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The Role of Social Support in Children with Attention-Deficit/Hyperactivity Disorder: Promoting Resilience in an At-Risk Population

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The Role of Social Support in Children with Attention-Deficit/Hyperactivity Disorder:

Promoting Resilience in an At-Risk Population

by

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Abstract

Children with Attention-Deficit/Hyperactivity Disorder (ADHD) face significantly increased risk for poor outcomes across domains; however, not all children with ADHD experience poor outcomes (Lee et al., 2008; Owens et al., 2009). Resilience perspectives can provide a valuable avenue through which to explore the factors and processes contributing to more positive trajectories among children with ADHD. The current study took a resilience approach to investigate the role of a potential protective factor, perceived social support, in promoting emotional well-being among children with ADHD. Social support has long been recognized as an important factor in promoting well-being among both typically-developing and at-risk populations (e.g., Cohen & Wills, 1985; Demaray et al., 2005), but has yet to be explored in this capacity within the ADHD population. This study specifically examined how school-age children with ADHD perceive support from key individuals in their lives (e.g., parents, teachers, peers, other adults) and the relationships between perceived social support and various indicators of emotional well-being (internalizing problems, self-concept). Additionally, main versus buffering models of social support were explored by evaluating the relationships of social support and emotional adjustment in the context of lower or higher social preference status. A total of 55 children ages 8 to 11 with ADHD-C or ADHD-HI and their parents participated in this study. Overall, results indicate positive and moderate associations between perceived social support and several aspects of self-concept, with parent and classmate support most consistently associated with these outcomes. Results further support a main effect model of perceived social support, with no interaction detected between social support and social preference status. Results of this study are discussed within the context of applying a resilience lens to the study of ADHD, and implications for both research and practice are discussed.

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List of Abbreviations

ADHD – Attention-Deficit/Hyperactivity Disorder

ADHD-C - ADHD–Combined Type

ADHD-HI - ADHD–Predominantly Hyperactive/Impulsive Type

ADHD-I - ADHD–Predominantly Inattentive Type

ADHD-C/HI – includes children with ADHD-C and ADHD-HI

CASSS – Child and Adolescent Social Support Scale

BASC-2 – Behaviour Assessment System for Children – Second Edition

DSM-IV-TR – Diagnostic and Statistical Manual of Mental Disorders, 4th edition - text revision

EF – Executive Function

FSIQ – Full Scale Intelligence Quotient

MTA – Multimodal Treatment Study of Children with ADHD

PIB – Positive Illusory Bias

SES – Socioeconomic Status

SPPC – Self-Perception Profile for Children

WASI – Wechsler Abbreviated Scale of Intelligence

Epigraph

Resilience does not come from rare and special qualities, but from the everyday magic of ordinary, normative human resources in the minds, brains, and bodies of children, in their families and relationships, and in their communities.

Masten, (2001). Ordinary magic: Resilience processes in development.

Chapter 1: Introduction

Children's mental health has been a topic of increasing attention across research, clinical practice, education, and public policy domains. Mental and behavioural disorders frequently begin in childhood or adolescence, with estimates that 15-20% of youth are affected at any given time (Belfer, 2008; Houtrow & Okumara, 2011). Without effective intervention, the burden of mental illness is substantial (Ratnasingham, Cairney, Rehm, Manson, & Kurdyak, 2012), as these disorders confer significant lifetime risk for a wide-range of functional impairments including reduced education and employment opportunities, poor relationships, involvement in the justice system, and further mental and physical health difficulties (Mash & Dozios, 2003; World Health Organization [WHO], 2004). Taken together with the high and increasing prevalence of mental health problems across the lifespan, it has become exceedingly evident that an emphasis on supporting mental health and well-being in childhood must become a priority (Kieling et al., 2011; National Institute of Mental Health [NIMH], 2001; U.S. Public Health Service, 2000; WHO, 2004).

Attention-Deficit/Hyperactivity Disorder (ADHD) is among those mental health disorders most commonly occurring in children (Center for Disease Control, 2005), with substantial and enduring impacts across domains of functioning and considerable economic implications (Matza, Paramore, & Prasad, 2005). Within the educational system, children with ADHD represent a disproportionate percentage of students receiving special education services (Loe & Feldman, 2007; Schnoes, Reid, Wagner, & Marder, 2006), and as a group, they obtain significantly fewer years of education than do those without ADHD (DuPaul & Stoner, 2003; Loe & Feldman, 2007). These children are also at risk for considerable social, behavioural, and emotional challenges and thus, for the development of further comorbid mental health

difficulties (Barkley, 2003; Biederman, Newcorn, & Sprich, 1991). The lifelong course and ongoing challenges associated with ADHD highlight a need for increased attention and support around this disorder in childhood.

Paralleling the increased attention to children's mental health is a growing interest in strength-based perspectives and practices. Grounded in resilience frameworks, which have demonstrated that personal and environmental assets can play an influential role in predicting outcomes among at-risk children and youth (Masten, 2001), a common goal of these perspectives is to give equal consideration to both strengths and weaknesses in understanding and supporting individuals in a more integrated way (Rashid & Ostermann, 2009). Proponents of these perspectives argue that they can improve school psychology practice by promoting interventions that capitalize on the child's resources and focus on nurturing those assets most likely to have broad and positive impacts on functioning (Jimerson, Sharkey, Nyborg, & Furlong, 2004; Terjesen, Jacofsky, Froh, & DiGiuseppe, 2004). Despite the growing interest in resilience and strength-based approaches, however, these perspectives have remained largely absent within the study of ADHD. Rather, the ADHD field continues to be guided primarily by a deficit-focused perspective aimed at understanding the deficits and correlates of ADHD and reducing the core symptoms of the disorder. Notwithstanding, a resilience perspective has the potential to make valuable contributions to our understanding of ADHD and its heterogeneous trajectories as well as to inform novel and diverse intervention approaches.

Guided by this notion, the current study falls within a larger research program exploring the impact of strengths and resilience factors that may support the positive development of children with ADHD. Specifically, the *Strengths in ADHD* project (Mastoras, Climie, Schwean, & Saklofske, 2010; Climie, Mastoras, Schwean, & Saklofske, 2011; see also Appendix A)

represents an attempt to broaden the scope of ADHD research from one focused on understanding and remediating deficits to one that equally recognizes and capitalizes upon influential strengths and protective factors present in the child's life. To this end, the current study explores the role of perceived social support in promoting the emotional well-being of children with ADHD. Social support was one of the foundational focuses of early resilience research (Rutter, 1985) and has since been well-documented as a resilience factor among at-risk groups (e.g., Cohen & Wills, 1985; Chu, Saucier, & Hafner, 2010); however, its role has yet to be explored among children with ADHD. As such, this study was conducted to investigate: (a) the social support profile of school-aged children with ADHD; (b) the relationships between social support from particular sources (e.g., parents, friends) and indicators of emotional well-being; and (c) the potential protective role of perceived social support in the context of peer rejection, one particularly common and detrimental experience faced by these children.

As a framework and introduction, Chapters 2-4 review current and relevant literature and empirical findings that serve as the basis for this study. Chapter 2 discusses the nature and correlates of ADHD, with an emphasis on the social and emotional functioning of children with ADHD. Given that this study is grounded in notions of resilience, Chapter 3 provides a brief review of current conceptualizations of the resilience construct and how this construct is applicable to the ADHD population. Chapter 4 provides a theoretical and empirical review of literature on perceived social support from a resilience perspective as it applies to both normally-developing children and those with ADHD. With this literature as a backdrop, Chapter 5 then describes the specific research questions and hypotheses of this study. Detailed methods and results of the study are presented in Chapters 6 and 7, respectively, followed by a general discussion of the interpretation, relevance, and implications of the study's findings in Chapter 8.

Chapter 2: Attention-Deficit/Hyperactivity Disorder

Attention-Deficit/Hyperactivity Disorder (ADHD) can be described as a developmental, neurobehavioural disorder, with both neurocognitive and behavioural correlates that lead to impairment and elevated risk for poor outcomes across prominent domains of functioning (Barkley, 2006b). ADHD is one of the most common disorders diagnosed in childhood (Center for Disease Control, 2005), with prevalence rates estimated at 5-10% among school-aged children in Canada (Scahill & Schwab-Stone, 2000) and similar rates worldwide (Faraone, Sergeant, Gillberg, & Biederman, 2003). Current estimates suggest that males are approximately 3-5 times more likely to be diagnosed than females, with higher male:female ratios in clinic-referred samples (Barkley, 2006b). Children are most often diagnosed during middle childhood, though diagnosis may occur as early as preschool or later into adolescence or even adulthood (Smith, Barkley, & Shapiro, 2007). Although previously believed to be largely a childhood-limited disorder, research in the last several decades has increasingly demonstrated a lifelong course for the disorder. Specifically, although symptoms may change in their manifestation and/or severity with development, up to 80% of individuals with ADHD go on to exhibit at least some continued symptoms and impairment through adolescence and adulthood (Faraone, Biederman, & Mick, 2006; Hinshaw, Owens, Sami, & Fargeon, 2006).

The etiology of ADHD, as with most forms of psychopathology, is complex and much remains to be understood. Research to date has highlighted a significant genetic component, with heritability estimates averaging 70-80% (Barkley, 2006b; Faraone et al., 2005). Several perinatal factors have also been found to make smaller contributions to the development of ADHD, including maternal smoking, high maternal anxiety, low birth weight, and pregnancy complications (Spencer, Biederman, & Mick, 2007; Tannock, 2009). In contrast, research to

date has conclusively demonstrated that family and environmental risk factors are not causative (i.e. 'poor parenting' theory), though they may modulate the course, severity, and/or risk of associated impairments and comorbidities (Barkley, 2006b).

Diagnostic Criteria

Since its initial recognition at the start of the 20th century, both the name and the specific symptoms of ADHD have undergone several revisions (see Barkley, 2006b, for a historical review). Currently, ADHD is diagnosed based on a set of behavioural criteria outlined within the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition - text revision* (DSM-IV-TR; American Psychiatric Association [APA], 2000). Specifically, ADHD is described as "a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and more severe than is typically observed in individuals at a comparable level of development" (APA, 2000, p. 85). Thus, this diagnostic paradigm is based on the identification of two broad behaviour factors that can occur alone or in combination to form three subtypes of the disorder.

The hyperactive-impulsive domain consists of behaviours such as fidgetiness, excessive talking and movement, interrupting others' conversations or activities, and difficulty waiting in line or turn-taking. These behaviours are typically observed by 3 to 4 years of age (Barkley, 2003) and often reduce in severity in later childhood and adolescence (Biederman, Mick, & Faraone, 2000; Hart, Lahey, Loeber, Applegate, & Frick, 1995; Larsson, Lichtenstein, & Larsson, 2006). The inattentive domain describes an inability to sustain attention for prolonged periods (i.e., poor vigilance), distractibility, disorganization, lack of persistence in the face of effortful tasks, and forgetfulness (APA, 2000). This group of symptoms typically emerges somewhat later (ages 5 to 7; Barkley, 2003) but is more likely to persist throughout development

(Biederman et al., 2000; Hart et al., 1995; Larsson et al., 2006). Using these symptom domains, the DSM-IV-TR delineates three subtypes of ADHD: ADHD-Combined Type (ADHD-C), which requires that 6 or more of 9 possible symptoms are present from each of the inattention and hyperactive-impulsive domains; ADHD-Predominantly Hyperactive-Impulsive type (ADHD-HI), in which 6 or more symptoms are present only within the hyperactivity domain; and ADHD-Predominantly Inattentive type (ADHD-I), in which 6 or more symptoms are present only within the inattention domain. As alluded to in the above definition, meeting criteria requires that the symptoms are present to a degree that is inconsistent with normal behaviour for the developmental level of the child, a key provision given the dimensional nature of these symptoms. Diagnosis also requires significant impairment across multiple settings (i.e., pervasiveness) and an onset of symptoms prior to age 7 (APA, 2000).

Despite this current diagnostic paradigm, there remains some ambiguity regarding the validity of these subtypes. A growing literature base supports the consideration of ADHD-I as a distinct subtype, with numerous differences identified in regards to the deficits, associated impairments, and risks of ADHD-I and ADHD-C (e.g., Milich, Balentine, & Lynam, 2001; Solanto, Pope-Boyd, Tryon, & Stepak, 2009; Wheeler Maedgen & Carlson, 2000). Although requiring further research evidence, it has been suggested that ADHD-I is in fact comprised of a mixed group, with some children showing a similar profile to those with ADHD-C but another subset displaying a distinct form of inattention known as 'sluggish cognitive tempo' (i.e., sluggish, daydreaming, slow-processing rather than distractible, poor persistence, and disorganized; Barkley, 2006b). In contrast, the ADHD-HI subtype has been suggested to represent a milder form and/or earlier developmental form of ADHD-C, and few distinctions have been consistently identified in regards to the neurocognitive underpinnings, correlates and

associated impairments, or trajectories between these two subtypes (Barkley, 2006b; Lahey, Pelham, Loney, Lee, & Willcutt, 2005; Riley et al., 2008). Given these findings, the current study focused specifically on children with ADHD-C and ADHD-HI, excluding the more distinct ADHD-I subtype. As such, much of the review below specifically addresses findings associated with ADHD-C. Although considerably less research has focused specifically on the ADHD-HI group, the relatedness of these subtypes suggests that many findings should be equally applicable to this group.

ADHD and Executive Dysfunction

Whereas ADHD is diagnostically defined by a set of behavioural characteristics, the disorder has increasingly become recognized as fundamentally neurocognitive in nature, leading to increased speculation and research into the mechanisms underlying the behavioural manifestations of the disorder (Barkley, 2006b; Tannock, 1998, 2003). Indeed, this perspective is supported by mounting neurological findings of both structural (i.e., reduced volume) and functional (i.e., reduced blood flow/activation) abnormalities among those with ADHD relative to neurotypical individuals, particularly within the right prefrontal cortex and components of the basal ganglia (striatum) and cerebellum (cerebellar vermis; Barkley, 2006b; Spencer et al., 2007; Tannock, 2003). Although direct evidence is not as strong, these findings also implicate a role for dopamine, a neurotransmitter that modulates the frontal-striatal-cerebellar networks and is targeted in stimulant medications (Swanson et al., 2007). From a functional perspective, these areas and networks are believed to mediate a set of neuropsychological abilities known as the executive functions (Best, Miller, & Jones, 2009), and indeed, accumulating neuropsychological evidence points to deficits within the executive functions as common, if not integral, to the

disorder (Bennetto & Pennington, 2003; Berlin, Bohlin, & Rydell, 2003; Nigg, 2005; Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005)[1].

Executive functions (EFs) describe a set of higher-level cognitive skills that are "goal-directed and future-oriented" (Bennetto & Pennington, 2003, p. 785). More specifically, they encompass a network of "brain circuits that prioritise, integrate, and regulate other cognitive functions ... much as the conductor manages the symphony orchestra" (Brown, 2006, p. 36-37). Models of EF vary in the specific skills and clustering of skills proposed to fall within this over-arching category, although perhaps the most commonly differentiated EF skills include inhibition, working memory, cognitive shifting, and planning (Best et al., 2009; Bennetto & Pennington, 2003). Within ADHD-C, deficits in inhibition (i.e., disinhibition) appear to be one of the most consistent and significant findings (Bennetto & Pennington, 2003; Barkley, 2006b; Nigg, 2001), although there is also evidence for deficits in at least some aspects of working memory (Martinussen, Hayden, Hogg-Johnson, & Tannock, 2005; Rapport et al., 2008) and planning (Willcutt et al., 2005). The relative importance of, and relationships between, various EF deficits, and how they relate to the behavioural symptoms and associated features of ADHD, has been the subject of many modern theoretical accounts of ADHD (for reviews see Barkley, 2006b; Brown, 2006; Nigg, 2001; Stefanatos & Baron, 2007; Tannock, 2003). The most prominent, comprehensive, and researched of these models has been Barkley's (1997a, 1997b, 2006) model of self-regulation and behavioural disinhibition, reviewed briefly below.

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[1] Although some have raised concerns that a substantial number of individuals with ADHD do not demonstrate impairments on EF tasks (e.g., Nigg, 2005; Willcutt et al., 2005), others assert that this reflects an issue with the ecological validity of neuropsychological EF measurement, claiming that EF impairments are indeed present among all individuals with ADHD when considered at the environmental or behavioural level (Barkley, 1997a; Brown, 2006).

Barkley (1997a, 1997b, 2006) proposes that ADHD-C arises from a chronic developmental delay in behavioural inhibition, which refers to the ability to inhibit or stop an imminent or ongoing impulse-driven response and protect internal cognitive processes from distraction (i.e., interference control). Under normal circumstances, Barkley suggests that these functions of inhibition provide the opportunity for the coordination of secondary EF processes that contribute to deliberate decision-making processes and the successful execution of these planned actions. In ADHD, then, disinhibition is argued to impair the development and appropriate functioning of several additional aspects of EF including: verbal and non-verbal working memory (mental representation, retention, and manipulation of information, internalized speech); reconstitution (analysis and synthesis of behaviour; planning & generation); and self-regulation of affect, motivation, and arousal (modulating emotional reactions, eliciting motivation for the purposes of persistence). These secondary EF deficits, in turn, lead to a limited ability to internally regulate one's behaviour (i.e., motor control).

According to this model, the behavioural manifestations of ADHD represent behaviour that is "controlled more by the immediate context and its consequences" (Barkley, 1997b, p. 75) rather than by internally-represented rules or future-oriented goals. This link is perhaps most obvious for the hyperactive-impulsive domain, wherein limited inhibitory control of responses, self-speech, planning of intentional behavioural sequences, and modulation of arousal leads to impulsive responding and contextually-inappropriate behavioural/verbal activity with little thought to consequences. Inattentive symptoms, within this model, are attributed to limited "goal-directed persistence" (Barkley, 2006b, p. 317), due to an inability to hold in mind and plan towards future goals and elicit the internal motivation to persist toward such goals in the face of more immediate or motivating interests. Distractibility due directly to weak interference control

may also be implicated to some degree (Barkley, 1997a). The highly immediate- and externally-driven basis of behaviour also helps to explain the robust finding of inconsistency and situational-variability in ADHD performance and behaviours (DuPaul & Stoner, 2003), which have been described elsewhere as "the essence of ADHD" (Tannock, 2003, p. 757). Ultimately, the self-regulatory nature of this model suggests that ADHD-C represents a problem with performance, or the application of one's knowledge, rather than a lack of knowledge of appropriate behaviour (Barkley, 2006b).

As noted above, Barkley's model of disinhibition represents only one of numerous models put forth, which vary in their emphasis on the foundational deficits of the disorder. For instance, other neuropsychological models have emphasized the role of attentional network deficits, reduced sensitivity to rewards and/or punishment, or delay aversion as the primary deficit (Barkley, 2006b; Tannock, 2003). Recent work has also begun to explore integrative models based on the presumption that heterogeneity in the causes and manifestations of ADHD may be explained by divergent underlying mechanisms (Tannock, 2003). While this issue is not yet resolved, it is clear that executive dysfunction, and particularly behavioural disinhibition, should be critical considerations in any characterization of ADHD.

Social-Emotional Correlates and Outcomes of ADHD in Childhood

As a result of both the cognitive deficits underlying ADHD-C and their behavioural manifestations, the disorder is associated with a broad range of impairments across academic, social, behavioural, and emotional domains. For instance, within the academic domain, executive function impairments (working memory, time management, motivation, task persistence) and behavioural disruptions within the classroom, as well as frequent comorbid learning disorders, contribute to high rates of under-achievement (DuPaul & Stoner, 2003; Loe

& Feldman, 2007). Behavioural correlates represent another area of significant concern, including elevated rates of aggression and comorbid disruptive behaviours. Indeed, rates of co-occurring Oppositional Defiant Disorder and/or Conduct Disorder are estimated at 40-70% of children with ADHD-C (Newcorn, Halperin, & Miller, 2009), and children with these comorbidities have been shown to have poorer prognoses (Connor, Steeber, & McBurnett, 2010). For the purposes of this study, however, the social and emotional correlates of ADHD are of primary relevance and warrant more thorough exploration. A discussion of each of these areas and their relationship, from both a normative perspective and then in relation to ADHD, follows.

     Social functioning. Within bio-psycho-social frameworks of development, children's relationships and interactions with both adults (particularly parents) and peers represent significant factors contributing to both skill development and long-term adjustment. Family relationships have long been recognized as influential across multiple facets of development, particularly in regards to the implications of early attachment (Hartup, 1989). These relationships are characterized by nurturing and protective functions and promote the development of early language and perspective-taking skills, which can subsequently influence the development of peer relationships (Hartup, 1989; Ladd, 1999). Peer relationships, in turn, provide opportunities for the development and refinement of prosocial, communication, and conflict resolution skills (Hartup & Moore, 1990), with peer reputation and dyadic friendship correlated but having unique functions and making distinct contributions to adjustment (Hoza, Bukowski, & Beery, 2000; Parker & Asher, 1993). Both adult and peer relationships can also have supportive functions, as discussed in Chapter 4.

     Unfortunately, impaired social functioning across environments has been recognized as a widespread phenomenon within the ADHD population (e.g., Barkley, 2006b; Hoza, Mrug, et al.,

2005; Solanto et al., 2009; Deault, 2010). Efforts to directly link EF impairments to social functioning have been inconsistent in their findings (e.g., Diamantopoulou, Rydell, Thorell, & Bohlin, 2007; Huang-Pollock, Mikami, Pfiffner, & McBurnett, 2009; Kofler et al., 2011; Rinsky & Hinshaw, 2011), though studies suggest, in general, that EF may play an indirect role in contributing to the social behaviours that predict social functioning. Somewhat more fruitful has been research incorporating social information-processing models (Crick & Dodge, 1994), which has demonstrated weak social cue encoding and integration, social comprehension difficulties (understanding cause and effect), and limited solution generation skills in children with ADHD. (McQuade & Hoza, 2008; Zentall, Cassady, & Javorski, 2001). ADHD children with comorbid aggression and/or conduct problems may also display a hostile attribution bias, further debilitating their interactions (Stormont, 2001). However, ultimately it appears to be the disruptive and developmentally-inappropriate behaviours characterizing ADHD-C that have the greatest impact on social functioning. In their social interactions, children with ADHD-C have been found to be more socially intrusive and argumentative, use more commands, fail to respond to verbal cues, display increased aggression, and have difficulty modulating their emotional reactions and behaviour to social situations (McQuade & Hoza, 2008; Nijmeijer et al., 2008; Stormont, 2001).

Given these difficulties, it is not surprising then that among their peer group, children with ADHD are at an exceedingly high risk of experiencing peer rejection, as "the larger group seeks to isolate those individuals who tend to disrupt normal peer interactions" (Deater-Deckard, 2001, p. 566). Indeed, across several studies using sociometric ratings of school-aged children, children with ADHD-C have been found to be less socially preferred than typical children, with 50-70% of these children rejected by their peers (e.g., Gresham, MacMillan, Bocian, Ward, &

Forness, 1998; Hoza, Mrug, et al., 2005). These same studies further demonstrate that children with ADHD-C tend to have impairments in their dyadic friendships, with a significantly higher number of children with ADHD having no reciprocated friendship relative to non-ADHD children. Those children exhibiting more negative social behaviours (e.g., noncompliance, aggression, interrupting, whining) experience greater rates of peer rejection and dislike (Erhardt & Hinshaw, 1994; Mrug, Hoza, Pelham, Gnagy, & Greiner, 2007). Peer judgments about children with ADHD are often formed exceedingly quickly after only a few interactions (de Boo & Prins, 2007; Erhardt & Hinshaw, 1994; Sibley, Evans & Serpell, 2010) and can be long-lasting even with improvements in core ADHD symptoms (Bagwell, Molina, Pelham, & Hoza, 2001). Moreover, developmental cascade models have demonstrated that early peer rejection in turn reduces opportunities for social skill development, thereby predicting ongoing and increasing rejection (Murray-Close et al., 2010). Thus, for many children with ADHD-C, peer difficulties are observed early in childhood and continue to be a significant source of concern throughout adolescence. Of note, although children with ADHD-I also experience significant peer difficulties, they appear to be qualitatively different, characterized by more withdrawn rather than intrusive behaviours and peer neglect rather than rejection (Solanto et al., 2009).

Child-adult relationship difficulties are also widespread among the ADHD population and have been particularly well-documented within the family environment (Barkley, 2006b; Deault, 2010; Johnston & Mash, 2001). For instance, families of children with ADHD have been repeatedly documented to display elevated parent-child conflict, more negative parenting behaviours (e.g., more commands, less warmth and responsiveness), and reduced parent involvement, particularly in the presence of comorbid ODD/CD. These families are also at greater risk for family stressors including marital discord or break-up, parental psychopathology

and substance use, and decreased parenting confidence (Johnson & Mash, 2001). Disentangling the relative contributions and directionality of child ADHD behaviours, comorbid conduct problems, parent behaviours, and family stressors has been complex. However, research to date suggests that as with peers, the ADHD child's behaviours play a primary role in impacting parenting practices and resulting family functioning, with improvements in family functioning often observed following medication initiation (Johnston & Mash, 2001; Deault, 2010). However, as with the cascading models of peer relationships described above, the resulting negative parenting practices have in turn been linked to higher persistence and severity of ADHD, as well as poorer prognosis and adjustment (Deault, 2010). Although significantly less studied, research suggests that children with ADHD are also likely to experience more frequent teacher negativity (Kos, Richdale, & Hay, 2006). For instance, teachers report higher levels of stress in teaching children with ADHD, particularly those with more aggression or social difficulties (Greene, Beszterczey, Katzenstein, Park, & Goring, 2002). Moreover, their negative affect about teaching these students may increase with more experience and knowledge of ADHD (Anderson, Watt, Noble, & Shanley, 2012).

Emotional functioning. Emotional functioning can be considered one of the chief indicators of well-being or quality of life. As a broad concept, contemporary definitions of emotional health include both the absence of mental illness or internalizing problems as well as the presence of positive indicators of well-being (e.g., happiness, self-esteem; WHO, 2005). Internalizing problems most often refer to the presence of mood disorders (depression, dysthymia) and anxiety disorders, both of which have genetic and environmental contributions and are associated with significant functional impairments (Albano, Chorpita, & Barlow, 2003; Hammen & Rudolph, 2003). Although increasingly common in adolescence, both depression

and anxiety disorders can occur in childhood (Albano et al., 2003; Hammen & Rudolph, 2003). While the clinical syndromes comprising these disorders are particularly concerning and detrimental, it is notable that both depression and anxiety can also describe specific dimensional symptoms along a spectrum of severity, with elevated levels of these symptoms suggesting increased risk for, or the presence of, the disorders. Self-concept, as a positive indicator of well-being, can include the related notions of domain-specific evaluations (i.e., evaluations of specific traits or competencies) and global self-worth (one's overall sense of self-worth or value; DuBois & Tevendale, 1999; Guindon, 2010). Although related, there are several notable distinctions between these constructs. From a developmental perspective, children are able to make domain-specific self-evaluations (though typically overly positive) from a relatively young age, whereas the cognitive capacity to reflect upon and integrate these thoughts into a broader sense of global self-worth does not occur until around age 8 (Harter, 2006). These constructs also appear to have distinct correlates (Rosenberg, Schooler, Schoenbach, & Rosenberg, 1995), with self-evaluations predicting behaviour in associated domains (e.g., achievement), but global self-worth more closely linked to adjustment outcomes such as depression, anxiety, and life satisfaction (Hammen & Rudolph, 2003; Marsh, Craven, & Martin, 2006). Personal self-efficacy, defined as confidence in one's ability to solve problems or cope with stressors, is also sometimes considered as a key aspect of one's self-concept and an important positive indicator of well-being (Rutter, 1987; WHO, 2005). Of course, positive and negative indicators of emotional functioning are typically related, with lower self-concept a common finding in, and risk factor for, internalizing problems. Taken together, positive emotional functioning can be considered both a resilience factor and a positive outcome, whereas poor emotional functioning has clear links with poorer global functioning and well-being.

Although externalizing disorders have received more attention and are certainly the most common comorbidity in ADHD, children with ADHD of both genders have also been recognized as being at an elevated risk for the development of internalizing symptoms and disorders (APA, 2000). Average rates of comorbidity of approximately 25-30% have been reported for both anxiety disorders (Jarrett & Ollendick, 2008; Tannock, 2009) and depression (Barkley, 2006b). In both cases, rates appear to increase with age, with more frequent onset in adolescence and more elevated rates in adulthood (Biederman et al., 1996). Whereas previous notions held that internalizing disorders were more common among children with ADHD-I, more recent work has found similar rates across ADHD subtypes (Angold, Costello, & Erkanli, 1999; Tannock, 2009), highlighting that anxiety and depression remain a valid concern and area warranting attention for children of ADHD-C/HI subtypes. Although there may be some genetic and biological contributions to these comorbidities (Barkley, 2006b), there is also evidence in support of 'complex ADHD' models, wherein comorbid internalizing disorders arise "as a result of the persistent demoralization from the problems associated with ADHD" (Tannock, 2009, p. 131). This thus points to a trajectory in which the chronic academic, behavioural, and/or interpersonal difficulties experienced by some children with ADHD may in turn increase their risk for internalizing problems. As with most comorbidities, research suggests that those with comorbid internalizing problems have poorer outcomes and ongoing psychopathology into adulthood (Barkley, 2006b). Moreover, even sub-threshold internalizing symptoms have been linked to poorer outcomes (Carlson & Meyer, 2009), emphasizing the value of considering the dimensional nature of these symptoms.

Self-concept within the ADHD population has become a complex and increasingly researched issue. Intuitively, considering the well-documented difficulties and frequent criticism

and negative feedback experienced by these children, one might expect them to report low self-evaluations and self-worth. Indeed, low self-esteem is frequently cited as a common correlate of ADHD (e.g., APA, 2000). However, research findings within the last two decades have been decidedly more mixed. This discrepancy has been largely due to a phenomenon known as the *positive illusory bias* (PIB), wherein many children with ADHD seem to rate themselves as largely equal to their non-ADHD peers in regards to their performance or domain-specific competence, despite significantly poorer actual performance or parent/teacher-ratings (Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). The PIB is most consistently found in ratings of academic competence, social acceptance, and behavioural conduct (relative to the ratings of others; Hoza, Pelham, Dobbs, Owens, & Pillow, 2002; Hoza et al., 2004). Although ratings of global self-worth have been less frequently reported, several studies including this variable have found similar ratings between children with and without ADHD, consistent with general PIB findings (e.g., Bussing, Zima, & Perwien, 2000; Gresham et al., 1998; Hoza, Pelham, Milich, Pillow, & McBride, 1993; Hoza et al., 2002;). At this stage the PIB is not fully understood, though several theoretical mechanisms have been proposed to explain its occurrence, including conscious/unconscious self-protective mechanisms or cognitive and EF deficits that limit self-awareness and self-monitoring (Owens et al., 2007).

While some have suggested that a PIB (and thus the failure to recognize one's areas of difficulty) may reduce the capacity and motivation for improvement (e.g., Mikami, Calhoun, & Abikoff, 2010), a growing research base supports a negative association between the PIB and internalizing problems, suggesting that it may have a self-protective function in buffering the impact of negative experiences common among these children (Owens et al., 2007; Hoza, Murray-Close, Arnold, Hinshaw, & Hechtman, 2010). For instance, the PIB is typically absent

among those with elevated depression and anxiety symptoms (e.g., Hoza et al., 2002, 2004). Negative associations between PIB and depressive symptoms have also been found in three longitudinal studies (Hoza et al., 2010; McQuade, Hoza, Waschbusch, Murray-Close, & Owens, 2011; Mikami & Hinshaw, 2006), with the most recent of these studies finding that declining PIB (especially in regards to social evaluations) predicted subsequent increases in depression and/or internalizing problems. Thus, while poor self-competence and self-esteem may not be as consistent an outcome as initially believed among children with ADHD in general, there does appear to be a clear link between these self-evaluations and comorbid internalizing symptoms, suggesting that self-concept remains an important outcome variable in regards to emotional well-being.

Relationships between social and emotional functioning. As might be expected, there appear to be important relationships between social and emotional domains of functioning. For instance, among normative populations, family variables including family stressors, parent-child conflict, and particular parenting practices (e.g., low warmth, high criticism) have been linked to both depression (Hammen & Rudolph, 2003) and anxiety (Albano et al., 2003). Peer rejection, particularly when chronic, has also been found to predict internalizing problems (Burt, Obradovic, Long, & Masten, 2008; Pedersen, Vitaro, Barker, & Borge, 2007), although these associations may be at least in part mediated by self-perceived social acceptance and/or social withdrawal (Deater-Deckard, 2001; Ladd & Troop-Gordon, 2003; Prinstein, Rancourt, Guerry, & Browne, 2009). Additionally, dyadic and mutual friendships have been linked to better emotional functioning, with the presence of one close friend related to higher self-esteem and lower rates of depression and anxiety relative to those with no close friends (Vitaro, Boivin, & Bukowski, 2009). In turn, depression and anxiety can contribute to further withdrawal and social

impairments (Albano et al., 2003; Hammen & Rudolph, 2003; Mikami, Ransone, & Calhoun, 2011).

Similar relationships have been demonstrated within the ADHD population, particularly in regards to the impact of peer rejection. For instance, numerous studies have demonstrated concurrent associations between peer functioning (particularly peer rejection) and internalizing symptoms or disorders (e.g., Greene et al., 1996; Hoza, Mrug et al., 2005; Karustis, Power, Rescorla, Eiraldi, & Gallagher, 2000; Mikami & Hinshaw, 2003). In line with such findings, longitudinal studies of children with ADHD suggest that peer rejection, or peer difficulties more broadly, significantly increase the risk of both internalizing and externalizing symptoms and disorders (Biederman, Mick, & Faraone, 1998; Bukowski, Laursen, & Hoza, 2010; Greene, Biederman, Faraone, Sienna, & Garcia-Jetton, 1997; Mrug et al., 2012). No studies could be identified that specifically explored other-rated peer-rejection in relation to measures of self-concept among children with ADHD. However, one study (Ostrander, Crystal, & August, 2006) is notable in finding that poor peer-based social competence (rated by others) predicted depression in younger children with ADHD (age 6-8) whereas a combination of poor social competence and low self-evaluations of social competence predicted depression in the older children (age 9-11). The long-term impact of close friendship on outcomes is less clear, with Mrug et al. (2012) finding no benefits of close friendship beyond that predicted by peer rejection.

Research exploring the impact of family and parenting characteristics on emotional well-being among children with ADHD has been more limited, with most studies focusing on the associations between family functioning and conduct problems (Deault, 2010). While conclusions are thus limited, the handful of studies to date are suggestive of a potential role of family functioning in contributing to comorbid internalizing problems. For instance, Ostrander

and Herman (2006) found that less effective parenting behaviours predicted depression in young school-age children, with this relationship becoming partially mediated by an external locus of control with increasing age. Two studies have also found associations between negative family functioning (e.g., controlling, lack of positive parenting) and child comorbid anxiety (Kepley & Ostrander, 2007; Pfiffner & McBurnett, 2006). Finally, a recent study found that among girls with ADHD, parent-child conflict (and peer rejection) in childhood predicted later eating pathology (Mikami, Hinshaw, Patterson, & Lee, 2008).

Current Directions in Treatment and Intervention for ADHD

Treatment and intervention efforts for ADHD can be grouped at a broad level into pharmacological and psychosocial approaches. Both approaches primarily address the fundamental deficits and core symptoms of ADHD. Pharmacological treatments are the most commonly used intervention method and most often involve the use of stimulant medications, which serve to increase the availability of dopamine and norepinephrine within the brain (Connor, 2006). Overall response rates to stimulants of approximately 70% have been reported in children with ADHD (Spencer et al., 1996). Psychosocial approaches can include academic and social interventions but have primarily focused on behaviour management strategies, often involving parent- or teacher- training programs (Daly, Creed, Xanthopoulos, & Brown, 2007). These approaches are intended to provide more direct contingencies and immediate reinforcement, creating 'external' control where it is lacking internally (Barkley, 2006b).

In the largest randomized clinical trial to date (Multimodal Treatment Study of Children with ADHD [MTA]), both medication alone and combined behavioural intervention + medication have been found to reduce core ADHD symptoms during treatment, with combined treatment showing a slight advantage in regards to associated internalizing symptoms, social

skills, and achievement (MTA Cooperative Group, 1999). However, long-term follow-up at 2, 3, 6, and 8 years has failed to show any long-term group differences between treatment groups. Although all groups showed some sustained treatment gains, they remained significantly impaired relative to non-ADHD peers across functional domains (Jensen et al., 2007; Molina et al., 2009; MTA Cooperative Group, 2004). Moreover, rates of medication use were found to decrease significantly over time, with only 32.5% of the original medicated sample continuing their medication regimen at 8-years follow-up (Molina et al., 2009). Social functioning has proven particularly resistant to intervention, with limited gains even immediately following MTA treatment protocols (Hoza, Gerdes, et al., 2005). Numerous evaluations of social skills training programs have also shown limited success (Daly et al., 2007; Nijmeijer et al., 2008; Storebo et al., 2011), leaving this as an area of great concern given the significant impacts that such negative social interactions have on long-term functioning.

Conclusions

Overall, the deficits and impairments associated with ADHD have been well-documented, as have the longer-term risks associated with the disorder. As has been demonstrated, children with ADHD are at increased risk of difficult and conflictual interpersonal relationships with both peers and adults, which can have important implications for their emotional well-being. In fact, not only are these difficulties likely to influence the mental and behavioural functioning of children with ADHD, but as will be discussed in later chapters, these strained relationships may also have implications for their access to the benefits that can be derived from social relationships, such as the availability of social support. However, heterogeneity in the outcomes of children with ADHD is widely recognized, with a minority of children well-adjusted across social, emotional, and/or behavioural domains by adolescence and

more showing gains in at least some of these domains (Biederman et al., 1998; Lee, Lahey, Owens, & Hinshaw, 2008; Owens, Hinshaw, Lee, & Lahey, 2009).

Relative to the focus on deficits and impairments in ADHD, considerably less attention has been given to those experiencing more positive outcomes (Owens et al., 2009). As a result, much remains unknown with regards to the strengths and resources of children with ADHD, why some of these children have primarily positive outcomes, and what factors can best support their development, success, and well-being. Within the context of recent findings demonstrating limited long-term treatment gains using current 'best practice' intervention approaches, resilience perspectives may provide a fruitful avenue through which to broaden interventions, complementing deficit-reduction approaches with those that promote key resilience processes.

Chapter 3: A Resilience Perspective

Resilience: A Conceptual Framework

Resilience can be described as "the process of, capacity for, or outcome of successful adaptation despite challenging or threatening circumstances" (Masten, Best, & Garmezy, 1990, p. 426). Grounded in findings that some children experiencing considerable adversity were able to become functional and well-adjusted youth and adults, early literature in this area described the resilience phenomenon as signifying special and unusual qualities (i.e., 'invulnerability'; Rutter, 1993). However, more recently, it has been recognized that resilience in fact represents a common and normative process, supported by "basic human adaptational systems" within the child, their family, and their community (Masten, 2001, p. 227). Masten suggests that it is when these normative adaptational systems break down that children are no longer able to overcome adversity and follow more deleterious trajectories. It has been further stipulated that resilience is a relative and dynamic rather than absolute construct, which may fluctuate based on the quality, nature, and severity of adversity, developmental timing, and the outcomes being considered (Rutter, 1985, 1993). Although specific conceptualizations of resilience have varied (see Luthar, Cicchetti, & Becker, 2000 for an in-depth review of definitional and measurement issues), several key features of resilience models have been articulated.

By definition, models of resilience attempt to explain the trajectories of individuals or populations from (1) exposure to significant adversity to (2) the achievement of positive adaptation or outcomes. Adversity, defined as "negative life circumstances that are known to be statistically associated with adjustment difficulties" (Luthar & Cicchetti, 2000, p. 858), has traditionally been conceptualized as environmentally-based, such as child maltreatment, poor or unsafe living conditions, parent psychopathology or bereavement, or exposure to traumatic

events (Luthar et al., 2000). However, to the extent that it significantly elevates risk for poor adjustment and is characterized by heterogeneity in trajectories, pre-existing psychopathology might also be considered a form of adversity through which resilience can be achieved (Climie, Mastoras, McCrimmon, & Schwean, 2013). Positive adaptation has most often been conceptualized as the achievement of competence within age-salient domains and/or the avoidance of psychopathology (Masten, Herbers, Cutuli, & Lafavor, 2008), although the breadth and focus of what might be considered resilient functioning can vary. For instance, Masten and colleagues (1990) have differentiated three resilience phenomena including positive outcomes despite high risk for maladjustment, maintenance of competent functioning in the context of ongoing stressors, and recovery following an adverse event. Definitions of positive outcomes have also varied from 'ok' to 'good' functioning (Masten, 2001) and from overall adjustment across domains to domain-specific indicators of resilience (e.g., "educational resilience" or "emotional resilience"; Luthar et al., 2000). In particular, emotional well-being has been identified as an important outcome variable, as it can influence the capacity to achieve and maintain resilience in other domains and has significant long-term implications (Luthar & Cicchetti, 2000).

Importantly, the focus on the adversity to positive outcome trajectory implies an emphasis within resilience theories on individual differences or within-population variability; that is, what it is that makes some people more able to cope while others continue to struggle in the face of the same adversity (Rutter, 1985). Thus, models of resilience are concerned with identifying risk/vulnerability factors (i.e., those factors that increase susceptibility to negative outcomes) and, more importantly, protective factors that serve to "modify, ameliorate, or alter a person's response to some environmental hazard that predisposes to a maladaptive outcome"

(Rutter, 1985, p. 600). Resilience perspectives are firmly grounded in bio-psycho-social models of development, emphasizing the importance of considering factors at multiple levels of influence, as well as the transactional nature between child and context in predicting developmental trajectories (Luthar et al., 2000; Lynch & Cicchetti, 1998). Converging findings across studies to date have led to the identification of a number of protective factors that appear to promote resilience across numerous at-risk populations. These prominent factors include: intelligence, positive self-esteem and self-efficacy, happy temperament, authoritative parenting, family cohesion and positive climate, socioeconomic advantage, effective teachers, positive school experiences, stress-management and self-regulation skills, spirituality, and positive relationships with other competent and caring adults (Brooks, 1994; Luthar et al., 2000; Masten, 2001; Masten & Coatsworth, 1998; Masten et al., 2008; Rutter, 1987).

The identification of risk and protective factors is a necessary first step to understanding resilient trajectories. However, the transactional underpinnings of resilience models emphasize that risk and protective factors may vary in their function, mechanism, and degree of influence between low- and high-risk populations, as well as between particular at-risk groups (Rutter, 1987). Thus, a central and defining feature of models of resilience is that they are concerned above all with the *processes* underlying successful adaptation in the face of threat or the mechanisms through which protective factors interact with particular risks to exert their effect. For instance, Rutter (1987) has delineated four processes through which protective factors may be influential, including reducing the impact of a risk, reducing or disrupting a set of chain reactions that perpetuate the effects of a risk (e.g., low SES → poorer school readiness → lower achievement → earlier school exit), promoting positive coping resources (e.g., self-esteem, self-efficacy), and opening up opportunities for changing trajectories.

Masten (2001) has further delineated several models characterizing the function and relative influence of protective factors. Factors with *main effects* exert a positive influence independent of the level of risk, either directly or through their influence on another factor or adaptive system. From a resilience perspective, main effect models consider the cumulative or additive benefits of protective factors, with the benefits of these factors found in compensating for the effects of risk. In contrast, protective factors with *interaction effects* are only (or more significantly) influential for those facing a particular risk and thus serve to mitigate or buffer the influence of a particular risk factor on an outcome (Masten, 2001). Luthar and colleagues (2000) have suggested that the nature and influence of such interactions can be further explored and specified, such as having 'protective-stabilizing' functions (i.e., normalizing functioning relative to low-risk populations) or 'protective-enhancing' functions (i.e., improving functioning relative to low-risk populations through 'engaging' with the risk). Finally, it is also possible for the same factor to have both main and buffering effects, either through the same mechanism that is intensified under conditions of stress or through alternate mechanisms of action (House, Umberson, & Landis, 1988). Ultimately, Rutter (1987) contends that it is through exploration of *protective processes* that resilience models make their greatest contribution to both scientific understanding and its application to intervention.

Given the complex nature of the resilience phenomenon and the varying definitions and understandings of the construct, it is not surprising that the measurement of resilience can also take diverse forms (Climie et al., 2013). Based on what is known about risk and protective factors to date, several measures evaluating common protective factors have been developed that can be used to assess the general resilience of a given individual (e.g., *Resiliency Scales for Children and Adolescents*; Prince-Embury, 2007). Using such measures, individuals obtaining

higher scores (i.e., having more or higher levels of protective factors in general) can thus be identified as more resilient. However, this approach to measuring resilience is limited to those factors identified by the scale and does not allow for exploration of the specific pathways and relationships between given risk and protective factors in relation to particular outcomes. A more common approach within the resilience literature has been to create an operational definition for specific resilient outcomes, in which case resilience is conceptualized as the attainment of more positive outcomes at a particular moment in time (Masten, 2001). This approach then allows for the exploration of the effects, functions, and processes of specific hypothesized protective factors within the context of specific risks and outcomes of interest. The current study adopted this latter approach as a means to explore the relationships between one specific protective factor (perceived social support) in relation to the resilient outcome of emotional well-being.

A Resilience Framework Applied to ADHD

Resilience and the study of protective factors have increasingly been recognized as central to the promotion of mental health and the prevention and intervention of mental illness (NIMH, 2008; WHO, 2004, 2005). Indeed, a resilience perspective has been proposed to bring several strengths to both research and intervention, including a focus on positive rather than negative outcomes and on strengths rather than deficits, thus bringing a more positive message to families and stake-holders (Luthar & Cicchetti, 2000; Masten & Curtis, 2000). Furthermore, resilience approaches provide a means to more fully understand and make use of the interactions and processes between risks and assets that contribute to developmental trajectories. Given the well-documented and substantial associated risks and negative outcomes as presented in Chapter 2, ADHD can certainly be considered a form of adversity and thus is applicable for study

through a resilience lens (Deault, 2010). Moreover, the heterogeneity in the course, outcomes, and adjustment of children with ADHD provides a compelling case that resilience processes are at work. Applied to children with ADHD, a resilience paradigm entails a shift in emphasis from the long-standing deficit-perspective to one that encompasses and gives equal consideration to strengths and resources; from "preventing or 'curing' ADHD to ... coping successfully with it" (Climie et al., 2013, p. 120). Given recent advances pointing to its biological basis and lifelong course, such a change in perspective may be particularly timely and valued among those whose lives are impacted by this disorder.

Within such a framework, both ADHD and its associated impairments can be considered to be risk factors, with pathways incorporating the documented 'chain reaction of risks' (Rutter, 1987) that can transpire from core deficits and symptoms to associated impairments to related outcomes (e.g., ADHD increases risk for peer rejection, which increases risk for poor emotional well-being). The reduction of core symptoms might be one way to conceptualize positive outcome among this population. However, a focus on adaptation within associated areas of risk, such as competence within academic or social domains or the absence of comorbid internalizing or externalizing symptoms, may be more clinically meaningful, as it is these associated impairments that more often form the basis for referral (Pelham & Fabiano, 2008). Protective factors would thus include those variables associated with, or predictive of, better outcomes within academic, social, emotional, or behavioural domains. Hypotheses on such protective factors may be informed by research on both resilience in other populations and the known risk pathways in ADHD.

Resilience factors within the ADHD population. To date, research examining protective factors and processes within the ADHD population is scarce (Deault, 2010; Modesto-

Lowe, Yelunina, & Hanjan, 2011). Nonetheless, there are some initial findings that provide a glimpse into the contributions that a resilience perspective can bring toward understanding the heterogeneity of ADHD trajectories. For instance, results of the MTA studies suggested that higher IQ, family marital and financial stability, lower early behavioural problems, and social skills were more predictive of outcomes than the type of treatment received (Molina et al., 2009). The positive illusory bias (PIB), as discussed previously, may also serve as a protective factor at least for some outcomes (McQuade et al., 2011). Interestingly, in one of the few ADHD-based sets of studies specifically exploring resilience processes, Mikami and Hinshaw (2003, 2006) found that among school-aged girls, popularity with adult staff and goal-directed solitary play concurrently buffered the impact of peer rejection on aggression and internalizing symptoms, respectively, whereas only academic self-concept (regardless of actual academic performance) served as a buffer at follow-up. From a family perspective, the well-documented associations between parent-child conflict and evidence of the efficacy of parent training programs suggest that positive parenting practices may play a protective role at least for externalizing outcomes (Deault, 2010; Modesto-Lowe, Danforth, & Brooks, 2008) and potentially for internalizing problems as well (Ostrander & Herman, 2006). Moreover, a recent study of Chinese children with ADHD found that maternal affect buffered the relationship between attention problems and social problems among fourth to sixth grade children (Kawabata, Tseng, & Gau, 2012). However, in their recent review, Modesto-Lowe and colleagues (2011) were able to find no existing data on school or peer factors that contribute to positive outcomes within this population, and an exploration of protective mechanisms is virtually absent.

Conclusions

As described above, although rarely studied, research on resilience in ADHD has the potential to provide a more positive message and a more balanced approach to understanding and working with ADHD. Indeed, within the context of ADHD, resilience perspectives can provide a needed complement to the extensive knowledge base on risks and deficits, helping to further clarify what and when particular vulnerability and protective factors contribute to diverging trajectories. This understanding, in turn, has significant applications for practice. From an assessment perspective, resilience can help to broaden the focus from the identification of ADHD and its comorbidities to considering influential protective factors and identifying those who may be most at risk and in need of more intensive supports. From an intervention perspective, resilience-informed interventions can extend beyond reducing symptoms to promoting successful coping and adaptation across domains, a need which has been increasingly highlighted as central to effective treatment of this population. To achieve these goals within an evidence-based framework, the process must begin by developing an understanding of those protective factors most influential for this population and how and for whom they are most influential. This study represents one such attempt, in which the role of a commonly cited protective factor, social support, was explored to better understand its role and associations specifically for children with ADHD.

Chapter 4: Social Support

Social support became a popular topic of research in the 1970s and early 1980s and served as one of the foundational domains of resilience research (Rutter, 1985). An extensive literature base since that time has provided converging and compelling evidence for its role in promoting well-being among adults (Cohen & Wills, 1985) and, more recently, among children and adolescents (Chu, Saucier, & Hafner, 2010; Demaray & Malecki, 2002a; Werner & Johnson, 2004). Despite its well-documented benefits, however, social support eludes easy definition and the field has been repeatedly criticized for the considerable variability in how this construct has been conceptualized and measured (e.g., House et al., 1988; Rueger, Malecki, & Demaray, 2008; Tardy, 1985; Winemiller, Mitchell, Sutliff, & Cline, 1993). For instance, social support has been variously conceptualized as the quantity of social relationships (*social integration*), the actual utilization of support from others during previous times of stress (*received support*), or the perceived availability of support within one's social network (*perceived social support*). Its measurement has further varied in capturing overall support from one's social networks versus support from particular sources (e.g., parents, spouse, friends), as well as in the types and range of supportive behaviours included (Tardy, 1985). This considerable variability has led to diverse findings and challenges in integrating and interpreting results across studies.

The current study focuses on *perceived social support,* defined as "an individual's perceptions of general support or specific supportive behaviors (available or enacted upon) from people in their social network" (Malecki & Demaray, 2002, p. 2). It is thus a subjective construct that reflects one aspect of the content or quality of social relationships (House et al., 1988). Importantly, perceived social support has repeatedly been demonstrated to be more predictive of outcomes than are more objective measures of support (e.g., Chu et al., 2010;

Wethington & Kessler, 1986). That is, it appears to be the comfort in the knowledge or belief that social support is available that provides the greatest benefit. Supportive behaviours can come in numerous forms and manifestations (Shumaker & Brownell, 1984; Tardy, 1985). For instance, according to a typology initially proposed by House (1981; cf. Malecki & Demaray, 2003), social support can be categorized into four broad domains: (a) *emotional support* (conveyance of caring, trust, value, and unconditional acceptance); (b) *informational support* (provision of information or advice); (c) *appraisal support* (provision of evaluative feedback); and (d) *instrumental support* (provision of time, material or financial resources). Each of these types of support might include a range of exchanges that can involve cognitive, emotional, and behavioural components. Finally, social support can come from numerous sources within one's social network (Tardy, 1985). For children, prominent sources of support might include parents, peers, close friends, and teachers. As will be discussed, other adults may also be supportive resources for some children (Sterrett, Jones, McKee, & Kincaid, 2011).

Functions of Social Support

While social support has been frequently linked to a range of well-being outcomes (e.g., Chu et al., 2010; Cohen & Wills, 1985), a vital issue particularly from a resilience perspective involves the mechanisms or processes underlying its effects; that is, how, when, and for whom social support is beneficial. Central to the theoretical discussions of social support has been a distinction between main effect and stress-buffering (i.e., interaction effect) models, which differ in the proposed functions and mechanisms of action of social support. Although these theories were initially developed in the context of adults, they have relevance across the life span and have served as the underpinnings for research in children and adolescents.

Perhaps the most commonly referenced main effect theory asserts that social support fulfills a basic psychological need for belongingness, attachment, and companionship that is necessary for achieving well-being (e.g., House et al., 1988; Shumaker & Brownell, 1984). By addressing a universal need, this model asserts that social support will be beneficial for all individuals regardless of stress level, conferring positive affect, a sense of stability and social embeddedness, and a recognition of one's value in society (Cohen & Wills, 1985). Based on their review of early adult-based social support studies, Cohen and Wills (1985) concluded that this theory was better supported by measures of social integration (i.e., number of social relationships) than of perceived social support. Moreover, consistent with the premise of this theory, they found that the main effect of social integration seemed to be driven primarily by significantly poorer outcomes for those with few to no social relationships (i.e., social isolation). Thus, while having few relationships may be a risk factor, increasing the number of social relationships beyond a certain threshold does not necessarily confer added protection.

A second theory, arising from social constructionist perspectives, suggests that supportive relationships, particularly those that convey caring and positive feedback (i.e., emotional and appraisal support), contribute to one's self-image (i.e., the 'looking-glass self'; Harter, 1999; Lakey & Cohen, 2000; Shumaker & Brownell, 1984). For instance, Harter (1999) has proposed one elaboration of this theory in her model for the development of self-concept. Combining the influential theories of William James and Charles Cooley, she suggests that global self-worth is determined by the additive effects of (1) one's domain-specific self-evaluations (in areas deemed personally important) and (2) one's opinions of how others perceive them (i.e., perceived social support/approval). Thus, from this standpoint, social support promotes well-being by contributing to the development, maintenance, and validation of self-identify and self-esteem.

This theory is also typically described as a main-effect model, though in this case, it is tied more specifically to the perceived quality and content, rather than the quantity, of social relationships. While not specifically linked to stress, this model has implications for resilience in compensating for threats to self-esteem that may come with particular forms of adversity. This theory may also have particular developmental relevance, as the views of others become increasingly internalized over childhood and adolescence into a self-concept that is then somewhat more stable and self-sustaining in adulthood (Harter, 1999).

In contrast to these main-effect models, the stress-buffering theory suggests that the primary function of social support is to help individuals in more effectively coping with stressors (e.g., House et al., 1988; Thoits, 1986). Thus, it is presumed to only (or more significantly) benefit those in higher-stress situations. More specifically, social support is purported to play several roles, including: (1) helping individuals to reappraise potential stressors as benign; (2) helping them develop more effective ways of coping; and/or (3) directly addressing the stressor (Lakey & Cohen, 2000; Shumaker & Brownell, 1984; Thoits, 1986). For instance, knowing that support is available if needed and/or perceiving general approval from others may help the individual feel more capable of handling stressors (e.g., self-efficacy). Specific supportive behaviours might include providing information about the stressor, providing reassurance, modeling responses or ways of coping with the stressor, or even providing distraction from the stressor (Shumaker & Brownell, 1984). A fundamental component of this model is the matching hypothesis, which states that to be effective, the type of support must fit with the demands of the stressor and the needs of the individual under stress (Lakey & Cohen, 2000). For instance, Cohen and Wills (1985) have proposed that emotional and informational support will be more generally beneficial across a range of stressors, whereas specific forms of instrumental support

may be more pertinent to particular stressors. This theory has clear implications for resilience paradigms, as it specifically addresses an individual's ability to cope with adversity. In adult populations, the stress-buffering model has been most consistently supported in studies evaluating perceived social support (rather than social integration), with buffering effects found against both specific stressors and more chronic levels of stress (Cohen & Wills, 1985). However, as will be discussed, evidence for a buffering role of social support in children has been less consistent.

Perceived Social Support and Well-Being in Children and Adolescents

Perceived social support in youth has been a continuously expanding research field, with a recent meta-analysis identifying nearly 250 studies exploring this issue (Chu et al., 2010). As a whole, these studies have demonstrated largely consistent findings of modest but significant associations between higher perceived social support and a range of positive outcome indicators (Chu et al., 2010). Cross-sectional associations have been demonstrated from early school-age through adolescence (though the majority of studies have focused on middle- to high-school students) and across typically-developing and various at-risk populations including children from urban minority and low-income communities, with learning disabilities, and facing bullying or a range of family stressors (e.g., Cowen, Pedro-Carroll, & Alpert-Gillis, 1990; Demaray & Malecki, 2002a, 2002b; Forman, 1988; Hagen & Myers, 2003; Jackson & Warren, 2000; Rigby, 2000; Rothman & Cosden, 1995; Rueger et al., 2008; Wenz-Gros & Siperstein, 1998). Moreover, several longitudinal studies have demonstrated prospective effects of perceived social support on outcomes across 1-2 year spans (e.g., Demaray, Malecki, Davidson, Hodgson, & Rebus, 2005; Dubow, Tisak, Causey, Hryshko, & Reid, 1991; Kinard, 1995; Rueger, Malecki, & Demaray, 2010; see Werner & Johnson, 2004 for a rare example of a 30-year findings from the

Kauai Longitudinal Study). Although small associations have been documented with academic achievement and conduct, the largest and most consistent effects of perceived social support in children and adolescents have been on self-concept and psychological functioning (Chu et al., 2010).

Sources of support and developmental considerations. The above findings speak to the associations between overall social support and well-being, and indeed, those who perceive support from multiple sources seem to have better outcomes than those with only one source of support (e.g., Levitt et al., 2005; Demaray et al., 2005). However, the value of considering perceptions of support from specific sources (source-specific support) has become increasingly recognized in understanding the dynamics of these associations (Harter, 1999; Winemiller et al., 1993; Malecki & Demaray, 2002). In particular, given the varying functions of parent, peer, and friend relationships (Hartup, 1989; Hartup & Moore, 1990), as well as the normative developmental changes in social networks from childhood to adolescence (Levitt, Guacci-Franco, & Levitt, 1993), understanding the relative influence of these sources at different stages of development has been emphasized (DuBois et al., 2002). More recent studies adopting this source-specific approach have found evidence for making these distinctions. For instance, children have been found to associate different support functions (e.g., emotional, informational) with different sources (Furman & Buhrmester, 1985; Malecki & Demaray, 2003) and typically report higher support from parents than other sources (Levitt et al., 1993).

In general, perceived parental support appears to be most predictive of a broad range of adjustment outcomes, with perceived peer support in some cases also playing an influential role for emotional well-being indicators (self-concept, depression, anxiety; Demaray et al., 2005; Garnefsky & Diekstra, 1996; Levitt et al., 1993; Rueger et al., 2010; Stice, Ragan, & Randall,

2004). In contrast, perceived support from teachers may be more specifically related to school functioning outcomes (Demaray et al., 2005; Rosenfeld, Richman, & Bowen, 2000). Interestingly, studies that have distinguished between classmate (i.e., peer group) versus close-friend support typically find that classmate support is considerably more predictive of adjustment (e.g., Demaray et al., 2005). However, the presence of a close friend may moderate to some degree the impact of peer rejection on emotional outcomes (Vitaro et al., 2009). Developmental shifts have also been identified, such that perceived parent support appears to remain most influential until early adulthood whereas perceived peer support becomes increasingly influential with age (Harter, 1999; Helson, Vollebergh, & Meeus, 2000; Levitt et al., 1993). Finally, sources of support may interact in some cases in predicting outcomes. For instance, one study found that perceived support from friends became more predictive of self-esteem among adolescents with low levels of perceived support from parents (Hoffman, Ushpiz, & Levy-Shiff, 1988). However, in some cases, higher peer or friend perceived support among adolescents has been found to predict increased externalizing behaviour (Davidson & Demaray, 2007; Stice et al., 2004), particularly when it occurs in the context of lower perceptions of adult support (DuBois et al., 2002; Helson et al., 2000).

Main versus buffering effects in promoting emotional well-being. Taken together, the consistency of the above findings across broad and diverse populations suggest that for children and adolescents, perceived social support (particularly from parents and the larger peer group), may have a generally positive influence (i.e., main effect) in promoting a positive self-concept and reducing vulnerability to depression and anxiety. However, these studies do not directly evaluate main versus buffering effects nor the specific mechanisms or processes through which social support exerts its function. Only a smaller number of studies have specifically evaluated

these issues, with mixed results. For instance, Malecki and Demaray (2006) found that perceived social support buffered the impact of socioeconomic status (SES) on academic achievement among middle school students. Dubow and Tisak (1989) found perceived social support to buffer the relationship between stressful life events and teacher-rated 'problem behaviours' (combined internalizing & externalizing symptoms) among elementary school children, whereas a main effect of perceived social support was found in regards to 'competent behaviours' and parent-rated problem behaviours. Two studies of adolescents found only main effects of stressful life events and perceived social support on self-esteem (Hoffman et al., 1988) and psychological symptoms (Compas, Slavin, Wagner, & Vannatta, 1986).

Finally, and particularly relevant to the current study, several studies have also explored the main versus buffering role of perceived social support in mitigating the effects of peer victimization. For instance, Rigby (2000) found that among 12 to 16 year-olds, perceived support from parents and teachers had only a main effect on internalizing problems. In contrast, Davidson and Demaray (2007) found that among middle-school students, perceived social support buffered the impact of victimization on both internalizing and externalizing problems, though with distinct source contributions across gender. Another recent study also found buffering effects of perceived parent and school support on mental health problems generally, though it should be noted that the size of buffering effects was rather small (Stadler, Feifel, Rohrmann, Vermeiren, and Poustka, 2010). A recent study of middle-school students found evidence for both main and buffering models, with perceived support from parents and a close friend buffering the relationship between victimization and depressive symptoms for boys but only a main effect of overall perceived support on depression for girls (Tanigawa, Furlong, Felix, & Sharkey, 2011). Finally, an alternative mediation model was supported in a study of 10 to 12

year-old Dutch children, in which low perceived social support was found to mediate the relationship between peer victimization and depressive symptoms (Pouwelse, Bolman, Lodewijkx, & Spaa, 2011). No studies could be identified that explored social support within the context of other peer stressors, such as social preference or rejection.

Taken together, these results are not as consistent in supporting a buffering model of perceived social support as has been suggested in adults. However, the variability between studies renders it difficult to derive conclusions. In addition to potential gender differences as evidenced above, developmental changes throughout this period are conceivable given an increasing capacity of children to integrate and internalize feedback as well as an increasing level of independence and self-sufficiency in addressing potential stressors. Moreover, buffering versus main effects may also vary based on the specific outcome considered. For instance, whereas self-esteem has been considered an outcome in many studies, DuBois et al. (2002) found in one study that in early-to-mid adolescence, the effects of social support on internalizing and externalizing symptoms were mediated by self-esteem.

The role of competent and caring adults. Most studies that have differentiated between sources of perceived social support among children have focused on parent, teacher, close friends, and the larger peer group, or a subset of these. However, an additional source of social support has been identified in the resilience literature as on the 'short-list' of protective factors – that from other competent and caring adults (Masten, 2001; Masten et al., 1990; Scales, Benson, & Mannes, 2006; Werner & Johnson, 2004). A large majority of children and adolescents are typically able to identify at least one important and/or supportive non-parental adult in their lives, from whom they often report consistently high levels of support (Beam, Chen, & Greenberger, 2002; Harter, 1999). These individuals may include extended family members,

teachers or other school staff, coaches, family friends, parents of friends, or community members.

A recent comprehensive review of the roles and functions of supportive non-parental adults among adolescents underscored that such individuals may provide a range of support functions (e.g., emotional, informational, instrumental), with such support linked to a variety of academic (e.g., attendance, motivation, achievement), self-concept, behavioural, and emotional outcomes (Sterrett et al., 2011). Moreover, these individuals may provide unique functions for youth, such as providing an outlet for sharing information that might not be shared with parents, acting as a role model, and providing resources and experienced opinions unavailable from peers (Beam et al., 2002). As with the social support literature in general, research has focused more on adolescence than earlier childhood. However, such individuals may be particularly relevant to school-aged children given findings that perceived extended family support was highest and most predictive of emotional well-being for 10 year-old children relative to either 7 or 14 year-olds (Levitt et al., 1993).

Although there is evidence for some main effects of non-parental adult support, there is also evidence that support from such adults may have a primarily compensatory role, wherein they have a more significant influence for children who perceive lower levels of support from parents (Harter, 1999; Sterrett et al., 2011; Werner & Johnson, 2004) or peers (Levitt et al., 2005). Thus, this additional source of support may be particularly influential for at-risk children facing more strained family and peer relationships. Notably, although teachers may be considered as candidates for this role, for populations with known challenges in the classroom setting (such as children with ADHD), it is likely that alternative sources, such as extended family or community members, may become more valuable.

Relevance of Perceived Social Support to Resilience in ADHD

Given the broad-ranging benefits of perceived social support among both typical and high-risk children, there is reason to believe that it may be an influential factor in predicting resilient trajectories among children with ADHD, particularly in regards to emotional well-being outcomes (self-concept, psychological distress). Based on what is known about children with ADHD, it is difficult to predict the social support profile for children with ADHD. On one hand, the significant and well-documented challenges in social relationships would predict that children with ADHD as a group perceive lower levels of social support than do non-ADHD children. Alternatively, findings of the PIB in regards to ratings of competence and social acceptance imply that it is also possible that social support would not be rated more poorly. More importantly, while similar relationships to outcomes as found in other groups are likely, it would be important to specifically evaluate the nature of such associations for children with ADHD given their distinct cognitive/behavioural characteristics and social experiences.

Unfortunately, research exploring the profile or role of perceived social support among children with ADHD has been quite limited to date. Demaray and Malecki (2002a) found no differences in perceived social support ratings between children with disability status (included special education students and students with ADHD) and those without but did not explore correlates of perceived social support between these groups. A study exploring parent and child perceptions of specific parent-child relationship characteristics (e.g., parental warmth and power assertion) found no differences in child-ratings between those with and without ADHD (Gerdes, Hoza, & Pelham, 2003). Interestingly, this result was found despite lower parent ratings in the ADHD group relative to parents of non-ADHD children, suggestive of a potential PIB effect.

Only one study to date has directly and specifically examined perceived social support among boys (grades 3 to 6) with ADHD characteristics (Demaray & Elliott, 2001). Children displaying ADHD characteristics perceived lower overall social support than those without such behaviours, with more extreme ADHD behaviours associated with lower support ratings especially for classmates and friends. Notably, these lower ratings of perceived social support were found despite virtually identical self-rated social acceptance scores between groups, suggesting that the PIB is at least not as strong in regards to social support ratings. Correlations with self-concept were surprisingly low among both the ADHD and comparison groups in this study, with no group-specific correlations between parent or classmate perceived support and self-concept. Significant associations between perceived close friend support and self-concept were found for both groups, whereas perceived teacher support and self-concept were associated only for the comparison group. The influence of social support on internalizing problems, however, was not explored. Moreover, as diagnostic status was not confirmed, this study can only be suggestive of such associations among children with diagnosed ADHD.

Thus, there is much that remains to be understood about how children with ADHD perceive support from their relationships and how such perceptions might contribute to resilient trajectories. Certainly, many of the outcomes found to be associated with perceived social support coincide with areas of concern for children with ADHD, suggesting a potentially valuable role in compensating for or moderating some of the risks associated with the disorder. Understanding the specific functions of social support and what sources of support are most influential for this population would provide novel avenues for interventions geared at nurturing influential relationships and potentially helping these children to recognize the support available around them.

Chapter 5: Research Questions

It was argued in the previous chapters that a resilience perspective has much to contribute

to the study of ADHD by focusing attention on the attainment of positive outcomes. This

research agenda can be informed by both the models and findings from the resilience literature

with other at-risk populations, as well as what is known about the deficits, associated

impairments, and outcomes of children with ADHD. The intent of the current study was to

explore the role of perceived social support in promoting emotional resilience specifically among

8 to 11 year-old children with ADHD-Combined or Hyperactive/Impulsive type (ADHD-C/HI).

Specifically, this study examined the profile of perceived social support in children with ADHD-

C/HI, the associations of such support with both negative and positive indicators of emotional

well-being, and the potential protective effects of social support in the context of peer rejection.

To reach these goals, the following research questions were posed.

Research Question 1: Social Support Profile and Variability among Children with ADHD

First, given the limited research on social support in children with ADHD to date: *What is*

the source-specific perceived social support profile of children with ADHD-C/HI? Do levels of

overall or source-specific perceived social support among children with ADHD-C/HI vary with

age, IQ, the severity of hyperactive-impulsive or inattentive symptoms, ADHD subtype

(combined or hyperactive/impulsive), medication status, and/or comorbidity? Given the

relatively narrow age-range of participants in the current study, no significant declines in social

support were expected with age. As hyperactive-impulsive symptoms are likely to cause greater

disruptions in social interactions, it was expected that social support would have stronger

correlations with these symptoms than those of inattention. Relatedly, no differences were

expected between ADHD-C and ADHD-HI given their apparent relatedness in the literature to

date. The potential impact of medication was unclear, as medication does reduce core symptoms of ADHD (MTA Cooperative Group, 1999), but has not consistently been found to improve social functioning (Hoza, Gerdes, et al., 2005). Finally, given the increased challenges and stress faced by children with comorbid disorders, it was predicted that children with comorbidities would rate lower social support than those with only ADHD.

Research Question 2: Relationships between Social Support and Emotional Well-being

Second, to understand the relationships between perceived social support and emotional well-being: *Are overall or source-specific perceptions of social support among children with ADHD-C/HI related to negative (depression and anxiety symptoms) and/or positive (global self-worth, self-efficacy) indices of emotional well-being? If so, which sources are most predictive of these outcomes?* Previous research documenting associations between perceived social support and well-being outcomes among other populations, as reviewed above, led to a hypothesis of moderate positive correlations between social support and self-concept outcomes and small to moderate negative correlations between social support and internalizing symptoms. Moreover, in line with findings in other populations, it was predicted that parent and peer support would have the strongest correlations with these outcomes.

Research Question 3: Social Support in the Context of Peer Rejection

Third and lastly, to evaluate the role of social support within the context of a specific stressor: *What are the relationships between perceived social support, social preference status, and emotional adjustment among children with ADHD-C/HI, and can perceived social support moderate the association between peer rejection and emotional adjustment?* Figure 1 demonstrates main versus buffering models of social support and peer rejection using Masten's (2001) framework. Given the inconsistency across studies of other populations in finding main

versus buffering effects of social support, as well as the absence of similar research in ADHD, this question was exploratory and no specific hypotheses were established in regards to a main versus buffering role.
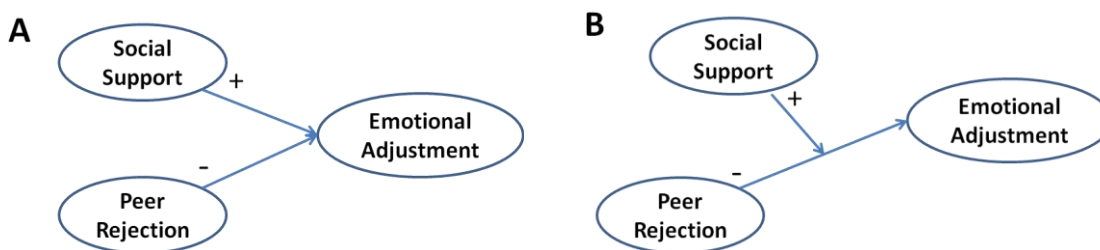

Figure 1. Examples of main (A) versus buffering (B) effects of social support.

Chapter 6: Methods

This study occurred within the context of a larger collaborative research project exploring resilience in children with ADHD, with joint data collection across numerous studies investigating particular resilience factors. As such, the methodology described below is in line with methodology requirements established by the research group for the larger project and all of its studies. However, only those measures relevant to the current study are described here.

Participants

A total of fifty-five 8 to 11 year-old children with ADHD-C/HI participated in this study (46 boys, 9 girls). Consistent with criteria frequently put forth within the ADHD literature (e.g., Barkley, Fischer, Smallish, & Fletcher, 2002; Rapport, Kofler, Alderson, Timko, & DuPaul, 2009), all children were required to meet a number of preliminary eligibility criteria. First, an initial screening phone interview was conducted with interested parents, which was used to ensure that all participants: (a) were within the appropriate age range of 8 to 11 years; (b) resided with their parents or current guardians for at least the past five years; (c) attended school full-time within an Alberta Education school district; (d) had no previous diagnosis or identification of Autism Spectrum Disorders, psychosis, epilepsy, or gross neurological, sensory, or motor impairments; and (e) had received a previous diagnosis of ADHD from a psychologist or physician. Children who met all of these criteria were booked for research sessions. Further eligibility criteria were confirmed at the first research session. Children were required to have at least Average cognitive abilities, as determined by a Full Scale Intelligence Quotient (FSIQ) of 85 or above on the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) administered during the study. Additionally, presence of ADHD symptomology was confirmed with the Conners-3 Rating Scale (Conners, 2008) parent report, using criteria intended

to ensure diagnostic rigour of this clinical group while allowing for variability in current symptoms resulting from medication or other interventions. Specifically, confirmation of diagnosis was established if participants met at least one of the following criteria based on parent ratings: (a) the T-score on one or both of the ADHD-Inattentive and ADHD-Hyperactive/Impulsive scales was at least 70; or (b) the T-Score on one or both of these scales was at least 65 and the corresponding symptom count was at least 5. Where parent ratings indicated sub-threshold severity (e.g., potentially due to medication and/or intervention efforts), parents were asked to complete an additional Conners-3 form to retrospectively evaluate symptoms prior to intervention efforts. Participants who met the above criteria based on this retrospective scale were also included at this stage. As parents were often unaware, or had not been informed, of a specific subtype diagnosed, subtype was then established based on meeting the above criteria for one or both of the ADHD-Inattentive and ADHD-Hyperactive/Impulsive scales of the Conners-3 (current or retrospective). As noted above, only those participants identified as ADHD-C and ADHD-HI were included in the current sample. Given few documented distinctions between these subtypes (Barkley, 2006b; Lahey et al., 2005; Riley et al., 2008), the decision was made a priori to combine them into a single group for analysis.

Overall, of the 97 participants who met initial screening criteria for the larger project and attended research visits, a total of six participants were excluded for failing to meet IQ or ADHD symptom criteria, and one additional participant refused participation during a visit. Another 15 participants were excluded from the current sample because they best fit criteria for ADHD-Inattentive Type. Due to time constraints, not all measures were consistently completed with all participants. Thus, in addition to the above selection methods, only participants from the larger project who completed the social support measure were included in the current sample, resulting

in the exclusion of another 17 participants. Finally, an additional three participants were excluded due to significant validity concerns in their completion of the social support scale and other measures. This was established based on either a clinical judgment from the research assistant conducting the session with the child or significant response style concerns identified during scoring such as producing considerable patterning across ratings (e.g., 6-5-4-3-2-1-2-3...). On the recommendation of the scale authors (M. Demaray, personal communication, June, 2012), participants who produced consistently high ratings across items/scales of the social support scale were retained in the sample, as this is not an uncommon response and cannot be assumed to be inaccurate. Ultimately, this resulted in 55 participants retained for analysis in the current study.

Measures

Each participating family completed a number of standardized, norm-referenced assessment measures including direct assessment with children, as well as rating scales completed by children and their parents. Relevant background information was also collected from parents. Of note, teacher participation in completing several scales was also requested with parental consent. However, due to a very low response rate, these data were not included within the current study. The measures completed and used within the current study are described below.

Measures to assess eligibility criteria. The following measures were used to establish the eligibility criteria described previously.

Wechsler Abbreviated Intelligence Scale (WASI; Wechsler, 1999). The WASI is a standardized intelligence test consisting of a series of four core subtests designed to measure the intellectual functioning of individuals aged 6 to 89 years as compared to others of the same age.

The four subtests include two subtests evaluating verbal reasoning abilities (Vocabulary and Similarities), and two subtests evaluating perceptual or non-verbal reasoning skills (Block Design and Matrix Reasoning). For the purposes of this study, eligibility was determined based on the FSIQ-4 comprised of the four core subtests. The FSIQ-4 is reported as a standard score (mean = 100; SD = 15). The manual reports strong psychometric properties of the WASI FSIQ-4 as a brief measure of intelligence among children generally, as well as among children with ADHD specifically (Wechsler, 1999). Though based on American normative data, the WASI has also been demonstrated to be predictive of other achievement and ability tests among Canadian children (Saklofske, Caravan, & Schwartz, 1999). Of note, the WASI does not include tasks specifically evaluating cognitive efficiency, an area in which children with ADHD often perform more poorly (Mayes & Calhoun, 2006). As such, it is more comparable to the General Ability Index (Saklofske et al., 2008) of the Wechsler Intelligence Scale for Children – 4th edition (WISC-IV; Wechsler, 2003). As noted above, participants were required to obtain an FSIQ-4 score of at least 85 for inclusion in this study. No upper maximum score was established.

Conners-3 (Conners, 2008). The Conners-3 uses observer ratings to help assess ADHD symptoms and other problem behaviour in children and adolescents. The parent-scale consists of 108 items, with each item rated on a 4-point Likert-scale from *Not true at all/Never/Seldom* to *Very much true/Very often*. Only the ADHD-Inattentive and ADHD-Hyperactive/Impulsive scales (based specifically on DSM-IV-TR ADHD symptom criteria) were used for this study. The Conners-3 demonstrates excellent reliability and validity, and it and previous versions have been well-established for use among children with ADHD (Conners, 2008; Kao & Thomas, 2010; Pelham, Fabiano, & Massetti, 2005). The Conners-3 was used to establish eligibility and

subtype, as described above, as well as to index symptom severity for some analyses. Only current symptom ratings were used in establishing symptom severity.

Measures for variables employed in this study. Several measures and items were used to evaluate the primary variables of interest for this study, including perceived social support, peer rejection, medication status, and the following adjustment outcomes: depression, anxiety, self-reliance, global self-worth, perceived social acceptance, and perceived academic competence.

Parent Demographic Questionnaire. A detailed parent demographic questionnaire was developed by the broader research group to collect relevant background information. The complete demographic questionnaire is provided in Appendix B. However, only some aspects of this questionnaire were used within the current study, including family information (family composition, income level), ethnicity, and the child's comorbidity status, as well as social acceptance and medication status measures described in greater depth below.

Dishion Social Acceptance Scale (Dishion, 1990). This is a three item scale that was included within the parent demographic questionnaire and used to evaluate the peer rejection/acceptance status of children. Raters were asked to estimate the proportion of the child's peers that like/accept, dislike/reject, and ignore him/her based on a 5-point Likert-scale ranging from 1 (*very few/less than 25%*) to 5 (*almost all/more than 75%*). Responses were then translated into a social preference score, which has been well-validated as a measure of social status and found to be more reliable and stable than scores of peer rejection or acceptance alone (Coie, Dodge, & Coppotelli, 1982; Jiang & Cillessen, 2005). Specifically, this score was calculated by subtracting the dislike/reject raw score from the like/accept raw score, thus resulting in scores ranging from 4 to -4 (with higher scores indicating greater social preference).

This measure has been used in numerous studies including several specifically with children with ADHD (e.g., Lahey et al., 2004; Lee et al., 2008; Owens et al., 2009; Wheeler Maegden & Carlson, 2000) and has been found to have moderately strong correlations with sociometric peer ratings (Dishion, 1990). Notably, although both parents and teachers completed these items, only parent ratings were available for the current study.

Medication Status. Children's use of medication to treat ADHD symptoms was established with a set of questions adapted from Barkley (2006a) and also included within the larger parent demographic questionnaire. Specifically, parents indicated whether their child took ADHD medication on weekdays and weekends, and during the summer, with each option rated as 'never', 'sometimes', 'usually', or 'always'. Current medication status was dummy coded for analysis. To be considered on medication, children were required to be rated as "usually" or "always" on medication at least on weekdays during the school year.

Child and Adolescent Social Support Scale (CASSS; Malecki, Demaray, & Elliott, 2000). The CASSS measures the perceived social support of children and adolescents in grades 3 to 12 and has been used in a number of recent studies evaluating social support in children and youth. It is a 60-item measure consisting of five 12-item subscales (Parent, Teacher, Classmate, Close Friend, and School). Each item is a statement of one of four types of support (emotional, informational, appraisal, and instrumental). Students were read each statement and asked to rate how often they perceive that form support on a 6-point scale ranging from 1 (*never*) to 6 (*always*). For the current study, the parent, teacher, classmate, and close friend scales of the CASSS were used. The School scale was omitted for this study and was replaced with an "Other Adult" scale, intended to identify the social support perceived from a non-parent or -teacher adult in the child's life. This scale was created by adapting relevant items from the Parent and

Teacher scales, with items selected to match the general format of three items for each of four types of support. For the Other Adult scale, children were asked to identify another adult to whom they felt close and to complete this scale based on that specific adult (see Appendix C). Raw scores for each scale were calculated by summing responses for each item (range 12 to 72). A total social support score was then calculated by averaging the totals of the five subscales. Missing items were accounted for by determining the average of the other two items within that specific source and type of support. In cases where the child was unable to identify a person of reference for whom to complete one of the scales, responses were coded as "1/never" for each item resulting in the minimum score of 12 for that scale. This approach was endorsed by the scale authors (M. Demaray, personal communication, June 21, 2012). This occurred for one participant for the Close Friend scale and for three participants for the Other Adult scale.

The CASSS has been shown to have strong psychometric properties as reported in the manual for middle-to-high school students (Malecki et al., 2000), established across several independent samples. Factor analysis supports the source-specific model of subscales. Strong internal consistencies have been demonstrated for both the total scale (α = .96 to .97) and source-subscales (α = .92 to .96). Strong test-retest reliability has also been demonstrated, as well as moderate to large correlations with other measures of social support. The scale has been less frequently used with children of elementary school-age, and full reliability information was not available in the manual at this time. However, a recent study using this scale with 251 grade 3 to 5 students demonstrated excellent internal consistency within this sample (α = .95; Jenkins & Demaray, 2012). Notably, although some of some of the above studies have included children with ADHD, the scale has not yet been specifically validated within the ADHD population. As such, reliability analyses were conducted prior to the main analyses of this study.

Behaviour Assessment System for Children – 2nd edition (BASC-2; Reynolds & Kamphous, 2004). The BASC-2 is a broad-band, multisource rating scale that evaluates the behavioural and emotional functioning of children 4 to 18 years of age. It is frequently used in both clinical and research contexts. This scale was completed by both a parent (most often mothers) and children. While mothers and fathers can show discrepancies in their reports (e.g., mothers tend to rate somewhat more problems), several meta-analyses have reported moderate to high correspondence between mother and father behavioural ratings, suggesting some confidence in interchanging raters where necessary (Achenbach, McConaughy, & Howell, 1987; Duhig, Renk, Epstein, & Phares, 2000). The parent scale consists of 160 items, with each item rated on a 4-point Likert scale from *Never* to *Almost Always*. The child form has 139 items, with some items using a similar scale and others using a true-false dichotomous scale. Scores are reported as T scores (mean = 50; SD = 10) using a general (i.e., non-clinical) and gender-specific normative group. Only select scales were used within the current study. Specifically, the depression and anxiety scales on the parent and child forms were used as a measure of internalizing symptoms/emotional maladjustment. The self-reliance scale on the child self-report was used as one aspect of self-concept, specifically evaluating self-efficacy or "confidence in one's ability to solve problems; a belief in one's personal dependability and decisiveness" (Reynolds & Kamphous, 2004, p. 74).

Self-Perception Profile for Children (SPPC; Harter, 1985). The SPPC is a self-report rating scale that evaluates the global and domain-specific self-perceptions of children in grades 3 to 6. The self-report scale consists of 36 items within six domains. Each item is presented in a "structured alternative format" (Harter, 1985, p. 7), wherein the child is presented with options of two children with opposing perceptions (e.g., Some kids often forget what they learn ... but ...

other kids can remember things easily). Ratings are made in a two-step process; first, the child chooses which child is more like him or her and then chooses whether this is "sort of true for me" or "really true for me". Items are combined to form six scales, including global self-worth and five domain-specific scales (academic competence, social acceptance, athletic competence, physical appearance, and behavioural conduct). For the purposes of this study, only three of these scales were included: global self-worth ("the extent to which the child likes oneself as a person, is happy the way one is leading one's life, and is generally happy with the way one is"); scholastic competence ("the child's perceptions of his/her competence or ability within the realm of scholastic performance"); and, social acceptance ("the degree to which the child is accepted by peers or feels popular;" Harter, 1985, p. 6). Internal consistencies as reported in the manual range from .75 to .85 for the selected scales. The SPPC has been used frequently with children with ADHD, particularly in research exploring the PIB (e.g., Hoza et al., 2002, 2004).

Procedure

Approval from the University of Calgary Conjoint Faculties Research Ethics Board was obtained for all aspects of this study and funding was secured from the Alberta Centre for Child, Family & Community Research (ACCFCR), the Social Sciences and Humanities Research Council of Canada (SSHRC), and the Carlson Family Research Award in ADHD. Information regarding the study was dispersed throughout the Calgary community with the support of ADHD agencies, school boards, community newsletters, and local psychological clinics (example recruitment materials provided in Appendix A). Interested participants contacted the researchers and were provided with more information. A brief screening phone interview was also completed at this time to ensure initial eligibility criteria. Participants interested at this stage were booked for two visits at the University of Calgary with their child. Parking and

refreshments were provided during visits. Upon arrival at the first visit, an informed consent process was reviewed with the parent and child. Parents also provided contact information for their child's teacher.

All visits were conducted with a Masters or PhD student researcher in the School and Applied Child Psychology program who had graduate-level training in standardized test administration. During visits, parents completed a number of questionnaires in a separate room, while the researcher worked with the child to complete child-focused measures. Breaks (including refreshments) were provided when requested or when signs of fatigue or stress were evident. Assessment measures were administered in a pseudo-random order, with the WASI and Conners-3 always administered in the first visit to ensure eligibility. For all self-report rating scales, items were read by the researcher to the child unless the child requested to complete it independently and was deemed able to do so. Children selected small prizes after each visit, and a $25 gift card was provided to the family at the conclusion of the second visit. In cases where children did not meet minimum IQ, the second visit was cancelled with full compensation provided at the first visit, and where appropriate, parents were encouraged to pursue psychoeducational assessment as required by ethical standards. As a whole (including measures not used in the current study), child and parent measures took approximately 4 to 5 hours to complete.

Data Analysis Plan

Prior to evaluation of the proposed research questions, preliminary analyses were conducted to evaluate the integrity of the CASSS scale with this sample and to assess demographic characteristics of the sample in order to better understand generalizability to the broader population of children with ADHD.

To address the first research question regarding the profile and variability of perceived social support on the CASSS among children with ADHD, several descriptive analyses and subgroup comparisons were conducted. Paired sample t-tests were used to compare levels of support reported across sources within the ADHD-C/HI sample. One sample t-tests were also conducted to compare scores of the ADHD-C/HI sample to scores on the CASSS of a similarly-aged previously published sample (Jenkins & Demaray, 2012) to obtain a general sense of how children with ADHD scored relative to non-ADHD children. Variability in levels of social support within the ADHD-C/HI sample was evaluated using correlational analyses for the continuous variables of IQ, age, and symptom severity. For categorical variables (sex, medication status, ADHD subtype, comorbidity), independent-samples t-tests and/or one-way ANOVAs were planned to compare total perceived social support ratings between groups, and MANOVAs were planned to evaluate differences in source-specific support, with subsequent post-hoc analyses to explore significant findings. However, due to limited and unequal sample sizes of subgroups, only total social support comparisons were conducted, using corresponding nonparametric tests (i.e., Mann-Whitney U and Kruskal-Wallis tests).

The second research question explored the relationships between perceived social support and emotional well-being outcomes. This question was evaluated primarily with the use of correlational analyses, including total and source-specific social support scores as well as the following outcome variables: parent-rated depression and anxiety from the BASC-2; child-rated depression, anxiety, self-reliance from the BASC-2; and, child-rated global self-worth, social acceptance, and academic competence from the SPPC. Given the modest sample size and exploratory nature of this study, the use of Bonferroni corrections was rejected in favour of retaining a more generous alpha of $< .05$ to reduce the likelihood of missing positive results.

Next, several linear regression analyses were planned to evaluate the incremental importance of specific sources of support on outcomes with which significant correlations were found.

Finally, the third research question exploring main versus buffering models of social support in the context of peer acceptance/rejection was evaluated using a similar approach to that used by Davidson and Demaray (2007) and Malecki and Demaray (2006), and in accordance with recommendations of Wu and Zumbo (2008). Specifically, a series of six multiple regression analyses were planned, with one for each source of support and for total support. To reduce the overall number of analyses, a composite outcome measure was derived to represent emotional adjustment (described in Chapter 7). For each analysis, social preference and one source of support were entered at step one, with their interaction term entered at step two. Although social preference had initially been planned to be used as a continuous variable, the distribution (see Chapter 7) warranted dichotomizing this variable into low and high social preference groups for these analyses.

Chapter 7: Results

Preliminary Analyses

Sample characteristics. The final sample consisted of 55 children with ADHD-C/HI.

Based on the subtyping approach described in the previous chapter, 49 children were identified

as ADHD-C and 6 as ADHD-HI. Their ages ranged from 8:0 to 11:11 years with a relatively

even distribution across ages ($m = 9.99$ years, SD = 1.16). Boys represented the majority of

participants ($n = 46$; 84%), with the male:female ratio on the higher end of what might be

expected within the ADHD population. The majority of participants identified themselves as

Caucasian (82%), with the remaining participants identifying as Asian, African American,

Aboriginal, East Indian, or Hispanic. The sample was socioeconomically advantaged relative to

what would be expected for the population. In particular, income levels were not evenly

distributed within this sample - 46% of participants indicated family incomes of $100,000 or

greater, with only 4% indicating incomes under $25,000. Moreover, the majority of participants

(76%) lived in a two-parent home. A significant majority of participants were taking

medications for ADHD symptoms, with 51% consistently taking medications across weekdays,

weekends, and summers, and another 29% taking medication at least on weekdays during the

school year. Only 14% of participants reported no medication use, and an additional three

participants did not clearly indicate current medication use. Finally, 49% of participants were

reported by their parents to have no identified or diagnosed comorbid disorders. Of the

remaining 51%, 15 participants were reported to have a learning or language disability, 5 had an

anxiety disorder, 6 had Oppositional Defiant Disorder, and 2 had Developmental Coordination

Disorder. An additional two participants did not provide this information. Table 1 (below)

provides descriptive statistics for age, IQ, and current ADHD-symptom ratings (based on

Conners-3 parent T-Scores) for the full sample as well as for ADHD-C and ADHD-HI subgroups specifically. As would be expected, mean symptom levels for both inattentive and hyperactive/impulsive symptoms were in the Clinical range (T Score ≥ 70) for ADHD-C participants, whereas only hyperactive/impulsive symptoms met this threshold for ADHD-HI participants. As noted previously, subtypes were combined for all analyses aside from the direct comparison in research question 1.

Table 1

Participant Sample Descriptive Information

	ADHD-C ($n = 49$)		ADHD-HI ($n = 6$)		Full Sample ($N = 55$)	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age	9.93	1.13	10.53	1.41	9.99	1.16
Verbal IQ	105.82	13.03	109.50	19.81	106.22	13.73
Performance IQ	109.29	13.11	106.33	10.37	108.96	12.79
FSIQ-4	108.00	10.68	108.83	13.00	108.09	10.83
ADHD-Inattentive T-Score	75.57	9.30	60.50	3.27	73.93	10.02
ADHD-Hyp/Imp T-Score	76.98	11.26	78.83	13.59	77.18	11.40

CASSS reliability analyses. As the CASSS has not previously been used specifically with children with ADHD (Demaray & Elliott, 2001), the reliability of the scale within the current sample was evaluated. Moreover, given the adaptation of the scale to form the Other Adult scale, it was important to establish preliminary reliability estimates for this adapted portion of the measure, as well as the adjusted Total Support scale. Table 2 (below) presents the internal consistency reliabilities using Cronbach alpha for each scale, as well as the intercorrelations between source subscales and the total scale on the CASSS. In general, results suggested strong internal consistency reliability for the CASSS within the current sample, with reliabilities for the five subscales (12 items each) ranging from .91 to .97. Intercorrelations generally fell in the moderate to high range, consistent with expectations, demonstrating at least a moderate relationship between the ratings from the different sources. However, it is notable that

correlations between the Other Adult scale and other subscales were somewhat lower than the remaining intercorrelations.

Table 2

Internal Consistencies and Intercorrelations between Social Support Subscales

Scale	α	Parent	Teacher	Classmate	Close Friend	Other Adult
Parent	.91	--				
Teacher	.92	.70***	--			
Classmate	.93	.69***	.56***	--		
Close Friend	.96	.57***	.46**	.72***	--	
Other Adult	.97	.47***	.36**	.37**	.46***	--
TOTAL	.97	.85***	.75***	.83***	.82***	.71***

*p < .05, **p < .01, *** p < .001

Research Question 1: Social Support Profile and Variability among Children with ADHD

Table 3 (below) presents CASSS raw scores for the sample ($N = 55$). The distributions for Parent, Teacher, Classmate, Friend, and Total support were approximately normal, with skewness and kurtosis values falling within the ±1 range. The Other Adult scale was more negatively skewed with positive kurtosis, due in large part to a high number of participants providing the highest score for this scale. However, skewness and kurtosis statistics fell within the ±2 range, a range deemed acceptable but warranting some caution in interpretation (Miles & Shevlin, 2001). One participant indicated no close friend and three participants indicated no supportive other adult, resulting in outliers with a minimum score of 12 for these scales. However, given that being unable to identify any supportive individual within that role implies an extremely low level of support that may have clinical implications directly pertinent to the nature of this study, these ratings were retained for analysis.

Next, variability in the strength of perceived support across sources was evaluated. A paired-samples t-test approach was selected to allow for an exploration of any general trends in

how particular sources of support were rated relative to children's overall tendency to rate

support. Specifically, the total rating for each source of support was compared to the combined

average of the other four sources. Results, presented in Table 3, indicated comparable levels of

perceived support across parents, teacher, and close friend scales. Classmate support was found

to be significantly and moderately lower than support from other sources ($d = 0.73$), whereas

support from other adults was found to be significantly but only slightly higher than support

from other sources ($d = 0.30$).

Table 3

Social Support Descriptive Statistics (N = 55)

Social Support Scale	*M*	*SD*	Range	Skewness	Kurtosis	*t*(54)	*p*	Cohen's *d*
Parent	54.49	11.38	32-72	-.264	-.936	.91	.37	0.12
Teacher	54.49	11.72	29-72	-.429	-.542	.70	.48	0.09
Classmate	48.65	12.57	20-72	.158	-.517	**-5.43**	**<.001**	**0.73**
Friend	53.94	14.08	12-72	-.675	.076	.18	.86	0.02
Other Adult	57.14	15.93	12-72	-1.448	1.614	**2.34**	**.02**	**0.30**
TOTAL	53.74	10.34	33-72	-.286	-.727			

Note. Paired t-tests results comparing specific source support to support from the other four sources combined is indicated in right-most columns. Significant results are in bold.

Other adult support was further explored by considering the specific sources identified by

children on this scale, with data presented in Table 4 below. Specific responses were categorized

into three groups: grandparents, other extended family (e.g., aunts, uncles, adult cousins), and

community members (e.g., coach, family friend, friend's parent). An additional three

participants indicated no supportive adult and another five did not provide the specific individual

or relationship. A one-way ANOVA comparing the Other Adult support means between those

who identified grandparents, other extended family, or community members was not significant

($F(2,44) = .301, p = .74$).

Table 4

Specific Sources of Other Adult Support

Other Adult Category	*n* (% of sample)	Other Adult SS	
		M	*SD*
Grandparents	21 (38%)	62.05	9.83
Extended family	13 (24%)	60.31	13.52
Community members	13 (24%)	58.77	13.96
Relationship unclear	5 (9%)	53.40	12.12
No other adult	3 (5%)	12.00	0.00

With no matched non-ADHD comparison sample or published standardization data for the CASSS with the 8 to 11 age group, conclusions could not be drawn as to whether the social support ratings were consistent with what is typically found for children of this age. However, as an additional exploratory comparison to obtain a general baseline of the levels of perceived support reported by these children, the CASSS results were compared to the results of a recent sample reported in Jenkins and Demaray (2012). This study was selected because it used the same version of the CASSS (without the addition of Other Adult support) with a group of similar-aged children. Specifically, the sample included 251 children grades 3 to 5 from Chicago, IL. The sample was reported to be evenly distributed for sex and representative of the population in regards to socioeconomic status. Although specific information regarding ADHD status of participants was unavailable, the sample consisted of 77% regular education students, with the remaining 23% comprised of students receiving speech-language (8%) or resource support (11%) or within a self-contained classroom for emotional disorders (4%; L. Jenkins, personal communication, December, 2012). Means and standard deviations for the two samples are presented in Table 5 (below), as well as the results of t-tests comparing current results to the mean for each source reported by Jenkins and Demaray (2012). Results suggested somewhat

lower social support among the current sample for parent, teacher, and close friend support but

no differences in classmate support.

Table 5

Social Support Comparison to Jenkins & Demaray (2012)

	ADHD-C/HI Sample (*N* = 55)		Comparison Sample Scores[a]		T-test results		
Social Support Scale	*M*	*SD*	*M*	*SD*	*t*(54)	*p*	Cohen's *d*
Parent	54.49	11.38	60.18	9.11	**-3.71**	**<.001**	**0.60**
Teacher	54.49	11.72	61.52	11.22	**-4.45**	**<.001**	**0.62**
Classmate	48.65	12.57	48.97	14.03	-.19	.85	0.02
Friend	53.94	14.08	60.43	12.65	**-3.417**	**.001**	**0.58**

Note. Total score comparison not included due to the distinct contributors of Other Adult in the current sample versus School Support in the comparison. [a]Based on data presented in Jenkins & Demaray (2012) on a sample of 251 grade 3-5 students from Chicago, IL. Not to be considered a proper standardization sample.

Next, variability in perceived social support within the ADHD sample was explored

based on several key child characteristics. Pearson's product moment correlations were

conducted between overall and source-specific social support with age, IQ, and current severity

of inattentive and hyperactive/impulsive symptoms, and are presented in Table 6 below. No

significant correlations were found between overall or source-specific support and IQ or ADHD

symptom severity. However, negative correlations were found between age and total social

support (r = -.30, p = .03), as well as between age and parent support (r = -.28, p = .04) and

classmate support (r = -.33, p = .01). Descriptive data were calculated by age to further explore

this relationship and are presented in Table 7. Visual inspection of these data suggested that this

correlation was driven primarily by higher support reported by 8 year-olds, whereas declining

scores were not observed across the remaining age-groups.

Table 6

Correlations between Social Support and Sample Characteristics (N = 55)

Child Characteristics	Parent SS	Teacher SS	Classmate SS	Friend SS	Other Adult SS	Total SS
Age	-.28*	-.18	-.33*	-.17	-.22	-.30*
FSIQ-4	-.08	-.21	-.17	.07	.22	-.02
ADHD-Inattentive T-Score	-.11	-.11	-.04	-.07	.18	-.02
ADHD-Hyp/Imp T-Score	-.10	-.19	-.06	.22	.16	.03

$* p < .05$

Table 7

Social Support Descriptive Statistics by Age

Age	n		Parent SS	Teacher SS	Classmate SS	Friend SS	Other Adult SS	Total SS
8 year-olds	11	M	61.09	59.18	60.09	62.64	63.55	61.31
		SD	9.63	15.01	12.83	13.64	11.29	9.49
9 year-olds	18	M	54.00	53.22	45.61	50.22	59.50	52.51
		SD	12.30	12.63	10.59	14.41	10.14	9.42
10 year-olds	12	M	52.67	56.17	48.17	52.58	49.33	51.78
		SD	11.17	10.83	11.50	15.47	22.99	12.39
11 year-olds	14	M	51.50	51.00	44.00	53.07	55.79	51.07
		SD	10.65	7.23	11.15	10.96	16.54	8.18

Subgroup comparisons were then conducted to compare perceptions of social support by sex, subtype, medication status, and comorbidity status. A note of caution is necessary in these analyses given very small sample sizes of some subgroups. Given this issue, non-parametric tests were selected for these comparisons, and only total support was examined across these variables to reduce the number of analyses conducted. Descriptive data by subgroups are presented in Table 8 below, including both means and standard deviations as well as medians and intraquartile deviations. Using a Mann-Whitney U test, no significant difference in total social support ratings was found between boys and girls ($U = 160.00$, $N1 = 46$, $N2 = 9$, $p = .28$). Nor were significant differences in total support found by ADHD subtype ($U = 122.00$, $N1 = 49$, $N2 = 6$, $p = .52$) or medication status ($U = 164.00$, $N1 = 44$, $N2 = 8$, $p = .78$). A Kruskal-Wallis

test was used to evaluate differences in total support ratings across comorbidity groups. Due to

the limited numbers of children with specific comorbidities, children were categorized into

groups of ADHD only, ADHD with comorbid learning/language/developmental coordination

disorders, and ADHD with comorbid behavioural and/or anxiety disorders. Again, no significant

differences were found between groups ($X^2 = 13$, $df = 2$, $p = .94$). Predictions regarding

variability in social support among children with ADHD were thus not supported, although the

small and unequal sample sizes in many of these analyses warrant caution in interpretation and

results should be considered exploratory. Overall findings of research question 1 are

summarized in Table 9 below.

Table 8

Total Social Support Descriptive Statistics by Subgroup

Subgroup	Total Social Support				
	n	*M*	*SD*	Median	*IQD*
Total sample	55	53.75	10.34	54.80	7.40
Sex					
Boys	46	54.39	10.16	55.00	6.85
Girls	9	50.44	11.25	53.40	10.05
ADHD Subtype					
ADHD-C	49	53.73	10.20	54.80	7.05
ADHD-HI	6	53.87	12.50	53.10	11.28
Medication Status					
Medicated	44	53.67	10.70	55.00	7.83
Not medicated	8	54.50	10.85	54.70	8.35
Comorbidities					
None	27	53.09	9.34	53.40	7.00
LD/Language/DCD	15	53.12	11.44	55.20	6.70
Emotional/Behavioural	11	54.11	11.78	54.40	11.90

Table 9

Research Question 1 – Summary of Findings

Research Subquestion	Variables Analyzed	Significant Findings
Source-specific social support profile among ADHD sample	▪ Parent, teacher, classmate, close friend, & other adult perceived support ratings (CASSS)	▪ No significant differences between parent, teacher, and friend support ▪ Classmate support significantly and moderately lower than other sources ▪ Other adult support significantly but only slightly higher than other sources ▪ No significant differences in levels of support by specific type of other adult support (grandparent, family friend, community member)
Social support ratings relative to non-ADHD same-aged sample of Jenkins & Demaray, 2012	▪ Parent, teacher, classmate, & close friend perceived support ratings (CASSS)	▪ Parent, teacher, and friend support significantly and moderately lower than non-ADHD sample means[a] ▪ Classmate support at similar level as non-ADHD sample mean[a]
Variability of perceived social support by child characteristics	▪ Perceived social support ratings (CASSS) ▪ Age, IQ, symptom severity, sex, subtype, medication status, comorbidity	▪ Age: negative correlations (~ -0.3) between age and social support ▪ No other significant correlations or subgroup differences[a]

[a] To be interpreted with significant caution – see discussion in text

Research Question 2: Relationships between Social Support and Emotional Well-being

　　　　Preliminary analysis of outcome variables. Emotional well-being outcomes evaluated

within this study included scales of depression and anxiety (self- and parent report), as well as

several self-report measures of self-concept including self-efficacy (self-reliance), domain-

specific evaluations of competence, and global self-worth. Preliminary inspection of the

distributions of outcome variables necessitated some initial considerations specifically in regards

to self- and parent-reported depression (discussed below). All other scales approximated a

normal distribution with no significant skew or kurtosis.

First, self-reported depression was found to have an extremely positive (>2; Miles & Shevlin, 2001) kurtosis (2.36), as well as positive (>1) skew (1.66). Given the extent of skewness and kurtosis and the overall non-normal distribution, subsequent correlations with this outcome were conducted using the nonparametric Spearman's *rho*. Second, parent-reported depression, while approaching a normal distribution (skewness = 1.16, kurtosis = .97), contained three significant outliers. T-scores for these outliers were 97, 104, and 105, thus all more than 4 standard deviations above the mean. The basis of these highly elevated ratings was unclear and of significant concern. From a clinical perspective, the extent of elevation of these scores might suggest that these children may be highly unusual and considerably less 'functional' within their day-to-day environment, thus facing issues largely distinct from the more general population of children with ADHD. On the other hand, research suggests that parent ratings can be significantly influenced by parental-based factors such as parental stress or psychopathology, in which case they may not accurately reflect the child's functioning (Reynolds & Kamphous, 2004; Smith, 2007). In fact, these ratings were not consistent with other outcome ratings such as self-reported depression, calling into question their validity.

In addition to these clinical concerns regarding the meaning and implications of these ratings, with the modest sample size outliers of this degree are particularly concerning as they are likely to have a disproportionate statistical impact on results. To further evaluate the influence of these outliers, several correlations were conducted comparing the relationship between parent-rated depression and other outcome variables with and without these three outliers included. As expected with the smaller sample sizes, these outliers did influence results and removing them strengthened the expected correlations with theoretically-related outcomes. For instance, removing the three outliers gave rise to modest but significant correlations between parent-rated

depression and self-rated depression (Spearman's *rho* = .30, *p* = .03), global self-worth (*r* = -.37, *p* = .02), as well as self-perceived scholastic competence (*r* = -.38, *p* = .02) and social acceptance (*r* = -.34, *p* = .03). Removing these outliers also considerably reduced skewness and kurtosis statistics for parent-rated depression to .81 and .18 respectively. Given the focus on emotional well-being for this and the following research question and the ambiguous interpretability of these ratings, as well as the significant statistical implications of including these outliers, these three participants were excluded from subsequent analyses. This resulted in a reduced sample size of 52 participants for remaining analyses.

With these adjustments made, Table 10 (below) provides descriptive statistics for all outcome variables for the ADHD-C/HI sample (*n* = 52) and intercorrelations between outcome variables are presented in Table 11. Of note, due to missing data for varying scales caused by time constraints and some errors in administration, sample sizes are not equivalent for all measures. As might be expected, results demonstrate small to moderate correlations between self- and parent-rated internalizing symptoms and small to moderate correlations between various aspects of self-concept. This latter finding supports the separation of these facets of self-esteem as only minimally related variables. The relationships between internalizing symptoms and self-concept ratings were more variable, though all significant correlations were in the expected directions. Scholastic competence was most consistently related to self- and parent-reported internalizing symptoms. In contrast, self-reliance was associated only with self-rated depression/anxiety symptoms, and both social acceptance and global self-worth showed an association only to parent-rated depression.

Table 10

Descriptive Statistics for Outcome Variables

	N	M	SD	Range	Skewness	Kurtosis
Depression Self-Report[1] *(median reported)*	51	44.00	8.06	39-71	1.57	2.02
Depression Parent Report[1]	52	56.48	13.01	39-90	.81	.18
Anxiety Self-Report[1]	51	49.20	9.70	35-73	.49	-.55
Anxiety Parent Report[1]	52	52.90	11.54	33-77	.24	-.87
Self-Reliance[2]	51	49.88	9.80	33-67	-.10	-1.01
Scholastic Competence[3]	40	2.77	0.79	1.17-4	-.44	-.63
Social Acceptance[3]	40	2.87	0.85	1.17-4	-.44	-.80
Global Self-Worth[3]	40	3.33	0.56	2-4	-.71	-.10

[1] based on T-Scores from the BASC-2, m=50, SD=10, higher scores indicate a more negative outcome.
[2] based on T-Scores from the BASC-2, m=50, SD=10, higher scores indicate a more positive outcome.
[3] based on raw scores from the SPPC self-report, scale range 1-4.

Table 11

Intercorrelations between Emotional Well-Being Outcomes

Outcome Scale	1[a]	2	3	4	5	6	7	8
1. Depression (self) *(Spearman's rho)*[a]	--							
2. Depression (parent)	.30*	--						
3. Anxiety (self)	.68**	.22	--					
4. Anxiety (parent)	.06	.37**	.34*	--				
5. Self-Reliance	-.49**	-.27	-.38**	-.09	--			
6. Scholastic Competence	-.38*	-.38*	-.36*	.03	.51**	--		
7. Social Acceptance	-.23	-.34*	-.28	-.16	.36*	.46**	--	
8. Global Self-Worth	-.04	.37*	-.17	-.06	.39*	.37*	.37*	--

Note. Correlations are shown for the sample of 52 participants, although particular correlations are based on smaller samples due to missing data. [a]Self-reported depression correlations reported as Spearman's rho due to the non-normal distribution. All other correlations based on Pearson's product-moment.
* $p < .05$, ** $p < .01$

Relationship between social support and emotional well-being outcomes. The

relationship between social support and emotional well-being outcomes was evaluated first

through correlational analyses. Results are provided in Table 12 (below). Contrary to

predictions, no significant relationships were found between social support and internalizing

outcomes (depression, anxiety) as rated by children or their parents. However, total support

showed positive and moderate correlations with all indicators of self-concept ($r = .34$ to $.42$).

Furthermore, results highlighted differences in the relationships between specific sources of

support and particular facets of self-concept. For instance, global self-worth showed moderate to

large correlations with parent, classmate, and close friend support ($r = .36$ to $.53$). However,

self-reliance had significant and moderate correlations only with support from parents ($r = .40$)

and other adults ($r = .29$). Interestingly, scholastic competence was only related to parent and

classmate support and did not show the expected relationships with teacher support. Social

acceptance, as might be expected, showed the strongest correlation with classmate support ($r =$

$.51$). Relationships were also found, however, with parent and teacher support but not with close

friend or other adult support.

Table 12

Correlations between Social Support and Emotional Well-Being Outcomes

Outcome Scale	Parent SS	Teacher SS	Classmate SS	Friend SS	Other Adult SS	Overall SS
Depression Self-Report (Spearman's rho)	-.09	-.01	-.02	-.04	-.01	-.05
Depression Parent Report	-.11	-.22	-.19	-.18	.06	-.15
Anxiety Self-Report	.02	-.04	.07	.07	.02	.04
Anxiety Parent Report	.08	-.10	.02	-.03	-.06	-.03
Self-Reliance	.40**	.25	.26	.25	.29*	.36**
Scholastic Competence	.40*	.29	.34*	.31	.08	.34*
Social Acceptance	.44**	.40**	.51**	.25	.01	.38*
Global Self-Worth	.36*	.22	.53**	.46**	.14	.42**

Note. All correlations represent Pearson's product-moment except the correlations of self-reported depression with other outcomes, which are reported as Spearman's rho due to the non-normal distribution.
$* p < .05, ** p \leq .01$

To further evaluate the overall and relative contributions of support sources in predicting

outcomes, several standard linear regression analyses were conducted specifically for variables

found to be significantly correlated with social support. In each case, all sources of support that

were found to correlate significantly with the outcome were entered together into the regression.

For instance, for global self-worth, parent, classmate, and friend support were added as predictors. Results are presented in Table 13 (below). In each case, the models were statistically significant but explained only a small amount of the variance in outcomes, ranging from 12 to 24%. Individual predictors did not consistently reach significance, and held relatively small regression weights. The only significant individual predictors were parent support in predicting self-reliance, and classmate support in predicting global self-worth. Classmate support also approached significance as a predictor of social acceptance ($p = .08$).

Table 13

Regression Analyses of Social Support Sources in Predicting Emotional Well-Being

Outcome	n	Independent Variables	β	R^2
Self-Reliance	51	Parent Support*	.338	.134*
		Other Adult Support	.122	
Scholastic Competence	40	Parent Support	.336	.120*
		Classmate Support	.089	
Social Acceptance	40	Parent Support	.059	.220**
		Teacher Support	.146	
		Classmate Support	.383	
Global Self-Worth	40	Parent Support	-.103	.24**
		Classmate Support*	.466	
		Friend Support	.200	

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

Thus, predictions were partially supported, in that social support was related to self-concept indicators but not indicators of emotional distress. Moreover, results support the notion that different sources of support may have somewhat different functions, with parent and classmate support the most consistently influential. Overall findings for research question 2 are summarized in Table 14 below.

Table 14

Research Question 2 – Summary of Findings

Research Subquestion	Variables Analyzed	Significant Findings
Associations between perceived social support and internalizing problems (Correlational analyses)	▪ Social support ratings (CASSS) ▪ Depression and anxiety (BASC-2)	▪ No significant correlations between social support and internalizing problems
Associations between perceived social support and self-concept ratings (Correlational analyses)	▪ Social support ratings (CASSS) ▪ Self-reliance (BASC-2) ▪ Perceived scholastic competence, social acceptance, global self-worth (SPPC)	▪ Total support had significant and moderate positive correlations with all self-concept outcomes ▪ Parent and classmate support most consistently and strongly associated with outcomes ▪ Friend support related only to global self-worth ▪ Teacher support related only to social acceptance ▪ Other adult support related only to self-reliance
Predictiveness of social support for self-concept outcomes (Regression analyses)	▪ Same as above	▪ Social support predicted 12 to 24% of variance in self-concept outcomes ▪ Parent support was a significant individual predictor of self-reliance ▪ Classmate support was a significant individual predictor of global self-worth

Research Question 3: Social Support in the Context of Peer Rejection

As previously described, children with ADHD are at elevated risk for being excluded and rejected by their peers. Moreover, peer rejection in turn has been associated with a range of negative outcomes, including poor emotional well-being. Within the context of a resilience model, the third research question evaluated the function of social support in the context of peer rejection, or more accurately, lower social preference among peers. As this research question involved a combined examination of numerous study variables within the analysis, only those participants with complete data for all variables of interest were included, resulting in a sample

of 38 ADHD-C/HI participants. Several preliminary analyses were required in preparation for the regressions.

          Emotional adjustment composite outcome. As the purpose of this research question was to evaluate the role of peer rejection and social support on emotional well-being, a composite measure was believed to be most useful as the outcome of interest. Composite measures of emotional adjustment have been used in several studies (e.g., DuBois, Felner, Meares, & Krier, 1994; Harter, 1999; Ostrander & Herman, 2006). A composite approach can be valuable in reflecting a broader and more clinically-meaningful construct that reflects both the presence of positive well-being and the absence of negative symptomology, as well as in reducing the number of analyses (as compared to conducting separate analyses for each individual outcome) and the impact of single rater bias. Although there are several methods to create a composite, for this study a composite was derived to parallel the approach used by Harter (1999) in her research modeling the relationships between social support, self-evaluations, and well-being. Specifically, Harter proposed an emotional adjustment composite comprised of depressive affect, self-worth, and hopelessness. Because the current study did not measure hopelessness, the composite measure combined global self-worth with the absence of depressive symptoms. Parent-rated depression was selected in this case due to the non-normal distribution of self-rated depression as described above. The composite was created by standardizing each score for the subsample of 38 participants and then translating into T-Scores. Depression was reverse-scored, and then the two T-scores were summed. Thus, higher scores on the emotional adjustment composite reflect more positive well-being. The final composite scale was normally distributed with a mean of 100 and a standard deviation of 16.55.

Social preference. The social preference outcome (liked/accepted minus disliked/rejected ratings; possible range -4 to +4) did not present as a normal distribution, with the majority of participants rated as having high social preference and one outlier. As such, social preference was dichotomized using a median split approach into high (score of 3 or 4, $n = 19$) and low (score of 2 or less, $n = 19$) and was dummy coded for use in regression analyses (0 = lower social preference, 1 = higher social preference). This approach thus allowed for a more meaningful comparison between those who are generally well-liked and rarely rejected by their peers (higher social preference) versus those who are liked by less of their peers and/or more frequently rejected (lower social preference). Age was evenly distributed across lower ($m = 10.20$, SD = 1.19) and higher ($m = 10.50$, SD = 1.03) social preference groups.

Table 15 presents means and standard deviations for perceived social support and all well-being outcomes by social preference status, as well as the results of statistical comparisons to evaluate differences between groups. No significant differences were detected in the total social support score between lower and higher social preference groups, nor in a MANOVA comparing specific sources of social support ($F(5,32) = 1.50$, $p = .22$). However, as expected, independent samples t-tests comparing social preference groups revealed significant and moderate to large differences across most emotional outcomes, with a trend towards significance for self-reported depression and self-reliance. In all cases, those of higher social preference tended towards lower internalizing symptoms and higher self-concept ratings. Only scholastic competence ratings did not show a similar pattern. Of particular relevance for subsequent analyses, those with lower parent-rated social preference were found to score significantly and substantially lower on the emotional adjustment composite score than those with higher social preference.

Table 15

Descriptive Statistics by Lower and Higher Social Preference Groups

		Social Preference				t-tests between low and high social preference groups			
		Lower (n=19)		Higher (n=19)					
		M	SD	M	SD	t	Df	p	d
Social Support	Parent SS	51.79	13.87	55.21	10.57				
	Teacher SS	52.16	14.24	56.21	10.48				
	Classmate SS	44.63	13.42	48.63	11.43	Ns.[a]			
	Friend SS	51.47	15.79	54.68	14.02				
	Other Adult SS	59.68	10.90	50.53	21.75				
	Overall SS	51.95	11.17	53.05	11.05	-.31	36	.76	0.10
Emotional Outcomes	Depression (self)[b]	48.33	9.39	43.95	4.03	1.83	22.81	.08	0.61
	Depression (parent)	63.79	13.88	49.58	8.35	**3.82**	**36**	**.001**	**1.24**
	Anxiety (self)	52.11	9.70	46.84	8.83	**2.10**	**35**	**.04**	**0.57**
	Anxiety (parent)	55.37	10.29	48.16	9.51	**2.24**	**36**	**.03**	**0.73**
	Self-reliance	46.28	8.84	52.42	10.54	-1.91	35	.06	0.63
	Scholastic Comp.	2.62	0.87	2.89	0.73	-1.04	36	.30	0.33
	Social Acceptance	2.57	0.92	3.20	0.70	**-2.40**	**36**	**.02**	**0.77**
	Global self-worth[b]	3.13	0.67	3.54	0.38	**-2.30**	**28.55**	**.03**	**0.75**
	Emotional Adjustment	91.16	17.00	108.84	10.44	**-3.86**	**36**	**.001**	**1.25**

Note. T-tests comparing low and high social preference groups indicated in the right-hand columns. Significant differences are bolded. [a]Based on a MANOVA for all sources. [b]Due to significant differences in variances, results for these analyses are presented based on calculations with equal variances not assumed.

Regression analyses. Six simultaneous multiple regression analyses were conducted to examine the role of each source of support with social preference in promoting emotional well-being. As recommended by Wu and Zumbo (2008), social support scores were mean-centered before creating the interaction term. Each regression involved entering the dummy-coded social preference and one source of support at step 1 and the interaction term at step 2. Table 16 presents results of the regression analyses for the subsample of 38 participants.

Table 16

Regression Analyses of Social Preference & Social Support in Predicting Emotional Adjustment

Step	Independent Variables	B	R^2	ΔR^2
1***	Social Preference**	.501	.336	
	Parent Support*	.284		
2**	Social Preference**	.500	.317	.001
	Parent Support	.264		
	Social Preference x Parent Support	.032		
1***	Social Preference**	.497	.329	
	Teacher Support	.272		
2**	Social Preference**	.496	.309	.000
	Teacher Support	.260		
	Social Preference x Teacher Support	.020		
1***	Social Preference**	.485	.377	
	Classmate Support*	.348		
2***	Social Preference**	.486	.362	.003
	Classmate Support*	.391		
	Social Preference x Classmate Support	-.066		
1***	Social Preference**	.509	.340	
	Friend Support*	.290		
2**	Social Preference**	.508	.337	.015
	Friend Support	.180		
	Social Preference x Friend Support	.165		
1**	Social Preference***	.604	.308	
	Other Adult Support	.237		
2**	Social Preference***	.597	.288	.001
	Other Adult Support	.172		
	Social Preference x Other Adult Support	.070		
1***	Social Preference***	.523	.381	
	Total Support*	.348		
2***	Social Preference***	.523	.363	.001
	Total Support	.320		
	Social Preference x Total Support	.040		

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

    All regressions were significant at both steps. As might be expected, the regression incorporating total support was the strongest, accounting for 38% of the variance in emotional well-being. In regards to source-specific support, main effects for each independent predictor were found in the models including parent, classmate, and friend support. However, teacher and other adult support did not reach statistical significance as individual predictors after accounting

for social preference status. None of the interaction effects were significant for social preference

with total or any specific source of support. Thus, results with the current sample support a main

effect model rather than a buffering model of social support in the context of lower or higher

social preference. Overall findings for research question 3 are summarized in Table 17.

Table 17

Research Question 3 – Summary of Findings

Research Question	Variables Analyzed	Significant Findings
Main versus buffering effect of social support when considering level of social preference	▪ Parent-rated social preference (low-high dichotomized) ▪ Social support ratings (CASSS) ▪ Emotional adjustment composite (global self-worth and parent-rated depression)	Social Preference (low versus high) ▪ Significant and large group differences in emotional adjustment ▪ No significant group differences in any social support ratings Regression Models ▪ Main effect model supported. No significant interaction effects ▪ Total support and social preference together accounted for 38% of variance in emotional adjustment ▪ Parent, classmate, and friend support each had significant main effects in models

Chapter 8: Discussion

To better understand, predict, and positively influence the heterogeneous trajectories of children with ADHD, it is important that researchers and practitioners consider the strengths and resources of this population, as well as the risks and challenges that they may face. This study represented an initial exploration of the role of one potential protective factor, perceived social support, in promoting the emotional well-being of children with ADHD-C/HI. Previous research has repeatedly demonstrated associations between perceived social support and emotional well-being among both typical and at-risk children and youth (Chu et al., 2010), implicating social support as a valuable contributor to resilience. However, such explorations, and investigations of resilience more broadly, have been largely absent within the ADHD literature. Overall, results of this study provide initial support for the consideration of perceived social support as a beneficial resource and protective factor for children with ADHD-C/HI, with important implications for practice and further research into resilience and social support within this at-risk population.

Summary and Interpretation of Results

Perceived social support in children with ADHD. Although substantive research has explored the peer and family relationships of children with ADHD, only one study to date has specifically investigated perceptions of social support among children with ADHD characteristics (Demaray & Elliott, 2001). Results of the current study add to this previous work and provide initial support for the use of the CASSS with children with ADHD. In regards to relative levels of support across sources, children with ADHD-C/HI within this study reported similar levels of perceived support from parents, teachers, and close friends but lower levels of support perceived from classmates. While not frequently tested statistically in other studies, the

lower classmate support does appear similar to results of several other samples reporting source-specific profiles of perceived support (e.g., Demaray et al., 2005; Demaray & Malecki, 2003), although this is not consistently found (Rueger et al., 2008). In fact, this profile is not entirely unexpected given that parent, teacher, and friend relationships represent specific one-on-one relationships with individuals with intrinsically supportive roles, whereas classmates represent a broader group of individuals with varying levels of intimacy. Certainly within the ADHD population this finding is not unexpected given high documented rates of peer difficulties (e.g., Hoza, Mrug et al., 2005). Ratings of perceived support from other adults were slightly higher than other sources, also consistent with previously reported findings (Beam et al., 2002; Harter, 1999), and are discussed further below.

Although a matched-comparison sample of children without ADHD was not available at this time, an exploratory comparison to results of another similar-aged sample of children using the current version of the CASSS (Jenkins & Demaray, 2012) suggested that children with ADHD-C/HI rated somewhat lower levels of perceived support from parents, teachers, and close friends than non-ADHD children but comparable levels of classmate support. Interestingly, this finding diverges somewhat from the results of Demaray and Elliott (2001), who also found lower total support among children with ADHD characteristics but with source-specific differences indicating lower perceived support only from classmate and close friends and only by those with extreme ADHD characteristics. Conclusions here must be cautious, however, given the limitations of comparing to a distinct sample, as it is unclear whether the comparable levels of classmate support found in this study reflect a finding relevant to the children with ADHD or a specific feature of the Jenkins and Demaray (2012) sample. Nonetheless, taken together with Demaray and Elliott's (2001) findings, results do suggest that children with ADHD perceive

lower levels of social support in general than do their non-ADHD peers, as might be expected by the well-documented challenges faced in their relationships. While such baseline information can be informative, from a resilience standpoint it can be argued that comparisons to a normative group are less important than the variability in perceived social support among children with ADHD and the relationships between social support and outcomes for this particular at-risk group.

The first research question also explored several child characteristics that might predict variance in perceived social support within the ADHD group, including age, sex, IQ, ADHD subtype, symptom severity, medication status, and the presence of comorbidities. This question has importance for understanding factors that may contribute to perceptions of social support and thus for predicting subgroups of the ADHD population that may be at greater risk for low social support. For the most part, results did not reveal predictable variance based on these factors. Age was the one exception, wherein age showed moderate negative correlations with perceived social support. Although age declines in perceived social support have been previously documented between elementary, middle, and high-school groups (Demaray & Malecki, 2002a), this was an unexpected finding here given the narrow age range of participants. Interestingly, this association appeared to be driven primarily by higher ratings of perceived social support specifically by 8 year-olds, whereas continued developmental declines in social support were not observed between 9 to 11 year-olds. It is possible that the cumulative effects of ADHD on peer functioning were not yet as prominent for the 8 year-old children, leading them to perceive generally more positive relationships. Higher ratings may also reflect a more developmentally immature (but normative) capacity to accurately perceive the quality of relationships (Harter, 1999). Although the small sample sizes within this study prohibited further evaluation of

whether the associations between social support and outcomes differed by age, this may be a worthwhile avenue for future research.

Given small sample sizes of subgroups, between group comparisons were limited to the more robust total support score rather than specific sources of support. While differences in support within specific relationships was thus not captured, this approach allowed for the potential observation of more global tendencies of children within particular subgroups to perceive lower or higher support from their social networks. The lack of association between perceived social support and ADHD symptom severity, and the related similar support levels between medicated and un-medicated subgroups, is in contrast to predictions. Nonetheless, this result is interesting in suggesting that interventions targeted specifically at reducing core symptoms of ADHD may not necessarily improve perceptions of social support, akin to previous research demonstrating that pharmacological treatments to address symptoms do not consistently improve social functioning more broadly (Hoza, Gerdes, et al., 2005). As expected given their similar general profile and associated impairments, no differences in overall support were found between ADHD-C and ADHD-HI subtypes, though the sample of ADHD-HI participants was extremely small. The lack of sex differences in overall perceived social support diverges from previous findings of other child populations that have frequently documented higher perceived social support among girls overall and particularly from classmates and friends (e.g., Demaray & Malecki, 2002a; Malecki & Demaray, 2003; Rueger et al., 2008). While this difference in the perceptions of girls with ADHD relative to other populations might have interesting implications for the impact of ADHD on the perceived relationships of girls with ADHD, the small sample of girls limits conclusions at this stage. Finally, differences based on the presence of comorbidities were also not supported, although again small sample sizes limited the ability to examine this

issue in depth. For instance, by necessity, comorbid anxiety and behavioural disorders were combined into one group, whereas research suggests that those with aggression may be more likely to over-report their social relationships (Owens et al., 2007). The young age of these children in general may also have limited the capacity to detect differences by comorbidity status, as the impact of multiple comorbidities is likely to become more pronounced with age and the accumulation of negative experiences associated with the disorders.

Taken together, perceived social support showed little variability by several core child characteristics within this sample, meaning that these variables cannot at this stage be used to predict greater risk for low social support among subgroups of children with ADHD. However, given the small samples of some subgroups and the resulting focus only on total support, this issue warrants further study to better understand whether and how such variables might influence overall or source-specific perceptions of support, and in turn, associated outcomes.

Other adult support. One unique component of this study was the addition of an Other Adult social support scale using the CASSS framework. The impetus for this addition was the literature base suggesting that other adult support can play a protective role among other at-risk youth (e.g., Scales et al., 2006; Werner & Johnson, 2004), as well as the common practice of trying to connect vulnerable children with supportive and caring adults within schools and the community. Notably, although other adult support has received some research attention as described previously, its measurement has been more limited and has typically focused more on the presence rather than the specific supportive quality of such relationships. Within the current study, perceived support from other adults was measured by adapting relevant items from other subscales of the CASSS, allowing for perceptions of support to be rated in a similar fashion to the other sources.

Several comments regarding the measurement of this scale within the current study are warranted. Although the scale was found to have excellent internal consistency with this sample, its properties differed somewhat from the other subscales of the CASSS. Specifically, relative to the other subscales, this scale displayed more positive kurtosis and negative skew, the correlations with other subscales of the CASSS were somewhat smaller than the remaining intercorrelations, and overall ratings were modestly but significantly higher on this scale than for other sources of support. Taken together, these results suggest that children may have viewed and responded to this scale somewhat differently than they did to the others. One contributing factor may have been the question presentation (i.e., children asked to identify an adult to whom they felt close), which may have biased their responses in favour of higher ratings. It is also possible that the nature of such relationships is somewhat distinct from other sources measured by the CASSS. For instance, Beam and colleagues (2002) have suggested that relationships with such adults are unique in simultaneously taking on aspects of peer relationships and aspects of parent relationships. Moreover, the specific role of the individual may matter, resulting in a scale that is not as unified as other sources. Although a comparison of support ratings based on the specific source identified was not significant within the current study, future research could explore possible variance in overall or specific types of perceived support based on whether the relationship is with a grandparent, other family member, family friend, or community member. Ultimately, further consideration of how to best measure and quantify perceived support from other adults may be needed to improve the quality and utility of this information.

Relationships between perceived social support and emotional well-being. More central to the topic of resilience, the second research question of this study explored the associations between perceived social support and various indicators of emotional well-being,

including internalizing symptoms of depression and anxiety as well as multiple facets of self-concept. Significant positive associations were found between total social support and all measures of self-concept, including global self-worth, self-reliance, and specific perceptions of scholastic competence and social acceptance ($r = .34$ to $.38$). A series of regressions further demonstrated that social support was able to account for 12 to 24% of the variability in these self-concept outcomes. As predicted, parent and classmate support were most broadly and strongly associated with self-esteem outcomes, consistent with findings from other populations (e.g., Demaray & Malecki, 2002b; Garnefsky & Diekstra, 1996; Rueger et al., 2010). Thus, results demonstrate a moderate and significant relationship between how children perceive themselves and how they perceive support from those around them. Of course, it should be noted that correlational data cannot indicate directionality, and it is possible that those with higher self-esteem may in turn perceive higher levels of support in their relationships. However, when taken within the context of previous studies demonstrating an influence of perceived social support on emotional well-being over time (e.g., Demaray et al., 2005; Dubow et al., 1991), the findings of this study suggest that perceived social support may play similar roles for children with ADHD.

Contrary to predictions, no associations were found between perceived social support and self- or parent-reported internalizing symptoms. Although such relationships have frequently been found in other samples, it should be noted that most of these studies have evaluated somewhat older children, and relationships when found have typically been smaller with these outcomes than with measures of self-concept (Chu et al., 2010; Demaray & Malecki, 2002a). It may be that at this young age, there is relatively little clinically-significant depression/anxiety, and thus the relationships between protective factors and such outcomes are not yet established.

In particular, mean ratings on these scales fell below or close to the normative means, suggesting that the elevated rates of these symptoms reported among ADHD populations are not yet present to a significant degree at this age. It was also interesting that self-reported depression, though showing expected associations with self-reported anxiety and parent-reported depression, showed no association with global self-worth. It is unclear why this association was not present within this sample. Again, it is possible that such a relationship may develop over time, with self-esteem (and thus factors that contribute to self-esteem) acting as a risk or protective factor for later symptoms of depression and/or anxiety.

   Source-specific considerations. Results of the correlational and regression analyses also highlighted the importance of differentiating between facets of self-concept and between sources of support in understanding their associations. The most prominent example of this came from examining the associations of perceived support from specific sources with self-reliance and global self-worth. Specifically, whereas global self-worth was predicted primarily by classmate support (with associations also with parent and close friend support), self-reliance was associated only with parent and other adult support. This finding is interesting in suggesting a distinction between notions of "I like myself" versus "I believe in myself", and in particular a distinction in the factors related to these facets of self-concept. As might be expected, liking and valuing oneself were related to feeling supported by the prominent sources in one's life, which for children are typically their parents and peers. In particular, the strong role of classmate support highlights the significant association between peer group functioning and self-concept among children. However, perceived support from adults may also have a unique relationship with one's sense of self-mastery or self-efficacy. This further suggests that replacing one weak source of support with support from a distinct source (e.g., compensating for low parent support by

building friend support) may not necessarily impact the same outcomes. That support can relate in different ways to these related but distinct aspects of self-concept is in line with the multiple proposed functions of social support (e.g., Cohen & Wills, 1985; House et al., 1988; Lakey & Cohen, 2000), such that perceived support can contribute to feelings of belongingness and worth but can also promote one's sense of capacity to cope or deal with stressors.

Notably, teacher support was associated only with social acceptance within this study, in contrast to findings that typically demonstrate a small but notable relationship between teacher support and academic outcomes such as academic self-concept. In fact, such correlations between teacher support and academic self-concept were also absent within the ADHD-characteristics sample of Demaray and Elliot (2001). It is possible that for children with ADHD, this same relationship does not apply given other more significant factors that may impact their academic self-perceptions. Finally, though it was expected that support from other adults would have somewhat weaker associations relative to more prominent sources, the overall lack of such relationships aside from a modest correlation with self-reliance was surprising. Some considerations regarding the measurement of this source of support have been described above that may have influenced its relations with other outcomes. In particular, it is possible that the variability in roles captured by this scale (e.g., grandparents, coaches, family friends) masked possible associations of such support with specific outcomes. Despite the limited findings for this scale within the current study, further exploration of a potential role for other supportive adults would be valuable given the frequently cited relationship difficulties between many children with ADHD and their parents, teachers, and peers.

Social support in the context of low or high social preference. The final research question of this study explored the role of perceived social support within the context of lower or

higher social preference. Although a number of studies have explored social support within the context of peer victimization, social preference and/or peer rejection have not been investigated as risk factors within such a framework. Moreover, this type of exploration has been absent with ADHD populations specifically. First, it is notable that many of the children in this sample were rated by their parents as showing relatively high social preference and thus experiencing little to no peer rejection. In fact, the majority of those in the lower social preference group still fell at or above 0 on the scale, indicating that these children were not seen by their parents as predominantly rejected. These findings are not consistent with the extent of peer rejection typically documented in other studies of children with ADHD, and it appears that this sample may reflect a subset of the ADHD population who are relatively better functioning. As a result, it is possible that the restricted range of experiences further limited the power of analyses, and results must be discussed in the context of being more or less preferred rather than clearly rejected. That said, even without considerable rejection there remained significant differences across many of the well-being outcomes between those with higher and lower social preference, supporting the notion that even relatively lower social preference served as a risk factor within this sample. Interestingly, although children of lower and higher social preference (as rated by parents) differed in the expected direction in regards to their own ratings of social acceptance, they did not differ in their ratings of perceived social support, including that from classmates. This suggests that children within this study distinguished between their perceptions of peer acceptance and their perceptions of supportive peer relationships, paralleling the distinction between notions of social integration (quantity of relationships) and social support (quality of relationships) made in early social support literature (Cohen & Wills, 1985).

Results of the regression analyses demonstrated main effects for both social preference and total social support, together predicting 38% of the variance in emotional adjustment. Source-specific regressions further demonstrated similar findings when specifically evaluating parent, classmate, and close friend support. However, teacher and other adult support were not found to be significant individual predictors. While the second step of all regressions was significant, the non-significance of specific interaction effects and the lack of change in predictive value of the models indicate that a buffering effect was not detected within this study. Thus, social support was not *more* important in predicting emotional adjustment for those of lower social preference, but rather appeared to have a similar role for all children in the sample. It should be noted that given the smaller sample size and limited power, these results do not preclude a potential buffering effect that might be detected with a larger sample. Moreover, given the restricted range of social preference ratings, it is possible that a stress-buffering role of social support might be more likely in the context of more significant stressors, such as overt and predominant peer rejection. Alternatively, given the mixed findings in other studies evaluating main and stress-buffering models of support in children (e.g., Dubow & Tisak, 1989; Hoffman et al., 1988; Rigby, 2000; Tanigawa et al., 2011), it is also possible that there are developmental differences in the role and functions of perceived social support, leading to primarily main effects among children versus a stress-buffering role in adults. In any event, the lack of buffering effect found within this study does not negate the potential relevance of perceived social support in understanding resilience. Indeed, main effect models are commonly found and have clear relevance to models of resilience and their application (Masten, 2001), as will be discussed further below.

Additional Considerations for Interpretation of Results

     The positive illusory bias. As described previously, children with ADHD-C/HI have been found to over-rate their performance relative to objective measures or the ratings of others (Owens et al., 2007). Although the PIB was not directly investigated within this study, it warrants some consideration in interpretations given the reliance on self-reports. There are two places in which the PIB could conceivably play a role, each of which is discussed below: (1) ratings of perceived social support, and (2) ratings of self-reported outcomes.

     The primary variable of interest in this study, perceived social support, relied by necessity on self-ratings, and as such, a reasonable question might be whether the PIB could affect these ratings. First, it is notable that regardless of their accuracy (relative to what others might say), the presence of a PIB in such ratings may not matter, as research has demonstrated that it is the perceptions of support that matter more than actual supportive behaviours (Chu et al., 2010; Wethington & Kessler, 1986). In fact, from a theoretical standpoint, the benefits of social support have been argued to come largely from the feelings of belongingness, the perceptions that others view us positively and support us, and the reassurance that support is available if needed (Cohen & Wills, 1985). Thus, perceptions of support could be argued to be protective regardless of whether such support is in fact available to the degree reported. Second, it is notable that the PIB has been found primarily in regards to ratings of children's own behaviours, such as their competence in particular domains (e.g., academic, social; Hoza et al., 2002, 2004), or even their ratings of ADHD symptoms (Wiener et al., 2012). In contrast, children with ADHD have been found to accurately rate the behaviours of others (Evangelista, Owens, Golden, & Pelham, 2008), suggesting that they are not unaware of the actions of those around them. In regards to perceived social support, children are not being asked to rate their

own competence but rather to rate the availability of supportive behaviours from others. This distinction suggests, then, that a PIB effect may not be as likely or at least should not be assumed to be present.

Further support for this contention comes from the results of Demaray and Elliott's (2001) work, in which the authors had parents and teachers rate the support they provided using parallel items to the child's scale (e.g., "I help my child when he/she needs me to"). Although a PIB effect in ratings was not directly evaluated, the relationship between adult and child ratings was found to be similar for both children with and without ADHD characteristics (i.e., moderate item-level agreement), suggesting no difference by ADHD status in how children made their ratings. Finally, the fact that both the current study and this previous study of perceived social support in ADHD found somewhat lower ratings of social support among ADHD samples (as would be predicted from their social functioning) further suggests that a PIB is not masking results of this measure.

A second issue is whether the PIB could impact the self-report outcomes evaluated within this study (e.g., measures of self-concept, internalizing problems), and if so, how this might impact interpretations. In this case, it may be more likely that a PIB is present, given that the SPPC rating scale specifically is where the PIB has most frequently been observed in other studies (e.g., Owens et al., 2007). However, without a matched comparison sample and parallel parent ratings, this cannot be established as certain. Of greater import is whether and how the PIB, if present, should impact interpretations. In fact, given the lack of consensus to date on whether the PIB should be considered protective or detrimental, this is difficult to establish. While there is some research suggesting a downside to the PIB specifically in regards to motivation for improvement and levels of aggression (Hoza et al., 2010), research has

consistently documented links between the presence of the PIB and lower internalizing symptoms both concurrently and longitudinally (Hoza et al., 2002, 2004; McQuade et al., 2011; Mikami & Hinshaw, 2006). Thus, while it may be that outcome measures in this study reflect positively biased ratings, it could be argued that with a focus on emotional well-being, whether the ratings of self-concept are over-rated relative to what others might rate or not may in fact have little relevance to the present study. Of course, as more is learned about the PIB and its effects over time and across domains, it is hoped that more clarity around such issues will be gained that can guide future work in regards to both methodologies and interpretations.

  Socioeconomic status of the sample. An additional note is warranted regarding the make-up of the sample for this study. Specifically, this sample was found to have a high and negatively skewed household income relative to the general population, suggesting that this sample represents an advantaged group that is likely not fully representative of the population of children with ADHD. While this type of biased sampling is not uncommon among research studies of this nature, it raises important caveats for the interpretation and generalizability of results. Socioeconomic status (SES) figures prominently within resilience models, with low SES acting as a significant risk factor for poor outcomes across domains and high SES frequently found to have protective benefits (Masten, 2001). The pathways between SES and outcomes are often complex and multifaceted, as socioeconomically disadvantaged families "often contend with multiple 'vulnerability factors,' experiencing substantive challenges to adaptation across diverse domains" (Luthar & Cicchetti, 2000, p. 873). In fact, of particular relevance, some research suggests that socioeconomic disadvantage may place children at risk for poor adjustment especially through its influence on family functioning and aspects of the parent-child relationship (Rutter, 2005).

In relation to perceived social support, increased rates of parental stress, domestic violence, and parental psychopathology associated with lower SES (Mash & Dozois, 2003) might suggest that SES is associated with lower perceived social support in children. However, several studies have not found such differences in perceived support between lower and higher SES groups (DuBois et al., 1994; Malecki & Demaray, 2006). Perhaps more important is the impact or role of perceived social support, as it could be argued to be particularly important for children of lower SES given the increased stress and negative life events likely to be faced by these children. Indeed, findings of Malecki and Demaray (2006) support an interactive role between perceived social support and SES, as the authors found that social support was a more salient predictor of academic achievement for children of low SES than it was for children of high SES. Dubois et al. (1994) also found that youth with socioeconomic disadvantage had a "greater potential to benefit from social support" specifically from school personnel relative to youth of higher SES (p. 511). Thus, the specific role and importance of perceived social support may vary based on other risks faced by the child, particularly a broadly influential factor such as SES. In the case of this study, the negative skew of SES among participants implies a possibility that stronger associations between social support and emotional well-being might have been detected in a sample with a more balanced SES distribution. Nonetheless, the presence of significant associations even within this higher SES sample does speak to the value of social support for children with ADHD.

Limitations

A number of limitations of this study are acknowledged and should be considered in the interpretations, conclusions, and implications that are drawn from results. First and foremost, the modest sample size (N = 55) of this study restricted the complexity and power of analyses that

could be conducted. Moreover, this sample was not fully representative of the population given the relatively high income levels and high number of two-parent families as well as the predominance of Caucasian participants. This was also evident in the relatively restricted range and higher levels of reported social preference within the sample. Given the extensive nature of participation as well as the emphasis on strengths and positive functioning in recruitment for this study, this most likely reflects a sample bias in which families and children who were functioning more successfully were over-selected. As noted above, it is possible that findings regarding the levels of support as well as the associations between support and emotional outcomes may have varied with a more balanced and representative sample. Next, ADHD-C and ADHD-HI subtypes were combined within this study. Although literature to date provides support combining these subtypes, limited subgroup comparisons were possible to confirm the similarity of these groups within the current study given the small number of ADHD-HI participants. Further research exploring social support between subtypes, including the more distinct ADHD-I subtype, could help to clarify any meaningful differences and their basis and implications. The sample size also limited the capacity to conduct more in-depth within-group comparisons based on other child characteristics, which might have helped to better understand factors that may influence perceptions of support and their associations with outcomes. For instance, several previous studies have suggested that sex differences may exist in regards to the importance and functions of particular sources of support (e.g., Davidson & Demaray, 2007; Rueger et al., 2008, 2010; Tanigawa et al., 2011). A more comprehensive investigation of potential moderating factors such as sex, SES, comorbidities, or family factors (e.g., composition, parent ADHD/psychopathology) will be an avenue worthy of further study within the ADHD population.

   This study also relied heavily on the use of rating scales. Rating scales can provide a valuable and efficient means to obtain information regarding perceptions and feelings that cannot be easily accessed through other methods. Nonetheless, rating scales can also be affected by personal characteristics of the rater (Smith, 2007). Moreover, the use of multiple ratings by the same individual can lead to over-inflation of associations due to shared variance in ratings. While some of this issue was unavoidable due to the self-perceived nature of constructs evaluated, it was hoped that teacher input would be available to further supplement and broaden the sources of information available. Unfortunately, the limited teacher feedback prohibited its inclusion at this stage. This was particularly noteworthy in regards to ratings of peer acceptance/rejection, as teachers may have a more accurate picture of the children's social status at school. Future work that includes teacher ratings or other techniques such as sociometric peer ratings will add further credibility to such findings.

   Additionally, no typical matched-comparison group was available at this time. This data would have been helpful to provide a more accurate baseline as to the levels of social support reported by those with ADHD within this study. A matched comparison group would have allowed for additional analyses evaluating potential differences in the associations between social support and outcomes across ADHD status. This will be a valuable area for future research, particularly in regards to evaluating the potential for interactions between perceived social support and ADHD status as a risk factor of itself in promoting well-being outcomes. Finally, as a cross-sectional study, findings cannot establish directionality or causality between the variables of interest. Longitudinal research that follows children into adolescence would be particularly valuable in determining whether perceived social support can predict later emotional well-being, particularly during a developmental period wherein internalizing problems may

become more prevalent. Ultimately, this study was designed to be an initial exploration into the relevance and potential protective role of perceived social support for children with ADHD, which, it is hoped, can spur further research exploring in greater depth the potential functions and influences it may have.

Implications and Future Directions

Results of the current study demonstrate clear associations between the perceptions of social support held by children with ADHD-C/HI and their valuations of self-esteem, including specific evaluations of their scholastic and social competence, their capacity to solve problems, and their overall sense of value and worth. Moreover, perceptions of support from parents, classmates, and close friends continued to predict emotional adjustment when considering the social preference status of these children. In relation to the theories of social support functions described previously, these results as a whole seem to be most in line with the social constructionist main effect model of social support (Harter, 1999; Lakey & Cohen, 2000; Shumaker & Brownell, 1984), wherein one's perceptions of support from valued others are proposed to contribute to the establishment and maintenance of self-esteem and self-identity. As a main effect model, this theory proposes that social support will hold such functions for all individuals and thus does not interact directly with particular risks. However, social support, through its influence on self-esteem, may serve to compensate for risks that can threaten the development or maintenance of positive self-perceptions. In fact, the finding that perceptions of classmate support and actual social preference contributed independently to outcomes also fits well with this model, as it highlights a quality-based characteristic of social relationships that is at least partially distinct from the quantity of relationships.

Within the context of resilience, Masten (2001) has argued that protective factors with main effects (i.e., beneficial for all individuals regardless of risk) can be valuable contributors to resilience models, in that they can combine in an additive manner to help to compensate for stressors that may threaten the outcome of interest. This perspective thus implies that it is through the accumulation of such protective factors (and the reduction of risks where possible) that children become more resilient in the face of stressors. Indeed, this approach may be particularly relevant to children with ADHD, who do not consistently face one specific stressor but may face a range of challenges over time and across broad domains of functioning (e.g., peer rejection, family conflict, parental psychopathology, frequent negative feedback/discipline, academic difficulties, etc.). With the multitude of risks that can accumulate for these children, it seems logical that enhancing the quantity and quality of protective factors would have beneficial impacts. Of note, these findings could also be argued to fit within one of Rutter's (1987) proposed mechanisms of resilience, in which he suggests that a protective factor (e.g., perceived social support) can promote resilience indirectly through enhancing coping resources, such as self-esteem. Thus, here self-esteem would be considered to be on the pathway to resilient outcomes rather than an outcome in and of itself. Evaluating the validity of such a mechanism would require more in-depth study using more complex mediation-moderation models and a longitudinal design. Further exploration into the associations of perceived social support with other outcomes (e.g., behavioural) and common risks faced by children with ADHD would also help to clarify the role and breadth of influence of social support for these children.

Although results are preliminary and cannot alone be used to imply directionality or causality, their fit with previous research as well as with theories of social support and resilience can be used to outline some preliminary avenues for application to practice. For instance, from a

strength-based assessment perspective, evaluating perceived social support may be a valuable inclusion within comprehensive assessments of ADHD. Specifically, whether through the use of established scales or more informal discussions, understanding children's perceptions of supportive relationships may contribute to case conceptualization in regards to risks for poor self-esteem. In turn, this approach may also provide insight into avenues for resilience-based intervention. The main effects of current findings suggest a potential benefit from enhancing the supportive qualities of parent, classmate, and close friend relationships for all children with ADHD, though this may be especially valuable for those children facing more significant threats to their emotional well-being or with already poor self-esteem. While support from other adult relationships was not found to have significant associations with outcomes within this study, further exploration of this source of support would be valuable to better understand how such individuals might play a positive role.

Of course, interventions promoting social support first require a clear understanding of how to enhance perceptions of social support, an area that has been understudied within the broader social support literature. Indeed, better understanding the factors that contribute to perceptions of social support will help to ensure that interventions are targeted most effectively, which may include increasing the number of relationships, promoting particular supportive actions and communications from individuals in the child's life, or working with the child to increase their awareness of the support available to them. Specific intervention-based research may also help to clarify the benefits and particular features of intervention approaches that might be most influential, as well as potential indirect avenues for strengthening perceived social support. For instance, several studies have identified associations between social skills and social support with both ADHD and typical populations (Demaray & Elliott, 2001; Demaray &

Malecki, 2002a). It is thus conceivable that interventions targeting social skills might indirectly increase perceptions of support through their benefits on peer and adult relationships. Similarly, investigating whether commonly-used parent-focused programs, such as parent behavioural management training or parent support groups, can improve children's perceptions of parent support would prove valuable. Further educating parents and teachers on key aspects of social support (e.g., types of support and how to communicate support effectively) might also help to direct their efforts.

Finally, the distinction between social preference/acceptance and perceptions of classmate support holds promise that there may be ways of improving particular aspects of peer relationships even if the magnitude of peer rejection cannot be fully addressed. Perhaps qualitative work that helps to identify how children made their judgments of social support from their classmates would help to clarify specific intervention approaches, such as trying to establish a smaller supportive peer group or encouraging more adult-directed peer interactions that intrinsically involve supportive actions among peers. While much remains to be done to fully elucidate how to best promote this potential protective factor, regularly evaluating and trying to nurture positive and supportive interactions of children with ADHD with their families and peers would certainly be a positive place to begin.

Final Conclusions

This study represents one of only a few existing investigations into resilience factors and processes within the at-risk population of children with ADHD. Although current findings must be considered exploratory given the study limitations, when taken together with similar findings among other populations, results provide initial support for the consideration of perceived social support within a strengths-based understanding of ADHD, particularly as it relates to self-

concept outcomes. More broadly, this study provides support for the value of considering and investigating resilience processes among children with ADHD. As has been so well demonstrated among other at-risk populations and certainly among children with ADHD, heterogeneity in trajectories is the rule, and there are many factors that can influence, positively or negatively, a child's outcomes. An increasing emphasis on understanding the risk and protective factors that are influential for children with ADHD, and the processes and contexts through which they function, will add richness to our understanding of these children that cannot be achieved within deficit-focused models.

It cannot be denied that ADHD is ultimately a lifelong disorder that brings with it increased risks and challenges across multiple domains of functioning. While addressing core symptoms through pharmacotherapy and/or behavioural management is certain to remain as one necessary component of intervention, extensive research to date has repeatedly demonstrated that this approach alone is not sufficient to ensure positive outcomes. As clinicians and researchers, our goal should extend beyond this approach to help these children become happy and successful and learn to cope effectively with the disorder and the added challenges that it may bring. This study represented only one small piece of what will be required to shift towards more strength-based perspectives within the ADHD field. A number of directions for future research have been identified to better understand the role of perceived social support for children with ADHD, and there are many more areas worthy of exploration with this population within the broader framework of resilience. Ultimately, it is hoped that through continuing and expanding research exploring the resilience processes at work among children with ADHD, the next generation of interventions will put equal emphasis on nurturing and enhancing the positive strengths and resources available to these children and families.

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Appendix A: Strengths in ADHD Recruitment Brochure

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!

Strengths in ADHD

UNIVERSITY OF CALGARY

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

Carlson Family Research Award in ADHD

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 Schwean
Emma Climie & Sarah Mastoras
Faculty of Education, University of Calgary

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

CONTACT US!
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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 B: Parent Questionnaire

Participant Questionnaire - parent
*** Please note: This page will be removed from the participant package and will not be kept with any other information***

Today's date: _____

Your Name: _____   Relationship to child: _____

Child's Name: _____   Child's birth date: _____

Gender: Male   Female

Current Grade: _____

Phone Number: _____   Email address: _____

Address: _____

_____

Postal Code: _____   Phone Number: _____

We would like to contact a teacher who knows your child to collect additional information. Please indicate the teacher that you would like us to contact:

Teacher Name: _____

School Name: _____

School Phone Number (if known): _____

Is this your child's current teacher or past teacher?   Current   Past

What grade does/did this teacher teach your child? _____

What subjects does/did this teacher teach your child? _____

Would you be willing to be contacted about opportunities for follow-up data collection? (please note that you would be provided with detailed information and have the opportunity to consent to any follow-up data collection prior to participation)

_____ Yes, please contact me about future opportunities for follow-up participation
_____ No, I would not like to be contacted about follow-up participation opportunities

FAMILY INFORMATION

Mother:

Biological Parent?   Yes   No   Step-parent?   Yes   No

Age: _____   Occupation: _____

Highest level of education (please circle):

Graduate degree   Undergraduate Degree   College Diploma   Some College/University

High School Diploma   Some high school   Less than high school

Other: _____

Father:

Biological Parent?   Yes   No   Step-parent?   Yes   No

Age: _____   Occupation: _____

Highest level of education (please circle):

Graduate degree   Undergraduate Degree   College Diploma   Some College/University

High School Diploma   Some high school   Less than high school

Other: _____

Does this child have other parents/stepparents?   Yes   No   If yes:

Name: _____   Relationship to child: _____

Name: _____   Relationship to child: _____

Please list all siblings, and any other individuals living in the home (e.g., aunt, grandparent):

Age: ____   Sex: _____   Relationship to child: _____Lives at home? Yes   No

Age: ____   Sex: _____   Relationship to child: _____Lives at home? Yes   No

Age: ____   Sex: _____   Relationship to child: _____Lives at home? Yes   No

Age: ____   Sex: _____   Relationship to child: _____Lives at home? Yes   No

Age: ____   Sex: _____   Relationship to child: _____Lives at home? Yes   No

Age: ____   Sex: _____   Relationship to child: _____Lives at home? Yes   No

Ethnicity: With which group(s) listed below does your child most identify? (circle)

Caucasian   Asian   African American   Aboriginal   East Indian

Other: _____

Please identify which is most accurate for your child:
a) Lives with both parents in one home
b) Lives with one parent full-time
c) Lives primarily with one parent but sees other parent
    How often does he/she see other parent? _____
d) Other (please describe): _____

How long has this living arrangement been in place? _____
Has the child ever experienced a separation, divorce, or death in the family?   Yes   No
If yes, please explain briefly: _____
Which best describes your current yearly household income (please circle)?
0-$25,000 $25,000-$50,000 $51,000-75,000 $76,000-$100,000 $100,000+

LANGUAGE

What language(s) do you speak at home? Please check all that apply.

_____   English
_____   French
_____   Other (please specify all others) _____

What language(s) is your child instructed at school? Do not count language classes (e.g., one French lesson per week). Please check all that apply.

_____   English
_____   French
_____   Other (please specify all others) _____

Would you consider your child to be fluently bilingual (trilingual etc)?   YES   NO

Is your child able to FLUENTLY:

	Speak	Understand	Read	Write
English				
French				
Other _____				
Other _____				

FAMILY HISTORY

Not including this child, has anyone in his/her immediate family (e.g., biological or
step/adoptive-parents and siblings) experienced:

ADHD   Yes   No   If yes, who? _____

Learning Disability   Yes   No   If yes, who? _____

Depression   Yes   No   If yes, who? _____

Anxiety   Yes   No   If yes, who? _____

Oppositional Defiant Disorder or Conduct Disorder

                                   Yes   No   If yes, who? _____

Alcoholism/Drug Abuse   Yes   No   If yes, who? _____

Autism Spectrum Disorder   Yes   No   If yes, who? _____

Are there any other significant mental health problems within your immediate family?

    Yes   No   If yes, please describe:

_____

CHILD PHYSICAL & MENTAL HEALTH HISTORY

Illnesses & Medications

Does your child currently suffer from any chronic medical conditions (e.g., asthma)?   Yes   No

    If yes, please list: _____

Is your child currently on any regular medication?   Yes   No

  (please describe, including name, dosage, frequency):   _____

    If yes, for what purpose was this medication prescribed? _____

    For how long have they been on this medication? _____

Mental Health

Has your child received an ADHD diagnosis?   Yes   No

    If yes, when? _____

    By whom?   Pediatrician/family doctor   Psychologist   Psychiatrist

        Other: _____

Has your child received any other mental health or learning diagnoses (e.g., learning disability,
anxiety, autism, oppositional defiant disorder)?   Yes   No

    If yes, please list: _____

    When? _____

    By whom?   Pediatrician/family doctor   Psychologist   Psychiatrist

        Other: _____

Has your ever child received a psychological/psychoeducational assessment?   Yes   No

       If yes, when? _____

       For what purpose? _____

Has your child ever had psychological counseling or therapy?   Yes   No

       If yes, when? _____

       For what purpose? _____

CURRENT FUNCTIONING

Does your child have a close and positive relationship with any non-parental adults? (e.g., grandparent, coach, teacher, etc.)   Yes   No

       If yes, who? _____

Friendships

Are there children in your child's class with whom he/she plays?   Yes   No

Are there children in the neighbourhood with whom this child could play? Yes   No

Does your child have a best friend? (do not include siblings)   Yes   No

About how many close friends does your child have?   None   1   2-3   4+

Outside of school hours, about how many times a week does your child spend time with friends?

       Less than 1   1-2   3+

Does your child report being teased by peers at school?   Yes   No

Has your child ever reported being bullied at school?   Yes   No

Do you believe your child bullies other children at school?   Yes   No

How well does this child:	Very Poorly	Poorly	Average	Well	Very Well	Not Applicable
Get along with other kids?						
Behave with his/her parents?						
Behave with his/her teacher?						
Get along with his/her siblings?						
Play alone?						
Complete chores alone?						
Complete school work alone?						

For each of the following, please rate the proportion of this child's peers that:

	Very few (less than 25%)	Some (between 25-50%)	About half (50%)	Many (between 50-75%)	Almost all (more than 75%)
Like or accept him/her					
Dislike or reject him/her					
Ignore him/her					

Recreation/Interests:

Does your child enjoy playing with other children?   Yes   No

Please list the activities your child most likes to take part in with others (e.g., soccer, video games, bike riding): _____

Does your child enjoy playing alone?   Yes   No

Please list your child's favourite solitary hobbies and activities (e.g., musical instrument, crafts, video games, reading): _____

Please list any organizations, clubs, teams, or groups your child belongs to, and for each, please indicate if this is a group or individual activity:

_____   Group   Individual

_____   Group   Individual

_____   Group   Individual

During the school year, approximately how many days per week are spent participating in extracurricular activities?   None   1-2   3-4   5+

EDUCATION

What grade is your child currently enrolled in?   _____

Has your child been retained a grade in school?   Yes   No

   If yes, when & why? _____

Has your child skipped a grade in school?   Yes   No

   If yes, when & why? _____

Has your child changed schools?   Yes   No

   If yes, when & why? _____

Does your child currently have an Individual Program Plan in place at school?   Yes   No

Does your child currently receive any special education services at his/her school? Yes   No

   If yes, what type of services (e.g., academic, social-emotional)?   _____

   _____

   Hours/week: _____

Does your child enjoy going to school?   Mostly/Always   Sometimes   Rarely/Never

What level of education do you hope your child will complete?

a) High school
b) Technical/Vocational School
c) University
d) Law/Medicine/Other advanced studies

Please rate your child's current academic performance:

	Significantly Below Grade Level	Somewhat Below Grade Level	At Grade Level	Somewhat Above Grade Level	Significantly Above Grade Level
Math					
Reading					
Writing					
Social Studies					
Science					
Art					
Phys Ed					
Overall					

COMMUNITY INVOLVEMENT

We are interested to know what involvement you and your family have had in the local community. Please indicate which of the following you have contacted/attended/worked with (check all that apply):

_____ Church groups/organizations

_____ School functions (family nights, concerts etc)

_____ Community recreation centers

_____ City/community sports programs (soccer, basketball, martial arts)

_____ City events (Stampede, Global Fest, New Years eve events)

_____ Other (please specify) _____

We are also interested in which of the following resources you have accessed regarding ADHD (please check all that apply):

    ____ Parent support groups (e.g., CHADD)
    ____ Parent training groups
    ____ Learning Disabilities Association groups
    ____ Social skills programs
    ____ ADHD clinic
    ____ Support from family doctor/paediatrician
    ____ Support from family members
    ____ Attend local conferences (e.g., LDAA conference, CHADD conference)
    ____ Other (please specify) _____

Please tell us what you see as your child's strengths:

ADHD MEDICATION FOLLOW-UP

Please only complete this section only if your child is currently or has previously been on medication to address symptoms of ADHD.

What medication is your child currently taking to address ADHD symptoms?

     Name of medication: _____

     Dosage: _____

     How many times per day? _____

Is your child taking his/her medication during these research sessions?   Yes   No

How long has your child been taking this medication?   _____ years, _____ months

Has your child been prescribed other ADHD medications in the past?   Yes   No

     If yes, which ones and when? _____

     _____

     Why did you stop these medications? _____

     _____

We are interested in how often and consistently your child takes medication. Please indicate which best fits your child's medication regime for each of the following options.

   During the school year, does your child take medication on:

<u>Week days</u>:	Always	Most of the time	Sometimes	Never
<u>Weekends</u>:	Always	Most of the time	Sometimes	Never

   During the summer, does your child take medication on:

<u>Week days</u>:	Always	Most of the time	Sometimes	Never
<u>Weekends</u>:	Always	Most of the time	Sometimes	Never

Appendix C: Child and Adolescent Social Support Scale: Other Adult Scale
(CASSS; adapted from Malecki, Demaray, & Elliott, 2000)

Items for adapted Other Adult Scale

Now think of another grown-up in your life that you feel close to, that is not your parents or teacher. For example, it might be a coach, neighbour, grandparent, or family friend.

Who are you thinking of? _____

E	I	A	I	Another Adult ...	Never	Almost Never	Some of the Time	Most of the Time	Almost Always	Always
				49. ... cares about me	1	2	3	4	5	6
				50. ... understands me	1	2	3	4	5	6
				51. ... listens to me when I need to talk	1	2	3	4	5	6
				52. ... gives me good advice	1	2	3	4	5	6
				53. ... helps me solve my problems by giving me information	1	2	3	4	5	6
				54. ... explains things that I don't understand	1	2	3	4	5	6
				55. ... tells me how well I do on tasks	1	2	3	4	5	6
				56. ... tells me I did a good job when I've done something well	1	2	3	4	5	6
				57. ... nicely tells me when I make mistakes	1	2	3	4	5	6
				58. ... takes time to help me decide things	1	2	3	4	5	6
				59. ... spends time with me when I need help	1	2	3	4	5	6
				60. ... makes sure I have the things I need	1	2	3	4	5	6

How Often?

Another Adult ...