the majority of the children with AD/HD (40.0%), followed by performance approach (32.0%), and finally the learning goal option was the least selected (28.0%; see Table 2).

The point biserial was selected due to the use of a dichotomous categorical variable (*Task Choice Goal Measure; TCGM*). For the purpose of this analysis, all three performance goal choices on the child *TCGM* were collapsed into one “performance goal” category and thus created a dichotomous variable (performance and learning goal categories). This decision was made due to the fact that the adult goal choice measure does not distinguish between the types of

performance goals and is instead a scale ranging from performance-oriented to learning-oriented. The *Questionnaire Goal Choice* was found to have an acceptable internal consistency for the AD/HD group ($\alpha = .74, n = 25$).

Table 2

Frequencies for Achievement Goal Selection on the Child TCGM

	Frequency	Valid Percent	Cumulative Percent
Performance Avoidance Goal*	10	40.0	40.0
Learning Goal	7	28.0	68.0
Performance Approach Goal	8	32.0	100.0
Total	25	100.0	

*Both performance avoidance items collapsed into one category

There was no statistically significant relationship between parent achievement goal orientation and child goal orientation task choice, $r_{pb} = .06, p = .76 (n = 25)$, a small effect size according to Cohen (1988). Specifically, according to the point-biserial correlation coefficient, child selection of the learning goal choice was not significantly related to changes in parent goal orientation.

Research Question 3: Do parent and child intelligence beliefs and achievement goal orientations predict sense of mastery in children with AD/HD?

The overall goal of the current study was to identify factors which may contribute to indicators of resiliency in children who have AD/HD. Given the theoretical relationship between intelligence beliefs and achievement goals, as well as the postulation that a learning goal orientation (also known as a mastery goal orientation) may impact Sense of Mastery, these variables were hypothesised to predict a child's Sense of Mastery.

The *Sense of Mastery* scale of the *RSCA* was found to have a good level of internal consistency, as determined by a Cronbach's alpha of .83 ($n = 25$). *Sense of Mastery* was

therefore confirmed to be an appropriate measure for children ages 8-12 with a diagnosis of AD/HD. A simultaneous multiple regression analysis was completed to determine if intelligence theories (child and parent) and achievement goal orientation (child and parent) would predict children's *Sense of Mastery* scores. The *Task Choice Goal Measure* which was used as an indicator of child achievement goal preference is a categorical variable and was dummy coded for use in this analysis. The two *performance avoidance* items were collapsed into one category which was entered along with the *performance approach* category, using the *learning goal* choice as the reference category.

Table 3

Descriptive Statistics for the Multiple Regression Predicting Child Sense of Mastery

	Mean	Std. Deviation	N
Sense of Mastery Scale T Score	51.32	9.28	25
Theories of Intelligence Adult	15.84	4.75	25
Goal Choice Adult	21.08	3.48	25
Theories of Intelligence Child	22.28	5.83	25
Performance Avoidance Goal*	.400	.458	25
Performance Approach Goal*	.320	.476	25
* Dummy coded categories			

There were five Leverage values that fell within the “risky” range between 0.2 and 0.5. However, all Cook's Distance values were less than 1, indicating that there were no highly influential points. As such, no data points were removed. All other assumptions for regression analysis were met. The full model of parent intelligence theory, child intelligence theory, parent achievement goal orientation, and child achievement goal orientation to predict *Sense of Mastery*

($n = 25$) was not statistically significant ($F(5,19) = .431, p = .821$). R^2 for the overall model was .102 with an adjusted R^2 of -.134, a small effect size, according to Cohen (1988). See Table 4 for regression coefficients and standard errors.

The negative value for the adjusted R^2 indicates that there may be variables included in the model that do not contribute to the variance. As such, there is no predictive value in the current regression model with this population. The resulting positive slope coefficients in the regression model (see Table 4) indicate a general trend that *Sense of Mastery* scores might increase when parent incremental intelligence beliefs, child incremental intelligence beliefs, and parent achievement goal orientation scores increase (where increasing values indicate incremental beliefs and learning goals); while the negative values indicate that *Sense of Mastery* may decrease more with performance avoidance and performance approach goal choices than with a learning goal choice. However, none of these relationships were statistically significant, indicating that linear relationships did not exist within this model.

Table 4

Multiple Regression Coefficients for Model Predicting Child Sense of Mastery

	Predictor Variables	B	Std. Error	<i>p</i>
1	(Constant)	45.32	14.70	0.006
	Theories of Intelligence Adult	.438	.447	.340
	Theories of Intelligence Child	.026	.395	.948
	Goal Choice Adult	.046	.638	.944
	Performance Avoidance*	-2.19	5.06	.670
	Performance Approach*	-5.01	5.23	.350

* Dummy coded categories

CHAPTER 5: DISCUSSION

This exploratory, correlational study was intended to investigate potential resilience factors for children with AD/HD. Specifically, the relationship between parent and child intelligence theories and achievement goals, and the potential influence of these factors on a child's sense of mastery were explored. Results of this exploratory investigation suggest that there may not be a relationship between parent and child implicit intelligence beliefs and achievement goal orientation within the AD/HD population. Additionally, the regression model did not predict sense of mastery as anticipated. However, there are some interesting considerations that resulted from these outcomes. Results are discussed in relation to the strengths-based model and in relation to the current literature and with implications for future research and practice with this at-risk population.

Summary and Interpretation of Findings

Intelligence beliefs.

The first research question addressed the relationship between parent theory of intelligence and child theory of intelligence. There was no statistically significant association between parent theory of intelligence and child theory of intelligence for this sample of children with AD/HD. This result is contrary to the previous literature on the connection between parent and child intelligence beliefs within non-AD/HD populations (Bennet, 2010; Dweck, 2000; Hong et al., 1999). The following section outlines some potential explanations for this discrepancy in findings.

The average parent intelligence belief score was slightly towards the incremental belief end of the scale but was actually quite close to the mid-point score, indicating that respondents tended to endorse moderate levels of incremental beliefs (i.e. selecting a response of “mostly

agree”) or a mixture of beliefs. Similarly, the *mean* child intelligence beliefs score was quite central but leaning towards the incremental beliefs end of the spectrum. Two previous studies used the *Theories of Intelligence Scale for Children (TIS-C)* to assess theories of intelligence in similar populations, although both used the three-item version of the *TIS-C*, making direct outcome comparisons more difficult. Baird et al. (2009) found that children with learning disabilities reported an average score that was identified in the entity range. Similarly, Dunn and Shapiro (1999) found that children with AD/HD endorsed the entity theory of intelligence and had significantly different scores than the control group. Thus, when the average intelligence theory score for the children in the current study is compared to other studies which utilized the same measure, the results are counter to the mean score of children with AD/HD, making it unclear whether the results of the current sample are representative of the larger population of children with AD/HD or that there were sampling differences between the studies reported to date.

Based on past research, it was expected that the children with AD/HD in the current study would endorse an entity belief, however, they instead endorsed an incremental intelligence belief. As mentioned above, there may have been important differences between the current sample and past samples of children with AD/HD that could account for the difference in outcomes. One such factor may be that the current sample had a *mean* full-scale IQ of 110, which is considered to be above average. Children with AD/HD generally have IQ scores within the average range (Weyandt & Gudmundsdottir, 2014), indicating that this sample may not be entirely representative of the general population of children with AD/HD (although it is not unusual for some children with AD/HD to score in the high average to superior ranges of intellectual functioning). While there is no current research evidence available to link IQ scores

with intelligence beliefs, this is one factor that may indicate that the current sample is more unique, which may possibly be reflective of the demographics related to parents who are more likely to volunteer their families to participate in research. That being said, the unexpected result of incremental beliefs within this sample is an encouraging result, as it demonstrates that these children may already be utilizing a growth mindset as a personal strength which may be now and/or may later serve as a protective factor.

The relationship between parent and child intelligence beliefs was not examined in the Baird et al. and Dunn and Shapiro studies, however, a handful of past studies using non-AD/HD populations found significant correlations between parent and child intelligence beliefs, which leads to some interesting questions. Is there something unique to an AD/HD diagnosis that would make this relationship less consistent? Would these interactions differ depending on whether the parent had an incremental or an entity belief?

Fittingly, although not specific to an AD/HD population, Dweck and Haimovitz (2016) identified that some recent findings which attempted to directly link parent and child intelligence beliefs were not in fact always statistically significant (e.g. Gunderson, Gripshover, Romero, Dweck, Goldin-Meadow, & Levine, 2013). In an attempt to reconcile these deviations from earlier findings, Dweck and Haimovitz (2016) proposed that parent intelligence beliefs may not be directly related to child intelligence beliefs. The authors speculated that parents' beliefs may only influence children's beliefs if they lead to behaviours that are observable to the child (Haimovitz & Dweck, 2016). They further postulated that intelligence mindsets may not be visible to children, such that the parent may have a growth mindset but still praise the child's ability, whereas a parent's mindset regarding failure may be more evident through the parent's approach to specific situations. Given that parenting practices in families with AD/HD may be

more inconsistent and may involve more difficulties with communication, intervening factors such as those suggested above may provide possible explanation for the lack of relationship between parent and child intelligence beliefs.

Further, Haimovitz and Dweck (2017) go on to suggest that parent's failure mindsets may be linked to children's intelligence beliefs via interaction with parent's behavioural reactions to children's failures based on their performance/learning goal orientation. They proposed that there may be another variable at play which activates children's intelligence mindsets in certain situations; parents' theory of how to motivate children, and the resulting action taken in a failure scenario (see Figure 5 for an illustration of Dweck and Haimovitz's proposed model).

Ultimately, the key revelation from Haimovitz and Dweck is that parent mindsets about intelligence and failure may be more useful in predicting children's mindsets when considered as separate constructs (i.e. intelligence mindset and failure mindset). The lack of consideration for an interacting factor such as parent behaviour or parent beliefs about *how* to motivate children could be another explanation for the non-significant correlation between parent and child intelligence beliefs in the current study.

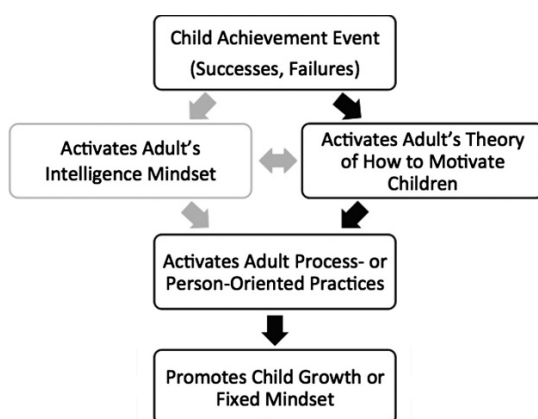


Figure 5. Haimovitz and Dweck's (2017) hypothesized model.

Additionally, the lack of association in the current study may lie with the measures themselves. As the *Theories of Intelligence Scale for Adults (TIS-A)* and the *TIS-C* have not specifically been used in an AD/HD sample previously, the reliabilities of these scales were assessed within the current study. Baird et al. (2009) reported a good internal consistency ($\alpha = .85$) for the three-item *TIS-C* in a sample of children with learning disabilities and normal controls, compared to the questionable reliability reported in the current study ($\alpha = .64$). The Baird et al. study had a much larger sample size ($N = 1518$) as well as an older age range (10-19 years) that fell within the age range recommended by the authors, so perhaps the small sample size and the downward extension of age range to include eight-year-olds contributed to the questionable reliability in the current study. As the *TIS-A* demonstrated “excellent” internal consistency, while the *TIS-C* was not as reliable, results based on the *TIS-C* in the current study should be interpreted with some caution and may have possibly contributed to a lack of correlation between the two measures.

Further research should aim to establish reliability of the *TIS-C* scale for use with an AD/HD population and with younger age ranges. Given the questionable reliability of the *TIS-C* it is possible that some children were not able to fully understand the questions, as the scale was initially intended for children 10 years and older. Further to this point, Haimovitz and Dweck (2016) reported that they had changed the word “intelligent” to “smart” in the child version of the questionnaire. There were also three items which were reverse-scored, meaning that half of the questions were worded in an entity framework and the other half in an incremental framework, which may have led to some confusion for children. Use of the three-item version so that the questions were only presented in one framework and changing the word “intelligent” to

“smart” in the current study may have led to greater understanding and more reliable responses, particularly with the 8 and 9-year-olds.

Finally, it is also possible that the lack of association within the current sample of children with AD/HD could indicate that there is something different about the relationship between parents and their children with AD/HD that interferes with the relationship between parent and child intelligence beliefs. The current study did not touch on the quality of the parent-child relationship or examine specifics of their interactions. Although most factors of the parent-child relationship have specifically been investigated in relation to conduct problems in children with AD/HD, Johnston and Chronis-Tuscano (2014) advocate that these relationships be examined with respect to other outcomes such as learning problems, comorbid depression and anxiety, and social problems. Thus, it is possible that factors such as high levels of relational frustration, inconsistent parenting styles, problems with communication, or parenting stress may interfere with the correlation of beliefs in this population.

Achievement goals.

The second research question addressed the relationship between parent achievement goal orientation and child achievement goal orientation for children with AD/HD. There was no statistically significant association between parent learning goal orientation and children’s learning or performance goal selection within the AD/HD group.

The *mean* parent achievement goal orientation score was on the learning goal end of the spectrum. On the categorical measure of child achievement goal selection, 40.7% of child participants chose performance avoidance goals, 33.3% selected the performance approach goal, and 25.9% picked the learning goal option. This is in line with previous research which demonstrated that students with AD/HD tend to select performance avoidance goals. Barron et

al. (2006) assessed achievement goals in middle school students with AD/HD using the *Patterns of Adaptive Learning Survey (PALS)* and found that students with AD/HD endorsed higher performance-avoidance goals than both the local and *PALS* manual normative samples. The students with AD/HD also endorsed more mastery goals than the normative samples. Similarly, in studies where the AD/HD group was given a dichotomous choice between performance and learning goals, Baird et al. (2009) reported that 74.3% of adolescents with AD/HD selected the performance goal and Dunn and Shapiro (1999) found that 85% of AD/HD boys and 90% of AD/HD girls selected the performance goal. The pattern of these results is congruent with the data from the current study, although comparisons to a control group were not completed here.

While not explicitly analyzed in the current study, an interesting observation was that children with AD/HD selected performance goals (performance-avoidance goals in particular), but their intelligence beliefs scores were more in alignment with incremental intelligence beliefs. The data observed do not fit the association detected in past research which indicates that an incremental score on intelligence beliefs would be associated with a higher percentage of respondents selecting learning goals. Although the results here do fit the previously established pattern of children with AD/HD tending to select performance goals, the link between intelligence beliefs and achievement goals identified in past research with both typically-developing and AD/HD populations did not appear to be present. One possible explanation for this perceived deviation could be that the theories of intelligence (*TIS-C*) scores were just too neutral to truly consider the result as “incremental”. The middle possible score on this scale (with incremental beliefs on one end and entity beliefs on the other) is 21, whereas the *mean* produced in this study was 22.3. Along similar lines, the measure itself produced questionable reliability, indicating that the results may not be as informative as anticipated.

Further to the discussion of achievement goal selection, previous research (Barron et al., 2006) has pointed out that children may endorse different goal orientations depending on their environment. It is possible that the goal selections made during the testing sessions for this research did not reflect the goals some children may have selected had they been in a classroom situation or doing homework. Similarly, past research has also highlighted that for children with AD/HD, confidence in their ability or their perceived ability can be a mitigating factor to their goal selection, regardless of the intelligence belief they ascribe to (Dunn & Shapiro, 1999).

Unfortunately, the categorical measure used in the current study is only one item and did not assess the child's more general achievement goal orientation in the same way that the adult measure did, rather, it assessed their preference in one specific context. Further, the question was a hypothetical one, as they were not given specific tasks (i.e. math vs reading vs puzzle, etc.) to select from, only a general category. As such it was not possible to determine whether their orientation may have varied depending on the context or specific subject. The achievement goal results could likely have been expanded upon had a rating scale measure of child achievement goal orientation similar to that on the *PALS* been included to more easily map onto the parent achievement goal measure and possibly to parallel the child's choice of task. Another possible explanation is that motivational beliefs may not have an effect until challenge is presented (Baird et al., 2009; Blackwell, Trzesniewski, & Dweck, 2007). In this study the students were not specifically or purposefully presented with a challenge before selecting a task preference.

As discussed above in relation to the correlation of parent and child intelligence beliefs, Haimovitz and Dweck's 2017 proposed model (see Figure 4) posited that parent mindsets alone may not directly shape children's behaviour, that the transmission of beliefs also involves parent's 'theory' of how to motivate children. In this newly suggested model, the interaction of

the parent's intelligence mindset and their beliefs about how to motivate children comes together to activate either person or process-oriented practices (i.e. behaviours related to performance or learning goals), which then result in the adoption of either a fixed or growth mindset for the child. Given this progression, future research would benefit from the inclusion of a measure which taps into parent beliefs about motivation and the parent behavioural (how a parent reacts to a child's failure) elements of this model.

Predicting sense of mastery.

The third and final research question addressed the role that parent and child intelligence beliefs and achievement goals might play in the prediction of a child's sense of mastery within the AD/HD population. The full model of parent intelligence theory, child intelligence theory, parent achievement goal orientation, and child achievement goal orientation to predict *Sense of Mastery* was not statistically significant. In fact, the negative adjusted R^2 value for the model indicates that there may be a variable(s) that does(do) not contribute at all to the variance in *Sense of Mastery* scores. Certainly, one consideration here is that the correlations between parent and child variables in the proposed regression model did not have the expected significant inter-correlations to begin with.

Considering newer research which advocates for a different pathway between parent beliefs/mindsets and child beliefs/mindsets (see Figure 4), a different regression model may be a better fit. Given the details of Dweck and Haimovitz's proposed model, a future regression model to predict sense of mastery may be more successful with the addition of a measure of parent motivation beliefs as well as a measure of parent behaviours in failure situations. Additionally, Major (2016) found that symptoms of inattention were indirectly related to student engagement through sources of self-efficacy and self-efficacy for self-regulated learning.

Following this revelation, perhaps future studies looking at sense of mastery in children with AD/HD might include diagnostic or symptomatic variables such as inattention or comorbid diagnoses as one of the predictors of *Sense of Mastery*.

The current sample of children with AD/HD reported a *mean* sense of mastery score ($M = 50.5$) as well as *mean* scaled scores of 10 on both the *optimism* and *self-efficacy* sub-scales, and 9 on the *adaptability* sub-scale. The reported mean here was very close to the set *mean* reported in the *RSCA* technical manual ($M = 50$, $SD = 10$; Prince-Embury, 2007) as well as the matched control sample ($M = 50.4$) used in a comparison against a clinical sample ($M = 41.3$; Prince-Embury & Steer, 2010). Overall, the sense of mastery scores on the main scale and subscales are indicative of quite average levels of functioning. By comparison, *mean* sense of mastery scores were reported for clinical inpatient youth ($M = 40.6$; Kumar, Steer, & Gulab, 2010) and clinical outpatient youth ($M = 40.4$; Prince-Embury, 2008) when compared to the average of $M = 50.9$ for non-clinical youth (Prince-Embury, 2008). These results could be indicative that children with AD/HD do indeed have the potential to experience similar levels of mastery to their peers. This could be taken as a positive in that mastery appears to be a strength/protective factor that children with AD/HD within the current sample may be capable of accessing.

Another possible explanation for the discrepancy could be the issue of “positive illusory bias.” Children with AD/HD often provide elevated ratings of their own functioning, particularly in areas such as competence and self-esteem (Hoza, Vaughn, Waschbusch, Murray-Close, & McCabe, 2012). It can be argued that this tendency may be adaptive, but it also may prohibit such children from the benefits of learning from mistakes, which is integral to a growth mindset. However, this is contrary to the literature which supports lower mastery and self-efficacy for

children with AD/HD, in which case it may be that the current sample is not particularly representative of the general population of children with AD/HD. For instance, this sample of children with AD/HD had a *mean* full-scale IQ score in the “high-average” range of intellectual functioning, potentially indicating that this particular group of children may in fact experience a higher sense of mastery. Thus, more research is needed to explore differences in sense of mastery between control and AD/HD groups, as well as the factors which may increase sense of mastery for vulnerable children, before any definitive conclusions can be made.

Implications

Overall, the findings from the current study may prove a useful first step to build towards a framework for the mindsets and mastery profiles of children with AD/HD. Although the results were not definitive, there is some indication that children with AD/HD may demonstrate similar levels of mastery and intelligence beliefs as those who do not have AD/HD, yet still display a tendency to select performance avoidance goals. This data leads to a few initial implications for practical intervention targeted at parents and parent-child interactions.

Although reported ratings of sense of mastery were within ‘typical’ levels within the AD/HD population in the current study, some possible explanations for this fact were offered in the previous discussion. While it is promising that the average sense of mastery rating among this sample of children with AD/HD is notably higher than the average for children with other disorders such as depression (about 1.0 SD higher), the possibility of an additional factor such as positive illusory bias could potentially impact sense of mastery in children with AD/HD in that these children may still be less likely to choose learning goals, which *was* reflected by the results of goal selection in this study. Thus, attempts to further increase sense of mastery should not be precluded as there were several limitations and potential confounding factors to the current study

that may have contributed to the non-significant results. In fact, past research offers some evidence that there are benefits to holding an incremental intelligence belief and learning goal orientation in terms of improving sense of mastery. For example, Conger et al. (2009) found that effective parent-child problem-solving (where intelligence beliefs and goal orientations would likely come into play) resulted in a greater sense of mastery, although this study did not examine an AD/HD population.

Further, encouragement of an incremental intelligence belief and a learning goal orientation may still be key to protecting children with AD/HD from increased frustration and helpless responding in the face of failure, despite that fact that these indicators did not result in a significant increase in sense of mastery in the current study. As past research in typically-developing populations has shown that children's mindsets can be influenced by external sources, parents and teachers may consider a targeted effort to encourage the implementation of a growth mindset. Of particular importance may be the middle school years, with some researchers identifying this transitional period as a key point of intervention for solidifying a growth mindset (Blackwell et al., 2007). It is important to note here that while it was not explicitly examined in the current study, one of the key interactions involved in the mindset framework is the influence of intelligence beliefs on achievement goals, which has been established in previous non-AD/HD populations. However, this relationship still requires study within an AD/HD population, as this trajectory did not appear to be present in our current data.

The fact that the current study did not find a link between parent and child beliefs does not necessarily rule out the important role parents may still have in this area. Broadly speaking we know that parent-child interactions are key in fostering resilience. How the mechanism works in regard to children adopting the same intelligence beliefs and achievement goals as their

parents is not yet known. The results of this study suggest that it may not be as simple as parent incremental belief leads to child incremental belief (for example), particularly within a population of children with AD/HD.

The work of Gunderson et al. (2013) points to another intervening variable. They showed that effort or process praise had more influence on children's incremental mindset than the parents own incremental theories did. As such, effort praise across the board may be instrumental in fostering the growth mindset. Further, as discussed in Chapter 2, Moorman and Pomerantz (2010) found that mothers who were prompted to hold an entity mindset engaged in more unconstructive involvement and performance-oriented teaching than mothers induced with an incremental mindset. They inferred that a parent holding an incremental theory of ability will engage more constructively with their children during homework and thus enhance the quality of their child's learning.

One specific area of concern previously identified for children with AD/HD is that they tend to struggle with many challenges during homework (Sheridan, 2009) and tend to have maladaptive responses to failure and frustration (Dunn & Shapiro, 1999). Homework scenarios provide a natural point of influence for parents to encourage or motivate their children through endorsement of learning goals. A few studies have included aspects of achievement motivation related to homework (Bempechat, 2004; Knollman & Wild, 2007; Murray et al., 2006; Pomerantz et al., 2006). Pomerantz et al. (2006) identified that mothers' mastery-oriented behaviours when helping with homework predicted positive emotional functioning among children with negative perceptions of their academic competence, which may be an important result for children with AD/HD.

Raggi, Chronis-Tuscano, Fishbein, and Groomes (2009) identified a lack of research on interventions targeted at homework difficulties faced by youth with AD/HD. Accordingly, they introduced an intervention targeted at parents and homework which included education about the homework difficulties faced by students with AD/HD, social learning theory, antecedent-behaviour-consequence model of behaviour, goal setting, contingency contracting, and parent-teacher consultation. The intervention resulted in improvements in homework problems, academic productivity, overall grades, and symptoms of inattention. As such, parent-child interactions around homework appear to be an area responsive to intervention. Although sense of mastery or other similar outcomes were not directly measured in this initial assessment, some of the positive outcomes that were identified have been associated with mastery. The Raggi et al. (2009) study only included 11 participants but the results point to the need for interventions to focus more specifically on parent-child interaction which foster a learning goal orientation during homework help for children with AD/HD, although similar results may likely be applicable to children who do not have AD/HD as well. In fact, Smith and Langberg (2018) highlighted that it may be beneficial to incorporate growth mindset intervention strategies into existing AD/HD interventions, as such interventions have reduced fixed mindsets and performance-avoidance orientations in typically developing youth.

Limitations

There are a number of limitations to the current study that must be considered in the interpretation of the findings. First and foremost, small sample size is the main limitation in this study. The small sample size limited the statistical analyses available and contributed to low power of the research. As the small sample size may have been a factor in the lack of significant

findings, generalizations to the larger population can not be made and all results and interpretations should be considered with caution.

It is also acknowledged that the FSIQ of this sample fell into the “high average” range of ability. While it’s not abnormal for children with AD/HD to score within the high average range, they more often tend to fall into the average range of cognitive ability (Weyandt & Gudmundsdottir, 2014). As such, a sample of children with higher than average intellectual functioning may share some fundamental differences not generalizable to the larger AD/HD population. Additionally, gender comparison was not possible in the current study due to very low female representation ($n = 3$) in the sample. As previous studies have demonstrated some interesting patterns related to gender differences in achievement goal selection, gender comparison may have added to some interpretation of the overall findings. Medication effects were also not taken into account in this study. The literature on the effects of medication used to treat AD/HD on the key variables in this study is sparse and unclear and will be important to examine in future research.

Another limitation was related to concerns with the measures used in the main analyses. Firstly, all were self-report rating scales and all but one were reported on a Likert scale. While most research looking at these constructs also use rating scales, the possibility remains that there were elements of the individuals’ beliefs and orientations that could not be captured and may be better captured or enhanced using qualitative measures. Additionally, the current study did not include any observations of parent-child interaction or a measure of the quality or nature of parent-child relationships. As such, it was not possible to test the hypothesis that parents transmit their beliefs through interactions, although this is highlighted in other research (i.e. Bennet, 2010; Haimovitz & Dweck, 2016). Given the robust relationship between the key measures in

the current study and academic achievement outcomes, it may have also been prudent to include an objective measure of academic achievement in order to examine a more objective positive outcome associated with these protective factors in an AD/HD population.

Further, the *Task Choice Goal Measure* used to represent child achievement goal preference was comprised of just a single question where the respondent selected one out of four categorical options and was originally intended for use with ages 10 and older. Given the categorical nature of the *TCGM*, the analyses that could be performed on the results of this scale were limited. Future research should consider a scale with multiple items and appropriate for a younger range of ages, such as the *PALS*.

In addition to the types of scales used, the reliability of the *Theories of Intelligence Scale-Child* reported questionable reliability within this group of children with AD/HD. Question remains whether the measures used were appropriate for this population or if there truly is a different pattern of findings with children with ADHD. In order to more adequately address this issue, future studies utilizing the *TIS-C* with younger age groups or children with AD/HD, whom are known to be less reliable responders, utilizing the three-item version of the *TIS-C* as well as replacing the word “intelligence” with “smart” as suggested in Haimovitz and Dweck (2016) may be more appropriate.

Given the limitations to the current study, the following section provides some guidelines for future research.

Future Research

The current study was limited by the small size and demographic composition of the sample. In the future, a study with a larger and more diverse sample would help to answer some of the questions posed by the limitations here. In particular, future studies should aim for a larger

sample size to allow for more generalizable results and to determine if the lack of results here were due to small sample size or a true difference in the model of these relationships within an AD/HD population. Attempts should also be made to include a more representative ratio of male to female participants in order to allow for gender comparison on key measures, as it is well documented that there are gender differences in the manifestation of AD/HD and some documented gender differences in the achievement goal literature (Dunn and Shapiro, 1999). The current sample also exhibited higher than average IQ scores which may have impacted the results. As Smith and Langberg (2018) indicated there may be links between IQ and motivation, future studies may wish to include IQ as a covariate.

The current study did not include a matched control sample of children without an AD/HD diagnosis. The ability to compare areas of strength and vulnerability between children with AD/HD and those without would be valuable in identifying interventions that may be beneficial to all children and those which may be particularly effective for children with AD/HD. Thus, future research would benefit from the inclusion of a control sample matched on age, gender, IQ, and other pertinent variables.

Further, the current study did not find a correlation between parent and child beliefs. However, as previous research has shown that intelligence beliefs and achievement goals can be taught and changed within neurotypical populations, it would be interesting to further investigate this link as well as determine if children with AD/HD are as susceptible to “learning” these beliefs when explicitly taught (as opposed to parents implicitly transmitting beliefs to their children through interactions and behaviours). Specifically, an investigation of the potential differences between reported beliefs and goals and imposed beliefs and goals might aid in determining differences in these relationships within the AD/HD population. Additionally, the

proposed regression model for the current study (parent and child intelligence beliefs and achievement goal orientations predicting sense of mastery) could be re-examined using a larger, more representative sample.

Given Haimovitz and Dweck's (2017) updated theory proposal, future research in this area should aim to follow the proposed model by including a measure which assesses parent's beliefs about how to motivate children, and ideally, a measure of parent's hypothetical or actual behavioural responses in a failure scenario. As such, investigations which include experimenter observation of parent-child interactions, as well as daily diaries which reflect the reasoning and beliefs of both the child and parent may be beneficial. Smith and Langberg (2018) reviewed the association between motivational deficits in youth with AD/HD and functional outcomes, and identified that Carol Dweck's mindset framework is an important consideration for future research in youth with AD/HD.

Finally, Johnston and Mash (2001), Deault (2010), and Dvorsky and Langberg (2016) all highlighted the need for longitudinal research which addresses multiple risk and protective/promotive factors in order to help identify resilient outcomes in children and youth with AD/HD. Longitudinal research may be of particular benefit to research involving intelligence beliefs and achievement goals, as it may help to track changes in mindset across development and to identify the potential role parent's mindsets may play in the predictions of children's mindsets and other aspects of resilience.

Final Conclusions

The current study did not find an association between parent and child intelligence beliefs or between parent and child achievement goals. Additionally, the proposed model that child sense of mastery would be predicted from parent and child intelligence beliefs or achievement

goal orientations was not supported. However, the results of this study add to the few existing investigations into resilience in AD/HD and there were some interesting findings which provide inspiration and guidelines for future research into implicit intelligence beliefs, achievement goals, and sense of mastery as possible protective factors for children and adolescents with AD/HD.

The non-significant results may be indicative that there is some factor related to the AD/HD population that interferes with the correlation between parent and child beliefs and goals. However, with the small sample size used in this study further investigation is needed with larger samples and consideration of variables related to the parent-child relationship and interactions. Despite the limitations of the investigation, positive outcomes from typical populations advocates the encouragement towards a growth mindset in the hopes of increasing resilient behaviours and outcomes in children with AD/HD. Interventions should address attitudes and beliefs children with AD/HD have about themselves and their abilities to foster mastery experiences through the increasingly widespread concept of the growth mindset. While the proposed model did not predict sense of mastery as anticipated, the result that sense of mastery scores in children with AD/HD were similar to those of children without AD/HD is promising, as certain populations of children with AD/HD may have a higher sense of mastery which may act as a protective factor against various negative outcomes.

It is important to continue to investigate strengths and abilities in children and adolescents with AD/HD in order to identify the many potential factors that may add to the existing information provided in deficit-focused models, and to strive for more definitive research outcomes. Furthering the potential of protective factors such as a high sense of mastery and a growth mindset within an AD/HD population will contribute to a more well-rounded

understanding of the interactions of factors which may influence the heterogeneous trajectory of this at-risk population as well as provide additional resources which are easily-accessible and easy to implement for professionals and parents working with these children and youth.

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Appendix A: Parent Questionnaire-TIS-A and QGC

Parent Questionnaire

Participant ID _____

Date _____

Theories of Intelligence Scale-Others Form for Adults

This questionnaire has been designed to investigate ideas about intelligence. There are no right or wrong answers. We are interested in your ideas. Using the scale below, please indicate the extent to which you agree or disagree with each of the following statements by writing the number that corresponds to your opinion in the space next to each statement.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

1. ____ People have a certain amount of intelligence, and you really can't do much to change it.
2. ____ Someone's intelligence is something about them that they can't change very much.
3. ____ To be honest, someone can't really change how intelligent they are.
4. ____ People can learn new things, but they can't really change their basic intelligence level.

Goal Choice Questionnaire

We would like to understand the types of goals you yourself have or have had in an educational setting. There are no right or wrong answers. Please respond to the following questions using the provided scale.

1. If I knew I wasn't going to do well at a task, I probably wouldn't do it, even if I might learn a lot from it.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

2. Although I hate to admit it, I sometimes would rather do well in a class than learn a lot.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

3. It is much more important for me to learn new things in my classes than it is to get the best grades.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

4. If I had to choose between getting a good grade and being challenged in a class, I would choose to get a good grade.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

5. If I had to choose between getting a good grade and being challenged in a class, I would choose to be challenged.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

Appendix B: Child Questionnaire-TIS-C and TCGM

Child Questionnaire

Participant ID _____

Date _____

Age _____

Implicit Theories of Intelligence Scale for Children-Self Form

Read each sentence below and then circle the *one* number that shows how much you agree with it. There are no right or wrong answers.

1. You have a certain amount of intelligence, and you really can't do much to change it.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

2. Your intelligence is something about you that you can't change very much.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

3. You can learn new things, but you can't really change your basic intelligence.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

4. No matter who you are, you can change your intelligence a lot.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

5. You can always greatly change how intelligent you are.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

6. No matter how much intelligence you have, you can always change it quite a bit.

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

Task Choice Goal Measure

We may have more time later on. If we do, which kind of task would you like to work on most? Mark only one answer!

I would like to work on:

- ☐ Problems that aren't too hard, so I don't get many wrong.
- ☐ Problems that I'll learn a lot from, even if I don't look so smart.
- ☐ Problems that are pretty easy, so I'll do well.
- ☐ Problems that I'm pretty good at, so I can show that I'm smart

Appendix C: Strengths in AD/HD Recruitment Brochure

THANK YOU FOR YOUR HELP!

In addition to receiving a \$25 family-friendly gift certificate and a special toy for your child, you will be helping advance research that is intended to help your child and others with ADHD.

OUR TEAM

**Dr. Don Saklofske & Dr. Vicki Schwewan
Emma Climie & Sarah Mastoras**
Faculty of Education, University of Calgary

Doctoral and Masters students in the School & Applied Child Psychology Program

If you know of other families who might be interested in participating, please pass this on!

The Strengths in ADHD Project is supported by grants from:

Alberta Centre for Child, Family, and Community Research



Social Sciences and Humanities Research Council of Canada
Conseil de recherches en sciences humaines du Canada

Carlson Family Research Award in ADHD

CONTACT US!

(403) 210-6726
adhdkids@ucalgary.ca
www.ucalgary.ca/adhdkids

Promoting the Positives in Challenging Children

STRENGTHS IN ADHD



Do you have a child 8-11 years of age diagnosed with Attention Deficit Hyperactivity Disorder (ADHD)?

If so, participate in our research!




What is **STRENGTHS IN ADHD?**

The *Strengths in ADHD* research study is intended to identify strengths in children with ADHD, and highlight factors that support children in achieving academic, social, and emotional success.



We will be exploring factors within the child, the family, and the community that are most important to promoting well-being.

How you can help

WE NEED YOU!

Children aged 8-11 with a diagnosis of ADHD provided by a doctor or psychologist.

We are also looking for children without ADHD to participate!

WHAT, WHEN & WHERE?

- 1-2 visits to the University of Calgary scheduled at a mutually convenient time
- Children will engage in activities designed to identify their strengths, and parents will be asked to provide information about the child and family
- Free parking and refreshments for your visits
- All information provided will remain confidential
- Please note that no diagnosis will be provided as a result of your participation

Why is this research IMPORTANT?

- Focus on a strengths-based understanding of ADHD – looking at what helps these children be happy & successful!
- Consider children within their everyday environments to ensure a well-rounded picture of their functioning and development.
- Further our understanding of how to identify children with ADHD who are most at-risk and require support and assistance.



Appendix D: Pre-Screening Questionnaire

Pre-screening Questionnaire (Administered over phone)

Thank you for your interest in the Strengths in ADHD study. In order to determine whether your child is able to participate in this study, we have some questions for you now which will take approximately 5 minutes to complete. Is this a good time to complete our pre-screening questionnaire?

*ASSIGNED ID: _____ Sibling participant ID (if applicable): _____

DATES BOOKED:

Session 1: _____ Session 2: _____

Name of researcher: _____ Date of questionnaire: _____

Name of individual completing this questionnaire: _____

Where did you hear about us? _____

Relationship to child: _____

Phone Number: _____ E-mail address: _____

Child's full name: _____ Gender: _____

Child's date of birth: _____ Age: _____

What are the living arrangements for this child? (e.g., lives with both parents, one parent)

If doesn't live with both parents, what is custody arrangement? _____

If joint custody, is other parent aware of this study? Will you be able to get a consent form signed by them as well? Y N

Does this child attend school full time? Y N *(we cannot accept home-schooled kids)

Child's primary language: _____

If English is not first language, is the child fluent in English? Yes No

Does your child have a diagnosis of ADHD? Yes No

If so, do you know if a specific subtype was provided? _____

Who provided the diagnosis? Profession: _____

When was this diagnosis made? _____

Has your child received any other mental health or learning diagnoses? Yes No

If so, what other diagnosis does your child have or has had and when were they diagnosed?

Has your child ever had a psychological assessment? Yes No

If so, when was the last time an assessment was completed? _____ (date)

Does your child suffer from any of the following medical conditions:

Epilepsy:	Yes	No
Gross motor difficulties:	Yes	No
Major hearing or vision problems:	Yes	No
Autism Spectrum Disorder:	Yes	No

Is your child currently taking medication for attentional concerns? Yes No

If yes, what medication? _____

***** **For office use only** *****

Based on these questions:

Does the child meet inclusionary criteria to participate in this study? Yes No

If so, in what group? ADHD Control

Is the child needed based on age, gender, or comorbidity needs at this time? Y / N

***** *Scripted responses to parents******

If participant does qualify:

Thank you for completing these questions. Based on the information provided, you are able to participate in this study. Do you have any questions at this time? If you choose to participate, when you first arrive for your session, you will be provided with an opportunity to review and sign the consent form. We would be happy to provide you an email copy of this consent form now to review before deciding to participate. The consent form will provide you with more detailed information about the study and your participation in it. Would you like to first have a chance to review this consent form or would you like to book a time to come to the University of Calgary to participate at this time?

If participant does not qualify:

Thank you for completing these questions. Based on the information provided, your child unfortunately does not meet our criteria to participate in this study. We do thank you for your interest in this research, and encourage you to pass on our information to anyone else you know who might be interested in participating. Do you have any questions for us? Thank you again for your interest and we wish you all the best.

Appendix E: Strengths in AD/HD Parent/Guardian Consent Form



Name of Researcher, Faculty, Department, Telephone & Email:

Emma Climie, Sarah Mastoras, Tara Semple, & Colleen Stinson
 Graduate Students
 Faculty of Education, Division of Applied Psychology
 (403) 210-6726, adhdkids@ucalgary.ca

Supervisor:

Dr. Vicki L. Schwean

Title of Project:

Socioemotional Resilience in Children with ADHD

This consent form, a copy of which has been given to you, is only part of the process of informed consent. If you want more details about something mentioned here, or information not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

The University of Calgary Conjoint Faculties Research Ethics Board has approved this research study.

Purpose of the Study:

The purpose of this research project is to better understand the factors that support children with ADHD in doing well and achieving their goals. Specifically, we are interested in the abilities that best promote social and emotional resilience in individuals with ADHD, and will be exploring these areas in relation to factors such as cognitive abilities, self-perceptions, family composition and functioning, and academic performance. Many of these factors will be evaluated in working directly with your child. However, in order to obtain multiple perspectives about their emotional and social abilities, additional information will be gathered from parents/guardians and teachers.

Two groups of participants will take part in this study: families that have a child with ADHD, and families that have a child without ADHD or any other learning or behavioural diagnoses. By comparing these two groups, we will be able to better understand what is similar and different about children with ADHD relative to other children and whether there are factors that are more important for children with ADHD in supporting their positive development. You and your son/daughter have been invited to participate in this research project because you meet criteria for one of these groups.

What Will I Be Asked To Do?

If you choose to participate in this research project and you are determined to be eligible based on a brief pre-screening questionnaire, you and your son/daughter will visit the University of Calgary Applied Psychology and Educational Services clinic (U-CAPES) for two sessions, totalling approximately 4-5 hours in total. Within this session(s), your child will work one-on-one with a researcher to complete a number of tasks that evaluate your child's cognitive, academic, and social abilities. Some of these tasks will involve having your child solve problems, and others will involve

asking them questions about how they think and behave. Most children find these tasks quite enjoyable. Your son/daughter won't be asked to do anything that is very difficult or that might make him/her feel uncomfortable. While the researcher is working with your child, you will be asked to complete a questionnaire that asks about your family and your child's history, as well as several scales that ask you about your child's behaviour. You will also be asked to provide the name of your child's current teacher, who we will contact and provide several scales that ask about your child's academic performance as well as the teacher's views of his/her behaviour and functioning in the school setting. There will be lots of breaks for your son/daughter, as well as drinks and snacks provided by the researcher. Your son/daughter will be given a small toy as a special thank you for their time and participation in this study. You will also have the opportunity at this time to indicate whether you are willing to be contacted in the future for follow-up data collection. Should you agree, you will be provided with full information on what this follow-up component would include and will given the opportunity at that time to consent to your continued participation.

Your participation in this study is wholly voluntary, and choosing to participate or not will have no impact on you or any services you currently receive. **Participants may withdraw from the research project for any reason, at any time, without penalty of any sort.** If participants choose to withdraw from the research project, the data collected up to this point may be used in the current study, unless the participants request that their data be destroyed. Further, participants will be informed if any new information arises that may affect their decision to remain in the research project.

What Type of Personal Information Will Be Collected?

Should you choose to participate, you will be asked to provide in-depth information about your family and your child. This will include educational and developmental history of your child, information about your family and family history, parent/guardian employment and educational information, and any medications or support your child has received. **Please understand that all information collected during the course of this research project will remain strictly confidential and the participant's name will not be identified at any time or associated with any published results.** All participating families will be assigned a participant number which will be used to identify their information. No names will be recorded on assessment measures.

Data generated from this research project are primarily intended to be used in doctoral and master's level student research. Only group information will be summarized for any publication or presentation of results and individual participants will not be identifiable.

Are there Risks or Benefits if I Participate?

Risks

As part of this research project, we will be collecting information about your child regarding their cognitive, academic, and emotional functioning. Though unlikely, it is possible that we may learn information about your child that suggests that they require further assessment or intervention. **It is important to acknowledge that we do not provide diagnoses or intervention within this study.** However, should we believe that your child requires a formal assessment or other mental health support, we will refer you to the appropriate services through Alberta Health Services.

In addition, as psychologists, we are required by law to report to the appropriate agencies suspicions of

harm to a child or harm to another person. Should information be revealed that fits within these categories, we will be required to pass this information on accordingly. It is important to note that only relevant information will be shared and no additional information about results within this research project will be revealed.

Benefits

It is expected that the information collected in this study will provide us with a better understanding of the social and emotional characteristics of children with ADHD. There is surprisingly little research examining the social and emotional abilities that best promote success and resilience in individuals with ADHD. The researchers involved in this study believe that it is important to understand these characteristics because these children have a greater likelihood of encountering social and emotional challenges.

This research is fundamentally important to ensuring that children with ADHD enjoy all the rights, privileges, and services granted to typically-developing children. The identification of factors that promote resilience has the potential to inform and guide government policy and subsequent funding initiatives for support services for children with ADHD, their families, and their communities. Most importantly, through the identification of factors that contribute to successful outcomes, this research becomes the first step in identifying interventions designed to build on and strengthen protective factors within these children. We want to thank you very much in advance for your help in furthering this research.

Participating families will be provided with a \$25 gift card as a thank you for participation. As well, your child will be presented with an age-appropriate toy at the completion of your visit to the university. Parking while at the university will be paid for. It is important to understand that you will not be provided with any specific results from the measures completed with your child, as these are for research purposes only. However, we would be happy to provide you with a list of the assessment tools that have been used should your child require a formal assessment. This will ensure that any assessment is not impacted by the work completed within this project. As well, you will be given the option of receiving a summary report of research findings upon the study's completion.

What Happens to the Information I Provide?

Participation in this study is completely voluntary and confidential. No one except the researchers and supervisor will be allowed to see any specific results or questionnaires or access any audio or videotapes. Only group information will be summarized for any presentation or publication of results. All materials will be stored in a locked facility by one of the researchers or the research supervisor, Dr. Vicki Schwan. Data will be entered onto a password protected computer without your or your child's name attached, and thus all electronic files will remain anonymous. Your data will be stored for five years in a locked cabinet and on anonymously on a password protected computer, at which point it will be destroyed or permanently erased.

Signatures (written consent)

Your signature on this form indicates that you 1) understand to your satisfaction the information provided to you about your participation in this research project, and 2) agree to participate as a research subject.

In no way does this waive your legal rights nor release the investigators, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from this research project at any time. You should feel free to ask for clarification or new information throughout your participation.

Participant's Name: (please print) _____

Participant's Signature _____ Date: _____

Researcher's Name: (please print) _____

Researcher's Signature: _____ Date: _____

Questions/Concerns

If you have any further questions or want clarification regarding this research and/or your participation, please contact:

Emma Climie, Sarah Mastoras, Tara Semple, Colleen Stinson
Educational Studies in Psychology, Faculty of Education
(403) 210-6726, adhdkids@ucalgary.ca

Supervisor: Dr. Vicki Schwean, Faculty of Education, Vicki.schwean@ucalgary.ca

If you have any concerns about the way you've been treated as a participant, please contact the Senior Ethics Resource Officer, Research Services Office, University of Calgary at (403) 220-3782; email rburrows@ucalgary.ca.

A copy of this consent form has been given to you to keep for your records and reference. The investigator has kept a copy of the consent form.