

UNIVERSITY OF CALGARY

Summer Camp for Adolescents with Attention-Deficit/Hyperactivity Disorder:

A Naturalistic Context for Enhancing Social Competence

by

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### **Abstract**

Many adolescents with Attention-Deficit/Hyperactivity Disorder (ADHD) experience difficulties in social competence (Ros & Graziano, 2018). Social difficulties in adolescents with ADHD have been tied to poor long-term outcomes and are predictive of global impairment (Morris et al., 2020). Summer camp programs have been overlooked as an opportunity for social growth and development. Evidence suggests that specialized summer camp with social skills training may have positive outcomes on social competence development in adolescents with ADHD (Pelham et al., 2010; Sibley et al., 2011, 2012). The current study investigated changes in social competence of adolescents with ADHD within a specialized social skills summer camp for children and adolescents with ADHD. The present study included a sample of 60 adolescents with ADHD between the ages of 12 and 16 years old and 15 camp counsellors. The Social-Emotional Assets and Resiliency Scales- Adolescent (SEARS-A) and Parent (SEARS-P) report were used to measure social competence. Overall, the present study demonstrated that adolescents with ADHD have significantly lower social competence when compared to a normative sample of adolescents. The study also confirmed that adolescents with ADHD improve their social competence after attending a specialized summer camp as demonstrated by higher social competence scores at the end of camp. Finally, the current study found similar scores between counsellor ratings of adolescent's social competence and adolescent ratings of social competence. In conclusion, specialized summer camp programs may be an innovative, cost effective and generalizable method to support social competence growth in adolescents with ADHD.

*Keywords:* Attention-Deficit/Hyperactivity Disorder, social competence, summer camp, social skills training, adolescents

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### List of Abbreviations

AAP	American Academy of Pediatrics
ACA	American Camping Association
APA	American Psychiatric Association
ANOVA	Analysis of Variance
ADHD	Attention-Deficit/Hyperactivity Disorder
ADHD-C	Attention-Deficit/Hyperactivity Disorder- Predominantly Combined
ADHD-HI	Attention-Deficit/Hyperactivity Disorder- Predominantly Hyperactive Impulsive
ADHD-I	Attention-Deficit/Hyperactivity Disorder- Predominantly Inattentive
ASD	Autism Spectrum Disorder
CADDAC	Centre for ADHD Awareness Canada
CADDRA	Canadian ADHD Resource Alliance
CD	Conduct Disorder
CDCP	Center for Disease Control and Prevention
CFREB	Conjoint Faculties Research Ethics Board
CGI	Campers Growth Index
CPA	Canadian Psychological Association
CSCP	Canadian Summer Camp Project
DCD	Developmental Coordination Disorder
EF	Executive Functions
GAD	Generalized Anxiety Disorder
LD	Learning Disability
MTA	The Multimodal Treatment of Attention/Deficit-Hyperactivity Disorder
NICE	National Institute for Health and Care Excellence
NSCH	National Survey of Children's Health
OCA	Ontario Camp Association
OCD	Obsessive Compulsive Disorder
ODD	Oppositional Defiant Disorder
SEARS	Social Emotional Assets and Resilience Scales
SIP	Social Information Processing
SST	Social Skills Training
STP	Summer Treatment Program
ToM	Theory of Mind



## Chapter 1: Introduction

Adolescence (10-18 years of age) is a crucial transitional period for developing and maintaining social and emotional habits important for a person's wellbeing (WHO, 2019). In addition to the physical development that happens during this time, adolescents begin building their social identities and understanding of themselves in relation to their social world.

Adolescents become more autonomous from their parents, spend more time with peers and begin to have control over their decisions, actions, and emotions (Choudhury et al., 2006). Adolescence involves an increased complexity in social interactions as individuals navigate new social hierarchies and learn to negotiate, compromise, and resolve conflict with peers (Brown & Larson, 2009). While most adolescents can adapt well to the changing social climate, some adolescents can struggle with social competence. Social competence is the ability to understand another in a social interaction and to apply knowledge learned from previous experience to the changing social landscape (Semrud-Clikeman, 2007). Impairments in social competence persist across the lifespan and exacerbate the risk for negative long-term outcomes such as lower educational attainment, employment status, delinquency, and development of psychopathology (e.g., substance abuse, depression, anxiety; Mikami et al., 2017).

One population at-risk are those with Attention-Deficit/Hyperactivity Disorder (ADHD). Social skills impairments and poor interpersonal relationships are common in adolescents with ADHD, with 50% to 70% of adolescents experiencing peer relationship difficulties (Gardiner & Gerdes, 2015). These social challenges are typically attributed to the core symptoms of ADHD, namely severe, persistent, and developmentally inappropriate levels of inattention, hyperactivity, and/or impulsivity (DuPaul & Weyandt, 2006; Stormont, 2001). For these children, difficulties with inattention can limit opportunities to acquire social skills through observational learning

(Hoza, 2007) and to attend to social cues necessary for effective social interaction (Normand et al., 2013). Many adolescents with ADHD are disliked within minutes of an initial social interaction (Hoza, 2007) and then denied further opportunities to practice social skills, which, in part, leads to rejection and difficulty forming relationships (Hoza et al., 2005). As such, adolescents with ADHD are more likely to experience peer rejection, isolation, and peer victimization compared to typically developing peers (McQuade & Hoza, 2015). These findings stress the significant role that social competence plays in adolescents with ADHD's functioning and long-term adjustment. Upon consideration of the long-term consequences associated with impaired social competence, the identification of effective interventions to address the social challenges experienced by adolescents with ADHD is crucial.

There have been numerous evidence-based treatments to support social competence development in adolescents with ADHD. Recent reviews suggest that social skills training (SST) may be the best intervention to target social deficits in children and adolescents with ADHD as it teaches and reinforces prosocial skills (Hoza et al., 2007; Mikami et al., 2017). To date, SST has shown limited success in improving the social functioning of adolescents with ADHD (Morris et al., 2020). Research has suggested this is likely due to the gap between instruction and real-world experiences (Mikami et al., 2017). Most interventions are carried out in academic settings that limit opportunities to practice learned skills in naturalistic environments and receive immediate social feedback (Mikami et al., 2017).

The present study aimed to examine social competence development in adolescents with ADHD within the context of a specialized summer camp. Specialized summer camps may offer a supportive environment (Hoza et al., 2003) where adolescents with ADHD can develop new skills and build their social competence with peers who have similar challenges (Meltzer &

Rourke, 2005). Research regarding social competence development in specialized camps has been promising in children and adolescents in clinical samples (Chronis et al., 2004; Fabiano et al., 2007, 2014; MTA Cooperative Group, 1999; Pelham et al., 1998, 2000, 2005, 2010; Sibley et al., 2011, 2012); however, there is limited literature supporting specialized camp programs in community samples (O'Connor et al., 2014). It is important to determine whether social competence can develop within alternative contexts (e.g., specialized summer camp), so that practitioners can take an assertive lead in promoting evidence based psychosocial programs for adolescents with ADHD in generalizable community settings.

Within this paper, a discussion of ADHD and the associated social challenges are described. Following this review, social competence, and the theoretical frameworks under which social competence is examined are outlined, followed by an examination of the present interventions used to enhance social competence. Camp literature is then reviewed in detail and an overview of the present study including the specialized camp is discussed.

## Chapter 2: Literature Review

### Attention-Deficit/Hyperactivity Disorder

Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most common mental disorders of childhood with global prevalence rates estimated between 8%–12% (Luo et al., 2019). ADHD is a neurobiological disorder that is marked by developmental challenges with inattention, hyperactivity, and impulsivity that may cause significant impairment or interfere with daily functioning and development (American Psychiatric Association [APA], 2013). ADHD is often identified in school aged children and can be seen as excessive movement (e.g., fidgeting, motor activity, talking), lack of sustained attention, and thoughtless impulsive actions (APA, 2013). In addition, individuals with ADHD often have difficulties in executive, academic and social functioning as well as emotion regulation (Centre for ADHD Awareness Canada [CADDAC], 2020). Despite these challenges, many individuals with ADHD demonstrate positive adaptation in the face of significant adversity and with support are often extremely resilient (Climie et al., 2019).

**Etiology.** ADHD is a complex and heterogeneous disorder, with multifactorial etiological risk factors (Costa Dias et al., 2015). Although the factors contributing to ADHD are not fully understood, the development appears to involve combinations of genetic, neurological, and environmental factors (Bélanger et al., 2018; Storebø et al., 2019). Current research definitively supports a strong genetic contribution for ADHD development (Akutagava-Martins et al., 2013). Faraone et al. (2005) note that the risk of ADHD among children of parents with ADHD is increased by twofold to eightfold compared with the population rate. Twin studies showed that monozygotic twin pairs have much higher concordance rates for ADHD than dizygotic twins (Faraone & Larsson, 2019). Moreover, a meta-analysis of 20 pooled twin studies estimated an

average heritability of 76%, suggesting that ADHD has one of the strongest genetic influences in psychiatry (Chen et al., 2017). Lastly, molecular genetic association studies (Faraone & Larsson, 2019), linkage studies (Faraone & Mick, 2010) and meta-analyses (Klein et al., 2017) have identified several genes that could contribute to the onset of childhood ADHD.

Neurocognitive impairments are hypothesized to contribute to ADHD symptomatology (Kofler et al., 2019; Shaw et al., 2015; van Lieshout et al., 2017). Structural and functional brain abnormalities in the frontal lobe, thalamus and striatum, which support attention and cognitive processing are said to be involved in ADHD pathophysiology (Shaw et al., 2015). Nonetheless, neuroimaging and neuropsychological studies report inconsistent results (Luo et al., 2019).

Despite evidence of genetic and neurological contributions, environmental factors are said to contribute to the development of ADHD (Faraone & Larsson, 2019). Environmental risk factors include both prenatal and perinatal factors, such as substance use and smoking (Schwenke et al., 2018), low birthweight and prematurity (Thapar et al., 2013), maternal stress (Glover, 2014), air pollutants (Chang et al., 2018), exposure to toxins (Thapar et al., 2013), and traumatic brain injury (Adeyemo et al., 2014). In addition, lifestyle and psychosocial factors such as family adversity, parent/child conflict, low socioeconomic status, neglect, and nutritional factors have been found to contribute to ADHD (Pheula et al., 2011).

**Specifiers and Diagnostic Features.** *The Diagnostic and Statistical Manual of Mental Disorders*, 5th Edition (DSM-5; APA, 2013) delineates three presentations of ADHD: predominantly hyperactive/impulsive (ADHD-HI), predominately inattentive (ADHD-I), and ADHD combined (ADHD-C). ADHD-HI can be characterized by four behavioural components: positive urgency, lack of premeditation, lack of perseverance and sensation seeking (Mash & Barkley, 2014). ADHD-HI presents as overactivity, fidgetiness, an inability to remain seated,

interrupting other's activities, and difficulties waiting their turn (APA, 2013). ADHD- I describes impairments in inattention and disorganization; specifically, difficulty sustaining attention, inability to persist at tasks or play activities, challenges remembering and following through on rules and instructions, and resisting distractions. The symptoms seen in ADHD-HI and ADHD-I must be excessive or inappropriate for the child's age or developmental level (APA, 2013).

In order to receive a diagnosis of ADHD-HI, ADHD-I, or ADHD-C six or more symptoms must be present within that subtype for at least six months, there must be evidence that the symptoms impair social, academic or occupational functioning and that they have been present prior to 12 years of age (APA, 2013). Moreover, ADHD symptoms must occur across multiple settings (i.e., home, school, or extra curricular activities (APA, 2013). The degree of symptomatology may differ between individuals and severity ratings can be identified (i.e., mild, moderate, severe). Mild symptomatology presents as a few symptoms in excess of the diagnostic requirements and minor functional impairments; moderate symptomatology presents as impairments and symptoms slightly higher than mild, but less than severe, and lastly severe symptomatology presents as most, if not all, symptoms listed in the diagnostic criteria resulting in significant functional impairments (APA, 2013).

**Executive Function in Children with ADHD.** In addition to core ADHD symptoms, there is strong empirical evidence suggesting executive function (EF) impairments are often prominent in individuals with ADHD (Kofler et al., 2019). EF refers to multiple interrelated, higher-order cognitive processes that enable conscious goal-directed problem solving (Kofler et al., 2019; Tatar & Cansiz, 2020). Individuals with ADHD present with difficulties in the domains of attention and cognitive function, with primary deficits in EF including: activation (i.e.,

initiation, prioritization, organization, and planning), focus (i.e., sustained attention and shifting focus), effort (i.e., alertness, sustained effort, and processing speed), emotions (i.e., emotion regulation), memory (i.e., working memory), and action (i.e., inhibition, monitoring and self-regulation; Brown & Larson, 2009).

**Comorbidities.** Comorbidities in children and adolescents with ADHD are highly prevalent (Reale et al., 2017). Comorbidity refers to the presence of one or more additional conditions co-occurring with a primary condition (Jensen & Steinhausen, 2015). Epidemiological and clinical studies suggest that non-comorbid ADHD occurs in only 13–32.3% of cases, and that most individuals with ADHD have multiple comorbid disorders (Larson et al., 2011). The prevalence of additional psychiatric disorders or neurodevelopmental conditions are robust in children and adolescents with ADHD and increase its burden and complexity of management (Reale et al., 2017; Verkuyl et al., 2015). Results from the 2007 National Survey of Children's Health (NSCH; Blumberg et al., 2012) reported that the prevalence of comorbid psychiatric disorders concomitant with ADHD range between 40%–80%, with rates being higher in clinical populations (67%–87%) compared to those in the community. In a large population-based study of children aged 6 to 17 years in the United States, 8.2% of children had received a diagnosis of ADHD based on parental reports. Of the children diagnosed with ADHD, 33% had one comorbid disorder, 16% reported having two comorbid disorders and a stark 18% had three or more (Larson et al., 2011). The most prevalent comorbidities associated with ADHD are oppositional defiant disorder (ODD; 50–60%), autism spectrum disorder (ASD; 65–80%), learning disability (LD; 46%), conduct disorder (CD; 20–50%), anxiety (10–40%), tic disorder (20%), obsessive compulsive disorders (OCD; 6–15%), depression (14%), speech problems (11%), and sleep

disorders (70%; Larson et al., 2011; Reale et al., 2017). These comorbidities may exacerbate social difficulties seen in children and adolescents with ADHD.

According to the Centers for Disease Control and Prevention (CDCP; 2013) rates of comorbidity in ADHD are high within males who present with a greater number of ADHD symptoms compared to females. Males show higher rates of comorbid externalizing disruptive behaviours such as ODD, CD, substance use (10.3%) and reckless driving (47%; Anastopoulos et al., 2018; Mash & Barkley, 2014). Females with ADHD are more likely to develop internalizing disorders such as depression (43%), anxiety (39.5%), trauma related disorders (10.5%), stress related disorders (4.4%), binge eating (26–31%) and bulimia (35–37 %) (Anastopoulos et al., 2018; Svedlund et al., 2017). Individuals with comorbid diagnoses may have increased difficulties due to their increased psychopathology, necessitating treatment comprehensiveness for intervention in all impaired domains (Katzman et al., 2017).

**Development and Life Course.** ADHD emerges in childhood and can affect individuals across the lifespan. Due to the interplay of genetic, neurological, and environmental factors (Bélangier et al., 2018) contributing to the expression of ADHD, a developmental perspective has been presented to account for ADHD's diverse pathways (Park et al., 2014).

**Early Life.** ADHD typically begins in childhood (APA, 2013), and hyperactive-impulsive symptoms are first noticeable during preschool years (3–4 years of age) often emerging before inattentive symptoms that are seen in school aged children (5–10 years of age; Brennan et al., 2015). As such, there has been a movement towards diagnosing ADHD in preschoolers as a preventative approach (Davis et al., 2019). Research suggests behavioural markers of ADHD, such as extreme levels of temperament and regulatory disturbances (i.e., increased irritability, crying, hyperactivity, and sleep problems) can be seen in preschool children prior to beginning



formalized schooling (Arnett et al., 2013). Nevertheless, diagnosing preschool children has become a controversial subject and ethical concern due to common characteristics of ADHD, such as increased activity levels and poor inhibitory control, which are typical in healthy developing preschool children (Davis et al., 2019). As a result, prior to beginning elementary school, it is challenging to distinguish lasting symptoms of ADHD from developmental behaviour (Einziger et al., 2018). Einziger et al. (2018) note that the possibility of misdiagnosis due to normal developmental variation is cause for concern. Few studies exist regarding ADHD prevalence rates in preschoolers; however, it is suggested that among preschool children it ranges from 2%–7.9% (Egger et al., 2006; Pastor et al., 2015).

***School Years.*** ADHD is most often diagnosed during elementary school (APA, 2013) with most research focused on school-aged children (Herzhoff et al., 2013). Diagnoses are commonly made in school-aged children due to identification of behavioural, social, and/or academic difficulties (Cherkasova et al., 2013). These challenges are often seen by teachers in the form of impaired academic achievement, poor social functioning, or increased rates of psychiatric comorbidity (i.e., ODD, CD, anxiety; Barkley, 2006; Danielson et al., 2018). Children with hyperactive symptoms are often identified first due to disruptive and inappropriate behaviours at school (Barkley, 2006; Stewart et al., 2016). However, as academic curriculum levels increase, inattentive presentations become increasingly recognisable (APA, 2013).

ADHD symptoms may present differently over the course of development. It is suggested that children who experience hyperactive symptoms often present with excessive motor activity (i.e., running, climbing) in early childhood, whereas in later years symptoms of hyperactivity can be evidenced in the form of restlessness (APA, 2013; Ray et al., 2017). Children that experience inattentive symptoms may present with greater difficulties during their school years due to

increased demands (Cherkasova et al., 2013; Hart et al., 1995). Research suggests that inattentive symptoms appear to remain stable or decline over an individual's development (Leopold et al., 2019; Mash & Barkley, 2014).

***Adolescence and Adulthood.*** Persistence of ADHD into adolescence (10–18 years of age; American Academy of Pediatrics, [AAP], 2011) and adulthood has found multiple varying rates of prevalence, likely due to different report measures and diagnostic criteria used in multiple studies (Cherkasova et al., 2013). ADHD prevalence is reported to remain stable, with 70%–86% of children continuing to meet full criteria for ADHD in adolescence (Langley et al., 2010; van Lieshout et al., 2016). During adolescence, many individuals experience widespread effects of ADHD in all aspects of life- academic, emotional, behavioural, and psychosocial (Leopold et al., 2019). Adolescents with ADHD frequently demonstrate more academic problems, significant antisocial problems, and poor self-esteem with continued impulsivity, emotional immaturity, distractibility, and increased hyperactivity compared to typically developing peers (Humphreys et al., 2016). Imeraj et al. (2013) suggest academic difficulties that are common in ADHD become more prominent due to increased demands in work completion, need for sustained attention, organization, accuracy, persistence, and motivation on challenging tasks. Many adolescents are aware they are not performing comparably to their same aged peers, which may result in lack of confidence and lower self-esteem (Imeraj et al., 2013). Adolescents may disengage from school to avoid humiliation and failure which can further exacerbate their learning challenges. This disengagement can lead to high risk of dropout, school failure, academic underachievement, and occupational difficulties (Barkley et al., 2008; Fredriksen et al., 2014).

Social impairments are prevalent in individuals with ADHD (Kofler et al., 2019) and social challenges that develop in childhood often persist into adolescence (Wehmeier et al., 2010). Adolescents with ADHD who have social challenges often experience difficulties in the changing social dynamics from childhood to adolescence which can be seen in ineffective social interactions in face-to-face conversation (Mikami et al., 2015) or on social media platforms (Dawson et al., 2019). The lack of social skills required for this developmental period may manifest in impairment in peer relationships, including peer rejection, lack of dyadic friendships or romantic relationships and risk for peer victimization (Murray-Close et al., 2010). Emotionality, temper, and mood during adolescence can be labile (i.e., dysphoric to overexcited; Sobanski et al., 2010). Some adolescences with ADHD may have trouble experiencing pleasure, feel defeated from consistent negative feedback or engage in sensation seeking behaviours (e.g., drinking and driving, substance use, unprotected sex; Zhou et al., 2015). A prominent concern for adolescents with ADHD is the development of comorbid disorders (Danielson et al., 2018). Although children with ADHD experience high rates of comorbidity, adolescents with ADHD are equally as susceptible to serious psychiatric and emotional disorders (Larson et al., 2011; Reale et al., 2017).

ADHD is increasingly recognized as a lifespan disorder with evidence showing that ADHD does not ameliorate for many adults (Hesson & Fowler, 2018). It is suggested that, by adulthood, 15% of individuals who were diagnosed in childhood with ADHD still meet full criteria, with only 40%–60% in partial remission (Faraone et al., 2006; Hesson & Fowler, 2018). Moreover, Faraone et al. (2006) report the rate of persistent residual impairment such as unemployment or underemployment, economic problems, and relationship difficulties in adulthood is 65%. Adult outcomes are heterogenous and it is proposed that adults with ADHD

have poorer long-term outcomes in terms of occupational performance, relationship problems, traffic violations, car accidents, and psychiatric comorbidities than those without ADHD (Barkley et al., 2008; Hesson & Fowler, 2018).

**Social Challenges Among Children and Adolescents with ADHD.** Despite the majority of ADHD literature focusing on attentional, academic, and behavioural challenges, social impairment in adolescents with ADHD is recognized as a critical area of research (Bunford et al., 2018). Although social challenges are not considered diagnostic criteria for ADHD, many adolescents with ADHD often experience clinically significant and impairing social and interpersonal challenges (Tatar & Cansiz, 2020). Social problems have been reported in 52%–82% of children with ADHD by their parents and teachers (Staikova et al., 2013). Social impairment may be a consequence of the defining symptoms of ADHD, often beginning in childhood and remaining into the adolescent years (APA, 2013; Hoza, 2007). Difficulty sustaining attention may limit the encoding of a continuous conversation and make it challenging to respond appropriately (Bunford et al., 2018). Children and adolescents often respond inappropriately and are incapable of adjusting their behaviour to the changing social contexts (Climie et al., 2019). Adolescents with ADHD respond less frequently, are less organized in structured and unstructured conversation, are less likely to ask questions of their peers, are more intrusive in conversation, and make more demands (Kofler et al., 2011). Consequently, these behaviours receive negative reactions from peers and may lead to impairments in the formation and maintenance of peer relationships (Kofler et al., 2011). Moreover, restlessness, talking excessively or interrupting others can be irritating and reduce reciprocal conversation (Bunford et al., 2018). As a result of these symptoms, children and adolescents are often poorly tolerated by peers and disliked within minutes of a new social interaction (Hoza, 2007). In the Multimodal

Treatment of Children with ADHD study (MTA), results indicated that just over half (56%) of the participants with ADHD had no friends and 33% had just one friend, compared to 32% of comparison peers having no friends and 39% having one friend (Hoza et al., 2005; MTA Cooperative Group, 1999). Similar findings have emerged in adolescent populations (Gardiner & Gerdes, 2015). These results suggest that many adolescents with ADHD can form friendships; however, they are rated as less popular, less competent (Kofler et al., 2011), more likely to be designated as “non-friends”, and have fewer reciprocal friendships (Murray-Close et al., 2010; Normand et al., 2013).

In addition, adolescents with ADHD may exhibit high rates of aggressive and impulsive behaviours relative to typically developing peers (Bunford et al., 2018). According to McQuade and Hoza (2015), manifestations of ADHD such as poor emotion regulation and impulsivity may contribute to poor peer perceptions (i.e., disruptive, intrusive) of adolescents with ADHD. In turn, these behaviours can contribute to peer rejection, isolation, and peer victimization (McQuade & Hoza, 2015). Adolescents with ADHD are more likely to experience peer rejection than typically developing adolescents (Gardner & Gerdes, 2015). It is theorized that peer rejection limits social opportunities, which impairs the development of social skills, leading to further peer rejection (Murray-Close et al., 2010; Sayal et al., 2017). In the MTA studies, childhood peer rejection predicted greater cigarette smoking, delinquency, and anxiety in early adolescence and more global impairment in early and later adolescence (Mrug et al., 2012). Comparable to the findings on peer rejection, adolescents with ADHD experience victimization at higher rates and are more at risk for victimization than typically developing youth (Monopoli et al., 2020). Becker et al. (2017) suggest that the rate of victimization in adolescents with ADHD is between two to four times higher than in typically developing youth.

Overall, social challenges resulting in peer relationship difficulties, such as lack of friendship, peer rejection, and peer victimization, represent a significant domain of impairment in adolescents with ADHD. Further attention is needed to implement strategies to support these social challenges.

### **Social Competence**

**Definition of Social Competence.** Multiple definitions of social competence exist (Dodge, 1985; Rose Krasnor, 1997; Ruben & Rose Krasnor, 1992) and have differed in specificity and focus. However, social competence in its simplest form is defined as “effectiveness in interaction” (Rose Krasnor, 1997, p.119). Effectiveness is defined as “the result of organized behaviours that meet short- and long-term developmental needs” (Rose Krasnor, 1997, p.119). Humans live in a social world, and social learning is built through social interactions (Hartup, 1979). It is through interacting with others that children and adolescents understand their social context and develop skills that help them interact effectively within their environments (Hartup, 1979). A socially competent individual is someone who can make use of their environmental and personal resources to achieve positive outcomes (Iarocci et al., 2007). Housed within social competence are multiple constructs, including social cognition (i.e., the mental processes that are used to perceive and process social cues; Beauchamp & Anderson, 2010), social skills (i.e., cognitive and interpersonal abilities that are required for appropriate social behaviour and positive interactions; Semrud-Clikeman, 2007), emotional competence (i.e., reading and comprehending the emotions of others; Rose Krasnor, 1997), social validation (i.e., acceptance or rejection from peers; Hubbard & Coie, 1994), and friendship quality (i.e., initiation and maintenance of relationships; Bukowski et al., 1996). For the present study, social competence was defined as having effective social cognition and social skills to engage in

appropriate social interactions, feel comfortable and accepted by peers, and make and maintain reciprocal friendships (Merrell, 20011; Morris et al., 2020; Semrud-Clikeman, 2007). This definition was created based on a combination of social competence definitions (Hartup, 1979; Iarocci et al., 2007; Rose Krasnor, 1997; Waters & Sroufe, 1983). It was selected as it best captures the social skill modules being taught at camp (e.g., conversation skills, body language, social problem solving, friendship building, deescalating conflict) and the constructs underlying social competence within the SEARS measure (Merrell, 2011).

**Theoretical Frameworks of Social Competence.** Social competence impacts multiple areas of development and poor social competence is associated with academic, behavioural, and psychological problems across the lifespan (Vahedi et al., 2012). High social competence can help build the necessary skills in order to effectively communicate, initiate and maintain relationships (Hartup, 1979). Multiple theoretical models for social competence exist within the literature (Iarocci et al., 2007; Lochman & Wells, 2002); however, Dodge and colleagues (1986) social information-processing (SIP) model was selected as it has solidified itself as a leading theory in understanding the development of social competence within children and adolescents. Moreover, the model is relevant today as its validity is evidenced in thousands of studies (Ziv & Elizarov, 2020) and numerous authors have reconceptualized and expanded its framework (Beauchamp & Anderson, 2010; Lemerise & Arsenio, 2000; Lemerise & Dodge, 2000). As such, for ease of reading, this paper will focus on describing the SIP model only.

Dodge et al. (1986) proposed a SIP model for understanding social competence. The basis of SIP is that children's comprehension and interpretation of a social interaction influences how they will behave and respond (Crick & Dodge, 1994). Crick and Dodge (1994) suggest children rely on past experiences and biologically determined capabilities that they can access

and use during an interaction. The model represents the cognitive bases of social skills and it conceptualizes the function of social information in the brain in the context of an individual's response to social demands (i.e., social interactions; Dodge et al., 1986). The original model describes a cyclical relation between social behaviour and SIP (Dodge et al., 1986) and entailed four processing steps: (1) encoding of situational cues; (2) representation and interpretation of the cues; (3) mental search for possible solutions; and (4) selection of a response. Based on a reformulation of this model, Crick and Dodge (1994) distinguished six processing steps that occur in response to a social interaction. The steps include: (1) Encoding relevant stimuli (verbal and non verbal social cues or stimuli); (2) SIP (i.e., interpretation of the cues); (3) Social behaviours (i.e., motivation of the interaction); (4) Representation of the situation (i.e., comparison of situation to previous situations); (5) Generation and selection of responses (i.e., response based upon perception of situation); and (6) The response and success of response is evaluated (See Figure 1; Crick & Dodge, 1994). Effective processing of social information at each stage is necessary for socially appropriate interactions. Difficulty at any stage generally suggests challenges in understanding and successfully engaging with others (Crick & Dodge, 1994).

According to the proposed model, the child's behaviour in a particular social situation is hypothesized to occur as a function of the way the child understands the social cues within an interaction (Crick & Dodge, 1994). To engage in a social interaction appropriately, the individual must encode the social cues. Encoding may be automatic or effortful and involves attention, perception of cues, and emotional competence (i.e., accurate understanding of the emotional state using nonverbal cues including facial expressions, prosody, and gestures; Rose Krasnor, 1997). These social cues are then interpreted in an accurate and meaningful way. Interpreting the social



cues requires a set of “rules” learned throughout a child’s development and are multidimensional, complex, culture specific, and child specific (Dodge et al., 1986). Dodge et al. (1986) suggests that understanding the context (i.e., correctly reading the cues) is vital for social competence, as the individual’s response can only be deemed effective or ineffective and competent versus incompetent based on their knowledge of the situation.

Once the situation is interpreted, the child generates possible behavioural responses and evaluates the perceived efficacy and consequences of those responses. The child then responds with the optimal choice, requiring verbal and motor skills. It is assumed that this model of SIP occurs rapidly, on an unconscious level, and repeats itself. Social competence requires accurate perception of a social interaction including a peer’s motivation and without clear understanding it is challenging to respond in a socially appropriate manner (Crick & Dodge, 1994). In addition, within a conversation the respondent must also use the SIP model to encode the speaker’s verbal and nonverbal behaviour (i.e., social cues), interpret the cues and then respond appropriately (Dodge et al., 1986). Assessment of the child’s level of social competence is based on peers’ judgement (i.e., peers’ perceptions and/or liking of the child) after the social interaction.

From an intervention perspective, when social problems arise, the SIP model provides the opportunity to isolate the deficient processing stages, thus facilitating the targeting of specific social processing skills that may require intervention. Crick and Dodge (1994) suggest many of the SIP stages may be beyond the scope of a child; however, children will acquire these skills, as cerebral maturation and cognitive development progresses until adolescence, where social independence typically begins. Although this model is not developmental in nature, the SIP approach provides a framework to conceptualize the emergence of social skills through

childhood and adolescence and link this social development with related cognitive abilities (e.g., executive function; Beauchamp & Anderson, 2010; Crick & Dodge, 1994).

In addition to SIP, it is suggested that social competence is tied to emotional competence (Halberstadt et al., 2001). Emotional competence can be described as the ability to recognize, identify, and describe one's own and others' emotions (Telzer et al., 2014). Rose Krasnor's model of social competence (1997) includes social, emotional, and cognitive abilities, behaviours, and motivations that are primarily individual. The theory suggests that social experiences are intimately connected to emotional competence and that it is rare to have social competence present without appropriate emotional competence (Rose Krasnor, 1997). Social interactions are often defined as communication with underlying emotional components (Halberstadt et al., 2001). It requires understanding a person's internal emotional state as well as the emotional state of another person (Rose Krasnor, 1997). Reading and comprehending the emotional state of another requires accurate encoding of nonverbal cues including facial expressions, prosody, and gestures (Beauchamp & Anderson, 2010). Recognizing facial expressions and body language accurately allows a person to understand other's moods, react to the behaviour, and to adapt accordingly (Singh et al., 1998). Emotional competence contributes to both intrapersonal (e.g., an individual's overall well-being) and interpersonal (e.g., initiation and maintenance of important social relationships) well-being (Telzer et al., 2014). When social and emotional competence do not develop in unison, a child can often have difficulty with many aspects of the environment (Rose Krasnor, 1997). Indeed, poor emotional competence within childhood can create negative implications for adolescent's well-being, including poorer academic adjustment and initiation and maintenance of friendships (Telzer et al., 2014).

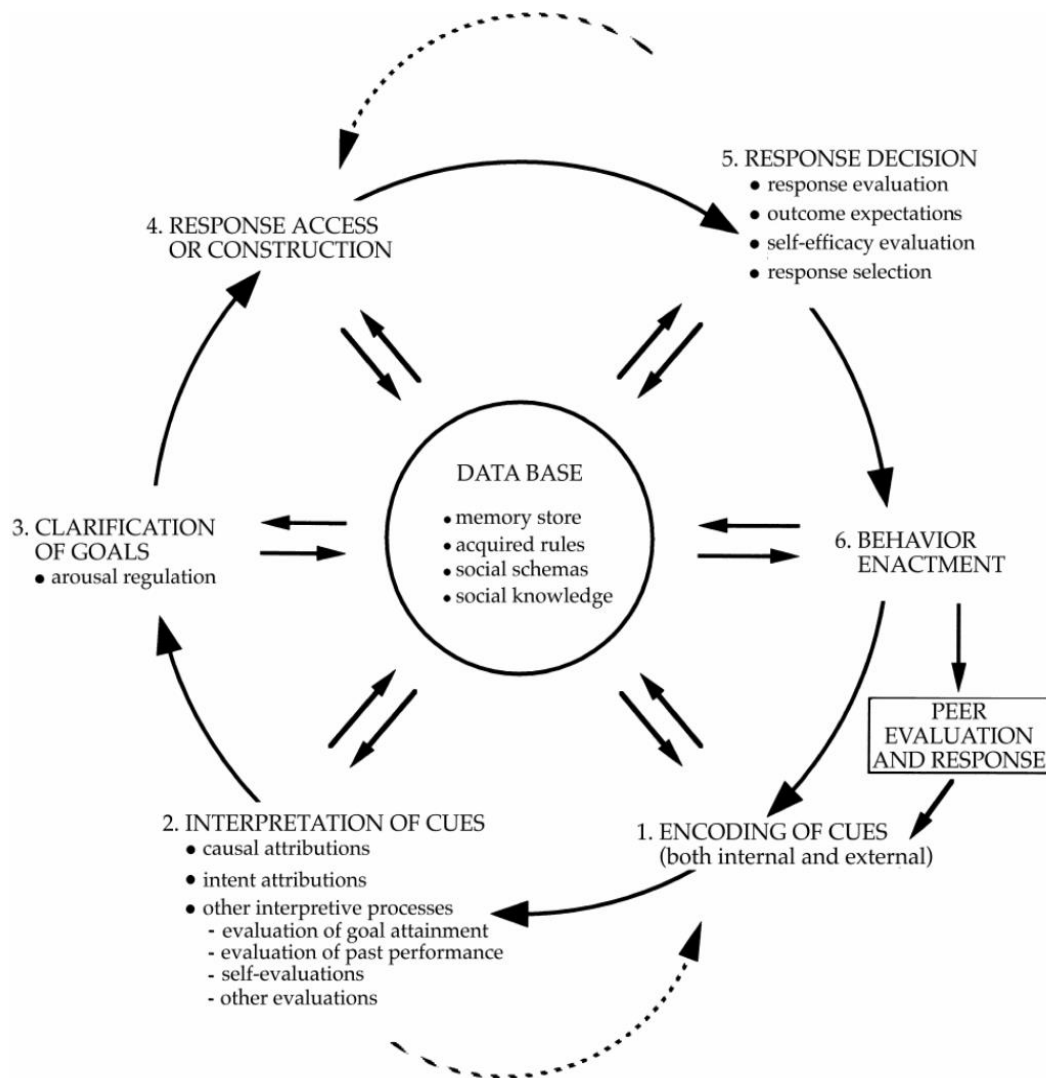


Figure 1. Crick and Dodge's social information processing model of children's social adjustment. Note: From "A review and reformulation of social-information processing mechanisms of children's social adjustment," by N. R. Crick & K. A. Dodge (1994), *Psychological Bulletin*, 115, p.74. Copyright 1994 by the American Psychological Association. Reprinted with permission.

**Development of Social Competence.** Social competence develops over time and plays a crucial role in a child's development (Piaget, 1932). Children begin to understand the world, interact socially, and access resources through sensory input (e.g., vision, hearing, and touch) to access what they need (Semrud-Clikeman, 2007). Newborns are sensitive to facial configuration

(e.g., straight heads, upright faces; Beauchamp & Anderson, 2010), begin to follow their parents gaze, adapt their behaviour dependent on parental response (positive or negative), and change emotion (i.e., cry) when not given what they want or need (Wellman et al., 2004). These primitive mechanisms are the foundations of a person's social development (Semrud-Clikeman, 2007). Crucial to the development of social communication is joint attention (Beauchamp & Anderson, 2010). Joint attention refers to the shared focus of two individuals in reference to an object or person and these early interactions support the development of social cognition where preschoolers begin to understand that others may have different thoughts or beliefs (i.e., Theory of Mind [ToM]; Beauchamp & Anderson, 2010; Uekermann et al., 2010). In preschool, children start to understand that emotions are internal, can be affected by others and communicated through language (Denham et al., 2004). Preschool (3-5 years of age) is often the first time that children must manage their emotions with people other than their family. They need to adapt to teacher or daycare provider expectations as well as interacting with peers which requires skills in sharing, emotion regulation and managing conflict (Bierman et al., 2008). It is suggested that once the child can manage his/her emotional response, the child can understand the emotion being experienced, analyze alternative behaviours, and recognize how others may respond (Saarni, 2011). Comprehension, management, and adaptation of emotions during the preschool years is an important aspect of socialization. A child who has difficulties adjusting their emotional reactions and responding to situations inappropriately may be rejected by peers (Nijimeijer et al., 2008). As children learn appropriate social responses, they begin to modulate their emotions and instances of intense emotional outbursts such as tantrums and crying decrease (Denham et al., 2004). Modulating emotions in different contexts is vital, as research suggests

social behaviours by preschoolers are predictive of behavioural responses in early and middle childhood (Denham et al., 2003, 2004; Diener & Kim, 2003).

During childhood (6-10 years of age), social development shifts from the family and peers become more important. Children's interactions with peers become multifaceted and can be attributed to the continued development to understand and value others' thoughts, intentions, and emotions (Izard, 2009; Rubin et al., 2011). The ability to regulate one's behaviours, feelings, and perceptions become foundational for friendships and peer acceptance (Wang et al., 2002). Social interactions continue to improve with age allowing for growth in shared meaning, achievement of social goals, and conflict resolution (Rubin et al., 2011). An important developmental ability learned in middle childhood is being able to solve conflict, negotiate solutions, compromise, or disengage (Joshi, 2008). Children who are unable to negotiate or disengage are generally less accepted by peers and show poorer social competence (Joshi, 2008). Development of social competence advances through multiple vital stages during childhood with new and sophisticated cognitive skills being learned through exposure to more social contexts and interactions (Beauchamp & Anderson, 2010). The emergence of these skills progress and continue to mature throughout childhood into adolescence. It is apparent that social competence learned and practiced in childhood impact's short- and long-term well-being and is typically a precondition for success in adolescence (Hall & Diperna, 2017).

Adolescence (10 to 18 years of age) is a major transitional period where in addition to social functioning, individuals undergo major developmental changes neurologically, physically, and cognitively (Hall & DiPerna, 2017). Adjustment to their new environment requires the acquisition of new skills and adaptation of established skills (Beauchamp & Anderson, 2010). During adolescence, peer relationships become more salient (Brown & Larson, 2009).

Adolescents seek a higher degree of autonomy and spend less time with their parents (van Rijsewijk et al., 2016). Brown and Larson (2009) suggest that the changing peer landscape in adolescence, in which new relationships and levels of peer interaction emerge, calls for a diverse set of social skills. As the social context changes, new types of relationships begin to emerge (i.e., romantic relationships) and a social hierarchy, based on reputation and popularity, becomes apparent (Brown & Larson, 2009). Adolescents must navigate this hierarchy, often aware of their status within this peer system and select friends, romantic partners, or friend groups based on their placement. Moreover, individuals identify and form appropriate friends and peer groups based on similarities (i.e., similar background, values, tastes) and interests they have in common (Brown & Larson, 2009). There is greater focus on validation from the peer group and adolescents can become more self-conscious about friends (Brown & Larson, 2009; Samter, 2003). The desire to belong and be accepted by peers is vital as it has been linked to healthy self-esteem as well as academic success (Hart et al., 2003). The validation of one's view of oneself that is received from positive peer social interactions provides a foundation for identity and self-esteem (Samter, 2003).

Establishing positive friendships requires perspective taking, emotion regulation, empathy, negative assertion (i.e., the ability to assert displeasure or stand up for oneself), and conflict resolution (i.e., the ability to work out disagreements and problem solve; Allen et al., 2014). Allen et al. (2014) suggest that social skills such as assertiveness, negotiating challenging and conflicting goals between peers, and demonstrating the capacity to think autonomously are vital and reduce the impact of negative peer influences (i.e., alcohol and drugs). Evidence suggests that adolescents with good social skills are better adjusted than those with poor social skills (Lodder et al., 2016). Social skill deficits may place adolescents at risk for poor academic,

social, and emotional outcomes in adulthood (Cheung et al., 2017). These findings underscore the importance of social skill development in adolescence for positive short- and long-term outcomes.

**Social Competence in Children with ADHD.** Social deficits are frequently reported in children with ADHD (Nijmeijer et al., 2008; Parke et al., 2018; Uekermann et al., 2010). Given the EF challenges in those with ADHD, social deficits can be seen in ineffective social cognition (i.e., encoding, correct interpretation of a social interaction; Uekermann et al., 2008) and socio-emotional processes (i.e., perception of emotion from facial recognition and prosody; Beauchamp & Anderson, 2010), contributing to poor social competence in this population (Uekermann et al., 2010). EFs allow an individual to attend to a social interaction, monitor his/her behaviour, and inhibit or modify behaviour according to contextual factors (Barkley & Russell, 2014). Children with ADHD have difficulty within these areas, often interrupting peers or not waiting their turn, which can result in negative peer responses and impact social interactions (Beauchamp & Anderson, 2010). Similarly, children with ADHD often have difficulty in self regulation (e.g., increased reactivity, intensity of response and response inhibition) which can impair social functioning (Barkley & Russell, 2014). For example, a child with ADHD-HI may be unable to inhibit a verbally or physically aggressive response toward a peer resulting in socially inappropriate behaviour. According to Crick and Dodge (1994), the SIP framework views self regulation as the crucial final step prior to giving a response in a social interaction. Deficient processing of any stage of the SIP model may occur in ADHD and lead to disruption of social cognition. In addition, the speed at which a child encodes and interprets a social interaction has been associated with social outcomes (Anderson, 2008). Children with ADHD may demonstrate slower cognitive processing, hindering their ability to follow a

changing conversation, keep up with the demands of the social interaction, and appropriately respond (Bora & Pantelis, 2016). Based on the SIP model (Crick & Dodge, 1994), children with ADHD show deficits in social cognition specifically encoding a social interaction and choosing appropriate responses (Matthys et al., 1999 in Uekermann et al., 2010).

A successful social interaction requires a child's recognition of emotional expressions and ToM to understand and predict other's behaviour (Bora & Pantelis, 2016; Uekermann et al., 2010). Children with ADHD may demonstrate impairments in perception (e.g., face, emotion, or mental states; Bora & Pantelis, 2016). Evidence suggests that ADHD symptoms affect learning of non-social information and can interfere with adequate social emotional information processing (Parke et al., 2018). Children with ADHD may struggle to recognize peers affect and have poor facial recognition (Ibáñez et al., 2011). In a meta analysis by Bora and Pantelis (2016), the most severe deficits in facial recognition were in anger and fear. Parents of children with ADHD indicated that their child demonstrated lack of knowledge of the emotions of their peers (Mikami et al., 2010).

Children with ADHD have difficulty decoding subtle differences in prosody (e.g., pitch, loudness, intensity, intonation) which puts them at a disadvantage given it's importance for communicating emotion, emphasis, clarification, and contradiction of word meaning (Rapport et al., 2002). Furthermore, many children with ADHD have difficulty with pragmatic language (i.e., the social use of language) and are unable to detect the underlying meaning in a conversation (e.g., irony, sarcasm) resulting an inappropriate responses or a breach of social rules, often leading to poor social performance and negative peer reactions (Staikova et al., 2013).



Overall, social functioning becomes a challenge when high emotional reactivity as seen in children with ADHD interferes with their ability to encode a social interaction, interpret the interaction correctly, and react appropriately. If a child consistently misreads verbal and nonverbal social cues within an interaction and responds incorrectly, it may become challenging to form relationships. Poor interaction patterns, low self regulation, disruptive, aggressive, or oppositional behaviour (Fernández et al., 2011; Pardos et al., 2009) in children with ADHD often results in peer rejection, social isolation, and fewer friends than those without ADHD (Aduen et al., 2018; de Boo & Prins, 2007; Hinshaw, 2002). Children with ADHD were found to be twice as likely as typically developing children to have no friends (Hoza et al., 2005). Of those who reported having friends, 56% of those friends did not consider these children to be their friends. When children report having friends, these relationships tend to be of lower quality and less stable than typically developing peers (Normand et al., 2011).

The ability to appropriately interact with other people is essential for personal development. Individuals with social-cognitive and socio-emotional deficits frequently make errors during social interactions. These deficits may impair the development of adequate communication, social, and occupational skills within adolescence and adulthood (Yuill & Lyon, 2007).

**Social Competence in Adolescents with ADHD.** Poor social competence in children with ADHD impacts the development of social competence within adolescents with ADHD (Gardiner & Gerdes, 2015). Although there is immense research on social competence of children with ADHD, there is limited literature on social competence within adolescents with ADHD (Bora & Pantelis, 2016). Nevertheless, the evidence available supports the contention that poor social competence remains prevalent in this population. Adolescents with ADHD are

rated less socially competent than adolescents without ADHD (Gardiner & Gerdes, 2015).

Adolescents with ADHD differed significantly from controls on parent, teacher, and self-report ratings of social competence, demonstrating significantly more social challenges compared to same-age controls (Sibley et al., 2012).

Social cognition and emotion regulation deficits contributing to poor social competence continue to be prevalent in adolescence (Gardiner & Gerdes, 2015). Sibley et al. (2010) found that poor attention in social interactions lead to poor encoding and interpretation of the interaction and misattributions about the behaviour and intentions of peers. Moreover, due to inadequate social problem solving and perspective taking skills, adolescents had difficulty generating appropriate and effective responses to peer interaction situations and performed poorly on tasks that assessed understanding of cause and effect in social situations. Parke et al. (2018) studied the relationship between social cognition and behavioural functioning in early adolescents (ages 11 to 13) with ADHD. Compared to the control group, adolescents with ADHD had more difficulty with cognitive components of social cognition in comparison to affective components, supporting the strong association between EF and cognitive aspects of social cognition (Uekermann et al., 2010). Adolescents continue to demonstrate inappropriate social behaviours with peers, such as impulsivity, intrusiveness, and hostility, and continue to lack appropriate social skills, such as cooperation and conflict resolution (Gardiner & Gerdes, 2015). The inappropriate social behaviours may result in an interaction style that is overbearing and aversive to peers (Hoza, 2007). Gardiner and Gerdes (2015) suggest poor attention to social feedback seen in adolescents with ADHD may lead to inaccurate interpretations of social success and failure.

Adolescents demonstrate impairments in emotion recognition (Ibáñez et al., 2011; Parke et al., 2018; Pelc et al., 2006) including facial recognition, prosody, and pragmatic language compared to typically developing peers (Hawkins et al., 2016; Staikova et al., 2013).

Adolescents with ADHD are less accurate at using contextual evidence to understand the emotions of others (Da Fonseca et al., 2009). It is suggested that experiencing heightened personal emotion as seen in adolescents with ADHD may interfere with the ability to recognize the emotions of others (Uekermann et al., 2010). These findings support the notion that adolescents with ADHD exhibit deficits in emotional recognition and processing that may influence social relationships (Da Fonseca et al., 2009).

Peer relationship difficulties, negative peer perceptions, and peer rejection often continue into adolescence and remain a significant source of impairment identified by parents and teachers (Mrug et al., 2012; Sibley et al., 2010). The core symptoms of ADHD make it more challenging for adolescents with ADHD to process accurate social cues to respond appropriately in a peer interaction (Sibley et al., 2010). Moreover, attentional challenges seen in adolescents with ADHD can make it difficult to develop social skills through observational learning (Hoza, 2007) and meet the socio-emotional demands of their friends (Normand et al., 2013). As a result, adolescents with ADHD are more likely to have friendships of lower quality, experience peer rejection, and peer victimization (Becker et al., 2017) than typically developing adolescents (Rokeach & Wiener, 2017). Studies suggest that peer rejection and victimization in adolescence may contribute to further negative outcomes, such as increased internalizing symptoms, which may impact future peer interactions (Monopoli et al., 2020; Mrug et al., 2012).

In summary, children and adolescents with ADHD experience intrusive social behaviours, socio-cognitive deficits, and emotion regulation difficulties. These challenges have

the potential to impact both short- and long-term consequences, such as peer rejection, internalizing problems, school dropout, and substance abuse. Given the multiple social deficits experienced by adolescents with ADHD and the severity and pervasiveness of the outcomes associated with social impairment, there is a crucial need for effective evidence-based treatments to improve social functioning in this population (Willis et al., 2019).

**Social Interventions for Children with ADHD.** There has been limited research investigating how best to support social competence in adolescents with ADHD. Empirically supported treatments for adolescents with ADHD include behaviour management, stimulant or non-stimulant medication, and social skills training (Evans et al., 2016; NICE, 2020; Sibley et al., 2014). Despite evidence of behavioural modification, medication or a combination of the two in reducing ADHD symptomatology within child samples, these supports fail to enhance prosocial behaviour (Abikoff et al., 2004; Hoza, 2005, MTA, 1999). Enhanced clinical practice guidelines have shifted to promoting behavioural, educational, and other therapeutic interventions to support children with ADHD socially (AAP, 2015; Evans et al., 2014; Moore et al., 2018). There is a desire toward effective social interventions that support social competence learning in children with ADHD (Hanston et al., 2012).

Given the high prevalence of children with ADHD reporting low social functioning and increasing awareness of the lasting effects that social competence can have on a child, SST programs have been designed to improve the social functioning of children with ADHD. SST is a well-established treatment for children with ADHD and is commonly used to address social impairment and to improve peer functioning (Willis et al., 2019). SST is a “psychological intervention focused upon the development or improvement of social interaction, social performance, or interpersonal skills” (Turner et al., 2017, p. 475). Horan et al. (2009) provide

SST supports social cognitive processes and social perception rather than changing neuropsychological variables such as memory, attention, or executive function. SST involves cognitions, emotions, and behaviours with varying foci on different aspects of social skills (Storebø, 2019). Storebø (2019) notes that the training generally incorporates problem solving, emotion regulation (i.e., coping skills), and verbal and nonverbal communication. Children may learn how to initiate conversations, recognise facial expressions of others, read subtle cues (i.e., verbal and nonverbal behaviour) in a conversation, and wait their turn to speak (Fohlmann, 2009). Moreover, Storebø (2019) provides SST teaches appropriate social norms, societal rules, and expectations within a social interaction. SST can be taught individually by a practitioner at a clinic or in a group format (Mikami et al., 2017). SST can be effective alone or in combination with medication (Mikami et al., 2017; Storebø, 2019; Turner et al., 2017).

Research on SST have found inconsistent results in efficacy (Willis et al., 2019). Despite promising results, SST when delivered in traditional clinical settings have been found to be ineffective for adolescents with ADHD, with meta analyses reporting no overall effect of SST compared to a no-SST intervention group (Evans et al., 2014; Mikami et al., 2017; Pelham & Fabiano, 2008). Mikami et al. (2017) suggest that the effectiveness of these programs have been mixed due to the lack of standardized administration, and lack of generalization to natural settings outside of the clinical setting resulting in limited maintenance of results. Specifically, a presumption of SST is that individuals will abstractly learn a skill with a clinician, recognize the current social interaction as similar to one they learned, think back to what they had learned to do in that situation, and then hopefully enact what was taught (Mikami et al., 2010). For an adolescent with ADHD, this process requires sustained attention and working memory that may be unrealistic (Mikami et al., 2010). Moreover, group-based SST are typically comprised of

adolescents who do not interact together outside of the group sessions and the skills are not reinforced across a range of settings (i.e., school, home, recreation) to allow for generalization (Corkum et al., 2010; DuPaul & Weyandt, 2006). School-based SST has been indicated as a promising setting to improve social skills of adolescents with ADHD as it can be implemented in an individual's school with his/her own peers and include teachers and parents (Corkum et al., 2010). Notwithstanding, school-based SST have multiple limitations. First, the interventions often focus on behaviour control, which rarely addresses social difficulties. Second, SST is often taught by overburdened teachers which raise feasibility and proper implementation concerns (DuPaul & Weyandt, 2006). Lastly, school-based SST may not adequately replicate the real-world social environments of adolescents (Morris et al., 2020). Morris and colleagues (2020) suggest that for generalization to occur, the context of interventions need to accurately mimic real-world interactions.

Nonetheless, evidence from systematic reviews have concluded that SST can be an efficacious treatment for social impairment in children and adolescents with ADHD when the intervention delivery is standardized, uses non aversive methods, and is generalizable to naturalistic settings (de Boo & Prins, 2007; Fabiano et al., 2009; Gardner & Gerdes, 2015; Mikami et al., 2014, 2017). Methods that have elicited positive results when teaching SST modules are brief didactic instruction, behavioural modelling, role playing, and behavioural rehearsal (Mikami et al., 2014, 2017). Often these methods include examples of common problem situations with different individuals (e.g., parents, siblings, friends, teachers) across multiple settings which promote the acquisition, generalization, and reinforcement of the social skills being taught. Parents are often informed on what social skills their child is learning but are not typically involved in supporting the treatment by implementing the skills at home. It is

suggested that having parents and teachers involved in the social skills intervention may improve SST efficacy in adolescents with ADHD (Mikami et al., 2010, 2014).

In addition, modifications to the traditional techniques used in SST have been suggested to enhance the efficacy of SST within this population (Mikami et al., 2017). Mikami and colleagues (2017) suggest incorporating multiple and consistent reminders to adolescents in vivo (i.e., during real world social interactions) with peers is more advantageous than receiving feedback in a session and having to transfer the knowledge to a later time. Feedback given during a social interaction provides adolescents with ADHD the opportunity to adjust their behaviour and adapt in the present moment. Furthermore, traditional SST has been taught by practitioners; however, using peers as social skill coaches has been proposed as an effective method to improve SST outcomes (Mikami et al., 2017). Peer coaching encourages appropriate social behaviours in real world contexts using peers who can be embedded in the social environment to reinforce skills (Vilardo et al., 2013). Moreover, adolescents with ADHD may be more likely to listen to their peers than to an adult (e.g., parents or teachers). SST programs that have incorporated peer coaching have increased receptiveness to the intervention and feedback as well as reduced stigma about ADHD (Mikami et al., 2010, 2017; Vilardo et al., 2013). Fox et al. (2020) conducted a systematic review and found evidence supporting the use of social skills interventions for children with ADHD that incorporate peers both with and without ADHD to increase play skills, reduce undesirable social behaviours, and improve communication and social participation. Additionally, 15 studies demonstrated statistically significant improvements after implementation of a social skills intervention and promotion of interactions with peers (Fox et al., 2020).

Overall, traditional SST, as provided in clinical settings, has been found to demonstrate inconsistent results. Nonetheless, SST has been found to be efficacious in improving social functioning in adolescents with ADHD under some conditions (Mikami et al., 2017). Moreover, effective modifications to SST, such as administering SST in a natural setting, using peer coaching to support, and providing feedback in vivo may increase the likelihood that these skills will be practiced, reinforced, and maintained (DuPaul & Weyandt, 2006; Fabiano et al., 2014; Mikami et al., 2017; Pelham et al., 2014).

### **Summer Camp**

For over 150 years, summer camp has been an influential place for learning and outdoor education in the lives of children and adolescents (Thurber et al., 2007). The American Camping Association (ACA, n.d.) estimates that 10 to 12 million individuals attend summer camp yearly in the United States. In Canada, summer camps have become a significant part of children's lives (Ontario Camps Association, n.d.) with approximately 7.5% of Canadian families sending their children to overnight summer camp each year (Statistics Canada, 2007b). For the purpose of this research, camp is defined as a structured, outdoor group living experience, where trained staff guide children to accomplish intentional goals (Henderson et al., 2007). With social and developmental goal-oriented programming, experiences children and adolescents have at camp may provide foundational skills to support them in the future (Henderson et al., 2007).

**Camp as a Learning Context.** The role of camp as a context for learning has important implications today (ACA, 2020). Garst et al. (2011) suggest that camp can foster motivation, skill development, and interest that can impact accomplishments later in life. Life skills facilitated at camp such as imagination, creativity, communication, leadership, collaboration, and problem solving are critical skills tied to non-cognitive measures (Garst et al., 2011). Camp



programming supports the development of non-cognitive skills as noted within camp research and are associated with over all positive outcomes for children and adolescents (Glover et al., 2011).

With a low counsellor-to-camper ratio (Michalski et al., 2003), camp programming involves activities planned by staff to optimally challenge participants with the aim of promoting emotional, social, and physical growth in campers (Ramsing, 2007). Meeting these challenges helps participants improve their self-esteem, sense of efficacy, social abilities, and life skills (Kelk, 1994). Programming includes physical activity (e.g., hiking and swimming), problem solving, skill building, social skill development, and spiritual growth (Ramsing, 2007). Researchers suggest that the camp setting demands more of its participants in the form of outdoor skills, planning, organizing, and completing camp tasks, which provides feelings of achievement and recognition (Thurber et al., 2007). Through functional camp tasks such as organizing meals for out trips, setting the dining hall for meals, cleaning the cabins, and leading evening campfire programs, campers learn self reliance, independence, resourcefulness, and responsibility (Brannan et al., 2000). Experiences at camp build positive self perceptions leading to increased self-esteem, feelings of personal adequacy and self worth, and growth in participants interpersonal skills (Garst et al., 2011; Glover et al., 2011).

**Camp Outcomes of Typical Developing Campers.** Since the establishment of organized summer camps, staff have recognized the potential for camps to be a positive environment for youth (ACA, 2019; Groves, 1981) and preliminary research has been promising. Researchers have examined the benefits of camp and uncovered positive outcomes on a variety of developmental dimensions (Bialeschki et al., 2002; Brannan et al., 2000; Chenery, 1991; Dworken, 1999). These dimensions include achievement, competence, community connections,

social skills, and social connections (Dworkin et al., 2003; Henderson et al., 2007; Thurber et al., 2007). Thurber et al. (2007) suggested that summer camps have promoted healthy development of young people through positive youth development. Positive youth development is the outcome of a combination of challenging opportunities and supportive relationships (Greenberg et al., 2003). Positive youth development takes a strengths-based approach and follows positive psychology principles (Thurber et al., 2007). It fosters the individual, social, and environmental characteristics such as positive identity, social competence, independence, and a willingness to try new things that promote healthy development. Moreover, camp promotes desirable behaviours such as manners, sportsmanship, and leadership (ACA 2005; Dimock & Hendry, 1929). Numerous researchers have documented positive findings on child development such as positive self concept (ACA, 2005), and healthy beliefs about effort and mastery (Treasure & Roberts, 1998). The ACA (1998) used camp directors to survey parents to understand the most important benefits of sending their youth (10-18 years old) to camp. Parents reported increased self confidence, self-esteem, new friendships, and getting along with others (ACA, 1998).

The first large scale national research project by the ACA (2005a, 2005b), *Youth Development Outcomes of the Camp Experience*, explored developmental outcomes of youth (8-14 years old) attending camp (Henderson et al., 2007). This study was foundational in confirming the belief that camp is a powerful growth experience for youth. Pre, post and follow up surveys were sent to over 5000 campers and their parents. Ten key outcomes were identified in four domains: (1) positive identity: self-esteem, independence; (2) social skills: leadership, friendship skills, social comfort and peer relationships; (3) physical and thinking skills: adventure/exploration; and (4) environmental awareness: positive values. Within the social skills domain, campers and parents reported significant increase in leadership and friendship skills

from pre to post. Six-month follow up surveys reported sustained growth in leadership suggesting campers found opportunities to show initiative at home, school, and in their communities (ACA, 2005). On social comfort, children reported no significant change from before camp to after camp; however, they did report significant increase in social comfort six months after camp ended. The increase in social comfort may be a delayed effect of social skills learned at camp. Similar to social comfort, children reported a decrease from the start of camp to after camp on peer relationships but reported a significant increase six months after camp. As peer relationships measure the camper's ability to keep friends after making them, the social skills learned at camp may have helped them sustain current relationships. Lastly, counsellors were asked to measure their perceptions of campers' social skills and results suggested statistically significant growth in the domain of social skills.

In addition, similar positive developmental outcomes appeared in research by Glover et al. (2011) and Thurber et al. (2007), who measured the degree of impact camp had on campers by rating camper growth before and after camp. Despite significant growth in all areas, 65% of campers experienced growth specific to social connections (Glover et al., 2011). In accordance, data from the Canadian Summer Camp Research Project ([CSCR], Glover et al., 2007) note that from pre to post camp over 65% of the youth in the study showed positive change in social connections and feelings of belonging. Furthermore, 67% of youth showed positive change in self-confidence and personal development (Glover et al., 2007). Lastly, The Youth Impact study (ACA, 2019) which conducted research on youth (15-21 years old) at a variety of camps within the United States and Canada found similar results on social development. Specifically, the most notable growth was associated with interpersonal outcomes such as relationship skills,

teamwork, empathy, compassion, and friendship, which made up 43% of the data and illustrates the strength of camp as a setting for social development (ACA, 2019).

In conclusion, summer camps provide a unique opportunity for building youth's social development. Much of the research assessing youth social competence in this setting has focused on the development of social skills and maintenance of friendships (Hanna, 1998; Parker & Seal, 1996). Outcomes of a typical camp experience highlight growth in intra- and interpersonal skills (e.g., communication skills and compassion), friendship, and confidence (Bialeschki et al., 2007; Henderson et al., 2007; Riley et al., 2017), which is vital for positive social interactions. These findings provide scientific evidence that experiences at camp can foster distinct change in vital areas for positive social development within a short time frame.

**Outcomes of Campers with Special Needs.** There has been a phenomenal growth in the number and variety of camp programs offered to children and youth (Kelk, 1994). A special area of interest within camp research is specialty camps or segregated "disorder-specific" camps. Specialized summer camps have been designed for multiple populations, including individuals with medical difficulties (e.g., Hunter et al., 2006; Kiernan et al., 2005), ADHD (e.g., Hantson et al., 2011; Pelham et al., 2000, 2010, 2014), developmental disabilities (e.g., Nimer, 2011), giftedness (e.g., Rinn, 2006), and LD (e.g., Michalski et al., 2003; Yssel et al., 2005). Specialized camps provide an opportunity for children with disorders or disabilities that would typically impede them from attending camp (due to physical, behavioural, or cognitive challenges) the opportunity to do so through specially designed facilities and qualified trained staff (Mishna et al., 2001). These camps are tailored to support and meet the youth and family's unique needs that a traditional camp is unable to deliver (Meltzer & Rourke, 2005). Specialized camps provide a supportive environment through scaffolding (Hoza et al., 2003) to support individual learning

needs and promote success (Mishna et al., 2001). As such, specialized camps may offer a unique environment where campers can develop new skills, increase their self-esteem (Mishna et al., 2001), and build social competence (Kronick, 1973). Moreover, a benefit of specialized camps is the ability to engage in social comparison with peers who have lived similar experiences (Meltzer & Rourke, 2005). In pediatric populations, attending specialty camps with peers who have similar diagnoses has been associated with more positive self perceptions and social interactions (Meltzer & Rourke, 2005; Odar et al., 2013). It is beyond the scope of this research to review camp literature for all specialized populations; however, a focused review on specialized camps for children and adolescents with ADHD follows.

**Camps for Children and Adolescents with ADHD.** For children and adolescents with ADHD, Michalski et al. (2003) note that a specialized summer camp may be a positive environment where campers can improve their social competence and self concept. Camps for youth with ADHD were primarily implemented as part of multimodal efficacy studies to reduce ADHD symptomatology (MTA Cooperative Group, 1999; Pelham et al., 1998, 2010). One summer program developed for youth with clinically significant behaviour challenges is the children's Summer Treatment Program (STP, Pelham et al., 1998). Pelham and colleagues (1998) STP is an 8-week intensive day treatment program conducted in a summer camp format for children and youth with ADHD (5-12 years of age). The STP uses SST alongside a token economy program to target social functioning and disruptive behaviour as well as group-based parent behavioural training sessions (Fabiano et al., 2014; Pelham et al., 1998). The STP meets the needs of families of children and youth with ADHD as it promotes generalization of learned skills in a multitude of settings (i.e., home, school, and recreation). The STP uses a combination of interventions aimed at improving children's peer relationships, interactions with adults, and

self efficacy (Wells et al., 2000). Despite its intensive treatment focus, it is structured to be an enjoyable experience from the individual's perspective, as it is conducted in a summer camp format (Wells et al., 2000). Within the STP, children and youth learn social skills modules and practice these skills with support of counsellors as groups rotate through recreational activities (i.e., sports, swimming). The STP was first conducted in 1980 and the program has been continuously developed and expanded over the past 40 years. The STP has been used as an intervention in over 20 locations (e.g., hospitals, clinics, schools, camps) worldwide (Pelham et al., 2014).

The STP was included as one of three psychosocial treatment modalities in the MTA study and demonstrated efficacy in reducing ADHD behavioural symptoms in children (Waschbusch et al., 2008). Numerous studies (Chronis et al., 2004; Fabiano et al., 2007, 2014; Pelham et al., 2000, 2005, 2010) that implemented the STP at various sites have also documented the STP's efficacy in improving the behavioural and social functioning of children (6-10 years of age) with ADHD. To address the utility of this program in an older population, a promising adolescent (11-16 years of age) version of the STP, STP-A (Sibley et al., 2011) was developed. Improvement ratings were obtained from parents, adolescents, STP-A counsellors, teachers, and clinical staff. Across raters, the STP-A showed improvements in 82.4%- 94.7% of adolescents in multiple domains of impairment (i.e., conduct problems, defiance, social functioning, inattention/disorganization, mood, and academic skills; Sibley et al., 2011). Moreover, improvements were present across home, school, and recreational settings. In a retrospective replication study of the STP-A's preliminary efficacy, Sibley et al. (2012) report similar results suggesting that 63.0% to 90.0% of adolescents improved across all target domains. Similarly, a therapeutic summer camp for children and youth (6-12 years of age) with

ADHD that provided social skills training, parent training and parent psycho-education sessions demonstrated improvements in campers ADHD symptoms, peer relations, social skills, self-esteem and over all functioning compared to a control group of campers (Hantson et al., 2011). In accordance, campers with ADHD who received intensive summer camp treatment, which included social skills training, attention training, and sports participation, in combination with medication, demonstrated improvements in neuropsychological functions, as compared to a control group (Gerber et al., 2011). Lastly, a modified social skills training program offered in a therapeutic summer camp versus a traditional social skills after school program for children (8-11 years of age) with ADHD found that children in the modified program demonstrated more improved understanding of emotions, perspective taking, and behaviour (Grizenko et al., 2000). Additionally, the improvements were maintained at nine months follow up.

To date, numerous camp programs have been described as beneficial for social competence; however, a disadvantage is that there is limited research on camp for youth with ADHD in community settings (Hantson et al., 2012). Almost all literature examining camp programs for children and adolescents with ADHD use clinical samples from hospitals or clinics. Specifically, the majority of camp programs for youth with ADHD have been part of hospital or clinic based intervention studies where participants are recruited from hospitals, have severe diagnoses of ADHD, and are often tracked by a psychiatrist or psychologist (Gerber et al., 2011; Grizenko et al., 2000; Hantson et al., 2011; MTA Cooperative Group, 1999; Pelham et al., 1998, 2000, 2010; Sibley et al., 2011, 2012). These intensive summer camp programs are often conducted in urban settings, are expensive, not covered by insurance, and require a moderate to severe diagnosis of ADHD, making accessibility to those in the community challenging (Pelham et al., 1999, 2010).

Currently in Canada, there are specialized summer camp programs for children with ADHD in community settings (CADDAC, 2020); however, limited research has been conducted on the outcomes of these programs other than parent satisfaction surveys (CAA, 2018). There is a major gap in the literature on camp programs within the community for ADHD children and adolescents with mild to moderate ADHD presentations. Due to the prevalence of children and adolescents with ADHD (approx. 6.1 million; Danielson et al., 2016) and the long-term consequences associated with impaired social functioning, the identification of the social benefits of camp in a community setting within this population is advantageous.

***Current Camp Setting.*** Camp Amicus is a specialized summer camp designed for children and adolescents with LD and ADHD but also accepts individuals with associated comorbidities. It is operated by Foothills Academy School, a designated special education private school for students in grades 3 to 12, all of whom have an LD diagnosis along with other possible comorbidities. This camp, while not explicitly therapeutic in nature, offers a traditional camp experience with the goal of supporting campers in teaching social skills, building self confidence, and self-esteem (Foothills Academy Society, 2018). Grounded in evidence-based, behavioural and social learning theories for children and adolescents with ADHD, the camp focus is on: (a) teaching and reinforcing social skills; (b) building peer relationships; and (c) increasing self-esteem (Foothills Academy Society, 2018). Camp staff foster social skills by facilitating campers' success in a variety of recreational activities and social interactions. With a 30-camper capacity per session, Camp Amicus functions in a 3:1 camper to counsellor ratio allowing each youth to have individualized attention that can help them grow in a safe and fun environment.



The camp has one-week overnight sessions for the month of August. Youth attend the program from Sunday morning to Friday afternoon. Youth are in groups of six similar-aged peers and are staffed by two counsellors. To promote intervention fidelity, staff members receive 120 hours of pre-service training. Counsellors were supervised by a camp director and camp managers. Supervisors provided daily feedback about adherence to the social skills protocol and inter-counsellor reliability.

Each day runs on a fixed schedule. A total of one hour was spent on social skill modules each day and a total of five key social skills were selected as the focus for the one-week period. The social skills include goal setting, friendship building, bullying, social problem solving, de-escalating conflicts, conversation skills, body language, and blowing off steam. Different social skills were chosen based on the needs of the group. Every morning campers participated in a one-hour social skills lesson. During the social skill lessons, the counsellors introduced the target social skill, and through a group brainstorming session discussed the goals, objectives, and the camper's general knowledge of the use of that particular social skill. The counsellors would then demonstrate, role play the use of the social skill, and have campers practice using the social skill with a partner and then together as a group. Counsellors encouraged positive social interactions throughout the activity, as the group worked to understand the new social skill and how to use it. The campers were able to not only witness their peers practising positive social interactions, but also learned to initiate positive social interactions. When appropriate, counsellors modeled acceptable and unacceptable social interactions and discussed tactics for dealing with particular circumstances (e.g., conflict). The counsellors praised the campers' efforts to strengthen their social self efficacy and social skills with the hopes of decreasing negative stressors associated with social situations. Moreover, praise was used as a tool to promote the practice of the new

skill throughout every camp activity during the day. Focus is maintained on practice of the social skills during all camp activities to apply the newly learned skills in-vivo to provide opportunity for practice, reinforcement, and generalization of the skills learned.

### **Current Study**

The present study aimed to explore social competence development in the context of a specialised, residential summer camp for adolescents with ADHD. Adolescents with ADHD display difficulties in social competence (Parke et al., 2018) and previous interventions aimed to foster these skills have demonstrated limited success (Corkum et al., 2010; Mikami et al., 2017). Friendships and social competence play a role in short- and long-term developmental outcomes and deficits place adolescents with ADHD at risk (Cheung et al., 2017). Given the challenges adolescents with ADHD have with social competence, it is crucial to identify contexts that promote positive development so that the skills learned within these contexts can be generalized to environments where adolescents struggle the most (e.g., school). SST that incorporates standardized administration, consistent feedback during in vivo interactions with peers as well as peers as coaches has been suggested as an efficacious intervention to improve the social functioning of adolescents with ADHD (Willis et al., 2019). Currently, the majority of research on SST for adolescents with ADHD have been conducted in clinical (i.e., hospital; MTA Cooperative Group, 1999; Pelham et al., 2000, 2010, 2014; Sibley et al., 2010, 2011) or school-based settings (Corkum et al., 2010; Mikami et al., 2017), resulting in poor generalization of skills to real life social interactions (de Boo & Prins, 2007; Mikami et al., 2017). Interventions in naturalistic settings may provide adolescents the opportunity to practice what they have learned in real world contexts and receive immediate social feedback (DuPaul & Weyandt, 2006).

A promising naturalistic setting to improve social competence is summer camp (ACA, 2019). Camp promotes emotional, social, and physical growth in campers through skill building activities that improves their sense of efficacy, and social abilities (Ramsing, 2007). Specialized summer camps provide a structured supportive environment where adolescents can experience success with those who have similar challenges to them (Mishna et al., 2001). Research on social competence growth at camp in specialized populations is promising, but limited (Allen et al., 2006; Hunter et al., 2006). Research on social competence growth using a summer camp model for adolescents with ADHD has only been conducted in clinical settings with severe ADHD populations (Hanston et al., 2012; Pelham et al., 2010, 2014; Sibley et al., 2010, 2011). Results from these studies have shown improvements in social competencies; however, the generalizability to community settings with mild to moderate ADHD populations is unknown. Despite the numerous specialized community camps for adolescents with ADHD in North America (ACA, 2019), limited research has been conducted on social outcomes. To date, there is a gap within the literature on social competence growth within community specialized summer camps for adolescents with ADHD. The present study intends to address the gaps in the literature relating to the efficacy of SST in a community setting and has practical implications in promoting novel evidence based social skills programs for adolescents with ADHD in Canada. The social impairment of these adolescents has the potential to lead to emotional distress and has been linked to negative short- and long-term outcomes including the development of comorbid disorders (Reale et al., 2017). Given the challenges in social competence for adolescents with ADHD, and effectiveness of camp in improving social competence within clinical settings the exploration of the benefits of camp for adolescents with ADHD in a community setting is warranted.

## Research Questions

To gain a better understanding of social competence in adolescents with ADHD and how a specialized summer camp program can support social competence development, the following research questions with specific hypotheses were posed:

**1. Is there a difference between adolescents with ADHD social competence as measured by the SEARS compared to the normed standardized sample?**

Social deficits are frequently reported in adolescents with ADHD (Parke et al., 2018; Uekermann et al., 2010). A number of studies have found deficits in social competence in individuals with ADHD (Bunford et al., 2018; Gardiner & Gerdes, 2015; Hoza, 2007; Kofler et al., 2011; McQuade & Hoza, 2015; Normand et al., 2013). Based on previous findings, it is hypothesized that adolescents with ADHD will demonstrate lower levels (i.e., at risk or high risk) of self-reported social competence when compared to adolescents in the normed standardized sample.

**2. What differences in social competence exist within the adolescents with ADHD from before to after participation in a summer camp?**

Based on current findings within camp literature for typically developing adolescents, adolescents improve in social competence specifically, social skills, social comfort, peer acceptance, and peer relationships after attending camp (ACA, 1998, 2005, 2019; Glover et al., 2007, 2011; Henderson et al., 2007; Thurber et al., 2007). Similarly, in specialized camps designed for multiple populations, campers improved in social interactions (Meltzer & Rourke, 2005; Odar et al., 2013). Lastly, within clinical specialized summer camps for adolescents with ADHD, campers improved their social competence from the start to the end of camp (Fabiano et al., 2007; Pelham et al., 2005, 2010; Sibley et al., 2011, 2012). As such, the current study

hypothesizes adolescents will demonstrate improvements in social competence from the start of camp to the end of camp.

**3. Is there a difference between ADHD adolescents' ratings of their social competence and counsellors' ratings of campers' social competence?**

Many camp studies have used multi raters such as camp directors, counsellors, or parents to supplement self report ratings of growth over the camp session. Findings have shown that ratings are similar between counsellor's report of campers' social competence and campers' ratings of their social competence at the end of camp (ACA, 2005, 2019; Glover et al., 2007, 2011; Henderson et al., 2007). Furthermore, within the STP-A, counsellors reported similar ratings of social competence to adolescent self report over the camp period (Sibley et al., 2011, 2012). For the current study, it is hypothesized that there will be no difference in counsellors' ratings of adolescents' social competence compared to adolescents' ratings of their social competence.

### Chapter 3: Methodology

This study was part of a larger project investigating self-esteem and social competence in children and adolescents with ADHD after attending a specialized summer camp. Only details relevant to the present study are discussed.

#### Participants

A total of 60 adolescents with ADHD (53 males, 28 females), and 15 counsellors participated in the study. Campers ranged in age from 12 to 16 years ( $M=13.35$ ,  $SD=1.32$ ). Further demographic information is provided in Table 1. All campers met Foothills Academy's intake criteria for a primary diagnosis of ADHD by a registered psychologist or psychiatrist prior to participation in the study, as well as an average or above IQ (Foothills Academy Society, 2020).

**Participant Recruitment.** Adolescents and their caregivers were recruited with an initial letter of contact distributed through email by Foothills to families registered in a one-week session of the overnight camp. Interested parents were asked to call or speak to the research staff and review study expectations as well as inclusion criteria to determine eligibility. Parents were asked to provide consent for their adolescent to participate in the study. Parent consent and adolescent consent forms were included in the Foothills Camp Amicus camp package. Parents were asked to bring this package on the first day of camp. Additionally, camp counsellors were asked to consent to participate and complete questionnaires for each of the participating adolescents who were under their direct supervision.

**Inclusion Criteria.** Children were required to meet several specific criteria to be eligible to participate in the study. Specifically, inclusionary criteria for children were:

1. Participants must be between the ages of 12 and 16 years of age and had previously received a diagnosis of ADHD from a psychologist, psychiatrist, or medical doctor.
2. Participants had to be attending a one-week session of the overnight camp.
3. Participants must not have any indication or previous diagnosis of Autism Spectrum Disorder, psychosis, epilepsy, or significant gross neurological impairments.
4. All participants were required to be able to fluently speak, write, and read English.
5. All participants were required to have an average or above average IQ score to ensure comprehension of questions.

Table 1. *Demographic Information*

Variable	Category	Adolescents			
		<i>n</i>	%	<i>M</i>	<i>SD</i>
Age		---	---	13.35	1.32
Gender	Male	39	65.0	---	---
	Female	21	35.0	---	---
Ethnicity	Canadian	51	85.0	---	---
	Southeast Asian	2	3.3	---	---
	Middle Eastern	1	1.7	---	---
	Hispanic	3	5.0	---	---
	European	3	5.0	---	---
Language	English	49	81.7	---	---
	English + Second language	11	18.3	---	---
Additional Diagnoses	Learning Disability (Non-Specified)	11	18.3	---	---
	Learning Disability (Math)	1	1.7	---	---
	Learning Disability (Writing)	2	3.3	---	---
	GAD	5	8.3	---	---
	Social Anxiety	1	1.7	---	---
	Obsessive Compulsive Disorder	1	1.7	---	---
	Depression	1	1.7	---	---
	Developmental Co-Ordination Disorder	4	6.7	---	---
	Communication Disorder	1	1.7	---	---
Medication	On Medication	29	48.3	---	---
Attendance	First Year	9	15.0	---	---
	Previously Attended	51	85.0	---	---

## Measures

Children completed a self evaluative standardized assessment measure and demographic questionnaire. Camp counsellors completed a standardized assessment measure of their campers.

**Camp Amicus Post Survey- Adolescent.** The Camp Amicus adolescent post questionnaire was used to collect demographic information (i.e., gender, age, ethnicity, and diagnosis), previous camp attendance and camper satisfaction ratings for Foothills Academy Camp Amicus.

**Social Emotional Assets and Resilience Scales.** (SEARS; Merrell, 2011). The SEARS questionnaire is strength-based measure that assesses social emotional competencies of children and adolescents from 5 to 18 years of age. The SEARS is a cross-informant measure and includes four rating forms: the SEARS-C (Child self report; ages 8 to 12 years), SEARS-A (Adolescent self report; ages 13 to 18 years), SEARS-P (Parent report) and SEARS-T (Teacher report). The SEARS assessment forms are designed to measure adolescent strengths from the perspective of each informant. The SEARS rating system measures social-emotional skills and assets with four empirically derived subscales: Self regulation (SR), Responsibility (R), Social competence (SC) and Empathy (E). The rating forms are brief, ranging from 35 to 41 items and gives a global construct of social resiliency score as well as each of the individual construct scores. Participants are asked to rate statements according to a 4-point Likert- scale ranging from 0=Never, 1=Sometimes, 2=Often, and 3=Always. Higher ratings are indicative of greater perceived competence. The SEARS rating system was chosen for its multi-informant, strengths-based focus, ease of administration, modest amount of subscale items, short completion time, and comprehensible score interpretation (Merrell, 2011).



For the current project, the SEARS-A and SEARS-P forms were used. The current study included numerous participants 12 years of age (33%). To increase the power within our sample, 12-year-old participants were scored with 13-year-old norms as delineated by age cut-offs on the SEARS-A. The SEARS-A rating forms have several items in common with the SEARS-C that reflect a youth's social emotional insight and self report perspectives that are not specific to age or developmental range (Merrell, 2011). The 10 social competence items from each form were used to measure the camper's social competence. Social competence on the SEARS is defined as "the measure of an adolescent's perspective of his or her ability to maintain friendships with peers, engage in effective verbal communication, and feel comfortable around groups of peers" (Merrell, 2008, p. 4). The SEARS-A social competence items include statements such as, "I am comfortable talking to lots of different people," "Other kids ask me to hang out with them," and "I make friends easily". To obtain the most accurate description of the child's social functioning in the context of camp, the SEARS-P was used with the counsellors. The SEARS-P is not limited to an academic context, unlike the SEARS-T. The SEARS-P social competence items include, "Other people like him/her", "People think she/he is fun to be around", "Is good at starting conversations" and "Is comfortable being in large groups".

Scoring the SEARS involves two steps, first interpreting the *T*-scores and percentiles based on a normative sample and second interpreting the score level based on their placement within a three-tiered model. The SEARS has three possible score levels: Tier one: Average to high functioning; Tier two: At risk, and Tier three: High risk. Tier one scores fall within the 21<sup>st</sup> to the 99<sup>th</sup> percentile with approximately 80% of individuals scoring in this range.

Internal consistency, a measure of the stability or consistency of scores within a measure, demonstrated strong internal consistency reliability for the social competence construct on both

the SEARS A ( $r = .85$ ) and P ( $r = .89$ ). Test retest reliability, a measure of stability of scores over time, was reported at two weeks as very strong, SEARS-A ( $r = .88$ ), SEARS-P ( $r = .89$ ), suggesting they are within the superior range (Merrell, 2008, 2011; Nese et al., 2012). Merrell (2011) reported strong convergent validity with other child behavioural assessments such as the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), and the Internalizing Symptoms Scale (ISSC; Merrell & Walters, 1995) on the adolescent and parent forms. The convergent validity of the SEARS-A and the SSRS found all correlations were positive and statistically significant ( $p < .01$ ) with the correlation between the scales at .69. Similarly, all correlations between the SEARS-A and ISSC were positive and statistically significant ( $p < .001$ ) with a median coefficient of .40. In addition, the correlation between the SEARS-P and the SSRS were positive and statistically significant ( $p < .01$ ) with correlations between the total scores of the scale at .71 (Merrell & Walters, 1995).

### **Procedure**

A month prior to the start of camp, caregivers were sent an email from Foothills Academy Camp Amicus with an initial letter of contact outlining the purpose of the research study, eligibility requirements, study expectations and how to participate. Parents were encouraged to get in contact with the research team to ask questions if needed. A week prior to the start of camp, caregivers were sent a camp package including paperwork required to attend camp. Included in the camp package was the parent/guardian consent form to be returned on the first day of camp. Counsellor consent forms were collected during counsellor training a month prior to the camp start date.

Camper questionnaires were completed during the morning on the first day of camp (Pre-camp) and the last day of camp (Post camp). All adolescents completed the surveys as a part of

camp. Counsellors obtained adolescent assent on the first day of camp during the cabin introduction meeting. The assent was conducted in the camper's individual cabin groups. Given the 2:6 ratio of counsellors to campers per cabin, one counsellor was able to read the assent form out loud to campers while the second counsellor answered questions and ensured comprehension. A counsellor then took campers individually outside the cabin door to ask for assent. The camper and counsellor then signed the assent form. Once all campers had been asked for assent to participate, campers then completed the pre-camp SEARS-A. On the last day of camp during cabin clean up, the campers completed the post Camp Amicus survey and the post SEARS-A. Counsellors read the survey out loud to campers while they completed them to ensure understanding of the questions. Campers completed the questions individually on their bunk beds to maintain the confidentiality of responses. Campers whose parents did not consent to participate in the study or had not given assent to participate themselves had their questionnaires removed from the study data. Counsellors completed the SEARS-P questionnaire at the end the last day of camp. This study was approved by the Conjoint Faculties Research Ethics Board (CFREB) at the University of Calgary.

## Chapter 4: Results

A total of 81 campers with ADHD (64% male, 35% female), and 15 counsellors (46.7% male, 53.3% female) participated in the study. To begin, campers with more than one missing data point were removed from the data set via listwise deletion. At this stage, three children were removed from analysis for missing responses at pre camp (i.e., one data point; 3.9%), nine were removed for missing responses at pre and post camp (i.e., two data points; 11.7%), and nine were removed for missing responses at pre, post and counsellor post rating (i.e., three data points; 11.7%). After listwise deletion, the final participant numbers were 60 campers (65% male, 35% female) and 15 counsellors. Normality of the data was then determined through an analysis of histograms, Q-Q plots, skewness, and kurtosis. This assessment showed that the data are approximately normally distributed. Similarly, the Shapiro-Wilk's test confirmed that the data are likely normally distributed. Next, standardized values were created to evaluate the presence of extreme outliers. All standardized values were within the normal range (i.e., +/- 3.29; Tabachnick & Fidell, 2013), and no extreme outliers were identified. A post-hoc power analysis was conducted using G\*Power3 (Faul et al., 2007). The present sample size was determined to be sufficient to detect effects with greater than 0.90 power.

### Research Question One

The first research question examined the difference between social competence in ADHD adolescents compared to a normative sample of adolescents. This research question compared adolescents with ADHD to the typically developing adolescents used in the normed sample of the SEARS measure, rather than a matched control sample of non-ADHD adolescents.

Normative data from a large sample establishes a baseline distribution for measurement which allows scores to be compared. Normative data is typically obtained from a randomly selected

representative sample of the population and often includes matched variables such as age and gender similar to those within a study (Campbell, 2013).

To determine if the adolescents differed significantly from the typical (i.e., normative) adolescent populations on which the SEARS-A was normed, a single subject t-test (two-tailed) was conducted. Scores for the social competence individual subscale at pre-camp were compared to the standardization mean score of 50 ( $SD=10$ ; Merrell, 2008). For each SEARS scale, the raw scores and total score were transformed into non-normalized linear T scores ( $M= 50, SD=10$ ; Merrell, 2011). As previously noted, the data from the adolescents with ADHD group were sufficiently normal. Results of the t-test revealed a significant difference in social competence scores of campers at the beginning of camp compared to the normative sample, with campers ( $M= 44.20, SD = 9.11$ ) scoring lower than the normative sample ( $M= 50, SD= 10$ ),  $t(59) = -4.93, p = <.001$ . See table 2.

Table 2. *A Single Sample Comparison of Social Competence at Pre-Camp.*

	Adolescents with ADHD	Normative Group			
Subscale	Mean Score (SD)	Mean Score (SD)	T-value	Sig. (two- tailed)	<i>Cohen's d</i>
Social Competence Pre-Camp	44.20 (9.11)	50.00 (10.00)	-4.93	<.001*	-0.61

## Research Question Two

The second research question investigated the possible change in social competence in ADHD adolescents from pre-camp to post camp. To test for significant differences over time, a paired samples t-test was conducted to compare adolescents' ratings of their social competence. Adolescent reports of social competence showed development over time (see table 3). Results of

the paired samples t-test revealed a significant increase in campers social competence scores from the start of camp ( $M= 44.20, SD= 9.11$ ) to the end of camp ( $M= 49.35, SD= 9.84$ ),  $t(59) = -5.16, p = <.001$ . Findings suggest that campers demonstrated growth in social competence from the start of camp to the end of camp.

Table 3. *Paired Samples T-Test of Social Competence at Camp.*

	Pre-Camp ( $n= 60$ )	Post Camp ( $n= 60$ )			
Subscale	Mean Score (SD)	Mean Score (SD)	T- Value	Sig. (two- tailed)	<i>Cohen's</i> <i>d</i>
Social Competence	44.20 (9.11)	49.35 (9.84)	-5.16	<.001*	-0.66

### Research Question Three

The third research question sought to determine the difference between ADHD adolescents' ratings of social competence and counsellor ratings of ADHD adolescents' social competence at the end of camp. A paired samples t-test was conducted, and findings demonstrated there was no significant difference between the adolescents' ratings of their social competence ( $M= 49.35, SD= 9.84$ ) and the counsellor ratings of ADHD adolescents' social competence ( $M= 46.58, SD= 10.25$ ),  $t(59) = 1.74, p = .088$  (see table 4). The results indicate similar scores between counsellor and adolescent perceptions of the adolescent's social competence abilities at the end of camp.

Table 4. *Paired Samples T-Test of Social Competence between Raters.*

	Adolescents with ADHD	Counsellors			
Subscale	Mean Score (SD)	Mean Score (SD)	T- Value	Sig. (two- tailed)	<i>Cohen's</i> <i>d</i>
Social Competence	49.35 (9.84)	46.58 (10.25)	1.74	.088	0.22

## **Chapter 5: Discussion**

The purpose of the present study was to investigate social competence in adolescents with ADHD, within a specialized summer camp. Specifically, it sought to understand the level of social competence in adolescents with ADHD and examine changes in social competence within the context of summer camp, as reported by adolescents and counsellors. Three research questions were investigated: (1) Is there a difference between adolescents with ADHD's social competence as measured by the SEARS compared to the normed standardized sample? (2) What differences in social competence exist within the ADHD sample from before camp to after participation in a summer camp? (3) Is there a difference between ADHD adolescents' ratings of their social competence and counsellors' ratings of camper's social competence.

### **Research Question One**

The first research question examined differences in social competence in adolescents with ADHD and a normative sample of adolescents. Results of the present study support the existing literature which suggests that adolescents with ADHD have lower ratings of social competence (Parke et al., 2018). The present study demonstrated that adolescents with ADHD have significantly lower levels of self reported social competence when compared to a normative sample of typically developing adolescents.

The findings of lower social competence in adolescents with ADHD may be influenced by several factors. Previous research investigating social competence within this population suggests that adolescents with ADHD often experience clinically significant and impairing social and interpersonal challenges (Tatar & Cansiz, 2020). Social competence deficits such as impaired social cognition, peer rejection, and lower levels of social skills are especially pronounced in ADHD (Morris et al., 2020; Ros & Graziano, 2018). Studies suggest that social



competence scores in children and adolescents with ADHD are lower compared to typically developing peers (Gardiner & Gerdes, 2015). Adolescents with ADHD often compare themselves to their typically developing peers in academic and recreational settings. Here, they often find themselves rejected or neglected by these peers which can limit social opportunities and impair the development of social skills, resulting in poor social competence (Murray-Close et al., 2010; Sayal et al., 2017).

Despite demonstrating lower social competence ratings than the normed sample, adolescents in the current study reported average levels of social competence at the beginning of camp, similar to typically developing peers. Although social impairment is well documented in adolescents with ADHD (Wehmeier et al., 2010), not all individuals with ADHD display such impairments (DuPaul et al., 2018). Recent studies suggest that children and adolescents with ADHD may exhibit social challenges in some areas but not in others (Ng et al., 2019). Social difficulties seen in some individuals may be differentiated by their ADHD presentation and comorbid disorders (Ng et al., 2019). Specifically, ADHD-HI which is often characterized by intrusive behaviours, rule violations and aggression are more likely to have difficulties in social settings, including social cognition and prosocial behaviour (Nijmeijer et al., 2008). Whereas an individual with ADHD-I may have withdrawn behaviour or low social motivation, contributing to overall social dysfunction (Ng et al., 2019). It is possible that adolescents with ADHD do not have social deficits to the extent that is believed. From a strengths-based perspective, these findings are extremely positive! If adolescents with ADHD have deficits in certain areas but not in others, interventions could use an individual's social competencies to strengthen their areas of social deficits.

It should be acknowledged that the SEARS scale highlights only individuals who are most at risk. An average score reflects all individuals that fall within the 21<sup>st</sup> to 99<sup>th</sup> percentile. Roughly 80% of individuals fall within the average range compared to the 15% rated as at risk and 5% at high risk (Merrell, 2011). Merrell (2011) notes the average range encompasses a wide range of scores with individuals who may be rated as “adequate” up to “highly skilled and popular” (p.34). Thus, it may be that the individuals in our sample have low social competence but due to the scale on the SEARS were rated as average.

With that said, four possible explanations are given. First, the timing of the measurement could be a factor in these informant discrepancies. The adolescents completed the initial measures on the first day within the supportive camp milieu. Adolescents may have attended previous years, have camp friends, and know their counsellors. At camp, they may already feel comfortable, supported, and accepted by others similar to them compared to at home, school or in recreational settings (Meltzer & Rourke, 2005). It may be that adolescents were more apt to compare themselves to their similar camp peers versus their typically developing school peers. If the initial social competence measure was completed prior to arriving at camp, the adolescent with ADHD ratings of social competence may have been different.

Second, the sample characteristics of adolescents with ADHD may account for the average rating of social competence. Camp Amicus is a specialized camp run by a community organization. As such, the adolescent participants may present with mild to moderate severities of ADHD compared to adolescents in a clinical intervention program operated in a hospital setting. ADHD symptoms affect learning of non-social information and can interfere with adequate social emotional processing (Parke et al., 2018); therefore, having fewer or less severe symptoms may manifest as average social competence.

Third, Camp Amicus is offered as a for-pay summer camp program that requires parent involvement (e.g., accessing funding to offset costs of program, intake process, registration, parent information sessions). As a result, most adolescents tended to be from middle-class, educated families with parents who possess high motivation for their adolescent's wellbeing. Parenting practices are listed as a protective factor across a wide range of risk factors in individuals with and without ADHD (Johnston & Chronis-Tuscano, 2014; Masten, 2014). It is possible that the average ratings of social competence, may be a result of highly engaged parents who are more involved in supporting and facilitating the development of their adolescent's social competencies (e.g., immediate feedback for non adaptive social behaviour and positive reinforcement for socially adaptive behaviour; de Boo & Prins, 2007).

Lastly, the self reported average ratings in social competence may be the result of a positive illusory bias. The positive illusory bias is defined as overestimating one's competencies and abilities (McQuade et al., 2011). Studies have found that children with ADHD often demonstrate a positive bias and report higher self perceptions of competence and performance (McQuade et al., 2011). The positive illusory bias is often seen in self reports of adolescents with ADHD and it is possible that the adolescents in the current study may have inaccurately perceived their own social performance (Morris et al., 2020).

### **Research Question Two**

In the present study, adolescent ratings of social competence indicated improvements from the start of camp to the end of camp. These findings are consistent with much of the present camp literature, which has highlighted the gains campers make in social competence over time, from self, counsellor, and parent report (ACA, 2005, 2019; Thurber et al., 2007). Moreover, the significant increase in social competence reflect similar findings from specialized camp

programs for children and adolescents with ADHD such as the STP, STP-A (Pelham et al., 2010; Sibley et al., 2011, 2012) and school wide adaptations of the STP (Pelham et al., 2005; Waschbusch et al., 2005). These findings are noteworthy given the short amount of time at camp and speak to the utility of specialized camps as a context where adolescents with ADHD can develop their social competence.

There are many explanations that could account for the significant changes in adolescents' self-reported social competence. First, Camp Amicus is a specialized summer camp specifically designed to support individual learning and the socio-emotional needs of children and adolescents with ADHD. The camp provides a structured, supportive and evidence based social skills program with the goals of building adolescent's confidence, self-esteem, and social competence. Using non-aversive SST techniques such as didactic instruction, behaviour modelling, role playing and behavioural rehearsal, adolescents can practice interacting with similar peers and receive feedback in vivo from trained counsellors. The unique camp setting allows for intervening at the point of performance and uses counsellors as social coaches which has been found to increase the effectiveness of SST programs in improving social competence (Mikami et al., 2017). The supportive and well-trained counsellors, low adolescent to counsellor ratio, and similar peers may have made the adolescents feel accepted and protected against victimization. When individuals feel accepted, they are more likely to engage in peer interactions and practice their social skills leading to social competence (Sullivan, 1953).

Second, most summer treatment programs for children and adolescents with ADHD are outdoor day camps within urban settings (e.g., clinics, community centres, universities, schools) where adolescents attend during the day and return to their families in the late afternoon. Overnight camps are often located in natural rural settings which allow children and adolescents

to unplug from technology and fully immerse in nature. The natural environment has been found to lower the symptoms of ADHD in children and allow them to better focus on skill development (Faber et al., 2001). Camp Amicus offers an immersive overnight camp in a natural setting where adolescents are continuously learning and then applying what they have learned. Due to the constant exposure, opportunities for practice, and counsellor feedback everything the campers learn may be better retained (Henderson et al., 2007). Fine (2005) suggests residential camp settings are strongly connected to experiential learning or “learning by doing” (p. 12). Fine (2005) notes, “If an individual is engaged in an authentic activity, that learning is thereby enhanced by the context and as a result any future associations to the original context will enhance a broader understanding” (pg.12). Like language learning, full immersion into the language and culture can impact the difference between basic competence and fluency (Fine, 2005). Residing at camp immerses the adolescent in a community and offers the consistent and repetitious exposure that is required for skill retention.

Moreover, children and adolescents who attend overnight camp become apart of a community or “camp family”. Within this community, individuals learn valuable life skills such as cooperation, problem solving, responsibility, assertiveness and independence that is fostered through participating and contributing to the camp’s daily functioning (e.g., morning bell, flag raising, setting the tables, cleaning; Dewey, 1991; Fine, 2005). As a member of the community, children and adolescents create bonds with others (e.g., campers, counsellors, camp director) and the natural world (Fine, 2005; Glover et al., 2011). The camp community fosters healthy social and emotional skills for children and adolescents to grow into considerate and competent adults (ACA, 2020).

Third, it is important to consider the possibility that the improvements in social competence may be due to a self-fulfilling prophecy. Adolescents may be aware that a goal of Camp Amicus is to improve their social skills. Therefore, they may have responded to the measure at the end of camp with the belief that they had improved their social competence when they may or may not have had any noticeable change. Moreover, adolescents with ADHD may have believed their social competence improved because they were engaged in increased positive social interaction, and problem solving. Through daily social skills lessons, adolescents were engaged in brainstorming, discussion, and activities to promote appropriate social behaviour to enhance their social skills. To support adolescents in having successful social interactions counsellors provided ongoing scaffolding throughout the day to facilitate prosocial behaviour. Additionally, counsellors offered labelled praise, constructive feedback, and frequent reminders to adolescents. Thus, this change may be due to the frequency of guided interactions by counsellors rather than the adolescents improved social competence. Real world interactions do not have the level of scaffolding provided at camp; therefore, if the scaffolding were removed it is unknown whether the adolescents would report the same level of social competence.

Lastly, it is possible that the improvements from before camp to after camp in this adolescent sample is due to the severity, or lack thereof, of ADHD symptoms. Dodge's SIP theory suggests that adolescents with externalizing behaviours such as ADHD make several key mistakes in their social information processing (Dodge, 2006; Martel, 2019). Due to hyperactive and or inattentive symptoms adolescents with ADHD attend to fewer cues and generate fewer possible responses within an interaction (Matthys & Lochman, 2017). With this in mind, the adolescents in our study were a part of a community sample and may represent those with less severe ADHD symptomatology. Adolescents with mild or moderate severity have less symptoms

and thus, may have been more attentive to learning the social skills modules. It is possible that having less ADHD symptoms allowed for improved attention to social cues and increased generation of responses compared to adolescents with severe ADHD symptomatology.

### **Research Question Three**

To provide a comprehensive evaluation of adolescents' social competence, ratings were obtained from the adolescents' counsellors. The third research question examined the difference between ADHD adolescents' ratings of their social competence and counsellors' ratings of campers' social competence at the end of camp. It was hypothesized that there would be no difference in ratings between adolescents' social competence and the counsellor ratings of adolescents' social competence. Results of the current study confirmed our hypothesis showing there was no significant difference between the adolescents' social competence scores and the counsellor report of adolescents' social competence at the end of camp. These findings support much of the current camp literature that show similar scores between raters (i.e., self report, parents, counsellors, teachers) after attending a camp program (ACA, 1998, 2005, 2019; Glover et al., 2007, 2011; Thurber et al., 2007). In addition, the results from specialized summer camp treatment programs highlight similarities in ratings between camper, counsellor, and parent perspectives on social competencies after camp (Chronis et al., 2004; Fabiano et al., 2007, 2014; Pelham et al., 2000, 2005, 2010; Sibley et al., 2011, 2012). These findings are consistent with the goals of Camp Amicus and are promising in promoting specialized summer camp as an avenue for social competence growth in adolescents with ADHD.

Counsellors showed similar perceptions to adolescent reports of their social competence by the end of the camp session. This finding increases the reliability of the adolescent reports, as the counsellors provided an external perspective that confirmed they are concurrent in their

response. Through the social skills training, counsellors may have helped the adolescents identify their areas of social competence and areas for social skill improvement. Through counsellor social skill teaching, scaffolding of the adolescents' social interactions, and consistent feedback, adolescents may have become aware of their effective and ineffective social skills. In identifying areas of improvement and receiving in vivo coaching, adolescents may have been overtly aware of their social skill improvements. Moreover, adolescents may have relied on their effective skills to support their social deficits. From a strengths-based perspective, adolescents being accurately aware of their social competence growth is positive and can be used to further their growth after camp has ended.

### **Limitations**

These results demonstrate some initial promise that camp may serve as a place of growth for social competence in adolescents with ADHD. Specifically, adolescents demonstrated growth in social competence after attending a one-week session and ratings on social competence after attending camp were similar between counsellor ratings of adolescents' social competence and adolescent ratings of social competence. More importantly, this research was conducted at a specialized community camp for adolescents with ADHD, filling a noticeable gap within the literature on effective programming to support social competence within this population. Despite numerous strengths and positive findings, there are several limitations that must be considered.

**Sample Limitations.** To begin, the current study did not include a control group of non camp ADHD adolescents. A control group resembles an experimental group but is not exposed to the experimental condition. As such, a control group is beneficial as it creates a benchmark to measure the success of an intervention, minimizes the impact of dependent variables, removes confirmation bias and highlights Type I error. Without a control group, it is not possible to



ascertain whether changes from the start of camp to the end of camp were a function of time, nontherapeutic influences such as rater bias or the social skills program. Previous research has demonstrated that adolescents who participated in specialized summer camp often improve their social competence (Sibley et al., 2012). In future research, a control group of non-camp ADHD adolescents such as those on a camp waitlist would be advantageous to confirm findings by controlling for potential influencing effects.

Additionally, the different presentations of ADHD (i.e., ADHD-HI, ADHD- I and ADHD- C) were analyzed as one ADHD group. Differences in social competence may exist between the three presentations of ADHD. Research suggests that the presentations may differ in the nature of their social deficits and interventions may require differences to target the divergent needs (Solanto et al., 2009). As the current study combined the three presentations into one group, it is possible that differences between each of the presentations may have confounded the results. Future research should consider the potential differences in social competence between groups and evaluate the groups separately. Moreover, the current study included adolescents with ADHD and secondary comorbid disorders such as LD's, DCD, GAD, OCD, and depression. The presence of comorbidities often augments social difficulties in adolescents with ADHD (Danielson et al., 2018); thus, it may be beneficial to take these additional psychological disorders into consideration. Lastly, 48.3% of the adolescents were taking medications during the camp session. Medication can be effective in reducing ADHD symptoms which may support the development of social competence (Coles et al., 2019; Wells et al., 2000). The current study did not evaluate differences in social competence for those taking medication versus those not taking medication. It is possible that taking medication may have augmented improvement for some adolescents. In the future, researchers should evaluate potential differences in competence

development between adolescents taking medication versus adolescents not taking medication.

**Self Report Challenges.** The reliance on self report to establish camper development, while a seemingly efficient means of data collection, creates the potential for participant bias (Olino & Klein, 2015). Most adolescents in the current study had attended Camp Amicus in a previous year (85%), had existing friendships, rated it positively, and believed in the goals of the camp. The adolescents may have grown in social competence because of previously attending and relearning the social skills modules for a second time. Within camp literature, multiple informants provide far more accurate reports than self report (Thurber et al., 2007). Adolescents with ADHD may overestimate their competencies (Sibley et al., 2012) and thus, it is unknown whether the improvements as rated through self report are accurate. To get a comprehensive evaluation of social competence development, it would be beneficial to obtain ratings from multiple informants (i.e., parents, teachers, camp staff). If results between informants were consistent it would strengthen the validity of conclusions and reduce the potential for erroneous conclusions. This information could lead to a deeper understanding of social competence growth as a result of attending a specialized camp.

**Evaluation and Measurement Limitations.** Other limitations pertain to evaluation and measurement, including the timing of data collection and the measure used. In the current study, self report of social competence was taken before and after camp while counsellors rated adolescent's social competence at the end of camp. The counsellor reports of adolescent's social competence were not collected at pre- camp as they would not have sufficient information at the start of camp to make an accurate rating. To supplement the pre-camp adolescent ratings of social competence and strengthen assumptions about change elicited, it would be advantageous to include a pre and post camp rating of social competence from parents. Moreover, although

improvement in social competence was reported, no long-term follow-up data was collected to assess whether increases in social competence maintain over time. Currently, there is inconsistent data on whether growth at camp is maintained after camp has ended (ACA, 2005). It would be valuable to measure the stability of social competence gains through follow up tests after camp has ended (e.g., one month, three months).

Finally, to reduce the intrusiveness and implement the study seamlessly into the camp setting, the SEARS was chosen as the measure has empirically derived constructs (i.e., social competence) that allowed the researchers to use a limited amount of questions (10) to capture a specific construct. Given the age and symptoms of the adolescents with ADHD completing the self reports, the amount of questions was appropriate. Nevertheless, it is possible that the number of questions limited the score range, sensitivity of responses, and understanding of the constructs (e.g., social cognition, social functioning, acceptance) within social competence. Future research may consider using additional measures with increased items to gain a comprehensive understanding of social competence and the constructs within it. Despite the limitations associated with the SEARS, it was selected for use in the present study as it remains a widely used measure of socioemotional competence (Merrell, 2011).

### **Implications**

Adolescents with ADHD frequently experience challenges in social competence that have direct implications on short- and long-term outcomes (Gardiner & Gerdes, 2015). Considering the consequences associated with poor social functioning, the identification of psychosocial interventions that support the development of social competence in adolescents with ADHD is vital. SST has been the main approach to improving social functioning in ADHD (Mikami et al., 2014). SST administered in naturalistic settings provides the opportunity to practice in real world

situations and can be effective in improving adolescent's social competence (Mikami et al., 2017; Morris et al., 2020). One setting that supports SST in a naturalistic environment is a specialized summer camp. Research on specialized summer camps have found significant results on social competence development in children and adolescents with ADHD (Hantson et al., 2012; Pelham et al., 1998, 2010; Sibley et al., 2011, 2012). The results of the present study parallel these findings.

The current study supports the notion that camp is an effective setting to build social competence. Results showed adolescents improved their social competence scores from the start to the end of camp. Moreover, counsellor report of adolescent's social competence was congruent with the adolescents' report of their social competence. Camp Amicus provides a rewarding and successful summer camp experience where adolescents with ADHD learn social skills, build relationships, confidence, and self-esteem. Overall, the present findings provide evidence that adolescents with ADHD enhanced their social competence. The camp structure, programming, and counsellor approaches provide practice and reinforcement of age-appropriate social skills in a fun and safe environment. These results support the premise that evidence based social skills programs can be effectively implemented in community settings such as summer camp and can help adolescents develop social competence in a short amount of time.

### **Future Directions**

The primary objectives of the present study were to understand the level of social competence in adolescents with ADHD and to investigate the development of social competence during their participation in a specialized summer camp. Although this study provided some promising results, additional research is necessary to further develop the present body of literature. In particular, the current study conceptualized social competence as a single construct;

however, previous research details that social competence consists of multiple underlying constructs (i.e., social cognition, social skills, social acceptance, reciprocal friendships, and friendship quality; Beauchamp & Anderson, 2010; Semrud-Clikeman, 2007). Adolescents may have deficits in some constructs but not in others. By identifying deficits within individual social competence constructs, interventions in specialized camps will be able to target and modify their programs to support adolescents in enhancing these specific areas (Sibley et al., 2010).

Our results showed a significant increase in social competence in adolescents with ADHD over a short amount of time (i.e., one week). This finding is remarkable and validates camp as an effective setting for skill development. Nonetheless, it is unknown whether these results would maintain over time. Future research should consider employing a longitudinal design as it would contribute to the understanding of the maintenance of social competence over time. Previous evidence suggests that once camp has ended, social competence growth reported at the end of camp maintains over a couple of weeks to months (i.e., three weeks; one, three and six months; Glover et al., 2011; Hanston et al., 2012). Despite this, little research has been conducted past six months, thus no conclusions can be drawn about the long-term effectiveness. Therefore, a deeper understanding of the maintenance of learned skills past six months is advantageous. Similarly, to prevent social skill deterioration, social skill “booster” sessions throughout the year have been suggested as an effective tool to mitigate social skill decay and prolong the maintenance of social competence after camp has ended (Sullivan et al., 2019). It would be interesting for future studies to conduct sessions throughout the year to see if these sessions result in better retention of social skills learned at camp. Moreover, future research should consider collecting multi-informant data to evaluate how the learned skills generalize into different settings (e.g., home, school, peers, recreation) once camp has ended. It would be

beneficial to follow up with adolescents, parents, and teachers to see if the social competence outcomes achieved at camp are seen longitudinally across settings.

In addition, although it was not analyzed in the present study, the role of ADHD presentations may be an important variable in this area of research. Existing literature suggests that the presentations may differ in the nature of their social deficits (Solanto et al., 2009). Unfortunately, due to the sample size in the current study it precluded the exploration of presentation differences in social functioning. Understanding the differences in social competence deficits between presentations will allow for a strengths-based approach to utilize the individual's social competencies to support their social impairments. It will be important for future research to pursue how symptomatological heterogeneity may contribute to differential social competence outcomes at the end of camp.

Another important extension of the current research is the effect of comorbidities on social competence development in adolescents with ADHD. For children and adolescents with ADHD and one or more comorbidities (e.g., LD, Autism, ODD, Anxiety, Depression), social competence deficits are significantly more pronounced (Al-Yagon, 2009; Wehmeier et al., 2010). In the interest of understanding social deficits in adolescents with ADHD, it would be valuable to investigate the potential contribution of comorbidities on social competence development. To this end, understanding the contribution of ADHD presentations and comorbidities on social competence development would help treatment developers target appropriate deficits (Sibley et al., 2010).

Alongside SST, parent training has been established as an efficacious treatment to improve the behavioural, social, and emotional functioning of children and adolescents with ADHD (MTA Cooperative Group, 1999; Pelham et al., 1998, 1999, 2000). Specialized summer

camp programs such as the STP have included parent training sessions during camp in order to facilitate the generalization and maintenance of skills learned once camp has ended. Future research should consider including parenting sessions alongside the adolescent camp program as it could support parents in helping their adolescent's practice and maintain their newly learned social skills across settings. Moreover, parenting sessions may allow parents to discuss their concerns with others who have similar concerns, exchange ideas, and create a supportive community for parents of adolescents with ADHD.

Finally, as Camp Amicus is apart of the limited specialized camps for ADHD in Canada (CADDAC, 2020) and the only ADHD focussed camp in Alberta, future work should examine the possibility for program development in community-based settings. In order to disseminate social skills interventions to an increased population of ADHD adolescents, examination of social skills interventions are required in order to understand the feasibility of implementation into additional camp and recreational settings. Future work should examine community-based camp programs (i.e., YMCA camps) where social skills training may be incorporated into existing camp programming.

## **Conclusion**

Results of the current study demonstrated positive social competence development in adolescents with ADHD as a result of attending a specialized summer camp. If future research supports our findings, of camp as a successful and beneficial setting for social competence development, the support of influential professional associations (e.g., the Canadian Psychological Association, Centre for ADHD Awareness Canada, Canadian ADHD Resource Alliance) should take an assertive lead in promoting and funding evidence based psychosocial programs for ADHD into more generalizable community settings.

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