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Thinking outside the box: Exploring creativity and social skills in children with Attention-Deficit/Hyperactivity Disorder

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Thinking Outside the Box: Exploring Creativity and Social Skills in Children with
Attention-Deficit/Hyperactivity Disorder

By

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A THESIS

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Cheers!

Abstract

The current study investigated the constructs of creativity and social skills in children between the ages of 8-11 years who had been previously diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD). Information on the construct of social skills was attained via self-report measures completed by both the participating child and his or her parents. Creativity was assessed with a measure of figural creativity. Children rated their social skills as significantly higher than did their parents; parents rated their children within the low average range, while the children rated themselves within the average range. It was also determined that the children's figural creativity fell within the average range in comparison to the normative data; however, contrary to the hypotheses, there was no relationship found between the constructs of social skills and creativity. These findings suggest that additional research should focus on creativity as a possible strength in children with ADHD, and its relationship with social skills should be investigated further with a larger sample.

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List of Abbreviations

ADHD	Attention-Deficit/Hyperactivity Disorder
ADHD-I	Attention-Deficit/Hyperactivity Disorder Inattentive Type
ADHD-HI	Attention-Deficit/Hyperactivity Disorder Hyperactive/Impulsive Type
ADHD-C	Attention-Deficit/Hyperactivity Disorder Combined Type
SST	Social Skills Training
SSIS	Social Skills Improvement System
TTCT	Torrance Test of Creative Thinking
WASI	Wechsler Abbreviated Scale of Intelligence
FSIQ	Full Scale Intelligence Quotient

CHAPTER 1: INTRODUCTION

Attention-Deficit/Hyperactivity Disorder

Described as a deficit of inhibition, Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most commonly diagnosed disorders in childhood, with prevalence rates estimated between 3-7% of school aged children (Center for Disease Control, 2005; American Psychological Association, 2000; Barkley, 1997a), and Canadian rates falling into the 5-10% range (Scahill & Schwab-Stone, 2000). It is not unusual for children to have lots of energy, to jump from one activity to the next as they explore novel environments, and respond impulsively; however, when these characteristics are presented in a much higher degree than what is expected for the child's age, they can be detrimental and impact negatively on the child's well-being (Barkley, 2003). The impacts of ADHD are seen most commonly within the home and school environments, and symptoms are usually recognized as abnormal during the first year of school (American Psychological Association, 2000; Goldstein & Rider, 2006).

Considered one of the most well-studied childhood disorders, ADHD-like symptoms have been referenced and written about since the time of Shakespeare, documented in plays, poetry, and later in medical and psychological books and journals. Although the labels and diagnoses attached to children presenting with symptoms of inattention, hyperactivity and impulse control have changed countless times in the past, the core behaviours and nature of the disorder have changed little (Barkley, 2003). More recently, however, the DSM-IV (American Psychiatric Association, 1994) divided the disorder into two separate sub-types, ADHD – Inattentive Type (ADHD-I) and ADHD –

Hyperactive/Impulsive Type (ADHD-HI), with the possibility of a third sub-type, a combination of the two previously listed: ADHD – Combined Type (ADHD-C).

ADHD-I is characterized by behaviours primarily related to attention, and is diagnosed in children who fail to give close attention to detail, make careless mistakes, have difficulty sustaining attention, are often easily distracted, and are often forgetful, among other symptoms (American Psychiatric Association, 2000). ADHD-HI is characterized by behaviours related to hyperactivity and impulsivity, and is diagnosed in children who present with behaviours such as fidgeting, leaving their seat in the classroom when expected to stay seated, excessive energy, blurting out answers rather than waiting for an appropriate time to speak, and difficulty awaiting turns, to name a few (American Psychiatric Association, 2000). ADHD-C is characterized by behaviours found in both ADHD-I and ADHD-HI, and is diagnosed in children when diagnostic criteria for both of the previously discussed sub-types are met (American Psychiatric Association, 2000). Similar to the majority of childhood disorders, not all children with ADHD present with identical symptoms, and some children without the disorder present analogous behaviours, but to a lesser extent. Combining a variety of symptoms together creates a syndrome, which causes impairment in the child's life, at which point ADHD is diagnosed (American Psychiatric Association, 2000).

Theoretical Framework of ADHD

There have been numerous theories of ADHD proposed since the beginning of its formal recognition, by any other name, in the early 1900s. Defective volitional inhibition, moral dis-regulation, deficient attention and arousal, preference for immediate reward, and rule governed behaviour, are only a few of the conceptualizations theorized

for ADHD in the past (Douglas, 1972; Haenlein & Caul, 1987; Barkley, 1981). Although past conceptualizations and models may partially encapsulate the disorder of ADHD, Barkley (2003) suggests that there have been two crucial questions on the nature of ADHD missing until he created his own theoretical (neurobiological) model of ADHD. Behavioural inhibition has played an integral role in these past theories, however Barkley's model of ADHD (1994, 1997b, 2001) attends not only to inhibition, but to the various other associated symptoms (e.g., motor control, executive functioning), as well as inattention, or poor sustained attention.

Barkley's (1997b, 2005) current conceptualization of ADHD, which is widely accepted, is that a primary deficit of behaviour inhibition interferes with the child's organization and behaviour regulation abilities across contexts. Behavioural disinhibition played a primary role in previous theories of ADHD, but Barkley (1997b) proposes that this disinhibition affects four separate domains of executive functioning. It is suggested that the inability to inhibit one's actions negatively affects working memory (i.e., inability to hold events in mind, poor anticipatory set, diminished sense of time, etc.), internalization of speech (i.e., reduced description and reflection, delayed moral reasoning, impaired reading comprehension, etc.), self-regulation/motivation (i.e., less social perspective taking, diminished self-regulation of motivation, etc.), and reconstitution (i.e., limited analysis and synthesis of behaviour, reduced verbal/behavioural fluency, less goal-directed creativity and diversity, etc.; Barkley, 1997b).

As a result of deficiency in the four areas of executive functioning presented by Barkley (1997b), children with ADHD often exhibit difficulty when completing tasks that

require these functions. It has also been suggested that these areas of executive function have evolved to support social activities such as reciprocal exchange and altruism, imitation and vicarious learning, self-sufficiency and innovation, and social-defense (Barkley, 2001). This theory suggests that not only are children with ADHD disadvantaged in the specific areas of executive ability, but also, more generally, in several domains of social development.

While the above mentioned theory of ADHD is widely accepted, it is necessary to recognize that ADHD-Inattentive Type has been explored to a lesser degree in comparison to Hyperactive/Impulsive and Combined Types, and it is thought that children with ADHD-I differ in their executive function abilities (Barkley, 1997b). When discussing negative outcomes in ADHD, it is important take into consideration the differences between subtypes, and keep in mind that the inattentive subtype present with fewer negative outcomes due to the minimal amount of impulsive behaviours in comparison to their hyperactive counterparts (Goldstein & Rider, 2006).

Negative Outcomes

ADHD is often associated with a number of negative outcomes associated with its neurological underpinnings. Deficits of executive function, as found in individuals with ADHD, can result in poor academic achievement, anxiety, depression, conduct problems, and delinquency (Barkley, 2003; Deault, 2010). Also, an overarching deficit that is seen in the majority of diagnosed children, which can often be overlooked, is poor social relationships with their peers, facing social rejection and isolation (Barkley, 2003; deBoo & Prins, 2006). Due to these associations with poor outcomes in multiple environments,

ADHD is deemed a risk factor in children for future negative outcomes (Deault, 2010; Modesto-Lowe, Yelunina, & Hanjan, 2011).

Considered to be aspects of an individual's life that predict or are strongly associated with an undesired outcome (Masten, Herbers, Cutuli, & Laffavor, 2008), 'risk factors' are often synonymous with childhood psychopathology. ADHD, in particular, can predict multiple life-long negative outcomes. As mentioned previously, children with ADHD frequently have difficulty interacting with children their own age and have lesser social skills than children without the disorder (Al-Yagon, 2009). Also, children with ADHD are at much higher risk of attaining mental health and educational diagnoses in the future, and are far more likely than their typically developing peers to fail in academic environments (Faraone, Biederman, & Monuteaux, 2002; Barbaresi, Katusic, Colligan, Weaver, & Jacobsen, 2007). In addition to factors that directly impact the child, ADHD has been related to difficulties in family functioning, including child-parent relationships, as well as an increase in parental stress (Deault, 2010; Johnson & Mash, 2001).

It is possible, however, for children diagnosed with ADHD to manage these risk factors and avoid potentially harmful outcomes. In fact, it has been found that children with ADHD have the ability to function quite well in a variety of areas (Hechtman, 1991; Molina et al., 2009). Research focusing on resiliency, which is described as positive or successful outcomes in a person's life despite significant adversity (Masten, 2001), has found that some children with ADHD will experience a positive transition into adulthood, and achieve some amount of success in several areas of functioning (Goldstein & Rider, 2006). This positive-focus of research is the basis for the current study; what

characteristics or traits allow children to be resilient and overcome the great adversity that is ADHD?

Social Skills

Although not always recognized as a primary deficit of ADHD, diminished social skills is something that children diagnosed with ADHD often struggle with (Barkley, 2003; Al-Yagon, 2009). Healthy peer relationships are considered an integral part of a child's optimal development, in turn, considering social impairment a primary indicator of adverse outcomes in adolescence and beyond (Parker & Asher, 1997; Greene, Biederman, Faraone, Sienna, & Garcia-Jetton, 1997). In children with ADHD, over activity and inability to sustain attention, interest, and persistence to tasks, affects not only academic and familial domains, but also severely impacts social interactions (Barkley, 2003). It is suggested that relational difficulty for those with ADHD stems from many of the symptoms most commonly associated with the disorder; frequent shift in conversation topic, inability to attend to others while they are speaking, initiating conversations at inappropriate times, interrupting, and acting inappropriately (APA, 1994). Interestingly, it has been estimated that it takes typically developing children only 30 minutes, with minimal social interaction, to identify children with ADHD as disruptive, unpredictable, and aggressive, often rejecting and criticizing the child with ADHD (Milich & Landau, 1982; Pelham & Bender, 1982).

Furthermore, social deficits faced by children with ADHD are said not only to stem from the basic difficulties in executive functions, but also from long standing social disruption in multiple environments. Beginning from a very young age, ADHD affects the interaction children have with their parents, which influences the manner in which

parents respond to these children (Johnston & Mash, 2001). It is reported that children with ADHD are more talkative, negative, and less able to function without the assistance of their mothers; while in turn, mothers of these children tend to be less responsive, more negative and demanding, and less rewarding of positive behaviours (Johnson & Mash, 2001; Gomez & Sanson, 1994). The patterns of negative and disruptive social and emotional interactions found within families (parent-child relationships) may extend beyond the home environment, and occur in child-teacher and child-peer interactions (Whalen, Henker, & Dotemoto, 1980; Clark, Cheyne, Cunningham, & Seigel, 1988; DuPaul, McGoey, Eckert, & VanBrakle, 2001).

As social difficulties are becoming more recognized as a pervasive issue faced by children with ADHD, social skill training (SST) has become a widely used, and clinically accepted, method of intervention (Mrug, Hoza, & Gerdes, 2001; Nixon, 2001). Although SST has proven to be affective in populations of aggressive and antisocial individuals (Webster Stratton, Reid, & Hammond, 2001), results found in samples of children with ADHD or learning disabilities are equivocal (Forness & Kavale, 1996). Social skills and knowledge may appear to have been learned during training, however evidence from research studies do not consistently suggest that SST is of benefit to children across environments (home or school; DuPaul & Eckert, 1994; Gresham, Sugai, & Horner, 2001). Furthermore, a lack of outcome studies examining SST for children with ADHD prevents us from drawing conclusions as to whether or not SST builds skills that can be generalized beyond the treatment environment. However, it is imperative to continue exploration of alternative methods to improve the social functioning of children diagnosed with ADHD.

The lack of adaptive social behaviour observed in most children with ADHD has been linked with the finding that this population presents with clinically significant levels of internalizing disorders such as depression and anxiety (Karustis, Power, Redcorla, Eiraldi, & Gallagher, 2000). The paucity of evidence supporting SST as a beneficial and generalizable intervention implies that researchers need to look elsewhere in order to assist these children in reaching their potential and possibly minimizing the collateral damage (i.e., internalizing disorders) thought to stem from social difficulty. The demand for alternative social skills interventions has lead to a second rationale for the current study; is there a domain of cognitive functioning that, if strengthened, can improve the social functioning of children with ADHD across domains?

The self-report nature of the widely used Social Skills Improvement System (SSIS; Gresham & Elliott, 2008) makes it important to take into consideration the sample from which data are being obtained. As suggested in the research literature, children with ADHD overestimate their own competence in multiple areas in comparison to other estimates of their actual competence (Hoza et al., 2004; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002). This means that the child's perception of their own performance does not parallel the outcomes of objective measures or ratings of performance given by parents or teachers (Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). In a study examining the cross-informant agreement of the SSIS (Gresham & Elliott, 2008) cross-informant agreement between parents and students were weak to moderate (Gresham, Elliott, Cook, Vance, & Kettler, 2010). As discrepancies between parent and student ratings of social skills are shown to exist within samples of typically developing children it may be

hypothesized that this discrepancy would be even greater when examining an ADHD population, taking into consideration the positive illusory bias.

Creativity

A generally accepted definition (Mumford, 2003), suggests that creativity, or a creative product, is something that is novel and original as well as useful and adaptive. Though this definition of creativity (or creative products) is relatively concise, the components and mechanisms that underlie creativity are far from simplistic. Creativity is a multifaceted occurrence that must take into account individual, social, and cultural factors in order to estimate a probable creative outcome (Ward & Kolomyts, 2010).

There are many theories of creativity including developmental, psychometric, economic, stage and componential process, and cognitive (Kozbelt, Beghetto, & Runco, 2010). The developmental theories of creativity focus on the development of creativity over time and the mediation of personal interaction and environment. Psychometric theories assert that creativity can be measured reliably and validly and is different from related constructs (i.e., intelligence). The economic theories present creativity as behaviour that is influenced by market forces and cost-benefit analyses. Stage and componential processes favour the idea that creative expression proceeds through stages and have linear and recursive elements. Lastly, the primary assertion of cognitive theories is that creativity is based on ideational thought processes as the bases of creative persons and accomplishments (Kozbelt, Beghetto, & Runco, 2010).

Regardless of the number of theories of creativity, for the purpose of the current study, no particular theory will be selected. Rather, research in the area of creativity, cognitive functions, and individual traits will be reviewed in order to provide rational for

exploring the role of creativity in children with ADHD and its possible relation to social skills.

Creativity in the Literature

Creativity has been investigated in many ways, and has been linked to a number of variables including intelligence, personality, neurobiological systems, and motivation, to name a few (Kaufman & Sternberg, 2010). Early philosophers first began to speak of creativity in association with intelligence and other expressions of exceptionality; however, such statements were made in the absence of empirical evidence. Although research in the field of creativity did not grow as quickly as did topics in other areas, the formal and scientific investigation of creativity has since flourished. For example, it has been cited that in the 1900s-1950s, only 186 articles from the well-known *Psychological Abstracts* spoke of creativity. Since this time, the number of publications in this journal had grown a minimum of 5% (Feist & Runco, 1993).

In relation to ADHD, it has been speculated that high creative abilities exist in children with ADHD; however, most of the literature in this area is based on anecdotes of creative persons, and discussions of how creativity and the disorder overlap. There is very limited empirical research supporting these claims (Healey & Rucklidge, 2005). Although the evidence of this suggested relationship between creative abilities and the diagnoses of ADHD is quite controversial, there are several areas of research where cognitive abilities have been linked to creativity. These links are important to keep in mind while examining creativity in any population.

In a sample of typically developing university students, creativity was found to have little relationship with cognitive ability, but was strongly associated with personality

traits, such as emotional intelligence (EI; Sánchez-Ruiz, Hernández-Torrano, Pérez-González, Batey, & Petrides, 2011). In another study, investigating creativity and coping abilities, results suggest that several composites of the TTCT figural measure (fluency, originality, elaboration, etc.; Torrance, 1981) had a strong, positive association with coping ability in children, as well, fewer problematic responses to stressors as reported by mothers (Carson, Bittner, Cameron, Brown, & Meyer, 1994). Both studies presented above provide reasonable arguments as to how creative ability is related to important cognitive and emotional functions. In terms of emotional intelligence, Lopez and colleagues (2004) recently provided evidence that the quality of social interactions, between an individual and their friends and family members, has a strong positive relationship to emotional intelligence. Thus, it is fathomable that creativity, as it relates to higher emotional intelligence and coping abilities (Sánchez-Ruiz, Hernández-Torrano, Pérez-González, Batey, & Petrides, 2011; Carson, Bittner, Cameron, Brown, & Meyer, 1994), could possibly share a similar relationship with social skills, enabling avenues for alternative intervention for children with ADHD.

Research on creativity and its relationship with ADHD has been controversial to say the least (Healey & Rucklidge, 2005). However, early research on the relationship between ADHD and creativity suggests that children with high levels of creativity are often characterized as having behavioural or conduct problems as a result of repressed creative needs (Torrance & Dauw, 1965). Also, Hennessey (2003) suggests that motivation plays a pivotal role in creativity. Not only does it take a specific amount of skill or understanding, creativity is catalyzed by intrinsic motivation. The findings of Hennessey (2003) and Torrance and Dauw (1965) imply that children with ADHD can

improve their social skills through a creative medium, both minimizing behavior problems and learning social skills through via intrinsic motivation.

The Present Study

ADHD is one of the most well researched areas of childhood psychopathology, and there is much known about the broad range of difficulties faced by children with the diagnosis and their families (American Psychological Association, 2000; Goldstein & Rider, 2006). It has been suggested, however, that children with ADHD can overcome such adversities associated with this diagnosis, and function ‘quite well’ in multiple domains (Hechtman, 1991; Molina et al., 2009). Thus, it is integral that we begin to examine the strengths found in children and families who are experiencing ADHD. Goldstein and Rider (2006) suggest that it is crucial that we begin to understand and explore the positive attributes of children with psychopathology in order to better understand their strengths, and mitigate the negative outcomes so often observed in this demographic.

The current study was completed as part of a large consortium project focusing on, and entitled, *Strengths in ADHD: Promoting Positives in Challenging Children*. The research project is based at the University of Calgary, and the vision of the project revolves around a resiliency model. The focus is to identify the positive attributes in at-risk children in order to mediate the negative outcomes commonly associated with childhood psychopathology, specifically, ADHD (Goldstein & Ryder, 2006; Brooks & Goldstein, 2001).

Research focusing on social skills deficits in children with ADHD is growing; however, evidence for effective interventions to remediate these skills is far from

adequate (Forness & Kavale, 1996; DuPaul & Eckert, 1994). It is critical that alternative methods of social skill intervention are investigated. The current study will explore the relationship between social skills, and the lesser-known construct of creativity, in hopes of generating discussion around possible methods of intervention, which may increase social skills in children with ADHD. The present study examined the relationships found among social skills and creative abilities using correlational analyses, regression analyses in order to describe the hypothesized relationships.

At this time, there has been virtually no research conducted exploring the relationship between creativity and social skills, therefore the hypotheses stated for the current study are based on a review of the literature and hypothetical associations derived from literature surrounding the two constructs separately. The following are the hypotheses of the current study:

1. Previous research on the SSIS scale (Gresham & Elliott, 2008) comparing self- and parent-reports has shown inconsistencies between ratings (Gresham, Elliott, Cook, Vance, & Kettler, 2010), possibly due to the positive illusory bias that exists in children with ADHD (Hoza et al., 2004; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002). Therefore, for the purpose of exploring the consistency of self- and parent-ratings in an ADHD population, it is hypothesized that there will be a difference between self- and parent-ratings on the SSIS, and that children will rate themselves higher in social skills than do their parents (Gresham & Elliott, 2008).
2. Based on research providing evidence that both social skills and creativity have a positive relationship with emotional intelligence (Sánchez-Ruiz, Hernández-Torrano, Pérez-González, Batey, & Petrides, 2011), it is expected that there will

- be a significant positive relationship found between social skills (SSIS; Gresham & Elliott, 2008) and overall creativity (TTCT-Figural; Torrance, 2008).
3. Given that previous research has found significant positive relationships among coping ability in children and several creative abilities (Carson, Bittner, Cameron, Brown, & Meyer, 1994), it is expected that there will be significant positive relationships found among social skills (SSIS; Gresham & Elliott, 2008) and the five composites of figural creativity (TTCT-Figural; Torrance, 2008).

CHAPTER 2: METHOD

Participants

Children taking part in the current study were required to meet several criteria in order to be eligible for participation. The inclusionary criteria were in line with those used by many ADHD researchers and included: Children residing with their parents or guardians for at least five years to ensure adequate information pertaining to family history; Children attending an Alberta Education school full-time; Children with no indication or diagnosis of Autism Spectrum Disorder, psychosis, epilepsy, or gross neurological, sensory, or motor deficits; and Children with cognitive abilities that fell within the Average range of functioning or higher (Full Scale Intelligence Quotient ≥ 85) to ensure that participants were able to understand what was asked and so that performance was not limited by low cognitive abilities. Intelligence was measured with an individually administered brief cognitive assessment measure (WASI, Wechsler, 1999).

Inclusionary criteria also included a previous diagnosis of ADHD from a qualified professional (psychologist, psychiatrist, or medical doctor). To substantiate the previous diagnosis, subtype (ADHD-C) and severity, DSM-IV-TR (American Psychiatric Association, 2000) inattentive and hyperactive/impulsive scales on the Conners-3 Rating Scale (Conners, 2008) Parent Report were examined. For a child to be included in this study, T-scores on the parent-report needed to be greater than or equal to 70 (Very Elevated) on at least one scale *and* of at least 65 (Elevated) on the second scale. DSM-IV-TR symptom counts must have been met on both the ADHD-H and ADHD-I scales so that the child could be identified as ADHD-C.

Nine children were excluded from the total sample due to not meeting the required average full-scale intelligence quotient assessed by the WASI or for not meeting ADHD inclusionary criteria. Also 20 children were not included in the current study's sample due to an identification of ADHD-H type (n=6) or ADHD-I type (n=14).

The participants in the final sample included 54 children between the ages of 8 years, 0 months and 11 years, 11 months of age ($M = 9.7$, $SD = 1.07$) who had been previously diagnosed with Attention-Deficit/Hyperactivity Disorder – Combined type (ADHD-C). Of the participants, 46 (85.2%) were male and 8 (14.8%) were female. Information regarding participant age and intelligence scores is provided in Table 1.

Table 1. Participant Characteristics

Variable	N	Mean	Standard Deviation	Range
Age (years)	54	9.7	1.07	8.00-11.92
Verbal IQ	54	105.33	14.73	80-144
Performance IQ	54	108.69	13.67	80-139
Full Scale IQ	54	107.45	12.90	85-143

Rather than recruiting a matched control sample for statistical comparison, the clinical sample was compared to the norming population of each measure respectively. Because the normative groups for each test include responses from hundreds or thousands of children of similar age to those in the current study, the use of the normative data provides a meaningful measure of typical responding by large samples of children.

Measures

An initial intake interview was administered to parents' of the participating children that provided information on age, grade, sex, diagnoses specifications, as well as other relevant demographic information. Once preliminary inclusionary criteria were

met, parents and children completed a battery of measures independently of one another, which provided a better understanding of the child's skills and abilities in several areas due the fact that this project is part of a collaborative research group investigating the strengths in children and families with ADHD. The current study examined data gathered through the administration of the WASI (Wechsler, 1999), Conners-3 (Conners 2008), SSIS (Gresham & Elliott, 2008), and the TTCT- Figural (Torrance, 2008). These measures provided imperative information for inclusionary/exclusionary criteria as well as pertinent information needed to answer the specific research questions associated with the current study.

Parent report measures. Several parent-rating measures were completed in order to gain information about the child's behaviour in the home environment. In addition to this, parents completed a demographic questionnaire, which included the child's developmental history.

Conners Rating Scale – 3rd edition – Parent Form. The Conners Rating Scale – 3rd edition (Conners-3; Conners 2008) is a standardized, observer rated measure used to assess a child's behaviour including inattention, hyperactivity/impulsivity, learning problems, executive functioning, aggression, and peer relations. The scale also provides total scores that suggest the presence or absence of attention or behaviour disorders. The Conners-3 Parent Form was used to determine the eligibility of children to be included in the clinical sample (ADHD-C) of this study.

The Conners-3 (parent report) demonstrates strong psychometric reliability and validity estimates. As reported in the technical manual, both internal consistency (.85 to

.94) and test-retest reliability (.72 to .98) coefficients were within the acceptable range (Conners, 2008).

Furthermore, convergent and discriminant validity were demonstrated by assessing the correlation between Conners-3 scores and scores from other relevant measures of childhood and adolescent psychopathology. Measures compared to the Conners-3 included the previous version of this measure, the Conner's Rating Scale – Revised (Conners, 1997), the Behavior Assessment Scale for Children - 2nd edition (Reynolds & Kamphaus, 2004), the Achenback System of Empirically Based Assessment (Achenback, 1991), and the Behavior Rating Inventory of Executive Functioning (Gioia, Isquith, Guy, & Kenworth, 2000).

Lastly, the Conners-3 (parent) discriminant validity results suggest that the measure is able to accurately classify children and youth with ADHD in contrast to those in the general population. As reported in the technical manual, classification accuracy is 77.61%, indicating adequate discriminative validity (Conners, 2008).

Social Skills Improvement System – Parent Form. The Social Skills Improvement System (SSIS; Gresham & Elliott, 2008) is a standardized rating scale which assists in the identification of social skill deficits, and can aid in the development of interventions for students who have less well developed social skills. The SSIS is a multi-rater scale, which may include ratings from parents, teachers, and students. The specific Social Skills evaluated by the SSIS include Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-control. It also measures Problem Behaviours that may impact the acquisition of Social Skills, such as Externalizing, Bullying, Hyperactivity/Inattention, Internalizing. Lastly, Academic

Competence is assessed with ratings of Reading Achievement, Math Achievement, and Motivation to Learn.

For the purpose of the current study, the Social Skills and subtest composite were used. Parents were requested to report how often his or her child performed a targeted behaviour (e.g., “Tries to understand how others feel”). A total of 46 items were completed, and parents could choose to answer based on four options: Never, Seldom, Often, or Almost Always.

The Social Skill composite is comprised of seven subscales and is reported as a standard score ($M = 100$, $SD = 15$). The seven subscales that contribute to the Social Skill composite are Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-Control. All subscale variables of the SSIS are reported only as raw scores with qualitative descriptors, as standard scores have not been created for these separate scales.

Adequate reliability and validity data are reported for the Social Skills composite and subscale score on the SSIS- Parent Report. Internal consistency for the Social Skills composite, reported in the technical manual, was .95, with subscale scores that ranged from .73 to .86 across gender and combined scores. Test-retest correlations were reported to fall between .74 and .86 across composite and subscale scores. Inter-correlation coefficients between the Social Skills composite and subscales fell within the range of .42 to .84, which is acceptable. Also, consistency was found between similar composite and subscale scores among different versions of the SSIS (e.g., Parent, Teacher, Student-report), which addresses convergent validity (Gresham & Elliot, 2008).

Child report measures. Along with the parent rating measures, the current study used child assessment measures that assessed the participant's cognitive abilities, self-reported social competencies, as well as a specific measure of figural creativity.

Wechsler Abbreviated Intelligence Scale. In order to assess the participant's cognitive abilities, the Wechsler Abbreviated Intelligence Scale (WASI, Wechsler, 1999) was administered. The WASI is a standardized measure of intelligence for individuals aged 6.0 to 89.11 years and is designed to act as a brief, accurate measure of the intellectual abilities of an individual as compared to same-age peers. Three composite scores are included in the WASI: Verbal Intelligence Quotient (VIQ), Performance Intelligence Quotient (PIQ), and Full Scale Intelligence Quotient (FSIQ), which is derived from the combination of results from the four core subtests. In order to be included in the current study, participants were required to attain a score within the Average range or above (standard score of 85) on the FSIQ.

The WASI normative sample consisted of 2,245 English-speaking individuals, aged 6 to 89 years, in the United States, which was representative of the 1997 U.S. census data. Internal consistencies are high, as reported in the technical manual, and range from .92 to .98 among the Intelligence Quotient scores (Wechsler, 1999). Internal consistency estimates range from .92 to .98 for the IQ scores.

In terms of validity, the WASI exhibited strong correlation with other measures that examine child cognitive abilities such as the Wechsler Intelligence Scale for Children, 3rd edition (.69 to .74 on subtests; .76 to .87 for IQ scores), Wechsler Adult Intelligence Scale, 3rd edition (.66 to .88 for subtests; .84 to .92 for IQ scores). Because this scale was normed on a United States population, it is also important to examine the

validity of the WASI for use in a Canadian context. As concluded in a Canadian study examining the validity of the WASI for use in Canadian populations, the correlational analyses between the WASI with the Canadian Achievement Test-2 (CAT-2, 1992), and the Canadian Test of Cognitive Skills (CTCS, 1992) strongly support the use of this measure for cognitive assessment in a Canadian context (Saklofske, Caravan, & Schwartz, 2000). Saklofske and colleagues' findings suggest that the WASI is an appropriate brief measure of cognitive ability (intelligence) for Canadian children, and therefore appropriate for that use in the current study.

Social Skills Improvement System – Self-Report Form. Along with the SSIS-Parent form, the child participants also completed the SSIS (Student form), which provided a personal view of their own social abilities. Similar to the parent form, as mentioned previously, the children only completed the Social Skills composite and subscales (Communication, Cooperation, Assertion, Responsibility, Empathy, Engagement, and Self-Control). The Social Skills composite is comprised of 46 items and children were required to disclose how true each statement was for them (e.g., “I try to make others feel better”). A four-option response scale is used from which the children can choose: Not True, a Little True, A Lot True, and Very True (Gresham & Elliott, 2008).

Adequate reliability and validity scores were described in the technical manual for the SSIS-Student report. Internal consistency for the Social Skills composite was .94, and the subscales ranged from .70 to .81 across gender and combined scores. Test-retest correlations were reported to fall between .58 and .80 across composite and subscale scores. Inter-correlation coefficients between the Social Skills composite and subscales

fell within the range of .49 to .84. Also, consistency was found between similar composite and subscale scores among different versions of the SSIS (e.g., parent, teacher, student-report), which addresses convergent validity (Gresham & Elliott, 2008).

Torrance Test of Creative Thinking – Figural A. The Torrance Test of Creative Thinking – Figural (TTCT-Figural; Torrance, 2008) is a standardized assessment measure used to identify creative abilities in school-aged children through the use of abstract drawing tasks. There are two parallel forms (A, which was used in the current study, and B), each consisting of three activities: Picture Construction, Picture Completion, and Repeated Figures. Each task allows the child ten minutes to complete as much as they can before proceeding to the next task, or completing the measure.

There are five norm-referenced composites of creativity assessed through the TTCT-Figural: Fluency, Originality, Abstractness of Titles, Elaboration, and Resistance to Premature Closure (see Appendix A for descriptions of the composites). The five composites of creativity can be compiled to yield an Average score of Creativity. Norm-referenced composites, as well as the Average Creativity score are reported as standard scores ($M = 100$, $SD = 10$). However, it is not suggested to use the Average Creativity score as the best measure of creative abilities, but rather use another composite called Creativity Index.

The Creativity Index, derived from thirteen criterion-referenced subscales, is considered to be the best overall reflection of creativity (Torrance, 2008). The thirteen criterion-referenced indicators include Emotional Expressiveness, Storytelling Articulatness, Movement or Action, Expressiveness of Titles, Synthesis of Incomplete Figures, Synthesis of Lines, Unusual Visualization, Internal Visualization, Extending or

Breaking Boundaries, Humor, Richness of Imagery, Colorfulness of Imagery, and Fantasy (see Appendix B for descriptions of criterion-referenced indicators). The thirteen subscales yield scores of 0, 1, or 2; however, the pooled score used to create the Creativity Index is reported as a standard score ($M = 100$; $SD = 10$). For the purpose of the current study, the Creativity Index will be used as the measure of creative ability.

Satisfactory reliability and validity results were described in the technical manual for the TTCT – Figural A. Internal consistency for the Creativity Index fell in the range of .89 to .94 across grades (5- to >16- years of age). Inter-rater reliability coefficient for the Creativity Index fell at .98. A 22-year longitudinal study was conducted to examine the predictive validity of the TTCT-Figural that compared TTCT scores with later creative achievements (Torrance, 1981). The TTCT-Figural scores correlated with a number of high school creative achievements ($r = .38$), number of post-high school creative achievements ($r = .46$), and quality of future career image ($r = .57$), to name a few (Torrance, 1981). Further validity analyses are not provided in the technical manual, possibly due to the lack of alternative creativity measures from which to compare the TTCT- Figural.

Procedure

Recruitment of children suspected of having ADHD took place in several ways. Information regarding the study was distributed throughout a large Western Canadian city via brochures, advertisements in local media, community newsletters, school boards, faculty and study website, as well as contacting previous clients from a university based psycho-educational assessment clinic. As the current study was part of a larger research project, recruitment information described the project as a strengths-based study,

investigating the positive attributes in children with ADHD. Families who were interested in taking part in the study had two possible ways to contact the researchers: telephone or email. When it was confirmed that the family was willing to participate in the study, a pre-screening telephone interview was conducted to ensure basic inclusion criteria. Several criteria were specified in the interview, previously describe above in the inclusionary criteria. When initial inclusion criteria were met, families were invited to participate in the study.

Most families took part in the study over two 3-hour sessions at a university clinic. Parking fees were provided to all families. When families arrived to the university, the researcher first reviewed participatory consent, ensuring that the parent(s)/guardian(s) and child understood the research project and what participation entailed. Assessment measures were then administered to the child in a random order, always beginning with the Wechsler Abbreviated Intelligence Scale (WASI; Wechsler, 1999) to determine whether or not the child's cognitive abilities fell within the Average range or higher, as stated in the inclusionary criteria. For self-report rating scales, the researcher would read the items to the child unless the child requested to read them on his or her own. During the child's assessment, the parent(s)/guardian(s) were able to complete parent-rating scales in a quiet room, and take home whatever was incomplete at the end of the session to return them at the second session. Most parent-rating forms were completed during the child's first assessment session.

Upon completion of the battery of measures, families were given a \$25 gift card (e.g., movie theatre, book store, restaurant) as an acknowledgement of their participation, and the child was able to select a toy from a prize box. Approval from the university's

Conjoint Faculties Research Ethics Board was obtained for all aspects of the current study.

Upon the completion of the two assessment sessions, the data gathered from each participating family was entered into a statistical analysis program. The individualized nature of the data collection, as well as the small sample size, ensured that both parents and children provided item responses. However, in some cases, due to the length of the assessment sessions and the amount of data collected in the overall study, not all participants completed every measure. Five families were not included in the current study due to information missing from either the parent or the child.

After the visual examination of the descriptive graphs and the raw data set, as well as box plot analyses, it was concluded that there were no extreme outliers on any of the measures completed by parents or children. Thus, no data were deleted or adjusted.

CHAPTER 3: RESULTS

Descriptive Statistics

For the SSIS parent-report, the mean value was 84.09 (SD=14.95), low average range. Additionally, the mean score for the SSIS self-report, as completed by the child participant, was 94.93 (SD=16.95), average range. Child participants also completed the TTCT-Figural during the on-site assessment session. The mean score for Average Creativity was 98.88 (SD=13.12), Fluency composite was 92.19 (SD=18.13), Originality composite 93.21 (SD=20.14), Titles composite was 87.58 (SD=14.57), Elaboration composite was 126.30 (SD=22.35), and Resistance to Closure composite was 94.60 (SD=19.79).

Differences in SSIS Rating

Is there a significant difference between self- and parent- ratings on the SSIS (Gresham & Elliott, 2008)?

In order to investigate whether or not the Positive Illusory Bias found in children with ADHD (reference) had an effect of the self-report measure of the SSIS, a Pearson correlation analysis between parent- and self- report measures was conducted. The two groups were compared based on the overall Social Skills standard score derived from the SSIS responses. There was a significant relationship found between parent- and self-report on the SSIS ($r(54) = .334, p < .01$). Child participants (self-report raters) rated themselves higher than did their parents (parent-report raters) on Social Skills as derived from the SSIS responses, however their responses followed similar trend.

Correlation between Social Skills and Average Creativity

Is there a significant, positive relationship found between social skills (SSIS; Gresham & Elliott, 2008) and overall creativity (TTCT-Figural; Torrance, 2008)?

As a first step in the examination of the relationship between social skills and creativity, the Social Skills score from the SSIS and the Average Creativity score from the TTCT-Figural were compared. Due to the significant difference found between parent-and self-report scores on the SSIS, two separate correlational analyses were conducted for each group. Pearson correlation coefficients (two-tailed) for the SSIS and TTCT-figural are presented in Table 2. Parent-rated Social Skills and Average Creativity showed no significant relationship. Similarly, there were no significant relationships found when examining self-reported Social Skills and Average Creativity.

Correlations between Social Skills and Creativity Composites

Is there a significant, positive relationship among social skills (SSIS; Gresham & Elliott, 2008) and the five composites of figural creativity (TTCT-Figural; Torrance, 2008)?

To further investigate the relationship shared between Social Skills and Creativity, a correlational analysis between Social Skills and the five composites of the TTCT-Figural subscales of Fluency, Originality, Titles, Elaboration, and Resistance to Closure, was performed. Table 3 also shows the Pearson correlation coefficients (two-tailed) for the Social Skills and TTCT-figural composite analyses. Similar to the previous analysis, parent- and self-report Social Skills scores were examined separately. There were no significant correlations found between Social Skills and TTCT-figural composites for both parent- and self-report measures.

CHAPTER 4: DISCUSSION

The current study was completed as part of a larger research program focusing on resilience and ‘positives’ in children with ADHD and their families. The project is entitled *Strengths in ADHD: Promoting Positives in Challenging Children*. The purpose of the current study was to examine the possible relationships between creativity and social skills in children with ADHD-C. As creativity and social skills have not been explored in relation to one another prior to the present study, this research provides important information to add to the literature surrounding children with ADHD. A secondary purpose for the current study was to investigate the possible presence of positive illusory bias to determine in children via their self-responses to social skills questionnaires in comparison to their parents’. Previous research has found that children with ADHD tend to rate themselves significantly higher than do their parents on many aspects of functioning, however this has not been investigated using social skills rating scales, so the results of the current study provide initial findings in this area in addition to that previously mentioned.

Based on a review of previous research, though limited, several hypotheses were formulated for the current study. The findings were somewhat inconsistent with these hypotheses; however, some interesting findings were observed. Hypotheses 1, which stated that children with ADHD-C would rate themselves differently than did their parents, was supported. Previous research has indicated that children with ADHD have a positive illusory bias, meaning they are less aware of their areas of weakness, and less able to recognize where they struggle (Hoza et al., 2004; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002). The current study supports the positive illusory bias in children with

ADHD who rated themselves significantly higher in terms of their social skills than did their parents on a parallel, parent-rater questionnaire. The data from the current study also extends the literature suggesting moderate cross-informant agreement on the SSIS rating scales. Previous research suggests that there is only moderate agreement between parent- and child-raters on the SSIS (Gresham & Elliott, 2008), and the present study, while examining an ADHD population, provides important information about the inter-rater agreement in the ADHD population.

Regarding the overall ratings of children's social skills, there is a very limited research base from which to draw inferences or comparisons to the current findings. Although no previous research has examined the social skills of children with ADHD through the use of the SSIS (Gresham & Elliott, 2008), it is widely accepted that children with ADHD struggle with social situations, and have difficulty initiating and maintaining social relationships (Barkley, 2003; Al-Yagon, 2009). Due to the positive illusory bias, the self-report measures from the current study must be interpreted with caution; however, the parent-rating scales appear to support previous claims that children with ADHD do have difficulty with social skills in general, which includes difficulty understanding social situations, inability to respond appropriately, and having the inability to monitor their own behaviour. In comparison to the standardization sample, parents rated their children's social skills in the low average range, whereas the child's self-report placed them in the average range.

Hypothesis 2 was based on the previous literature suggesting possible links between social skills and creativity, and predicted that a significant positive relationship would be found between social skills and overall creativity. However, there were no

significant findings in either direction. This is not an area where previous research has been conducted although the results were somewhat unexpected based on information gathered from related areas of study. Social skills and creativity share many similar cognitive processes and abilities, such as emotional intelligence and intrinsic motivation (Hennessey, 2003; Lopez et al., 2004). It has been found previously that emotional intelligence plays an integral role in both the acquisition and monitoring of social skills (Lopez et al., 2004), as well, those with higher emotional intelligence and intrinsic motivation have been found to be more creative (Sánchez-Ruiz, Hernández-Torrano, Pérez-González, Batey, & Petrides, 2011; Hennessey, 2003). It was assumed from these previously examined linking factors, that creativity and social skills may have a more direct relationship with one another but again, the results did not support this speculation and there were no significant relationships found.

Hypothesis 3 was based on the previously discussed connections between social skills and creativity, in addition to previous literature suggesting that coping abilities (which are beneficial to the understanding and performance of social skills) have a strong positive association with differing composites of creativity. The hypothesis stated that there would be significant positive relationships found among social skills and the five composites of figural creativity. This hypothesis was not supported by the present research findings, with no significant relationships found among social skills and any of the five composites of figural creativity. Given the findings of previous research examining the relationships that the five composites of figural creativity share with coping skills, and the integral role coping skills plays in maintaining relationships and practicing healthy social skills, these non-significant results were unexpected.

Although the results of this study did not show significant links between social skills and creativity in children with ADHD, it did offer additional evidence to support the positive illusory bias in children with ADHD, as well as adding to the literature on moderate respondent agreeability on the SSIS (Gresham & Elliott, 2008). There may be many possible explanations for the lack of relationship found between social skills and creativity in the current study.

Firstly, the relationship between social skills and five factors of creativity was assumed through the bridging of previous research in bordering areas, possibly implicating a direct relationship. However, the exploration of relatedness between two factors (i.e., creativity and social skills) is more than one dimensional, including multiple facets of skill, learned knowledge, previous experience, and innate abilities. Examining the relationship between social skills and creativity in the most basic form also does not take into consideration moderating or mediating variables. It is possible that the relationship does exist; however, that relationship may be less direct than assumed in the current study.

Also, the small sample size in the current study was most likely not representative of the ADHD population. Given a larger and more representative sample, it is possible that further associations between social skills and creativity may have emerged. It is also possible that the social skills self-report measure, as completed by the children, may not be a true representation of their abilities. In understanding that children with ADHD lack much self-awareness in regard to their areas of functioning where they are not performing as well as their typically developing peers (Hoza et al., 2004; Hoza, Pelham, Dobbs,

Owens, & Pillow, 2002), it is fathomable that self-report measures in this population need to be interpreted with caution.

Implications

Additional findings from the current study indicate that parents of children with ADHD view their children as functioning in the low average range in terms of their social skills and abilities. This information supports previous research stating that children with ADHD perform poorly in many social domains, and fall behind their peers in social competence (Barkley, 2001; Barkley, 2003; deBoo & Prins, 2006). These results provide further evidence that social skills continue to be an area where children with ADHD have difficulty self-monitoring and performing, and should be a focal point in which interventions should be implemented. There are, however, some issues with these findings; namely, relying on self-report measures. Results are still of value to the literature and the limitations will be addressed in the following section.

Although the expected relationships between social skills and creativity were not apparent in the current study, there are still possible implications for intervention strategies to increase children's social skill success and possibly minimize these symptoms of ADHD in the home, school, and other treatment environments. While creativity did not appear to be directly linked to social skills, it is possible that it may have positive impacts on other areas of functioning. It has long since been agreed upon in the literature that extracurricular activities benefit children in many ways.

Extracurricular activities have been found to increase academic achievement, social competence, and social support as well as minimize school dropout and anti-social behaviours (Mahoney & Cairns, 1997; Broh, 2002). In most cases, extracurricular

activities are thought of as team sports and clubs, physical activities; however, it is possible that art, music, and drama classes could provide similar benefits to children who struggle in social domains. As suggested by the current findings, taking part in creative activities should not be detrimental to the social skills of children with ADHD, and could possibly have numerous positive outcomes in multiple domains via increased social exposure.

Another implication that is important to take into consideration, specifically due to the strengths-based nature of the current study, can be drawn from the results provided by the creativity measure. Not all children with ADHD were found to have extreme creative abilities on the high or low end, but most were in the average range. While ‘average’ is not ordinarily interpreted as strength, it is critical to recognize the importance of *average* in an at-risk population. As most research within the field of childhood psychopathology focuses on the difficulties these children face, what they struggle with in comparison to typically developing children, it is imperative that we acknowledge what they *can* do. In comparison to the standardization sample, the children who took part in the current study fall within the average range in figural creativity, and ranged from extremely low to superior, not unlike the typical population. Being creative is something that children with ADHD *can* do, and does not imply a lack of creativity in the areas measured in the current study.

Limitations

In the interpretation of the current study’s findings, it is necessary to consider the preliminary status of the research. Although the data suggests interesting relationships (and non-relationships), limitations must be taken into consideration before generalizing

outcomes. Perhaps continuing this research program to increase the sample size and broaden the population sampled would reveal relationships not found in the current study. Nonetheless, results from the current study should not be generalized beyond the sample studied here as part of the *Strengths in ADHD* research project, and further information is needed prior to the use of these findings in domains surrounding intervention for, or prevention of, ADHD symptoms.

The current study was faced with several limitations. Firstly, the small sample size collected along with lack of data gathered from the children's classroom teachers, limits the generalizability of the findings. Due to the extensive data collection process, length of time donated by the participating families, and specific inclusionary criteria, collecting a large, representative sample within the limited time frame of this particular study was not possible. The small sample size limited the number of statistical analyses that could be used to examine the data, therefore affecting the robustness of the current study's findings. Contributing to the first limitation, it is also important to recognize the large commitment made by participating families. Time spent on campus during the child assessments, as well as time spent at their respective homes completing self-report measures required a great deal of commitment and time. This time commitment may have deterred some families from participating and also may bias the sample, in that only families with regular schedules, available child care for other siblings, and transportation to and from the assessment sessions could take part. Although necessary in order to attain a specific clinical sample and gather a large amount of data for the consortium, the responsibility placed on participating families can be seen as a drawback in many ways.

A second limitation to note is the missing teacher data, eliminating a third respondent on measures of social skills. Teacher information is currently being collected; however, due to summer vacation and delays due to mailing questionnaires through postal offices, there was not enough teacher data to be included in the current study. Input from the classroom environment is imperative when examining children and childhood behaviour and abilities as they spend a large percentage of their time in the school.

Another major limitation that impacts the results of the current study is the reliance on self-report measures. Although self-report measures are used frequently in research, it is best to have an alternative means of measurement along side the self-report. This was not possible in the current study as only particular measures were available and expending extra time completing additional measures was unreasonable to ask of participating families after their already time-consuming commitment. Self-report measures, as mentioned previously, are also more unreliable when used with children, ADHD children in particular. Children are limited in their personal insight, and can be unable to reflect on themselves in an unbiased fashion. There is also a larger chance for children to misunderstand what is asked of them, and answer a question without fully understanding what is being asked, and how to properly respond. Positive illusory bias in children with ADHD may decrease the reliability of self-report measures, however all measures used in the current study were deemed valid and reliable on standardization samples of children, which decreases the apparent problems of this form of data collection.

Lastly, a limitation that clearly affects the current study is lack of research in the area of social skills and creativity. Although there has been research conducted in both areas independently of one another, there have not been any connections made between the two before now. Information from which to derive hypotheses was limited, and scales of measurement for the two factors are minimal in spite of a thorough review of the literature. Measures were chosen from the most widely used and reliable scales and assessments found in the limited literature in this area of study.

Future Directions

Conducting further research within the field of social skills and creativity within a population of children with ADHD should be continued. Expanding the current study to include a much larger and representative sample will assist in making findings more generalizable and robust, yielding stronger implications for further understanding the social and cognitive strengths of children with ADHD and possibly further suggest relevant intervention strategies. Collecting information from participating families and classroom teachers would also enable the findings to be more robust and informative across different environments. While collecting a larger sample size may or may not affect the findings of the current study, it will also be important to examine the impact of creativity on other domains of function such as internalizing disorders or symptoms, and whether or not creative activities have similar benefits to extracurricular or team activities.

Once again, the current research is preliminary in nature, and therefore should be examined at greater depth in the future. Expanding on the current study will be useful in solidifying the current findings, however it is equally important to explore alternative

strength based areas in children with ADHD. Focusing on the strengths in these children, along with internal and external factors that help at-risk children become resilient is imperative.

Conclusions

In summary, the findings of the current study were inconclusive. The first hypothesis was supported, suggesting that children with ADHD rate themselves significantly higher than their parents do on a rating scale of social skills, while the second and third hypotheses, suggesting significant positive relationships between creativity and social skills, were not supported. Although it cannot be stated with confidence due to the limitations, the current study found no relationship between social skills and overall creativity, or among social skills and separate composites of creativity. Limitations for the current study need to be taken into consideration, and further investigations of the factors presently examined should be conducted. Continuing strengths-based research is an extremely important way to improve intervention and prevention strategies for children with ADHD and their families, as well as many other at-risk groups of children. The areas of social, academic, and behavioural difficulty are apparent in children with ADHD, and at most times the difficulties overshadow areas where they excel. Investigating the factors that help children become resilient, and assist them in reaching newly discovered potential, is crucial in bettering the lives of children who struggle in so many domains that are taken for granted by families not affected by childhood psychopathology.

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Table 2: Correlations for Social Skills and Average Creativity

Variable	1	2	3
1. SSIS (Parent-report)	-		
2. SSIS (Self-report)	.245	-	
3. Average Creativity	-.105	-.182	-

^a $N = 54$ children (8 female, 46 male)

* $p < .05$. ** $p < .01$.

Table 3: Correlations for Social Skills and Creativity Composites

Variable	1	2	3	4	5	6	7
1. SSIS (Parent-report)	-						
2. SSIS (Self-report)	.245	-					
3. Fluency	-.226	-.044	-				
4. Originality	-.111	-.122	.802**	-			
5. Abstractness of Titles	.192	.070	-.073	.127	-		
6. Elaboration	.013	-.187	.243	.526**	.326*	-	
7. Resistance to Premature Closure	-.213	-.232	.463**	.467**	.093	.203	-

^a $N = 54$ children (8 female, 46 male)

* $p < .05$. ** $p < .01$.

APPENDIX A:
Norm-references Composites of Figural Creativity

Fluency – this score is based upon the total number of relevant responses. As such, it is perhaps one of the most critical aspects of the test. All other scores depend in part upon the fluency score inasmuch as no subsequent scores may be given in other dimensions unless a response is first found to be relevant.

Originality – this score is based upon the statistical infrequency and unusualness of the response. As such it indicates whether a student produced a large number of relatively trite, common responses, (low originality), or unusual and highly imaginative responses (high originality). Combining two or more figures into a single image is given increased weighting.

Abstractness of Title – this score relates to the subject's synthesizing and organizing process of thinking. At the highest level, there is no ability to capture the essence of the information involved, to know what is important, enabling the viewer to see the picture more deeply and richly.

Elaboration – the basis of this score is two underlying assumptions: the minimum primary responses to the stimulus figure as a single response; the imagination and exposition of detail is such a function of creative ability, appropriately labeled elaboration.

Resistance to Premature Closure – the basis for this score is a persons ability to keep open, and delay closure, long enough to make the mental leap that makes possible original ideas. Less creative persons tend to leap to conclusions prematurely without considering the available information, cutting off chances for more powerful, original images.

Appendix B: Criterion Referenced Indicators of Creativity

Emotional Expressiveness – this measures a subject’s ability to communicate feelings and emotions verbally or nonverbally through drawings, titles, and speech of the figures in the drawings.

Storytelling Articulativeness – this indicates a subject’s ability to clearly and powerfully communicate an idea or tell a story by providing some kind of environment and sufficient detail to put things in context.

Movement or Action – this judges a person’s perception of movement through titles and the speech and bodily posture of figures in the drawings.

Expressiveness of Titles – this notes a person’s use of titles that go beyond simple description and communicate something about the pictures that the graphic cues themselves do not express without the title.

Synthesis of Lines – same as 5 above, except combination of sets of parallel lines or combination of circles.

Unusual Visualization – this measure points out an individual who sees things in new ways as well as old ways and who can return repeatedly to a commonplace object or situation and perceive it in different ways.

Internal Visualization – this measure indicates that a subject is able to visualize beyond exteriors and pay attention to the internal, dynamic workings of things.

Extending or Breaking Boundaries – this score suggests that a person is able to remain open long enough to permit the mind to make mental leaps away from the obvious and commonplace and to open up or extend the boundaries of limits imposed upon the stimulus figure.

Humor – this score suggests that an individual perceives and depicts conceptual and perceptual incongruity, unusual combinations, and surprise.

Richness of Imagery – this score reflects a subject’s ability to create strong, sharp, distinct pictures in the mind of the beholder.

Colorfulness of Imagery – this score reflects a subject’s ability to excite and appeal the senses.

Fantasy – this measure notes a person’s use of fantasy imagery in responding to the test tasks.