Friendship Quality in Adolescents with Attention-Deficit/Hyperactivity Disorder

by

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Applied Psychology and Human Development
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Abstract

The majority of research investigating the social functioning of youth with ADHD has examined peer rejection and social skills deficits while generally overlooking their friendships. The goal of this dissertation was to provide detailed information about friendship quality in adolescents with and without ADHD. The first manuscript compared ratings of social support and negative interactions in same- and other-sex friendship dyads in adolescents with and without ADHD, while examining the potentially moderating effects of age and gender. The second manuscript examined empirically supported correlates of friendship quality including friendship stability, co-morbid psychopathology, and interpersonal competence.

A sample of 115 adolescents, ages 13-18, were recruited to participate in the present study of whom 61 were classified as having ADHD (21 female) and 54 without ADHD (29 female). The measures used included parent and self-report rating scales and questionnaires assessing ADHD symptoms, friendship quality, friendship stability, externalizing behaviour (conduct problems, oppositional behaviour), internalizing behaviour (anxiety, depression), and interpersonal competence (social skills, social perspective taking).
Results from study one indicated that ratings of friendship social support diminished across age groups in youth with ADHD, but increased in typically developing youth. Adolescents with and without ADHD, however, did not differ on ratings of negative interactions experienced in their friendships. Compared to males, females rated their friendships to be more supportive, irrespective of ADHD status. Adolescents with and without ADHD rated their same-sex friendships to be simultaneously more supportive and more conflictual than their other-sex friendships. Results from study two indicated that friendship stability, social skills, social perspective-taking, oppositional behaviour, and anxiety explained unique variance in the prediction of friendship social support. However, results of exploratory mediation analyses indicated that the direct effects of oppositional behaviour and anxiety were no longer significantly predictive of friendship quality, after controlling for the mediators social skills and social perspective-taking, respectively. These findings, clinical implications, and future directions are discussed within the context of the existing peer relations literature.
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Chapter 1
General Introduction

1.1 Aim and Scope of Dissertation

The overarching purpose of the research presented in this dissertation is to investigate friendship quality in adolescents with and without Attention-Deficit/Hyperactivity Disorder (ADHD). This dissertation consists of two studies written in manuscript format with concomitant literature reviews and interpretations of findings discussed within each chapter. As the dissertation is written in manuscript format, there are unavoidable redundancies in the topics covered. Study one (Chapter 2) contributes to a circumscribed research base, by comparing self-reported friendship quality in adolescents with ADHD and their typically developing (TD) peers. Specifically, the goal of study one was to compare ratings of social support and negative interactions in same- and other-sex friendship dyads in adolescents with and without ADHD, while examining the potentially moderating effects of age and gender. Study two (Chapter 3) aimed to further our understanding of select determinants and correlates affiliated with supportive features of friendship quality in adolescents with and without ADHD. Specifically, the aim of this study was to examine empirically supported correlates of friendship quality including friendship stability, co-morbid psychopathology (e.g., anxiety, depression, oppositional behaviour, conduct problems) and interpersonal competence (e.g., social perspective taking, social skills). The final section of the dissertation (Chapter 4) includes an integrated discussion of key findings, strengths and limitations, clinical implications, and future directions of the overall research area.

The remainder of this chapter will be devoted to a brief review of ADHD and the literature on friendships in childhood and adolescence, including a discussion of the multidimensional assessment of the friendship experience, the significance of friendships in childhood and adolescence, and theoretical frameworks underlying the study of friendships. Specific research on the friendships of children and adolescents with ADHD and the influence of various individual level factors (e.g., age, gender, psychopathology, interpersonal competence) on friendship quality is described in chapters 2 and 3.
1.2 Attention-Deficit/Hyperactivity Disorder

Although ADHD is conceptualized as a neurobiological disorder (Kieling, Gonclaves, Tannock, & Castellanos, 2008), it is diagnosed on the basis of pervasive and impairing symptoms of inattention, hyperactivity, and impulsivity (American Psychiatric Association [APA], 2013). It occurs in most cultures in about 5% of children (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007). While ADHD was once considered to be a disorder of childhood, longitudinal research indicates that its symptoms and negative effects are chronic and often persist in adolescence and adulthood (Biederman, Petty, Evans, Small, & Faraone, 2010). Gender differences have been documented, with males being approximately three times more likely than females to meet criteria for this disorder. (Willcutt, Nigg, Pennington, et al., 2012). ADHD rarely occurs in isolation and nearly three-quarters of individuals with ADHD also meet criteria for another psychiatric disorder (Barkley, 2015).

ADHD constitutes a serious financial burden to families and society and it is characterized as a major public health concern (Polanczyk et al., 2007). It is associated with a broad range of negative outcomes across behavioral, social, affective, academic, and family domains (e.g., Frazier, Youngstrom, Glutting & Watkins, 2007; Hoza, 2007; Jensen, Hinshaw, Kraemer et al., 2001; Johnston & Mash, 2001; Kent, Pelham, Molina, et al., 2011; Pliszka, 2000). In adolescence, ADHD is additionally linked to risky driving (Fischer, Barkley, Smallish, & Fletcher, 2007), risky sexual behaviour (Flory, Molina, Pelham, Gnagy, & Smith, 2006; Barkley, Murphy, & Fischer, 2010; Rokeach & Wiener, 2018), and substance use (Lee, Humphreys, Flory, Liu & Glass, 2011). The interpersonal difficulties faced by individuals with this disorder are also profound and well-documented (Hoza, 2007; Marshal, Molina & Pelham, 2003; Sciberras, Ohan & Anderson, 2012; Sibley, Evans & Serpell, 2010; Whalen & Henker 1992). However, the majority of research investigating the social functioning of youth with ADHD has examined peer rejection and social skills deficits, while generally overlooking their friendships.

1.3 Context

Friendships are normative, adaptive, and they constitute a major developmental task of childhood and adolescence. However, it is only in the later part of the 20th century that children’s and adolescents’ relationships with their friends began to garner interest from the scientific community. The evidence is now robust; children with close friends are better off than children
without friends (Bagwell & Schmidt, 2011; Hartup, 1996; Newcomb & Bagwell, 1995). Friendships provide children and adolescents with opportunities to resolve conflicts, practice cooperation, cultivate patience, develop social perspective-taking, and foster empathy. Friendships also serve as a rubric for future interpersonal relationships that span the lifecycle (Buhrmester, 1996; Hartup & Stevens, 1997). Accordingly, friendships are paramount to the social, emotional, and cognitive development of children and adolescents. At the most fundamental level, studying friendships is important because children value them greatly.

1.4 Definition of Friendships

Throughout development, children are intertwined in a variety of relationships, including relationships with parents, teachers, other adults, siblings, peers, and friends. Two simple, yet critical, constructs distinguish friendships from other relationships - power and equality. Broadly speaking, relationships with friends are relationships among equals. Each participant benefits from and contributes to the relationship in a roughly equitable manner and there is a general balance of power (Erwin, 2013). In that regard, friendships are considered to be “horizontal” relationships because they are voluntary, reciprocal, and mutual, with a sense of equality at their core (Bagwell & Schmidt, 2011). They are often characterized by a strong affective tie, shared experiences, support, intimacy, and trust (Schneider, Wiener, & Murphy, 1994). By contrast, parent-child, parent-teacher, or sibling relationships, are hierarchical or “vertical” relationships. In these dyads, the relationship partners differ in age and developmental stage. Older children, parents, and adults have considerably greater resources, power, and influence in determining the course and nature of the relationship (Erwin, 2013).

1.5 Peer Status vs. Friendships

It is important to differentiate the term friend from general experiences within the peer group at large. Peer status is a measure of how (dis)liked a child is (Schneider et al., 1994). It is a summary of how other children in a particular group (e.g., a class or grade) feel about a child in terms of liking. In particular, peer acceptance refers to being liked by the majority of one’s peers and disliked by few, while peer rejection refers to being disliked by most peers and liked by few (Rubin, Bukowski, & Parker, 2008). Thus, peer status is a unilateral construct and only represents feelings of others towards a child (Bagwell & Schmidt, 2011).
Unsurprisingly, peer status and friendships are empirically linked to one another. Many of the social skills implicated in making friends are also implicated in enhancing social acceptance. Children who are rejected by their peers show lower rates of prosocial behaviours (e.g., cooperation, communication, emotion regulation, social sensitivity, social perspective taking) and higher rates of aggressive, disruptive, impulsive, and immature behaviours than children who are well-liked by their peer group (Bierman, 2004). Peer rejection is also a risk factor for a multitude of adjustment difficulties including loneliness, victimization, and internalizing and externalizing psychopathology (Bierman, 2004).

By contrast, children who are well-liked by their peer group have more opportunities to develop mutual friendships and exhibit higher levels of interpersonal competence (Erdley, Nangle, Newman, & Carpenter, 2001). However, the difference between friendships and peer status is evident in that not all popular children have close friends, and not all peer rejected children are friendless (Bukowski & Hoza, 1989; Gest, Graham-Bermann, & Hartup, 2001). Moreover, friendship and peer status do not necessarily lead to uniform developmental outcomes. For example, having a friend in early adolescence is associated with lower levels of depressive symptoms and higher levels of self-worth in early adulthood, while peer status is not. (Bagwell, Newcomb, & Bukowski, 1998). Conversely, peer rejection in early adolescence predicts decreases in school adjustment and aspirations in early adulthood, while having a friend may be unrelated to these outcome variables (Bagwell et al., 1998).

1.6 Adolescent Friendships

Adolescence is a time of dramatic changes filled with developmental challenges at the biological, cognitive, and social level. During this tumultuous time, adolescents awkwardly attempt to negotiate puberty, they develop more abstract patterns of thinking, and they seek to establish autonomy and new patterns of relating with parents. Further, they strive to become part of the prevailing youth culture and to develop a clearer sense of personal and sexual identity. As well, other-sex friendships become more prominent and romantic relationship begin to emerge (Rubin, Bukowski, & Parker, 2006).
Friendships also change as children age; they become more complex, more strongly embedded in a social context, and more intimate (Bagwell & Schmidt, 2011). The need for companionship is supplanted by a need for reciprocity, intimacy, self-disclosure and emotional support. As youth move from early to late adolescence, expectations of friends increase, the number of conflicts and levels of exclusivity decrease, and empathy, sharing, intimacy, and attachment levels tend to increase (Claes, 1992; McNelles & Connolly, 1999). Accordingly, friendship’s relative contribution to an individual’s psychological adjustment intensifies from middle childhood to adolescence (Buhrmester, 1996). In part, this may be related to the adolescent’s growing autonomy and participation in actively building his or her own social universe (Bagwell & Schmidt, 2011). Parents have less input regarding the selection of their children’s friends and consequently, older adolescents may choose to become friends with peers with whom they share more attributes, aspirations and achievement goals, resulting in a higher quality relationship than that of their younger counterparts (Claes, 2003).

1.7 Multidimensional Assessment of Friendships

Assessing friendships is a surprisingly complicated endeavour. In part, this is due to the multiple dimensions of friendships that there are to assess and the multitude of strategies through which to explore them. (Bagwell & Schmidt, 2011). Dimensions include the presence of friendships (e.g. friended or friendless; quantity of friends; friendship stability); the nature of the interactions (e.g., frequency and content of interactions); friendship quality (e.g., positive and negative features; agreement between friends’ perceptions); the personal characteristics of the child and their friend (e.g., gender, age, interpersonal competence, internalizing and externalizing behaviours); and the friendship context at large (e.g., parent-child relationship, peer status, school climate, cultural context) (Bagwell & Schmidt, 2011). Examining each of these dimensions is outside the scope of this dissertation. Instead, a review of pertinent dimensions to this thesis (i.e., friendship quality, friendship stability, and personal characteristics of the child and their friend) are described below.
1.7.1 Friendship Quality

In the 1980s, researchers began to investigate children’s perceptions of their own friendships (Bagwell & Schmidt, 2011). In particular, these studies attempted to identify features, both positive and negative, that distinguish friendships from other relationships. In the mid-90s, Berndt (1996) distinguished between friendship features, friendship quality, and friendship effects. Friendship features refer to the characteristics or attributes of the relationship (e.g., conflict, intimacy, companionship, etc.) and it is not evaluative. That is, it refers to both the negative and positive characteristics of the relationship. Friendship quality is evaluative by nature, and suggests that some relationships are better than others. Berndt (2002) defines friendship quality as the sum of positive or supportive (e.g., intimacy, support, conflict resolution, emotional proximity, and validation) and negative or discordant (e.g., conflict and aggression) features that characterize a friendship. For example, relationships with many positive features and fewer negative features are considered high quality friendships, where children are likely to experience a high degree of satisfaction from those relationships (Bagwell & Schmidt, 2011). Finally, friendship effects refer to the friendship features (both positive and negative) and friendship quality that influence a child’s adjustment or well-being.

The question of how many and which features define friendship quality varies from researcher to researcher. Early investigations of children’s friendships were biased towards positive outcomes while overlooking the negative features and the potential downside of having conflictual friendships. Therefore, choosing which features to include is important not only from a methodological standpoint, but also from a conceptual framework (Bagwell & Schmidt, 2011). For example, when considering the effects of friendship quality, specific features (e.g., intimacy) may be associated with specific outcomes – a finding that would be difficult to uncover with only global measures of positive and negative features (Bagwell & Schmidt, 2011).

1.7.2 Friendship Characteristics

The individual characteristics of each relationship partner (e.g., psychopathology, social skills, social perspective taking) have important implications for friendship stability, friendship quality, and overall adjustment (Bagwell & Schmidt, 2011). Said differently, the characteristics that friends bring to their relationship affect the relationship itself, and in turn that relationship has the potential to influence and change the individual.
Hartup (1996a) proposed that the selection of friends tends to occur on the basis of common interests (e.g., sports, music), personal characteristics (e.g., antisocial, shy, cooperative), and sociodemographic conditions (e.g., neighbourhoods, schools, classes, and extracurricular activities) (Hartup, 1996a). Adolescent friends also tend to be similar on attitudes, aspirations, and academic achievement as they relate to school, substance use, and dating (Bagwell & Schmidt, 2011). Collectively, the evidence suggests that the source of friends’ similarities are not only the result of these selection effects, but also due to socialization effects (Güroğlu, Lieshout, Haselager, & Scholte, 2007). That is, friends become more similar to one another over time due to their influence on one another.

Studies examining friendship characteristics are generally limited to an exploration of externalizing and internalizing symptoms within each partner of the friendship dyad. Research suggests that children who are rejected by peers tend to choose one another as friends (Vitaro, Tremblay, Kerr, Pagani, & Bukowski, 1997). Thus, negative socialization can occur within the context of even high quality friendships. For example, interactions amongst friends high on externalizing problems predict later antisocial behaviour (e.g., Dishion, Andrews, & Crosby, 1995; Dishion, McCord, & Poulin, 1999; Dishion, Nelson, Winter, & Bullock, 2004). Relatedly, co-rumination, or extensively discussing and revisiting problems and focussing on negative feelings, is associated with higher levels of anxiety, depression and friendship quality (Rose, 2002; Rose, Carlson, & Waller, 2007).

1.7.3 Friendship Stability

Unlike familial relationships which are considered to be relatively permanent, friendships are more likely to dissolve (Laursen & Bukowski, 1997). Friendship stability is defined as the maintenance of a friendship over time. The literature suggests that relationship stability fosters intimacy and companionship (i.e., friendship quality) in friendships (Poulin & Chan, 2010). In turn, high levels of friendship quality and stability are related to psychological adjustment (Berndt, 1989). Said differently, friendship stability may have an impact on adjustment by magnifying the specific benefits provided by friendships (Berndt, 1999; Poulin & Chan, 2010). Several factors have been proposed to account for friendship stability. A first group of factors that play a role in friendship stability is the congruence between the child and his/her friend’s various attributes. When children and adolescents are similar to one another on personal
characteristics such as gender, age, ethnicity, and/or interests, their friendships are most likely to be maintained over time (Poulin & Chan, 2010). Friendship stability is also incrementally associated with age (Berndt & Hoyle, 1985; Poulin & Chan, 2010). Although friendship instability is a relatively common phenomenon in early adolescence, it appears to increase again during late adolescence (Değirmencioğlu; Urberg, Tolson, & Richard, 1998). With regards to gender, several empirical studies do not find differences in friendship stability among boys and girls (Berndt, Hawkins, & Hoyle, 1986; Cairns, Leung, Buchanan, & Cairns; 1995; Değirmencioğlu et al., 1998). However, in studies where gender differences in friendship stability are found, the evidence suggests that girls’ friendships tend to be less stable than boys’ friendships (Benenson & Christakos, 2003). Different indices of internalizing behavior have also been linked to friendship stability. Notably, depressive symptoms and peer victimization appear to be associated with friendship instability (Chan & Poulin, 2009; Wojslawowicz, Rubin, Burgess, Booth-LaForce, & Rose-Krasnoret, 2006), although the direction of such associations remain unclear. Regarding externalizing behaviour, the research suggests youth who display impulsive, aggressive, and oppositional behavior have lower friendship stability than their typically developing peers (Asher, 1990; Blachman & Hinshaw, 2002; Marton, Wiener, Rogers, & Moore, 2015; Normand, Schneider, Lee, Maisonneuve, et al., 2013). Conversely, friendship stability has been associated with higher levels of prosocial behaviours and school adjustment (Berndt, 1989; Berndt; Hawkins, Jiao, 1999; Ladd, 1990).

1.8 Developmental Significance of Friendships

1.8.1 Emotional Significance

Friendships provide a unique context in which to develop emotional competence including appropriate emotional expression, emotional knowledge, and emotion regulation (Saarni, 1999). Displays of pleasant emotions tend to elicit favorable responses from others, whereas the expression of negative emotions often drives other people away (Furr & Funder, 1998). Children learn that it is socially acceptable to express different affective states with different social partners at different developmental stages (Saarni, 1999). For example, school-aged children are more willing to show strong emotions to parents than to friends, but friends allow each other to express mild aggression in a manner that is non-judgemental (Shipman, Zeman, Nesin, & Fitzgerald, 2003; Zeman & Garber, 1996). Friendships also contribute to increasing children’s
emotional knowledge. Children learn that recognizing their friends’ emotions and discussing their own emotions contribute to the relationship in a positive way. At the same time, friendships provide children and adolescents a context in which to cultivate their emotional understanding (Bagwell & Schmidt, 2011). Similarly, emotion regulation is associated with the ability to make and keep friends. That is, friendships provide children with opportunities to develop emotion regulation skills through experiences in conflict resolution and cooperation. Conversely those with poorly developed emotion regulation skills are less likely to have reciprocated best friends (Rose & Asher, 1999).

1.8.2 Cognitive Significance

An important body of research also discusses the importance of peer interactions in promoting cognitive growth (for a review see Rogoff, 1998). Piagetian theory (1932) denotes that a vital process in cognitive development stems from the disequilibrium that arises when a child’s views differs from his/her peer’s views. Acknowledging and resolving these discrepancies and assimilating them into one’s cognitive schemas leads to cognitive growth. In the preschool years, play, and in particular, play with friends, promotes language development through listening, imitating, and practicing (Ervin-Tripp, 1986). There are also connections between friendships and the development of social-cognitive abilities such as theory of mind. For example, children in high quality friendships engage in more cooperative play, which in turn is associated with better theory of mind (Cutting & Dunn, 1999). Friendships also promote cognitive growth because they provide a secure context in which to share opinions, disagree, and challenge one another without fear of repercussions (Hartup, 1996). In turn, this free exploration of thought may lead to more sophisticated and innovative ideas and collaborative problem solving techniques (Bagwell & Schmidt, 2011).

1.8.3 Psychosocial Significance

Finally, friendships also promote psychosocial adjustment. Friends are important sources of support for children and adolescents attempting to adjust to the increased cognitive, academic, and interpersonal demands of stressful school transitions (Ladd, Kochenderfer, Coleman, 1996). Friendships that precede a school transition, or develop once school begins, contribute to positive school adjustment (Ladd, Buhs, & Tropp, 2002; Newcomb & Bagwell, 1995). Friendships also
serve as a protective factor for children and adolescents encountering problems in other relationships, such as with parents or peers. That is, friendships may provide children and adolescents with another avenue in which to feel validated, foster self-worth, and learn skills and competencies, even in the face of rejection from parents or peers (Sullivan, 1953). For example, high quality friendships have been found to buffer against loneliness and internalizing distress in children who experience low maternal support and/or harsh parenting practices (Bukowski, Hoza, & Boivin, 1993; Criss, Pettit, Dodge, & Lapp, 2002; Nangle, Erdley, Newman, Mason, & Carpenter, 2003; Rubin, Dwyer, Booth-LaForce, et al., 2004).

However, making a blanket statement that friendships safeguard against maladjustment is erroneous. Friendship quality and the characteristics of the friendship partner play an important role in buffering against maladjustment. As mentioned above, interactions between socially maladjusted friends can also promote externalizing behaviour through deviancy training (Hoza, Molina, Bukowski, & Sippola., 1995) and internalizing problems through co-rumination (Dishion, et al., 2004; Rose, 2002; Rose et al., 2007). Similarly, having a low quality friendship may also contribute to feelings of loneliness (Asher & Paquette, 2003).

1.9 Theoretical Frameworks of Friendships

There is no single, unified conceptualization that provides a framework from which to organize research and describe the development, features, and significance of friendships (Bagwell & Schmidt, 2011). As such, the present research study on relationship quality is informed by a combination of Bronfenbrenner’s ecological systems theory (1979, 2005), interpersonal theory (Sullivan, 1953), and attachment theory (Bowley, 1969, 1982; Ainsworth, 1989). Combined, these theories suggest that an increase in friendship quality is evident during adolescence, as adolescents explore and achieve their own identities, and become more capable of finding mutually supportive and validating friendships (Way & Greene, 2006). Each of these perspectives are discussed in turn.
1.9.1 Bronfenbrenner’s Ecological System’s Theory

Ecological Systems Theory was first proposed in the 1970s and it was further developed over the course of several decades (Bronfenbrenner, 2005). Although not a theory of friendships per se, ecological systems theory positions friendships within a web of developmental contexts. Briefly, it posits that a child exists within multiple intersecting and overlapping contexts (e.g., peers, family, and school). In turn, these multiple ecological systems interact with a child’s maturing biology to shape the course of development (Bronfenbrenner, 1979; Cicchetti & Toth, 1997). The interaction of factors in a child’s maturing biology, the immediate family/community environment, and the societal landscape drive development in a bidirectional manner. Changes or conflict in any one layer will ripple throughout other layers.

As it pertains to this study, this framework suggests that the characteristics that children bring to a relationship (e.g., gender, age, social skills, social perspective taking, externalizing and internalizing psychopathology) have implications for their ability to form and maintain relationships, the quality of said relationships, and the significance of these relationships for their development. Although not explored in the current research project, proximal environmental conditions (e.g., family structure, parental influences) and the distal social context (e.g., culture, ethnicity, socio-economic status) also have implications for friendships in childhood and adolescence. As such, friendship quality can be considered to be both an independent variable and a dependent variable. As an independent variable, friendship quality is deemed to affect development. As a dependent variable, friendship quality is thought to be affected by developmental processes and other social experiences.

1.9.2 Sullivan’s Interpersonal Theory

Sullivan’s theory (1953) is developmental in nature and aspires to explain how personality develops within interpersonal relationships. It suggests that within each period of development, or “developmental epoch”, specific interpersonal needs or tensions arise and individuals are motivated to seek certain relationships to satisfy these needs. Thus, particular relationships are essential at particular moments in life to satisfy the different developmental goals of that epoch. The particular relationship (e.g., parent, friend, romantic partner) an individual turns to at any given time is determined by a variety of factors including age, development, and culture. For
example, with the arrival of adolescence comes a need for interpersonal intimacy that is best fulfilled through same-sex friendships. A primary outcome of those friendships is validation of self-worth. Through self-disclosure, children learn that others have similar interests, values, and concerns. As such, they are assured that they are important and worthy. Building on Sullivan’s theory, Buhrmester and Furman (1986) propose that social competence (e.g., empathy, social-perspective taking, altruism) develops as children interact with others in a variety of relationships.

1.9.3 Attachment Theory

First proposed by John Bowlby (1969), attachment refers to an intense and enduring emotional bond of an individual to one or a few significant others. Attachment theory suggests that attachment is a biological mechanism designed to protect and promote the adaptive development of a child. It is an evolutionarily derived aspect of the parent-child relationship that is activated when the infant perceives a threat. According to Furman and Buhrmester (2009), the goal of the attachment system is to maintain some degree of proximity to the attachment figure in order to gain comfort and security. This may involve seeking attachment figures as a safe haven when distressed or using them as a secure base from which to explore and learn about a complex and potentially dangerous world. Infants develop attachment with their primary caregivers when caregivers respond to their signals and behaviours. From these early experiences, mental representations (i.e., internal working models) of the self and others develop and guide future interactions and relationships.

Three main types of attachment are typically classified: secure attachment, insecure-avoidant attachment, and insecure-resistant attachment. Each of these attachment patterns are thought to be the result of specific parenting styles. Ainsworth (1989) delineated five characteristics that distinguish attachment relationships from other enduring social relationships: 1) proximity seeking; 2) distress upon inexplicable separation; 3) pleasure or joy upon reunion; 4) grief at loss; and 5) secure base behaviour. This list of behaviours makes evident the ways in which childhood friendships differ from attachment figures.
Secure attachment is archetypally the result of warm and responsive patterns of childcare. The primary attachment figure (historically the mother), appears to enjoy close contact with its child and encourages the infant to communicate and explore his/her environment. The securely attached child is generally receptive to such overtures and uses the attachment figure as a safe base for active exploration. Approximately 50-70 percent of 1-year-olds are classified as securely attached.

Insecure-avoidant attachment is typically characterized by low levels of responsiveness to the child’s demands and a tendency to avoid physical contact. Parent-child interactions are often brief and unrewarding. These attachment figures are often rigid and harsh and are likely to reject their babies if they are temperamentally difficult. In turn, these infants learn to reciprocate their attachment figure’s behaviour and do not show signs of distress when separated from them or joy when reunited. The caregiver is not perceived as a source of security and so the child shows little confidence in using him/her as a base from which to explore the world. Approximately 20-25 percent of 1-year-olds are classified as having this attachment style.

Insecure-resistant attachment styles are often characterized by a caregiver who attempts to provide close physical contact, but is inconsistent in attuning to his/her infant’s needs. As a result, the child may display ambivalence in the relationship, at times seeming dependent and clingy, and at other times, avoiding or even fighting against contact. The corresponding diffidence in using the caregiver as a secure base from which to explore makes the child appear anxious, reluctant to investigate the world, and suspicious of strangers (Erwin, 2013). Approximately ten percent of 1-year-olds are classified as having this attachment style.

Attachment studies after 1985 began to focus on infants at social or psychological risk that were difficult to classify into one of the three organized attachment categories described above. Common denominators of these atypical cases included an established background of abuse or neglect and the absence of an organized strategy to deal with stressful situations. Freezing for a substantial period of time or apprehension of the caregiver under stressful circumstances are behavioural indices of a disorganized attachment (Main & Solomon, 1990). The essence of disorganized attachment is fright without solution because the caregiver is simultaneously a source of fear, as well as the only potential haven of safety.
It is now widely accepted that early-attachment with parents significantly predicts psychosocial adjustment and attachment with peers (Schneider, Atkinson, & Tardif, 2001). When securely attached children learn to trust and rely on their primary attachment figure, they develop positive and enduring expectations that these characteristics can and probably will be achieved in subsequent relationships. That is, children with healthy internal working models are more likely to be successful in forming and maintaining positive relationships with friends that are characterized by positive expectations, intimate emotional interactions, behavioural flexibility, and an ability to modulate negative arousal (Allen, Porter, McFarlan, McElhaney, Marsh, 2007; Main, 1991; Sroufe, Egeland, Carlson, & Collins, 2005). By contrast, children who have experienced insensitivity and rejection by their caregiver may develop a blueprint of relationships that is characterized by insecurity, distorted communications, and negative expectations about others. These children are more likely to carry the baggage of their expectations forward to their future relationships and exhibit problems in social functioning (e.g., Cassidy Kirsh, Scolton, & Parke, 1996; Erwin, 2013; Lucas-Thompson & Clarke Stewart, 2007; Sroufe & Fleeson, 1986). Similarly, discomfort with attachment related affect may lead adolescents with dismissing attachment strategies to push close friends away (Larose & Bernier, 2001; Spangler & Zimmermann, 1999).

In early adolescence peers become an increasingly important reference group. Nevertheless, parents continue to be the base from which the demands of a rapidly expanding social world can be explored (Erwin, 2013). The primary attachment figure remains the mother, secondarily it is same-sex friends, and eventually, it becomes the romantic partner (Furman & Wehner, 1997). By late adolescence, youth evolve from strictly being a “receiver” of care, to a care “giver” to peers, romantic partners, and even potentially offspring (Allen, 2008). Thus, close friends and romantic partners in adolescence can serve as attachment figures, or at the very least, take on critical attachment functions (Allen, 2008).

1.10 Markers, Moderators, Mediators, Mechanisms and Meanings

Although friendship is not a unitary construct and can thus be examined in any of the aforementioned dimensions, Bukowski and Adams (2005) suggest that a major goal of friendship research is to identify how variables from these different dimensions are interrelated and how they function together to affect outcomes. Current studies of friendships have attempted to
understand the effects of friendships on adjustment though several means including markers, moderators, mediators, meanings, and mechanisms.

Markers refer to variables that represent a larger phenomenon; they are a signpost of something else that is afoot. In this way, the presence or absence of friendships could be seen as an index of interpersonal competence and/or ADHD symptomatology (Bukowski & Adams, 2005). Moderators are variables that effect the direction and/or strength of the relationship between a predictor variable and an outcome variable. In this manner, a fundamental concept of the friendship literature is the notion that high quality friendships serve an important protective function for at-risk youth. For example, having a high quality friendship may attenuate the effects of harsh parenting on externalizing problems and self-esteem (Gauze, Bukowski, Aquan-Assee, & Sippola, 1996). Mediators are variables that are correlated with predictor and outcome variables and explain or account for their association. They test whether the effects of a predictor on an outcome is due, at least in part, to the effects of a third variable. In this way, a mediation analysis examines whether an effect is direct or indirect. For example, the association between shyness and depressive symptoms has been found to be mediated by peer rejection (Dill, Vernberg, Fonagy, Twemlow, & Gamm, 2004). Mechanisms refer to the processes that presumably account for the observed associations between measures of peer relations and outcomes (Bukowski & Adams, 2005). For example, deviancy training affects externalizing problems (Dishion, McCord, & Poulin, 1999) and co-rumination affects internalizing problems (Rose, 2002). Finally, meanings refer to the subjective experience children and adolescents ascribe to their friendship. Measures developed to assess friendship quality were intended to give researchers a method of capturing the specific value that friendships have for individual children and adolescents.

1.11 Summary and Goals of Research

There exists a sizeable body of literature that has underscored the importance of friendships for children’s and adolescents’ social, emotional and cognitive development (Hartup, 1993; Savin-Williams & Berndt, 1990; Way & Greene, 2006). There remain, however, serious gaps in our understanding of these critical relationships. Although there is a greater awareness of the markers of friendships from a normative perspective, and differences between children with and without ADHD in these markers (i.e., presence of friendships, nature of interactions), comparatively little
is known about the ecological factors (i.e., moderators and mediators) that shape the subjective experience adolescents attribute to their friendship (i.e., meanings). Even less is known about the mechanisms that account for these effects (Bagwell & Schmidt, 2011).

Relatedly, the interpersonal difficulties faced by individuals with ADHD are profound and well-documented (Hoza, 2007; Marshal et al., 2003; Sciberras et al., 2012; Sibley et al., 2010; Whalen & Henker 1992). However, the majority of research investigating the social functioning of youth with ADHD has examined peer rejection and social skills deficits, while generally overlooking their friendships. The limited amount of published studies have tended to investigate the existence of friendships among children with ADHD and only a handful have examined adolescent friendships. Fewer still have paid heed to the quality of friendships of adolescents with ADHD, or the processes potentially underlying their friendship difficulties.

High quality friendships have been repeatedly shown to buffer children and adolescents from future maladjustment, even if they experience a non-optimal family environment or remain unpopular in the overall larger peer group (Bukowski et al., 1993; Cardoos & Hinshaw, 2011; Hodges, Boivin, Vitaro, & Bukowski, 1999; Ladd et al., 1996; Parker & Asher, 1993; Rose & Asher, 2000). Researchers have speculated that children and adolescents with ADHD may even benefit more from high-quality friendships then their non-disordered peers (Hoza, 2007; Mikami, 2010; Mrug, Hoza, & Gerdes, 2001; Normand, Schneider, & Robaey, 2007). Therefore, understanding correlates of friendship quality in adolescents with ADHD has important clinical implications for an at-risk population. As such, the overall purpose of this dissertation is to examine friendship quality in adolescents with ADHD. The specific aims of this research are to 1) investigate whether the quality of same- and other-sex friendships differ in adolescents with and without ADHD across age and gender, and 2) examine empirically supported correlates of friendship quality including friendship stability, co-morbid psychopathology (e.g., anxiety, depression, oppositional defiant behaviour, conduct problems), and interpersonal competence (e.g., social perspective taking, social skills).
Chapter 2
A Comparison of Friendship Quality in Adolescents with and without ADHD

Abstract

Objective: This study compared the quality of friendships (same- and other-sex) in adolescents with and without Attention-Deficit/Hyperactivity Disorder (ADHD), across age and gender. Method: A community sample of 115 participants (61 ADHD, 54 Comparison), ages 13-18, completed questionnaires assessing perceived levels of social support and negative interactions experienced in their friendships. Results: Ratings of friendship social support diminished across age in youth with ADHD, but increased in typically developing youth. Adolescents with and without ADHD, however, did not differ on ratings of negative interactions experienced in their friendships. Compared to males, females, rated their friendships to be more supportive, irrespective of ADHD status. Adolescents with and without ADHD rated their same-sex friendships to be simultaneously more supportive and more conflictual than their other-sex friendships. Implications of these findings are discussed.
2.1 Introduction

The purpose of the present study was to investigate the quality of same-sex and other-sex friendships in adolescents with and without Attention Deficit/Hyperactivity Disorder (ADHD). Friendships are co-constructed relationships that are reciprocal, mutual, and with a sense of equality at their core (Bagwell & Schmidt, 2011). Friendships are normative, they serve as a backdrop for development, and they are considered to be paramount in contributing to the social, emotional, and cognitive functioning of children and adolescents (e.g., Bagwell & Schmidt, 2011; Hartup 1996; Newcomb & Bagwell, 1995). Friendships provide children and adolescents with opportunities to resolve conflicts, practice cooperation, cultivate patience, develop perspective-taking, and they serve as a rubric for future interpersonal relationships that span the life-cycle (Bagwell et al., 1998; Berndt & Murphy, 2002; Hartup & Stevens 1997). At the most fundamental level, studying friendships is important because children and adolescents value them greatly.

Representing friendships as a unitary construct, however, is misleading (Hartup, 1995, Mikami, 2010). Friendships vary in their stability, quality, and the characteristics of the partners involved in the dyad (Hartup, 1995). High quality friendships comprise many positive features (e.g., intimacy, support, emotional proximity, and validation), few negative features (e.g., conflict, criticism, aggression), and they are positively associated with relationship stability and satisfaction (e.g., Bagwell & Schmidt, 2011; Branje, Frijns, Finkenauer, Engels, & Meeus, 2007). Although high-quality relationships with friends may safeguard adolescents from maladjustment (e.g., Berndt, 1999; Cotterell, 2007; Hodges, Boivin, Vitaro, & Bukowski, 1999; Waldrip, Malcolm, & Jensen-Campbell, 2008), poor-quality friendships have been linked to negative outcomes in youth and often jeopardize their academic, behavioural and socio-emotional functioning (e.g., Allen et al., 2007; La Greca & Harrisson, 2005; Molcho, Nic Gabhainn & Kelleher, 2007; Stice, Ragan & Randall, 2004).

To date, we have begun to gain a better understanding of friendships from a normative perspective, but know significantly less about the effects that individual differences, such as ADHD, may have on these relationships. The majority of research investigating the social functioning of youth with ADHD has examined peer rejection and social skills deficits (Hoza, 2007; Sciberras et al., 2012; Sibley, et al., 2010), while generally overlooking their friendships.
The few existing studies investigating the friendships of individuals with ADHD tend to focus on children and the mere presence/absence of friendships, while paying virtually no heed to adolescent friendships or the quality of these relationships.

2.1.1 Friendships and ADHD

Although ADHD is conceptualized as a neurobiological disorder (Kieling et al., 2008), it is diagnosed on the basis of a persistent pattern of inattention and/or hyperactivity-impulsivity that causes significant impairment across settings (American Psychiatric Association [APA], 2013). Attentional difficulties may make individuals with ADHD appear socially withdrawn and disinterested and may make it more challenging for them to be emotionally supportive and demonstrate a reciprocal understanding of their friends’ needs and feelings (Mikami, Huang-Pollock, Piffner, McBurnett, & Hangai, 2007; Normand et al., 2013). Symptoms of hyperactivity and impulsivity may result in difficulty modulating emotions, resolving conflicts equitably, and interacting in a sensitive manner. Thus, while friendship problems are not part of the inattentive and hyperactive/impulsive symptom list of ADHD per se, it is not surprising that the core symptom dimensions present in these individuals often interfere with the development of their social skills and social functioning (Mikami, 2010; Normand et al., 2007). Indeed, research suggests that the behavioural profile of children with ADHD in conjunction with their associated social skills deficits may account for the interpersonal difficulties they experience (e.g., Hoza, 2007; Marton et al., 2009).

Existing study findings suggest that children with ADHD have fewer friends than their typically developing (TD) peers and approximately half of children with ADHD have no reciprocal friend (e.g., Bagwell, Molina, Pelham, & Hoza, 2001; Blachman & Hinshaw, 2002; Hoza et al., 2005b; Marton et al., 2015). Those children with friends generally tend to have relationships that are characterized as less intimate, supportive, cooperative, and satisfying, and more conflictual than their TD peers (e.g., Blachman & Hinshaw, 2002; McKee, 2014; Normand et al., 2011, 2013). There is also some evidence that children with ADHD tend to value certain characteristics in their friendships (e.g., fun, mutually entertaining) that may conflict with the characteristics valued by children without ADHD (e.g., emotional support, sense of security) (Gardner & Gerdes, 2015; Heiman, 2005). Therefore, it is not surprising that there is evidence showing that
children with ADHD also have friendships that are less stable than their non-disordered peers (Blachman & Hinshaw, 2002; Marton et al., 2015, Normand et al., 2013).

### 2.1.2 Developmental Factors

Friendships change as children age. They become more complex, more strongly embedded in a social context, more intimate, and more significant to one’s psychological adjustment (e.g., Buhrmester, 1996; Hartup, 1996). The need for companionship that was prominent in childhood is supplanted by a need for reciprocity, intimacy, self-disclosure, and emotional support in adolescence. Accordingly, as youth move across adolescence, their expectations of friendships increase, the number of conflicts decrease, and levels of empathy, sharing, intimacy, and attachment within friendships tend to remain stable or increase (Claes & Simard, 1992; McNelles & Connolly, 1999).

The composition of adolescents’ social networks also changes and begins to include members of the other sex and romantic partners. Nevertheless, the developmental significance of other-sex friendships remains largely ignored, despite that same- and other- sex friendships have important and unique implications for psychological adjustment (Bagwell & Schmidt, 2011). Interestingly, adolescents who are either popular with, or rejected by, same-sex peers are more likely to have close other-sex friendships than adolescents with average peer status among same-sex peers (Bukowski, Sippola, & Hoza, 1999). Moreover, for unpopular boys, having other-sex friendships predicts higher self-worth and mitigates some of the deleterious effects of peer rejection (Bukowski et al., 1999). Regardless of peer status, by late adolescence, other-sex friendships may eclipse same-sex friendships on relationship features of cohesion and closeness (Berndt, 1982). Thus, other-sex friendships appear to offer a valued relationship with distinct rewards, including a compensation for a lack of close same-sex friends, a precursor to romantic relationships, and an additional context for self-exploration and identity development (Bagwell & Schmidt; 2011; Hand & Furman, 2009). Because youth with ADHD are more likely to be rejected by their same-sex peers (Bagwell et al., 2001; Hoza et al., 2005b), other-sex peers may offer another avenue to form high-quality friendships.
The potential influence of age on the quality of friendships in adolescents with ADHD remains unclear. Over and above the developmental changes that occur in TD peers, the manifestation of ADHD symptoms changes as these individuals progress through adolescence. Longitudinal studies have demonstrated that hyperactive-impulsive symptoms tend to decline across development while inattentive symptoms tend to remain stable (Biederman, Mick & Farone, 2000; Willcut et al., 2012). It is therefore possible that the social difficulties associated with inattentive symptoms (e.g., social withdrawal, disengagement, empathic understanding) may be more detrimental to the quality of friendships of adolescents with ADHD (Mikami et al., 2007; Normand et al., 2007, 2013). Given the increased developmental significance of same- and other-sex friendships across time, examining the largely unexplored relationship between age, ADHD status, and friendship quality is important.

2.1.3 Gender

Research has firmly established that the interpersonal relationships of boys and girls are qualitatively different (Rose & Rudolph, 2006). Boys tend to engage in interactions that are activity-based and involve sports and games and require large groups, whereas girls are more relationship-oriented and tend to interact in small groups of friends. (Claes, 2003; Rose, 2007). In general, research suggests that girls have higher quality relationships than boys, with girls placing a greater emphasis on intimacy, self-disclosure, emotional closeness, validation, enhancement of self-worth, conflict resolution, and helping behaviors (Bowker, 2004; Rose & Rudolph, 2006). By contrast, boys’ friendships tend to be characterized by a greater amount of competition and a dominance hierarchy (Rose & Rudolph 2006), but also friendships of greater stability than the relationships of girls (Benenson & Christakos, 2003).

The limited research investigating gender differences in the peer relationships of youth with ADHD suggests that girls with ADHD have at least as many difficulties in their peer relationships, if not more, than their male counterparts (e.g., Blachman & Hinshaw, 2002; Ohan & Johnston, 2007, Zucchetti, Ortega, Scholte, Rabaglietti, 2015). Although not empirically tested, Mikami (2010) suggests that the core symptoms and associated deficits (e.g., self-regulation, planning/organization, working memory) of ADHD may be more impairing to the friendships of girls, where features such as intimacy, conflict resolution, emotional closeness, are prioritized. In addition, because ADHD is less common in females, a girl with ADHD symptoms
may be perceived as more deviant, and their actions as less tolerable, relative to boys with a similar presentation (Chang, 2004; Mikami, Lerner, & Lun, 2010). Including gender as a factor in the comparison of adolescent friendships, in addition to ADHD status and age, may help shed light on some of these assumptions.

2.1.4 Study Rationale and Objectives

Collectively, the available research on the friendships of individuals with ADHD reveals some troubling tendencies. In addition to the well-known domains of impairment associated with ADHD, children and adolescents with ADHD and peer problems have higher rates of criminality, conduct problems, depression, anxiety, substance abuse, eating disorders, and school dropout than youth with ADHD without peer relationship problems (Greene, Biederman, Faraone, Sienna, & Garcia-Jetton, 1997; Mikami & Hinshaw, 2006; Mikami, Lee, Hinshaw, & Mullin, 2008). Nevertheless, if youth with ADHD are able to establish high quality friendships, this may serve to buffer them from future maladjustment, even if they remain unpopular in the overall larger peer group. Researchers have even hypothesized they may even benefit more from the buffering effect of these high-quality relationships than their non-disordered peers (Hoza, 2007; Mikami, 2010; Mrug, Hoza, & Gerdes, 2001; Normand et al. 2007).

Therefore, the overarching purpose of this study was to investigate the quality of friendships in adolescents with ADHD, across age and gender. Based on previous research examining the quality of friendships of children with ADHD (Blachman & Hinshaw, 2002; McKee, 2014; Normand et al., 2011, 2013), it was expected that adolescents with ADHD would have lower levels of friendship quality and that these difficulties would become more pronounced in late adolescence. It was also predicted that adolescents with ADHD would more frequently turn to other-sex friendships for support (Bukowski et al., 1999) and rate these friendships to be of relatively higher quality than those of their typically developing peers. Due to insufficient research examining gender differences in friendship quality in youth with ADHD, analyses of gender effects were exploratory.
2.2 Method

2.2.1 Participants

The original sample comprised 123 adolescents. Six participants with an ADHD diagnosis were excluded from subsequent analyses either due to IQ scores below a standard score of 80 (n = 3), as assessed by the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999), or because they no longer exhibited clinical levels of ADHD symptoms (n = 3). Two comparison participants were excluded because of elevated levels of ADHD symptoms. Thus, the final sample consisted of 115 adolescents (65 boys, 50 girls) between the ages of 13-18 (13-15 year olds (n = 58), 16-18 year olds (n = 57). Of these adolescents, 61 participants had a diagnosis of ADHD (mean age = 15.28, SD = 1.54) and 54 adolescents without a diagnosis of ADHD served as a comparison group (mean age = 15.41, SD = 1.75).

For inclusion in the ADHD sample, participants were required to have an existing diagnosis of ADHD from a physician or mental health professional. Participants and their parents and teachers were also asked to complete the Conners Rating Scales-Third Edition (Conners, 2008; Parent- Conners 3-P, Teacher- Conners 3-T, Self-report- Conners 3-SR) to confirm the presence of ongoing clinical levels of ADHD symptomatology. Based on the results of these measures, ADHD status was confirmed in one of two ways: 1) participants were rated in the clinical range (T-score ≥ 70) by one of their parents on the DSM-IV oriented ADHD subscales of the Conners’ Parent-3rd Edition (Conners, 2008) (n = 58); or 2) participants were rated in the borderline range (T = 65-69) by one of their parents and by a second informant (teacher or self-report) (n = 3).

For adolescents taking psychostimulant medication (n = 43), informants were asked to consider the participants’ behaviour off medication. For inclusion in the comparison sample, participants were required to have no diagnosis of ADHD. Additional eligibility criteria for the comparison sample included 1) Conners 3-P ratings within the average range (T ≤ 60) on the DSM-IV oriented ADHD subscales (n = 52); or 2) all three of the Conners 3-P, Conners 3-T, and Conners 3-SR ratings below the borderline range (T = < 64) (n = 2).

More than two-thirds (69%) of the ADHD sample (n = 42) had at least one comorbid diagnosis from a mental health professional (38 learning disabilities, 2 oppositional defiant disorder, 1 conduct disorder, 7 anxiety disorders, 2 mood disorders). Within the comparison group, 15% (n
= 8) of participants had diagnoses of a learning or mental health problem (7 learning disabilities, 1 anxiety disorder, 1 oppositional defiant disorder).

T-tests revealed no significant group differences on age or IQ (see Table 2.1). Chi-Square tests revealed no significant group differences on level of parental education attainment, parental marital status, parental country of birth, or the language spoken at home (see Table 2.1). However, there was a significantly higher proportion of males in the ADHD group (n = 40; 66%), than in the comparison group (n = 25; 46%), $X^2 (1, N = 115) = 4.33, p = 0.04$. As expected, participants with ADHD had significantly higher scores on variables measuring current manifestation of inattentive and hyperactive/impulsive symptoms (parent, teacher, self-report) and oppositional defiant behaviour and conduct problems (parent, self-report) (see Table 2.1).

2.2.2 Measures

2.2.2.1 The Networks of Relationships Inventory-Behavioral Systems Version

The Networks of Relationships Inventory–Behavioral Systems Version (NRI-BSV; Furman & Buhrmester, 2009) (see Appendix A) assesses the frequency with which different relationships (e.g., mother, father, same- and other-sex friends, romantic partners) are used to satisfy the functions of three behavioral systems: attachment, caregiving, and affiliation (Furman & Buhrmester, 2009). It is a 24-item survey, with 3 items per scale, rated on a 5-point scale from 1 (little or none) to 5 (the most). It assesses five support features (Seeks Secure Base, Seeks Safe Haven, Provides Secure Base, Provides Safe Haven, Companionship) and three negative interaction features (Conflict, Antagonism, Criticism). Two second-order factors (Social Support, Negative Interactions) are computed by averaging the five support and three negative interactions scales respectively. Sample items from the NRI social support factor include: *How much do you turn to this person for support when you are troubled about something?*; *How much does this person turn to you for support when s/he is troubled about something?*; *How often do you and this person go places and do enjoyable things together?*; *How much does this person show support for your activities?* Sample items from the NRI negative interactions factor include: *How much do you and this person say mean or harsh things to each other?*; *How often do you and this person argue with each other?*; *How much do you and this person get annoyed with each other’s behavior?* For the purposes of this study, only responses pertaining to the
participants’ same- and other-sex friends were explored. The second order factors (i.e., social support, negative interactions) demonstrate strong internal consistency for same- and other-sex friends and romantic partners with alphas ranging from .89 to .92. Test-retest reliability for this measure is moderate, with stability of scores over one year ranging from .58 to .75, for same and other-sex friends. Construct validity of the NRI-BSV has been established between coders’ ratings of observed interactions and adolescents’ ratings of their relationships with mothers and friends (Furman & Buhrmester, 2009). For the current study, internal consistency was also strong, with alphas ranging from .86 to .98. NRI-BSV Social Support scores were negatively correlated with the Conners 3-P and Conners 3-T peer relations scales (-.29, p = .002 and -.35, p = .001 respectively).

2.2.2.2 Conners Rating Scale – Third Edition

The Conners Rating Scales-Third Edition (Conners, 2008; Parent- Conners 3-P, Teacher-Conners 3-T, Self-report- Conners 3-SR) long-forms were used to confirm ongoing manifestation of ADHD symptoms in the domains of inattention and hyperactivity/impulsivity, as well as to assess oppositionality and conduct problems. The Conners is a well-validated standardized measure consisting of 99-115 items on a 4-point Likert scale from 0 (Not at all/Seldom, Never) to 3 (Very Much True/Very Often, Very Frequent). The DSM-IV subscales (DSM-IV Inattention, DSM-IV Hyperactive/Impulsive, DSM-IV Oppositional Defiant Disorder, DSM-IV Conduct Problems) demonstrate good internal consistency (Parent: .93, .92, .91, .83; Teacher: .94, .95, .93; .70; Self-report .89, .85, .83, 81) and good test-retest reliability (Parent: .84, .89, .88, .94; Teacher: .85, .84, .83, .87; Self-report .71, .72, .78, 81) respectively (Conner, 2008). For the current sample, internal consistency for the two DSM-IV ADHD subscales and the oppositional defiant disorder (ODD) and conduct disorder (CD) subscales, were high for all forms (parent, teacher, self-report) (α > .80).

2.2.2.3 Wechsler Abbreviated Scale of Intelligence

The Wechsler Abbreviated Scale of Intelligence (WASI; Vocabulary and Matrix Reasoning subscales, Wechsler, 1999) was used to determine eligibility for participation in the study and to estimate the participants’ cognitive functioning. The abbreviated IQ scale (based on the two subtest scores) demonstrates good internal consistency (Age ≤ 16 years: .93; Age ≥ 17 years:
.96) and test-retest reliability (Age ≤ 16 years: .85; Age ≥ 17 years: .88). The correlation with the Full Scale IQ on the WISC-IV is .82 (Sattler & Dumont, 2008).

2.2.3 Procedures

The present study was conducted as part of a larger research study on the peer and family relationships of adolescents with ADHD. Adolescents were recruited through advertisements in community newspapers and websites, by distributing flyers to physicians’ and psychologists’ offices and children’s mental health centres, and by phoning research participants from previous studies who had agreed to be contacted for future research. Institutional ethic’s board approval was obtained from the University of Toronto (protocol reference #25468) and all participants and their parents provided informed written consent prior to the start of the study. During an initial phone screening, parents of participating adolescents were given detailed information about the study, and parents provided demographic information about their children and families and completed the Conners-Parent long form. Adolescent participants were given the choice of receiving $30 as compensation for their time (approximately 4 hours) and travel expenses incurred, or receiving a volunteer service certificate documenting time spent participating in the study. Additionally, participants were provided with an educational report describing the adolescent’s cognitive, academic, and socio-emotional functioning.

On the day of testing, researchers assisted participants in completing an individually administered battery of standardized tests and self-report measures (e.g., WASI, Conners 3-SR, NRI-BSV). Researchers were graduate students in school and clinical child psychology with extensive training in psychological testing. Caregivers completed a combination of paper-and-pencil and online questionnaires and provided consent for the Conners 3-T to be sent to one of the adolescents’ teachers.

2.2.4 Data Analyses

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 22 (IBM Corp, 2013). The data were examined for outliers, and when detected, data points with SDs larger than 3 were adjusted using the winsorizing method. Descriptive statistics were calculated for the demographic characteristics (e.g., age, gender, IQ, parental education, parental marital status, parents’ country of birth, and language spoken at home) of the ADHD
and comparison groups separately (see Table 2.1). Measures of IQ, parental education, parental marital status, parents’ country of birth, and language spoken at home were not significantly correlated with ratings of friendship quality ($p > .430$) and were not covaried in the analyses. A mixed analysis of variance (ANOVA) was performed on two indices of friendship quality: social support and negative interactions. The within subjects factors were: relationship (same-sex friend, other-sex friend) and scale (social support, negative interactions). The between subjects factors were: group (ADHD, comparison), age (13-15 years, 16-18 years), and gender (male, female). When appropriate, follow-up univariate analyses of variance (ANOVAs) were conducted to determine the locus of the statistically significant effects. Partial $\eta^2$ values were computed to ascertain effect size and determine clinically meaningful differences. According to Vacha-Haase and Thompson (2004), $\eta^2 \geq .01$ constitutes a small effect, $\eta^2 > .09$ corresponds to a medium effect, and $\eta^2 > .25$ represents a large effect.

2.3 Results

2.3.1 Quality of Same- and Other-Sex Friendships

The mixed ANOVA showed an interaction effect between scale (social support, negative interactions) and relationship (same-, other-sex friends), Wilks’ $\Lambda = .883$, $F(1, 107) = 14.22$, $p < .001$, $\eta^2 = .12$, indicating that ratings of social support in same- and other-sex friendships were higher than ratings of negative interactions. To disentangle this interaction, separate analyses were performed for the two scales: social support and negative interactions.

2.3.2 Social Support

The group x age interaction effect was significant, $F(1, 107) = 4.72$, $p = .032$, $\eta^2 = .04$, indicating that ratings of social support in same- and other-sex friendships in participants within the comparison group were higher for the 16-18 year-old adolescents ($M = 3.23$, $SD = .79$) than for the 13-15 year-olds ($M = 2.83$, $SD = .7$), whereas ratings of social support in the friendships of adolescents with ADHD was lower in the 16-18 year-old adolescents ($M = 2.85$, $SD = .88$) than in the 13-15 year-olds ($M = 3.14$, $SD = .86$). In addition, the interaction effect of gender x relationship was statistically significant, Wilks’ $\Lambda = .96$, $F(1, 107) = 4.33$, $p = .04$, $\eta^2 = .04$. Although males ($M = 2.66$, $SD = .90$) and females ($M = 2.91$, $SD = .97$) reported similar levels of
social support in other-sex friendships, females rated their same-sex friendships ($M = 3.56, SD = .93$) to be more supportive than did their male counterparts ($M = 2.92, SD = .94$). No other higher-order interaction was significant. There was a significant main effect of relationship type, Wilks’ $\Lambda = .803$, $F(1, 107) = 26.18, p < .001, \eta^2 = .20$, where participants, irrespective of their ADHD status, age, or gender, rated the level of social support in their same-sex friendships ($M = 3.24, SD = .98$) to be higher than the level of social support in their other-sex friendships ($M = 2.77, SD = .93$). Finally, there was a significant main effect of gender, where females ($M = 3.23, SD = .96$), irrespective of their ADHD status or age, viewed their same- and other-sex friendships to be more supportive than the friendships of males ($M = 2.78, SD = .92$) (See Tables 2.2 and 2.3).

2.3.3 Negative Interactions

Negative Interactions: There was a significant main effect of relationship type, Wilks’ $\Lambda = .96$, $F(1, 107) = 4.18, p = .043, \eta^2 = .04$, where participants, irrespective of their ADHD status, age, or gender, had more frequent negative interactions with their same-sex friends ($M = 1.59, SD = .54$) than other-sex friends ($M = 1.44, SD = .46$). No other main or interaction effects were significant (see Table 2.3).

2.4 Discussion

The current study set out to compare the quality of friendships (same- and other-sex) in adolescents with and without ADHD, using an empirically validated and reliable self-report questionnaire of relationship quality. Results provide partial support for the prediction that adolescents with ADHD have friendships of lower quality than their TD peers. Age was found to moderate the relationship between ADHD status and perceived social support in friendships, such that self-reported ratings of friendship social support was lower across age groups in youth with ADHD, but increased across age groups in TD youth. These findings were consistent across same-sex and other-sex friendships. However, when compared to their TD counterparts, adolescents with ADHD did not rate themselves as having more frequent negative interactions in their friendships. Compared to males, females with and without ADHD rated their same- and other-sex friendships to be more supportive. Finally, all adolescents, regardless of their ADHD
status or age, rated their same-sex friendships to be simultaneously more supportive and more conflictual than their other-sex friendships.

2.4.1 Social Support

2.4.1.1 Developmental Factors

The main objective of the present study was to investigate the quality of same- and other-sex friendships in adolescents with and without ADHD, across age and gender. The prediction that adolescents with ADHD would have lower levels of friendship quality was only partially supported. Younger adolescents with and without ADHD did not differ in their ratings of social support in their friendships. However, as predicted, levels of perceived social support was lower in the friendships of older adolescents with ADHD, but higher in the group of older adolescents without ADHD. The finding that age moderates the relationship between ADHD and social support in friendships is consistent with previous research. Blachman and Hinshaw (2002) and Normand et al. (2013) found no group differences in self-reported ratings of positive friendship features in a sample of children with and without ADHD, but Mckee (2014) found that a sample of undergraduate students with ADHD had greater difficulty providing emotional support in their friendships than their non-ADHD counterparts.

As youth move across childhood and into adolescence, there is a shift in their interpersonal needs (Sullivan, 1953). Companionship is no longer the preeminent feature of friendships. Instead, older adolescents describe loyalty, intimacy, empathic understanding, and emotional reciprocity as the core features of a high-quality friendship (Berndt, 1986). Findings from this study suggest that the core symptom dimensions of ADHD may make it more difficult for teens with ADHD to shift their interaction patterns to adequately respond to these emerging friendship demands. Specifically, attentional problems may make it more difficult for teens with ADHD to develop social skills through observational learning (Hoza, 2007), to be attuned to the emotional needs of their friends (Mikami et al., 2007; Normand et al., 2013), and to process social cues to resolve conflicts in an equitable manner (Sibley et al., 2010). Hyperactive and impulsive behaviours may result in difficulty modulating emotions and an interactional style that is overbearing and undiplomatic (Hoza, 2007). In addition, children with ADHD tend to rely on their best friends for mutual entertainment, amusement and having fun, whereas their typically developing peers
favour caregiving and intimacy in their friendships (Heiman, 2005). Although these findings have yet to be replicated in older populations, findings from this study suggest there may continue to be a mismatch between the salient features prioritized in the friendships of older adolescents with ADHD and their TD peers. It is also possible that delays in cortical maturation in the brain regions associated with cognitive processes such as attention and executive functioning may play a role in the social difficulties experienced by youth with ADHD (Rommelse, Buitelaar, & Hartman, 2017; Shaw, Eckstrand, Sharp et al., 2007).

2.4.1.2 Gender

Female adolescents rated their friendships (same- and other-sex) as involving higher levels of social support when compared to their male counterparts, irrespective of their ADHD status or age. By now, there is ample evidence that girls value friendships based on emotional closeness, intimacy, self-disclosure, enhancement of self-worth, and helping behaviors, while boys’ friendships emphasize agentic needs, individual status, competition, and a dominance hierarchy (e.g., Bowker, 2004; Rose & Rudolph, 2006). Thus, the finding that typically developing adolescent girls have friendships that they perceive to be more supportive is hardly surprising. However, research investigating gender differences in friendship quality among adolescents with ADHD is sparse. In the multimodal treatment of ADHD (MTA) study, boys and girls were equally impaired in terms of peer status and number of dyadic friendships, but friendship quality was not examined (Hoza et al., 2005a). Blachman and Hinshaw (2002) found that girls with ADHD had higher levels of negative relationship features than did comparison girls, but levels of positive relationship features did not differ across subgroups. Furthermore, the study consisted of an exclusively female sample and lacked a group of boys with which to make gender comparisons. Zucchetti et al. (2015) found that symptoms of hyperactivity were associated with best friend conflicts among boys, whereas symptoms of inattention contributed to conflicts among girls. However, in their study, Glass and colleagues (2012) found no gender differences on positive friendships features or the overall quality of boys’ and girls’ friendships. In her review paper, Mikami (2010) hypothesized that symptoms of ADHD may be more impairing to the close friendships of girls relative to boys. Findings in this study, however, suggest that adolescent girls with ADHD, much like TD youth, report friendships that are more supportive than their male counterparts.
2.4.1.3 Same- and Other-Sex Friendships

Consistent with previous research (e.g., Kuttler, La Greca, & Prinstein, 1999; Lempers & Clark-Lempers, 1993), results from this study indicate that, irrespective of ADHD status, gender, or age, adolescents find their same-sex friendships to be more supportive than their other-sex friendships. However, a trend-level ($p = .078$) group by relationship interaction effect suggests that the levels of perceived social support in same-and other-sex friendships may be more similar in adolescents with ADHD, than in adolescents without ADHD. These findings are in line with previous research which proposes that adolescents that are either high or low in popularity in same-sex peer relationships are more likely than other children to be engaged in close friendships with the other sex (Bukowski et al., 1999; Kovacs, Parker, & Hoffman, 1996). It is well documented that children and adolescents with ADHD experience low levels of peer acceptance and are frequently ostracized by their peers (Bagwell et al., 2001; Hoza, 2007; Sibley et al., 2010). These results are perhaps indicative that other-sex friendships may offer an alternative means of forging supportive relationships in youth with ADHD. Nevertheless, the absence of a significant interaction effect suggests that a larger sample size may have been required to achieve a significant effect, or may be required in the future to reach a firm conclusion. In any event, while there may a link between high/low popularity and an orientation towards other-sex friendships, the mechanisms underlying this association remain unclear, and the present study did not investigate participants’ social status in their larger peer network.

2.4.1.4 Negative Interactions

Adolescents with and without ADHD rated themselves as having comparable levels of negative interactions in their friendships, irrespective of age and gender. These findings are inconsistent with previous research indicating that children with ADHD report increased levels conflict and relational aggression in their friendships (Blachman & Hinshaw, 2002; Zucchetti et al., 2015). These discrepant results may be potentially related to developmental changes in adolescent friendship selection. Adolescence represents a time of growing autonomy and participation in actively building one’s social universe (Bagwell & Schmidt, 2011). Parents have less input regarding the selection of their children’s friends and, consequently, adolescents may choose to become friends with peers with whom they share more attributes, aspirations and achievement
goals, resulting in less conflictual relationships than their younger counterparts (Claes, 2003). Future research is needed to replicate these findings.

Interestingly, adolescents with and without ADHD, irrespective of age and gender, rated their same-sex friendships to be simultaneously more supportive and more conflictual than their other-sex friendships. These findings suggest that an increase in negative friendship features may also reflect a greater openness and security within same-sex friendships, which in turn creates a context that allows friends to be more open about their potentially contrasting opinions, without the fear of reprisals (Banny, Heilbron, Ames, & Prinstein, 2011; Normand et al., 2013). Thus, conflict, and more importantly, conflict resolution, within a reciprocal same-sex best friendship may function to strengthen the relationship by providing a safe environment to share sensitive and intimate thoughts and to develop social skills.

2.4.2 Limitations and Implications

The current findings should be considered in light of several important limitations. Friendship quality was assessed through self-report only, and not corroborated with the other member of the dyad, or through observations of naturalistic or contrived interactions among friends. Research studies suggest that in ADHD dyads, partners often have conflicting views regarding their friendships (e.g., Normand et al., 2013). On the one hand, findings in the present study, however modest, suggest that older teens with ADHD are sufficiently self-aware to identify that their friendships are less supportive than those of their typically developing peers. On the other hand, individuals with ADHD are notorious under-reporters of problem areas in their lives, especially as it pertains to their social competence (e.g., Colomer, Martinussen, & Wiener, 2016; Owens, Goldfine, Evangelista, Hoza, & Kaiser, 2007). Therefore, the results may reflect an underrepresentation of their actual relationship impairment. Future studies should employ a multi-method, multi-informant assessment of friendship quality to provide more definitive conclusions.

Subsequent research should also collect information on the characteristics of the participants’ friends. Although high quality friendships are generally associated with better psychosocial functioning, deviancy training and co-rumination also co-occurs within the context of high quality friendships (e.g., Dishion et al., 2004; Oh, Rubin, Bowker, et al., 2008; Rose et al., 2007).
Because high quality friendships, for better or for worse, are more influential than low quality relationships (Berndt et al., 1999), and because youth with ADHD are more likely to befriend peers who exhibit behavioural and socio-emotional difficulties (Hoza et al., 2005b; Marton et al., 2015; Normand et al., 2011), it is especially important to consider the potential role that the characteristics of the friends have on adjustment, over and above friendship quality.

The present study provides some preliminary information about the quality of friendships in adolescents with and without ADHD, across age and gender. However, many relevant issues remain to be explored. The relatively small sample size prevented further exploration of additional factors potentially moderating or mediating the relationship between ADHD and friendship quality. Future studies, with larger samples, should examine the distal social context (e.g., culture, ethnicity, socioeconomic status), proximal environmental conditions (family structure, parental influences, peer groups), additional child characteristics (emotion regulation, aggression, social perspective taking, social skills), and their varying contributions to the quality of friendships. Investigating these associations over a longer period may also help to shed light on the potentially bidirectional relationship these correlates have with developmental outcomes such as self-worth, academic achievement, family and peer functioning, and externalizing and internalizing symptomatology.

Results from the present study indicate that older adolescents with ADHD, and males in general, perceive their friendships to be less supportive than the friendships of their respective counterparts. Empirical research indicates that it is the quality, rather than the quantity, of one’s relationships that is critical to psychosocial functioning (Berndt, 2002; Hartup & Stevens 1997). Therefore, comprehensive assessments of adolescents with ADHD should include a careful examination of their social functioning with particular attention devoted to the quality of their interactions with friends. A greater understanding of how teens with ADHD perceive the positive and negative features of their friendships may help mental health practitioners devise specific strategies for intervention. Existing intervention programs (e.g., Frankell & Myatt, 2003; Hoza, Mrug, & Pelham, 2003; Mikami, Griggs, Lerner, et al., 2013) are geared towards children with ADHD, and given the limited research on the friendships of adolescents with ADHD, it is premature to delineate more definitive implications.
These limitations notwithstanding, the present study contributes to the limited research base examining the friendships of individuals with ADHD in general, and adolescents in particular. To our knowledge, this is the first study to simultaneously investigate the quality of same- and other-sex friendships from the perspective of teens with ADHD. The sample, which included male and female participants, is one of the few studies to examine gender-specific differentiations in friendship patterns while also exploring both positive and negative friendship features.
### Table 2.1  Sample Characteristics and Demographics

<table>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; University Degree</td>
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<td>28</td>
<td>11</td>
<td>25</td>
<td>.12</td>
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<tr>
<td>≥ University Degree</td>
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<td>72</td>
<td>33</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>Parental Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.71</td>
</tr>
<tr>
<td>2 caregiver household</td>
<td>47</td>
<td>77</td>
<td>45</td>
<td>83</td>
<td></td>
</tr>
<tr>
<td>Other (e.g., single, divorced)</td>
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<td>23</td>
<td>9</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Parents Born in Canada</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.17</td>
</tr>
<tr>
<td>Either/Both</td>
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<td>78</td>
<td>34</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Neither</td>
<td>13</td>
<td>22</td>
<td>18</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Language Spoken at Home</td>
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<td>74</td>
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<td>67</td>
<td></td>
</tr>
<tr>
<td>Other (e.g., French, Spanish)</td>
<td>16</td>
<td>26</td>
<td>18</td>
<td>33</td>
<td></td>
</tr>
</tbody>
</table>

| Child Characteristics               |      |            |            |            |       |
| Age                                 | 61   | 15.28 (1.54)| 54         | 15.41 (1.75)| .42   |
| IQ                                  | 61   | 106.69 (11.69)| 54         | 110.31 (8.89)| 1.83  |
| Conners Parent                      |      |            |            |            |       |
| DSM Inattentive                     | 61   | 80.38 (8.07)| 54         | 49.04 (6.26)| 23.04***|
| DSM Hyperactive-Impulsive           | 61   | 80.11 (10.74)| 54         | 48.37 (5.94)| 19.25***|
| DSM Oppositional/Defiant            | 61   | 68.07 (12.43)| 54         | 49.85 (7.15)| 9.46***|
| DSM Conduct Disorder                | 61   | 59.57 (13.69)| 54         | 48.28 (8.43)| 5.22***|
| Conners Teacher                     |      |            |            |            |       |
| DSM Inattentive                     | 46   | 62.28 (12.41)| 43         | 51.84 (11.18)| 4.16***|
| DSM Hyperactive-Impulsive           | 45   | 59.78 (14.53)| 43         | 52.84 (13.63)| 2.31* |
| DSM Oppositional/Defiant            | 46   | 61.78 (18.27)| 43         | 57.26 (16.06)| 1.23  |
| DSM Conduct Disorder                | 43   | 54.33 (14.14)| 42         | 50.17 (11.33)| 1.49  |
| Conners Self-Report                 |      |            |            |            |       |
| DSM Inattentive                     | 61   | 64.56 (10.57)| 53         | 53.72 (11.15)| 5.32***|
| DSM Hyperactive-Impulsive           | 61   | 63.34 (12.53)| 53         | 51.85 (10.43)| 5.27***|
| DSM Oppositional/Defiant            | 61   | 54.41 (9.73)| 53         | 49.21 (8.21)| 3.06**|
| DSM Conduct Disorder                | 61   | 54.05 (11.15)| 53         | 49.30 (9.41)| 2.43* |

Note. DSM = Diagnostic and Statistical Manual of Mental Disorders.
*p ≤ .05, **p ≤ .01, ***p ≤ .001
### Table 2.2  Friendship Quality of Adolescents by ADHD status, Age, Gender, and Relationship

<table>
<thead>
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<th></th>
<th>ADHD N=61</th>
<th></th>
<th>Comparison N=54</th>
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<tr>
<td></td>
<td>13-15 Years</td>
<td>16-18 Years</td>
<td>13-15 Years</td>
<td>16-18 Years</td>
</tr>
<tr>
<td></td>
<td>n = 33</td>
<td>n = 28</td>
<td>n = 25</td>
<td>n = 29</td>
</tr>
<tr>
<td></td>
<td>Male n = 23</td>
<td>Female n = 10</td>
<td>Total</td>
<td>Male n = 17</td>
</tr>
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<td>OF</td>
<td>SF</td>
<td>OF</td>
</tr>
<tr>
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<td>2.57</td>
<td>3.90</td>
<td>3.16</td>
<td>2.98</td>
</tr>
<tr>
<td>(1.03)</td>
<td>(1.08)</td>
<td>(.63)</td>
<td>(.89)</td>
<td>(.98)</td>
</tr>
<tr>
<td>Negative Interactions</td>
<td>SF</td>
<td>OF</td>
<td>SF</td>
<td>OF</td>
</tr>
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<td>1.40</td>
<td>1.47</td>
<td>1.65</td>
<td>1.59</td>
</tr>
<tr>
<td>(.65)</td>
<td>(.42)</td>
<td>(.49)</td>
<td>(.65)</td>
<td>(.57)</td>
</tr>
</tbody>
</table>

*Note.* SF = Same-Sex Friend; OF = Other-Sex Friend.  
First number in each cell represents the mean and the number in brackets is the standard deviation.
Table 2.3. Mixed ANOVA of Relationship Quality by ADHD status, Age, Gender, and Relationship

<table>
<thead>
<tr>
<th>Effect</th>
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<th>Negative Interactions</th>
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<td>η²</td>
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<td>.00</td>
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<td>.16</td>
<td>.689</td>
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*Note. df (1, 107)*
Chapter 3
Predictors of Friendship Quality in Adolescents with and without Attention-Deficit /Hyperactivity Disorder

Abstract

*Objective:* The aim of this study was to examine empirically supported predictors of friendship quality including friendship stability, co-morbid psychopathology (e.g., anxiety, depression, oppositional behaviour, conduct problems) and interpersonal competence (e.g., social perspective taking, social skills). *Method:* A sample of 115 participants (61 ADHD, 54 Comparison), ages 13-18, completed questionnaires assessing perceived levels of social support in their friendships. Participants and their caregivers also completed a series of questionnaires assessing participants' interpersonal competence and levels of internalizing and externalizing psychopathology. *Results:* After controlling for the effects of gender, age, and ADHD status, friendship stability, social skills, social perspective-taking, and oppositional defiant behaviour were each found to positively predict friendship support. Surprisingly, anxiety levels were found to negatively predict friendship social support. However, results indicated that the direct effects of oppositional behaviour and anxiety were no longer significantly predictive of friendship quality, after controlling for the mediators social skills and social perspective-taking, respectively. Implications of these findings are discussed.
3.1 Introduction

Although friendship problems are not part of the diagnostic criteria of ADHD, they represent a significant area of impairment for this population (Hoza, 2007; Mikami, 2010). Attentional difficulties may make individuals with ADHD appear socially withdrawn, disinterested, and hinder their ability to notice social cues (Gardner & Gerdes, 2015; Landau & Milich, 1988; Mikami, et al., 2007; Normand et al., 2013). Symptoms of hyperactivity and impulsivity may result in difficulty modulating emotions and contribute to an overbearing, uninhibited, and aggressive interactional style (Gardner & Gerdes, 2015; Mikami, 2010; Mrug, et al., 2001; Normand et al., 2007). It is well established that, compared to their typically developing (TD) peers, youth with ADHD are more frequently rejected, stigmatized, and victimized by their peer group (Gardner & Gerdes, 2015; Hoza, 2007; Sciberras et al., 2012; Sibley et al., 2010; Timmermanis & Wiener, 2011; Wiener & Mak, 2009). However, there have been considerably fewer studies devoted to investigating the friendships of individuals with ADHD.

The available research suggests that children with ADHD have fewer friends than their non-ADHD peers (e.g., Bagwell et al., 2001; Blachman & Hinshaw, 2002; 2005b; Marton et al., 2015). Findings suggest that less than half of children with ADHD have a reciprocated friend (Hoza et al., 2005b) and these friendships are generally regarded as less intimate, supportive, cooperative, and satisfying, and more conflictual than the friendships of their non-ADHD peers (e.g., Blachman & Hinshaw, 2002; McKee, 2014; Normand et al., 2011, 2013; Rokeach & Wiener, 2017). Thus, it should come as no surprise that children with ADHD also have less stable friendships than their TD peers (Blachman & Hinshaw, 2002; Marton et al., 2015; Normand et al., 2013). These few existing studies, however, tend to focus on children and the occurrence of friendships while generally overlooking adolescent friendships and mechanisms explaining the quality of these relationships.

The purpose of the present study was to identify predictors and potential mechanisms of friendship quality in adolescents with and without ADHD. Friendships are voluntary, co-constructed relationships that are intimately linked with the social, emotional, and behavioural functioning of children and adolescents (e.g., Bagwell & Schmidt, 2011; Hartup, 1996). However, not all friendships are created equal (Hartup, 1995). Adolescents distinguish between
“friends” and “best friends”, with “best friends” being evaluated more positively and having a greater impact on adjustment than other friendships, or the peer group at large (Berndt & Keefe, 1995; Berndt, 1999; Demir, 2015). Friendships also vary in their stability, their quality, and the attributes of the partners involved in the dyad (Bagwell & Schmidt, 2011). High-quality friendships are characterized by high levels of prosocial behaviour (e.g., intimacy, support, and validation) and low levels of negative behaviour (e.g., conflict, criticism, aggression, rivalry). The question of how many and which features define friendship quality varies from researcher to researcher (Parker & Asher, 1993; Bukowski, Hoza, & Boivin, 1994). In the current study, friendship quality is defined by the sum of supportive features (e.g., secure base, safe haven, companionship) that characterize a friendship. Whereas high-quality friendships have been generally linked to better relationship stability, relationship satisfaction, and psychological adjustment (e.g., Bagwell & Schmidt, 2011; Berndt, 1999, 2002; Branje et al., 2007; Cotterell, 2007; Hodges et al., 1999; Waldrip et al., 2008), poor quality friendships have been linked to negative outcomes (e.g., Allen et al., 2007; La Greca & Harrisson, 2005).

The friendship literature suggests several individual factors may account for or modulate the relationship between ADHD and friendship quality including, age, gender, friendship stability, co-morbid psychopathology (e.g., oppositional behaviour, conduct problems, anxiety, depression) and interpersonal competence (e.g., social skills, social perspective taking).

3.1.1 Developmental Factors

As youth move across childhood and into adolescence, biological, cognitive and social changes provoke a shift in their interpersonal needs (Sullivan, 1953). Adolescents strive for autonomy from their parents and become progressively more attached to their peer group (Allen, 2008; Steinberg, 2001). Accordingly, adolescent friendships take on a more significant role and notions of intimacy, empathic understanding, self-disclosure, and emotional support become the preeminent features of high-quality friendships (Berndt, 2004; Poulin & Chan, 2010; Rubin Coplan, Chen, Buskirk, & Wojslawowicz, 2005; Selfhout, Branje & Meeus, 2009). However, research suggests that youth with ADHD may value certain characteristics in their friendships (e.g., fun, mutually entertaining) that are at odds with the characteristics valued by their TD peers (Gardner & Gerdes, 2015; Heiman, 2005) These incompatible friendship values, in conjunction with the core symptom dimensions of ADHD (i.e., inattention and
hyperactivity/impulsivity), may lead to friendships that are considered to be less supportive than the friendships of their TD peers (McKee, 2014; Rokeach & Wiener, 2017).

### 3.1.2 Gender

Research has firmly established that the interpersonal relationships of boys and girls are qualitatively different (Rose & Rudolph, 2006). Girls are typically more relationship-oriented, they tend to interact in small groups, and they value friendships based on intimacy, self-disclosure, and the enhancement of self-worth (Bukowski, Newcomb, & Hoza, 1987; Claes, 2003; Rose, 2007). Boys typically place greater emphasis on hierarchy and power dynamics, and they tend to engage in interactions that are activity-based and require large groups (Bowker, 2004; Claes, 2003; Rose, 2007). As such, boys and girls may vary in their conceptualization of friendship quality. Nevertheless, based on the construct of friendship quality as it is currently delineated, there is a preponderance of research suggesting that girls have higher quality friendships than boys (e.g., Bowker, 2004; Clark & Ayers, 1993; Furman & Buhrmester, 1985; Parker & Asher, 1993; Rose & Rudolph, 2006).

Research investigating gender differences in friendship quality among youth with ADHD is sparse. Previous studies have found that girls with ADHD have higher levels of negative friendship features (e.g., Blachman & Hinshaw, 2002; Zucchetti et al., 2015), but comparable (Glass et al., 2012; Zucchetti et al., 2015) or higher (Rokeach & Wiener, 2017) levels of positive friendship features in their relationships, when compared to their male counterparts.

### 3.1.3 Friendship Stability

Friendship stability refers to the preservation of a friendship over time. Friendship stability is linked to friendship quality whereby friendships that are high in relationship quality tend to persist over time (Berndt, 1999; Branje et al., 2007; Bukowski et al., 1994; Ladd et al., 1996). Various individual level factors may simultaneously influence friendship quality and friendship stability. For example, friendship stability and friendship quality tend to increase with age, as individuals increasingly seek stability in different facets of their lives (Granic & Hollenstein, 2006; Poulin & Chan, 2010). On the other hand, externalizing problems such as ADHD, aggressive and oppositional behaviour, and conduct problems, adversely impact friendship stability (Blachman & Hinshaw, 2002; Dishion et al., 1995). The effects of internalizing
symptomatology on friendship stability is mixed. Whereas youth with depressive symptoms have been found to have unstable friendships (Prinstein, Borelli, Cheah, Simon, & Atkins, 2005; Rose, Carlson, Leubbe, et al., 2011), other studies have found no differences in the stability of friendship dyads in anxious youth across the school year (e.g., Rubin, Wojlawowicz, Rose-Krasnor, Booth-Laforce, & Burgess, 2006).

3.1.4 Developmental Cascades

Researchers have long been interested in the interplay between specific domains of competence (e.g., academics, peer functioning, romantic relationships) and symptoms of psychopathology (Burt & Roisman, 2010). Traditionally, research examining these relationships has emphasized a medical model and has often assumed that impairments in major competence domains (e.g., peer relations, interpersonal skills) are the result of, rather than contributors toward, symptoms of psychopathology. (Burt & Roisman, 2010). More recent research on competence and psychopathology has highlighted the nuanced ways in which these constructs influence each other in a bi-directional manner (Masten, Roisman, Long, et al., 2005). For example, it is possible that children with limited social competence have fewer positive interactions with their environment and develop externalizing and internalizing problems as a result (e.g., Parker, Rubin, Erath, Wojlawowicz, & Buskirk, 2006; Rubin et al., 2006). Alternatively, internalizing and externalizing behavior problems may undermine the development of interpersonal competence and successful interpersonal relationships (Masten et al., 2005).

Accordingly, investigators have begun to adopt a developmental cascades analytical approach to examine how difficulties in one area of functioning, such as behavioral problems, can spill over into other areas of competence across time (Masten et al., 2005; Murray-Close, Hoza, Hinshaw et al., 2010). Applied to ADHD research, Murray-Close and colleagues (2010) suggest that the peer problems of children with ADHD may not simply reflect a failure to establish successful relationships with peers, but it is also possible that these difficulties arise from failures to negotiate other important developmental tasks (e.g., emotional regulation) across the lifespan (Murray-Close et al., 2010). In the Multimodal Treatment Study of Children with ADHD (MTA), Murray-Close and colleagues (2010) found that, from an early age, children with ADHD tended to exhibit more social skills problems and externalizing behaviors (e.g., aggression) than their TD peers. Problems in each of these respective areas were found to predict increases in
problems in the other area across development. That is, Time 1 aggression predicted lower Time 2 social skills. Lower Time 2 social skills predicted heightened aggression at Time 3, and heightened aggression at Time 3 predicted lower social skills at Time 4.

It is important to note that the current research is cross-sectional by design and cannot employ longitudinal structural equation modeling to parse out the directionality of effects. It is, however, an important first step in attempting to understand the relationship between ADHD, comorbidity, interpersonal competence, and friendship quality.

3.1.5 Comorbidity

ADHD and other externalizing and internalizing problems co-occur at a significant rate. Nearly half of youth with ADHD also meet criteria for comorbid oppositional defiant disorder (ODD), conduct disorder (CD), anxiety disorder, depressive disorder, or learning disability (Barkley, 2015; Jensen et al. 2001; Waschbusch, 2002). As such, focusing on co-occurring mental health problems is pivotal for the next generation of ADHD peer relations research (Becker, Leubbe, & Langberg, 2012).

Examinations of the unique contribution of ODD and CD on social impairment in youth with ADHD shows either no effect or an additive effect (e.g., Booster, DuPaul, Eiraldi, et al., 2012; Ostrander, Crystal, & August, 2006; Ray, Evans, & Langberg, 2017; Wehmeier, Schacht, & Barkley, 2010). Findings with regards to internalizing symptomatology are even more muddled. Some research indicates that, over and above ADHD status, symptoms of depression and/or anxiety are associated with social impairment, (e.g., Becker, Langberg, Evans, Giro-Herrera, & Vaughn, 2015; Ray et al., 2017), while other research suggests that, among youth with ADHD, internalizing symptomatology contributes to social impairment only in the presence of additional externalizing behaviour problems (e.g., Booster et al. 2012).

It is even less clear how ADHD and comorbid externalizing or internalizing disorders may relate to friendship quality. Zucchetti et al (2015) found that aggression and emotional and behavioural instability mediated the relationship between ADHD and conflict levels with best friends. Other studies found no additive effect of externalizing behaviour problems on measures of friendship quality (Normand et al. 2011), close friendship competence (Bagwell et al. 2001), or the number
of dyadic friendships (Hoza, Gerdes, Mrug, et al., 2005) in youth with ADHD. Al-Yagon (2016) found that friendship quality explained variations in loneliness and positive affect between typically developing peers and adolescents with ADHD and a comorbid learning disability. No studies were identified that examined the effect of comorbid depression on the friendships of youth with ADHD. The few studies examining co-occurring anxiety problems suggest they do not affect the ability of children with ADHD to make friends, or the quality of these friendships (Becker et al., 2012; Hoza et al., 2005b, Normand et al., 2011).

Although some of these findings are inconsistent and may appear puzzling, they are likely a reflection of methodological variability across studies, such as differing sample characteristics (e.g., gender, age, population-based vs. clinic-referred) and assessment methods (e.g., measures of peer status versus friendships, structured versus unstructured interviews, self-or parent report versus observational studies). It is evident that more research is needed to explain these discrepant results. A better understanding of the ways in which co-occurring mental health problems differentially affect friendship quality among youth with ADHD may inform prevention and intervention efforts.

3.1.6 Interpersonal Competence

The development of high quality friendships in adolescence is also associated with maturing social skills and perspective-taking abilities (Nelson & Crick, 1999; Selman, 1980; Sullivan, 1953). Social skills describe a class of verbal and non-verbal behaviours that an individual exhibits to elicit socially desirable outcomes (Gresham, Elliott, Cook, Vance, & Kettler, 2010; Merrell & Gimpel, 2014). Gresham and Elliot have identified seven domains of social skills: communication, cooperation, assertion, engagement, self-control, empathy, and responsibility, with a number of these domains being positively associated with friendship quality (e.g., Buhrmester, 1990; Chow, Ruhl, Buhrmester, 2013; Festa, Barry, Sherman, & Grover, 2012). There is a growing body of literature demonstrating that children and adolescents with ADHD have lower social competence than their typically developing peers (e.g., Kawabata, Tseng, & Gau, 2012; Mikami, et al., 2007; Owens, Hinshaw, Lee & Lahey, 2009; Thomas, Shapiro, DuPaul, Lutz, & Kern, 2011; Timmermanis, 2015). These social skills deficits suggest that individuals with ADHD may not sufficiently provide the emotional support, possess the requisite
skills in conflict management, or be able to carefully balance intimate exchanges, in a manner conducive to forming and maintaining high quality relationships (Bagwell & Schmidt, 2011).

The development and maintenance of friendships is also influenced by a number of socio-cognitive mechanisms (Adalbjarnardottir, 1995; Yeates, Schultz, & Selman, 1991; Spence, 2003). Social cognition is a broad term that refers to the cognitive mechanisms that individuals use to understand social situations (Staub & Eisenberg, 1981). Social perspective taking is a particular aspect of social cognition that is associated with social skills and social relationships (Adalbjarnardottir, 1995; Yeates et al., 1991). In essence, social perspective taking is the ability to understand a situation from another person’s perspective (Selman, 1971). The available evidence suggests that poor social perspective taking plays a role in the peer relations difficulties in children with ADHD (Marton, et al., 2009; Timmermanis, 2015). Children and adolescents with ADHD struggle with social problem-solving tasks (Uekermann, Kraemer, Abdel-Hamid, et al., 2010), they tend to interpret ambiguous interactions with peers as hostile (Mikami et al., 2008), and they overestimate their social-competence (i.e., positive bias), as compared to their TD peers (Colomer et al., 2016; Owens et al., 2007). Social perspective taking has also been found to moderate the relationship between ADHD symptoms and friendship stability in children (Marton, et al., 2009).

Combined, these social skills and socio-cognitive deficits may play a significant role in the determining the quality of the friendships of adolescents with ADHD, over and above their ADHD symptoms. It will be important to test these assumptions empirically and to establish the degree to which social perspective taking and specific domains of social skills relate to friendship quality. Knowledge in these areas may be particularly informative for the development of psychosocial interventions for individuals with ADHD.

### 3.1.7 Study Objectives and Hypotheses

The purpose of the present study was to build on the results from study one and determine whether friendship stability, psychopathology, and interpersonal competence were associated with friendship quality over and above gender, age, and ADHD status. The study was guided by four objectives. The first objective was to investigate whether friendship stability was related to friendship quality over and above age, gender, and ADHD status. Based on existing
research with TD youth (Berndt, 1999; Ladd et al., 1996), it was predicted that friendship quality and friendship stability would be positively associated. The second objective was to examine whether different indices of psychopathology (i.e., oppositional behaviour, conduct problems, anxiety, and depression) explain variance in friendship quality over and above gender, age, and ADHD status. Based on previous research (e.g., Booster et al. 2012, Ray et al., 2017; Wehmeier et al., 2010), it was expected that oppositional behaviour and conduct problems would have an additive and adverse effect on friendship quality, but it was not clear whether depression and anxiety would explain unique variance in friendship quality above age, gender, and ADHD status. The third objective was to determine whether two indices of interpersonal competence (i.e., social skills, social perspective taking) would explain unique variance in the prediction of friendship quality, over and above the variance accounted for by gender, age, ADHD status and friendship stability. Given research findings within the friendship literature, it was expected that social skills and social perspective taking would be uniquely and positively associated with friendship quality (Adalbjarnardottir, 1995; Buhrmester, 1990; Chow et al., 2013; Festa et al., 2012; Nelson & Crick, 1999; Yeates, et al., 1991). The final objective was to explore the relationship between different domains of social skills (i.e., communication, cooperation, assertion, engagement, self-control, empathy, and responsibility) and friendship quality in adolescents with and without ADHD. As this topic has not been examined among children or adolescents with ADHD, it was unclear which domains of social skills would be particularly germane to friendship quality.

3.2 Method

3.2.1 Participants

A sample of 123 adolescents (67 ADHD, 56 Comparison), ages 13-18, were recruited to participate in the present study. Six participants with an existing ADHD diagnosis were excluded from further analyses because they no longer exhibited clinical levels of ADHD symptoms (n = 3), or because their abbreviated IQ scores were below a standard score of 80 (n = 3), as assessed by the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999). Two comparison participants were excluded because of elevated levels of ADHD symptomatology. Thus, the final sample comprised 115 adolescents (65 boys, 50 girls). Sixty-one participants had a diagnosis of ADHD (mean age = 15.28, SD = 1.54) and 54 adolescents, without a diagnosis of
ADHD, served as a comparison group (mean age = 15.41, SD = 1.75). Within the ADHD group, 43 (70%) adolescents were taking medication to manage their ADHD symptoms, although on the day of testing, participants were asked to refrain from taking their medication.

The adolescents who were classified as having ADHD in this study were required to have received a diagnosis of ADHD from a physician or psychologist. To ensure the ongoing manifestation of clinical levels of ADHD symptomatology, participants and their parents and teachers were also asked to complete the Conners Rating Scales-Third Edition (Conners, 2008; Parent- Conners 3-P, Teacher- Conners 3-T, Self-report- Conners 3-SR). Based on the results of these measures, ADHD status was confirmed in one of two ways: a) participants had at least one parent rating within the clinically significant range (T ≥ 70) on the DSM-IV Inattentive or DSM-IV Hyperactive/Impulsive scales of the Conners 3-P (n = 58); or b) participants had at least one borderline rating (T ≥ 65) by a parent and a second informant (teacher or self-report) (n = 3). For inclusion in the comparison sample, participating adolescents were required to have no diagnosis of ADHD. Additional eligibility criteria for the comparison sample included 1) parent ratings in the average range (T ≤ 60) on the DSM-IV oriented ADHD subscales (n = 52); or 2) all scores below the borderline range (T ≤ 64) on teacher, parent, and self-reported ratings on the DSM-IV oriented ADHD subscales (n =2).

Roughly two-thirds (69%) of the ADHD sample (n = 42) had at least one comorbid diagnosis from a mental health professional. Thirty-eight adolescents within the ADHD group were diagnosed with a comorbid learning disability, seven with an anxiety disorder, two with a mood disorder, two with oppositional defiant disorder, and one with conduct disorder. Eight adolescents (15%) within the comparison group had been diagnosed with a learning and/or mental health disorder. Specifically, seven adolescents were diagnosed with a learning disability, one with an anxiety disorder, and one with oppositional defiant disorder.

Chi-square and t-tests were performed to determine whether there were any demographic differences between adolescents with and without ADHD. T-tests revealed no significant group differences on participant age or IQ (see Table 3.1). Chi-square tests revealed no significant group differences on family demographic variables including parent educational attainment, parental marital status, parent country of birth, or the language spoken at home (see Table 3.1). However, there was a significantly higher proportion of male adolescents in the ADHD group (n
Unsurprisingly, participants with ADHD had significantly higher scores on variables measuring inattentive and hyperactive/impulsive symptoms (parent, teacher, self-report) and oppositional defiant behaviour and conduct problems (parent, self-report). Teacher ratings, however, indicated no group differences in oppositional behaviour or conduct problems (see Table 3.1). Participants with ADHD rated themselves as manifesting more depressive symptoms, \( M_{ADHD} = 53.03, SD = 9.47, M_{TD} = 46.39, SD = 9.71 \); \( F(1,113) = 13.76, p < .001, \eta^2 = .11 \), but comparable levels of anxious symptoms, \( M_{ADHD} = 46.64, SD = 9.70, M_{TD} = 43.98, SD = 9.88 \); \( F(1,113) = 2.11, p = .15, \eta^2 = .02 \), to their TD peers on a self-report measure (Revised Child Anxiety and Depression Scales; Chorpita, Yim, Moffitt, & Unemoto, 2000).

3.2.2 Measures

3.2.2.1 The Networks of Relationships Inventory-Behavioral Systems Version

The Networks of Relationships Inventory–Behavioral Systems Version (NRI-BSV; Furman & Buhrmester, 2009) (see Appendix A) was administered to assess self-reported perceptions of friendship quality and friendship stability. The NRI-BSV is a 24-item survey, with 3 items per scale, rated on a 5-point scale from 1 (little or none) to 5 (the most). It assesses the frequency with which different relationship dyads (i.e., mother, father, same- and other-sex friends, romantic partners) comprise five support features (Seeks Secure Base, Seeks Safe Haven, Provides Secure Base, Provides Safe Haven, Companionship) and three negative interaction features (Conflict, Antagonism, Criticism). From these scales, two second-order factors (Social Support, Negative Interactions) are computed by averaging the five support and three negative interactions scales respectively. For the purposes of this study, only responses pertaining to participants’ perceptions of social support in their best friendships are reported, with higher values indicating more supportive friendships. Sample items from the NRI social support factor include: How much do you turn to this person for support when you are troubled about something?; How much does this person turn to you for support when s/he is troubled about something?; How often do you and this person go places and do enjoyable things together?; How much does this person show support for your activities? The social support factor demonstrates strong internal consistency for same- and other-sex friends with both alphas at .95. Test-retest reliability for this measure is moderate, with stability of scores over one year at .66.
for same-sex friendships and .75 for other-sex friendships. Construct validity of the NRI-BSV has been established by correlating coders’ ratings of observed interactions and adolescents’ ratings of their relationships with friends (Furman & Buhrmester, 2009). For the current study, internal consistency was also strong, with alphas at .96 for same- and other-sex friendships. NRI-BSV Social Support scores were negatively correlated with the Conners 3-P and Conners 3-T peer relations scales (-.29, p < .05 and -.35 p < .05 respectively). Friendship stability was calculated by dividing the reported length of the friendship in years by the adolescents’ age.

3.2.2.2 Conners Rating Scale – Third Edition

The long form of the Conners Rating Scales-Third Edition (Conners, 2008; Parent- Conners 3-P, Teacher- Conners 3-T, Self-report- Conners 3-SR) were used to assess ADHD symptomatology (i.e., inattention and hyperactivity/impulsivity), as well as oppositional defiant behaviour, and conduct problems. The Conners’ scales are a well-validated standardized measure consisting of 99-115 items on a 4-point Likert scale from 0 (Not at all/Seldom, Never) to 3 (Very Much True/Very Often, Very Frequent). The DSM-IV subscales (DSM-IV Inattention, DSM-IV Hyperactive/Impulsive, DSM-IV Oppositional Defiant Disorder, DSM-IV Conduct Problems) demonstrate good internal consistency (Parent: .83-.93; Teacher: .70-.95; Self-report .81-.89) and good test-retest reliability (Parent: .84-.94; Teacher: .83-.87; Self-report .71-.81) respectively (Conner, 2008). For the current sample, internal consistency was strong for the two DSM-IV ADHD subscales and the oppositional defiant disorder (ODD) and conduct disorder (CD) subscales (parent, teacher, self-report) (all α > .80).

3.2.2.3 Wechsler Abbreviated Scale of Intelligence

The Vocabulary and Matrix Reasoning subtests of the Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999) were administered to obtain an estimate of adolescents’ intellectual functioning and to determine eligibility for participation in the study. The abbreviated IQ scale demonstrates good internal consistency (Age ≤ 16 years: .93; Age ≥ 17 years: .96) and test-retest reliability (Age ≤ 16 years: .85; Age ≥ 17 years: .88). The correlation with the Full Scale IQ on the WISC-IV is .82 (Sattler & Dumont, 2008).
3.2.2.4 Social Skills Improvement System

Parent reported social skills were assessed using the Social Skills Improvement System (SSIS, Gresham & Elliot, 2008) (see Appendix C). On this measure, parents rated the frequency with which their children demonstrate a variety of positive social behaviours while interacting with others on a 4-point scale from 0 (Never) to 3 (Almost Always). The SSIS has seven domain subscales including communication, cooperation, assertion, engagement, self-control, empathy and responsibility, and a composite ‘Total’ score. For the main analysis of this study, only the ‘Total’ score was used. For follow-up exploratory analyses, all seven subscales were examined. The SSIS is a technically sound measure. On the parent form, coefficient alphas for the social skills scales range from .74 to .96 and median test-retest reliability is at .86. In the present sample, these scales also demonstrated adequate internal consistency, with Cronbach alphas ranging from .65 to .89 for parent-reported subscales.

3.2.2.5 Revised Child Anxiety and Depression Scales

Self-reported anxiety and depression were assessed by administering the Revised Child Anxiety and Depression Scales (RCADS; Chorpita et al., 2000). The RCADS is a 47-item self-report questionnaire with a number of scales assessing a variety of anxiety and mood disorders including: separation anxiety disorder, social phobia, generalized anxiety disorder, panic disorder, obsessive compulsive disorder, and major depressive disorder. Participants rated the frequency with which each item applies to them on a 4-point Likert scale ranging from 0 (never) to 3 (always), with higher values indicating greater impairment. The RCADS has been shown to have good internal consistency (alphas ranging from .71-.85), test-retest reliability (alphas ranging .65-.80) and convergent and discriminant validity (Chorpita et al. 2000; de Ross, Gullone, & Chorpita, 2002). In the present sample, the total Anxiety ($\alpha = .86$) and total Depression ($\alpha = .89$) scales also demonstrated strong internal consistency.

3.2.2.6 Interpersonal Reactivity Index

The Interpersonal Reactivity Index (IRI; Davis, 1980) was used to assess self-reported social perspective taking. The IRI is a 28 item instrument scored on a Likert-type scale ranging from 0 (doesn’t describe me at all) to 4 (describes me very well). The IRI has four subscales including: social perspective taking, empathic concern, personal distress, and fantasy. The IRI was
conceptualized to evaluate each subscale separately because the instrument was not intended to measure overall empathy. For the present study, only the social perspective taking scale (see Appendix D) was used in the analyses, with a higher value indicating greater self-reported perspective taking. Sample items from the IRI social perspective taking scale include: 

*I sometimes try to understand my friends better by imagining how things look from their perspective; When I'm upset at someone, I usually try to "put myself in his shoes" for a while; If I'm sure I'm right about something, I don't waste much time listening to other people's arguments.* The IRI has been shown to have solid psychometric properties with internal consistency coefficients ranging from .70 to .78 and test-retest reliability coefficients ranging from .62 to .81. (Davis, 1980). For the current sample, internal consistency ($\alpha = .76$) was adequate for the Social Perspective Taking subscale.

### 3.2.3 Procedures

The present study was conducted as part of a larger research study investigating the peer and family relationships of adolescents with ADHD. Institutional ethic’s board approval was obtained from the University of Toronto (protocol reference #25468). Participants were recruited through advertisements in community newspapers and websites and by phoning research participants from previous studies who had agreed to be contacted for future research. To specifically recruit adolescents with ADHD, flyers and brochures were distributed to physicians’ and psychologists’ offices, and children’s mental health centres. During an initial phone screening, parents of participating adolescents were given detailed information about the study, and parents provided demographic information about their children and families. Parents also completed the Conners 3-P long form as a first step in identifying children who would likely meet the study criteria. If the Conners 3-P results were in the required range for the study, an appointment was booked with the adolescent and parent. On the day of testing, participants and their parents provided informed written consent prior to the start of the study. Adolescents were given the option of counting their participation in the study toward their required secondary school community service hours, or receiving $30.00 as compensation for their time (approximately 4 hours) and travel expenses incurred. In addition, adolescents and their parents were given a brief educational report describing the adolescents’ academic, cognitive and social/emotional functioning.
Graduate students in school and clinical child psychology with extensive training in psychological testing assisted participants in completing an individually administered battery of standardized tests and self-report measures (i.e., WASI, Conners 3-SR, NRI-BSV, RCADS, IRI). Caregivers completed a combination of paper-and-pencil and online questionnaires (i.e., SSIS, Conners 3-P) and provided consent for the Conners 3-T to be sent to one of the adolescents’ teachers.

3.2.4 Data Analyses

Statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 22. The data were examined for outliers, and when detected, data points with SDs larger than 3 were adjusted using the winsorizing method. Multiple imputation procedures (Graham, 2009) were employed to handle missing data points for the variable social skills, where less than 10% of the data was missing at random. The data points for all other variables were complete.

Descriptive statistics were calculated for the demographic characteristics of the ADHD and comparison groups separately (see Table 3.1). Covariates (e.g., gender, age, IQ) and potential predictors of friendship quality (i.e., friendship stability, social perspective taking, social skills, anxiety, depression, oppositional behaviour, conduct problems) were examined through Pearson correlations and results are displayed in Table 3.2. Variables not significantly associated with friendship quality (i.e., IQ, conduct problems, depression) were not included in subsequent analyses.

A hierarchical multiple regression analysis was conducted to predict friendship quality. The variables explored in the second chapter of the dissertation were entered in Step 1 (i.e., gender, age, ADHD status, and the interaction term ADHD*age). Friendship stability was entered in Step 2. Two indices of psychopathology (i.e., oppositional defiant behaviour and anxiety) were entered in Step 3. Lastly, two indices of interpersonal competence (i.e., social skills and social perspective taking) were entered in the fourth and final step. Intercorrelations among the predictor variables are reported in Table 3.2, though tests revealed that multicollinearity was not a concern (i.e., all variance inflation factors (VIF) < 3). Statistical assumptions checking for linearity, normality, collinearity, and homoscedasticity were met in all analyses. Results of this model are presented in Table 3.3.
3.3 Results

3.3.1 Preliminary Analyses

3.3.1.1 Age and Gender

As discussed in study one, in the present sample, gender was negatively correlated with ratings of friendship quality, such that males rated their friendships to be less supportive than females ($r = -.30, p < .001$). Although age ($r = .08, p = .82$) and ADHD status ($r = -.14, p = .14$) were not significantly correlated with ratings of friendship quality, the interaction term Age*ADHD status was negatively correlated with friendship quality ($r = -.21, p = .03$), suggesting that older adolescents with ADHD perceive their friendships to be less supportive than younger adolescents with ADHD and comparison adolescents in general (see Table 3.2).

3.3.1.2 Friendship Stability

All adolescents in the present sample reported having a best friend, with 110 out of 115 participants rating their same-sex friend to be their best friend. Adolescents with ADHD ($m = .37$) and their TD peers ($m = .34$) had comparable levels of self-reported friendship stability, calculated by dividing the reported length of their best friendship in years by the adolescents’ age, $t(113) = -.46, p = .64$. Friendship stability ($r = .21, p = .02$) was positively associated with friendship quality indicating that longer lasting friendships were associated with greater perceptions of friendship quality (see Table 3.2).

3.3.1.3 Comorbidity

Parent rated oppositional defiant behaviour was negatively correlated with friendship quality ($r = -.24, p = .009$), indicating that adolescents who were rated as more oppositional had friendships that they perceived to be less supportive. Anxiety was marginally positively correlated with self-reported friendship quality ($r = .17, p = .06$), suggesting that more anxious adolescents tended to perceive their friendships as more supportive. Parent rated conduct problems ($r = -.10, p = .28$) and self-reported depression levels ($r = .01, p = .95$) were not significantly correlated with ratings of friendship quality and were therefore not included in subsequent analyses (see Table 3.2).
3.3.1.4 Interpersonal Skills

In the present sample parent-reported social skills ($r = .31, p < .001$), and self-reported social perspective taking ($r = .33, p < .001$) were positively associated with friendship quality, indicating that higher levels of interpersonal skills were associated with greater perceptions of friendship quality (see Table 3.2).

3.3.2 Main Analysis

A hierarchical linear regression was conducted to determine the unique variance of a number of different variables in the prediction of friendship quality in adolescents with and without ADHD. When the combination of gender, age, ADHD status, and age*ADHD status variables were entered in the first step, they explained 14% of the variance in friendship quality, $R^2 = .14, F (4, 110) = 4.42, p = .002$, though gender ($p = .002$) and age*ADHD status ($p = .036$) were the only significant predictors. Friendship stability was entered into the next step of the regression and it explained an additional 5% of the variance, $R^2 change = .05, F (5, 109) = 5.19, p < .001$. Anxiety and oppositional behaviour were entered into step 3 of the regression and they were both significant predictors of friendship quality. Specifically anxiety was positively associated with friendship quality ($B = .018$) and oppositional behaviour was negatively associated with friendship quality ($B = -.019$). Together they explained an additional 7% of the variance, $R^2 change = .07, F (7, 107) = 5.41, p < .001$. Finally, social skills and social perspective taking were simultaneously entered in the fourth and final step of the regression. Together they explained an additional 7% of the variance, $R^2 change = .07, F (9, 105) = 4.96, p < .009$. In total, this model explained 33% of the variance in friendship quality. In this final step, social skills ($p = .04$) and social perspective taking ($p = .02$) were significant predictors of friendships quality, but anxiety ($p = .14$) and oppositional behaviour ($p = .26$) no longer significantly predicted friendship quality over and above social skills, social perspective taking, friendship stability, ADHD*Age, and gender.
3.3.3 Post-Hoc Exploratory Analyses

3.3.3.1 Indirect Effect of Oppositional Behaviour and Anxiety on Friendship Quality

Although not hypothesized, given that oppositional behaviour and total anxiety no longer predicted friendship quality when simultaneously examining the contribution of social skills and social perspective taking, two mediation analyses were tested using bootstrapping techniques with bias-corrected confidence estimates (Preacher & Hayes, 2004). In the present study, the 95% confidence interval (CI) of the indirect effect was obtained with 5000 bootstrapped re-samples (Preacher & Hayes, 2008). Specifically, exploratory regression analyses were used to investigate whether social skills mediated the effect of oppositional behaviour on friendship quality and whether social perspective taking mediated the effect of anxiety on friendship quality, after controlling for gender, age, ADHD status, age*ADHD status, and friendship stability.

Results indicated that oppositional behaviour was a significant predictor of social skills, \( b = -0.54, SE = 0.14, t(108) = -3.75, p < 0.001 \) (Path A); social skills were a significant predictor of friendship quality, \( b = 0.01, SE = 0.01, t(107) = 2.34, p = 0.02 \) (Path B); and oppositional behaviour significantly predicted friendship quality, \( b = -0.02, SE = 0.01, t(108) = -2.24, p = 0.02 \) (Path C). This analysis confirmed the mediating role of social skills in the relationship between oppositional behaviour and friendship quality (\( b = -0.01, SE = 0.003, CI -0.02 \) to -0.01) as the confidence interval did not include 0. Results indicated that the direct effect of oppositional behaviour was no longer a significant predictor of friendship quality after controlling for the mediator, social skills, \( b = -0.01, SE = 0.01, t(107)= -1.36, p = 0.18 \) (Path C’) (see Figure 3.1).

Results of the second mediation analysis indicated that anxiety was a significant predictor of social perspective taking, \( b = 0.11, SE = 0.05, t(108) = 2.27, p = 0.02 \) (Path A); social perspective taking was a significant predictor of friendship quality, \( b = 0.05, SE = 0.02, t(107) = 2.79, p = 0.006 \) (Path B); and anxiety significantly predicted friendship quality, \( b = 0.02, SE = 0.01, t(108) = 2.04, p = 0.04 \) (Path C). The mediation analysis confirmed the mediating role of social perspective taking in the relationship between anxiety and friendship quality (\( b = 0.01, SE = 0.002, CI .001 \) to .012) as the bias corrected confidence intervals did not contain 0. Results indicated that the direct
effect of anxiety was no longer a significant predictor of friendship quality after controlling for the mediator, social perspective taking, \( b = .01, SE = .01, t(107) = -1.46, p = .15 \) (Path C’) (see Figure 3.2).

### 3.3.3.2 Domain Specific Social Skills

Follow-up exploratory analyses were conducted to determine which social skills (i.e., communication, cooperation, assertion, engagement, self-control, empathy and responsibility) were associated with friendship quality. Correlational analyses revealed that communication \( (r = .19, p = .04) \), assertion \( (r = .20, p = .04) \), empathy \( (r = .34, p < .001) \), engagement \( (r = .30, p = .001) \), and self-control \( (r = .19, p < .04) \) were all significantly associated with friendship quality. However, cooperation \( (r = .15, p = .10) \) and responsibility \( (r = .12, p = .19) \) were not significantly correlated with friendship quality and were therefore not included in subsequent hierarchical regressions.

Subsequently, hierarchical regressions were conducted to determine which social skills explained unique variance in self-reported friendship quality over and above the variance accounted for by gender, age, ADHD status, ADHD*age, and friendship stability. When communication was entered into the regression, it did not account for a significant portion of the variance, \( R^2_{change} = .02, F (1, 108) = 2.10, p = .15 \), after the variance attributed to gender, age, ADHD status, age*ADHD status, and friendship stability was considered. Similarly, when assertion was entered into the regression, it did not account for a significant portion of the variance, \( R^2_{change} = .03, F (1, 108) = 3.16, p = .08 \). However, when empathy and engagement were entered into the regression, they explained an additional 8% and 7% of the variance in self-reported friendship quality respectively: empathy, \( R^2_{change} = .08, F (1, 109) = 9.63, p = .002 \); engagement, \( R^2_{change} = .07, F (1, 108) = .722, p < .01 \). Lastly, when self-control was entered into the regression, it did not account for a significant portion of the variance, \( R^2_{change} = .03, F (1, 108) = 3.61, p = .06 \).
3.4 Discussion

This study represents an initial foray into correlates of friendship quality in adolescents with and without ADHD, including age, gender, friendship stability, co-morbid psychopathology (e.g., anxiety, depression, oppositional behaviour, conduct problems), and interpersonal competence (e.g., social perspective taking, social skills).

As described in Chapter 2, age was found to moderate the relationship between ADHD status and perceived social support in friendships, such that self-reported ratings of friendship quality was lower across age groups in youth with ADHD, but higher across age groups in TD youth. Similar to previous research in the typically developing literature, female adolescents rated their friendships to be more supportive than their male counterparts, irrespective of their ADHD status (Bowker, 2004; Clark & Ayers, 1993, Furman & Buhrmester, 1985; Parker & Asher, 1993; Rose & Rudolph, 2006).

Findings from this study also suggest that for adolescents with and without ADHD, friendship stability is associated with friendship quality, such that friendships that are higher in social support tend to persist over time. This finding is consistent with previous work examining friendships in typically developing children (e.g., Berndt, 1999; Bukowski, Hoza, & Newcomb, 1994; Ladd et al., 1996). Contrary to previous research investigating friendship stability in children with ADHD (Blachman & Hinshaw, 2002; Marton et al., 2015; Normand et al., 2013), adolescents with and without ADHD did not differ on self-reported friendship stability. Developmental factors related to the adolescent’s growing autonomy and participation in actively building his or her own social universe may explain the absence of group differences in the present sample. Across development, parents have less input regarding the selection of their children’s friends. Consequently, adolescents with and without ADHD may choose to become friends with peers with whom they share more attributes, and by extension, form more enduring relationships than their younger counterparts (Claes, 2003).

Previous research has identified ADHD and other comorbid psychopathologies as potentially compounding risk factors for social impairment (Booster et al. 2012; Ostrander et al., 2006; Ray et al., 2017; Wehmeier et al., 2010). However, less is known about the potential mechanisms through which ADHD and other co-occurring mental health concerns increase the risk for
friendship difficulties in individuals with ADHD. The current study highlights the importance of interpersonal competence (i.e., social skills and social perspective taking) in explaining the relationship between adolescents’ comorbid psychopathology and friendship quality. Specifically, results from exploratory regression analyses suggest that social skills and social perspective taking respectively mediate the effect of oppositional behaviour and anxiety on friendship quality.

3.4.1 Externalizing Behaviour, Social Skills, and Friendship Quality

After controlling for the effects of gender, age, ADHD status, and friendship stability, results indicated that oppositional behaviour was significantly and negatively associated with friendship quality. Comorbid externalizing behaviour problems has been found to exacerbate social impairment in youth with ADHD (Becker et al., 2015; Booster et al. 2012, Ostrander et al., 2006; Ray et al., 2017; Wehmeier et al., 2010). Few studies, however, have examined its impact on friendships specifically. Thus far, available research has found no additive effect of externalizing behaviour problems on measures of friendship quality in children with ADHD (Bagwell et al. 2001; Hoza et al., 2005b; Normand et al. 2011). The present study suggests that parent-rated oppositional defiant behaviour further diminishes self-reported friendship quality in adolescents with ADHD. However, findings also suggest that social skills may mitigate this pathway.

It is well established that ADHD symptomatology and oppositional behaviour are associated with deficits in social skills (e.g., Kawabata et al., 2012; Mikami et al., 2007; Owens et al., 2009; Sibley et al., 2010; Thomas et al., 2011; Timmermannis, 2015). The present study extends prior research by investigating the relationship between social skills, oppositional behaviour, and the close friendships of adolescents with ADHD. Findings suggest that social skills play a central role in determining friendship quality in adolescents with ADHD. It is possible that the relationship between social skills, friendship quality, ADHD, and ODD interact in a recursive loop. That is, symptoms associated with ADHD and ODD hinder children’s and adolescents’ ability to develop friendships. In turn, this limits the opportunity to further cultivate their social skills and insight into others’ perspectives, leading to more impoverished friendships (Bagwell et al., 2001; Mikami & Hinshaw, 2006; Murray-Close et al., 2010). However, it is also possible that ADHD symptoms predispose children to have difficulty acquiring age-appropriate social
skills. In turn, this may lead to more negative interactions with their environment and contribute to subsequent feelings of frustration and aggression (Parker et al., 2006; Rubin et al., 2006).

In particular, it appears that empathy and engagement may be the domain specific social skills most relevant to measures of friendship quality in adolescents of ADHD. Individuals high in empathy are more attuned to the feelings and thoughts of others and are better able to appreciate a viewpoint different from their own (Chow et al., 2013). Accordingly, adolescents who exhibit high levels of empathy tend to have friendships that are more satisfying, more intimate, and less conflictual than adolescents with lower levels of empathy (Chow et al., 2013; Clark & Ladd, 2000; Davis & Kraus, 1991; Soenens, Duriez, Vansteenkiste, & Goossens, 2007; Smith & Rose, 2011). Although children with ADHD are reported to exhibit lower levels of empathy than their TD peers (e.g., Braaten & Rosen, 2000; Dyck, Ferguson, Shocher, 2001; Marton et al., 2009), findings from this study suggest that fostering empathic understanding in children with externalizing behaviours may be a protective factor in their social functioning.

It has been suggested that attentional difficulties may make individuals with ADHD appear socially withdrawn and disinterested (Gardner & Gerdes, 2015; Mikami et al., 2007; Landau and Milich 1988; Normand et al., 2013). Findings from this study suggest that engagement level is a particularly pertinent social skill in determining the friendship quality of adolescents with ADHD. Engagement, or disengagement, has been shown to be increasingly associated with social acceptance across development (Laursen, 1996; Rubin et al., 1998). By adolescence, disengagement is less normative than at younger ages and it is typically associated with feelings of social anxiety and low self-esteem (Rubin et al., 2006). Children who are disengaged (e.g., do not try to be with other people, do not seek help from others) demonstrate poorer conflict resolution abilities (Adalbjarnardottir, 1995). Adolescents who are disengaged tend to have friendship’s characterized by low levels of intimacy and self-disclosure (Berndt & Hanna, 1995; Shulman, 1995). However, given the cross-sectional nature of the data, it is not possible to establish directionality of the findings. It is possible that children without supportive friendships become less engaged and empathic over time.

Interestingly, in the present study, the social skill domains of cooperation (e.g., pays attention when other speak; ignores classmates when they are distracting), responsibility (e.g., keeps promises; takes care when using other people’s things), communication (e.g., takes turns in
conversations; speaks in appropriate tone of voice), assertion (e.g., says when there is a problem; questions rules that may be unfair), and self-control (e.g., stays calm when teased; stays calm when disagreeing with other) did not significantly predict friendship quality over and above ADHD symptomatology. It is possible that the shared variance between these domain specific social skills and ADHD related-behaviours can account for these non-significant findings. From a developmental perspective, it is also possible that these particular domains of social skills are less relevant to the friendship demands of adolescence, where the emphasis is on intimacy, self-disclosure, and emotional support (Berndt, 2004; Furman & Buhrmester, 1992; Hartup, 1993; 1996).

3.4.2 Internalizing Behaviour, Social Perspective Taking, and Friendship Quality

This study represents an initial examination of the effect of depressive symptomatology on friendship quality in adolescents with ADHD. Self-reported ratings of depression were not significantly related to friendship quality, over and above ADHD status. Interestingly, friendship quality was positively associated with anxiety symptoms. This is contrary to previous research which suggests that ADHD and comorbid anxiety has either no effect or an additive and detrimental effect on the social relationships of youth with ADHD.

Findings from this study suggest that social perspective taking may account for the relationship between co-occurring anxiety symptoms and friendship quality. Social perspective taking is generally considered to be an adaptive skill. It is associated with affective empathy, social competence, social acceptance, high quality relationships, and the development of conflict negotiation strategies (Bosacki & Wilde-Astington, 1999; Rose et al., 2007; Yeates & Selman, 1989). In line with this past research, social perspective-taking was positively associated with friendship quality in the present study, even after accounting for the effects of gender, age, ADHD status, friendship stability, and social skills.

Despite its reputed benefits, social perspective taking was also found to be related to emotional costs in the present sample in the form of higher anxiety levels. According to Rose et al (2007), when youth with well-developed social perspective-taking skills encounter a friend who is troubled or upset, the tendency to take the friend’s perspective may increase the likelihood of sharing in their friend’s affective state. This heightened sensitivity in interpersonal relationships
may promote close friendships, but may also create a greater risk for internalizing distress. This adjustment trade-off is in line with developmental research recognizing that behavioral and social-cognitive traits can be simultaneously linked with positive and negative outcomes (Rose 2002; Rose et al., 2007).

Closely related to social perspective taking is the construct of co-rumination, or excessively discussing, rehashing, and speculating about problems and dwelling on negative affect (Rose, 2002). Co-rumination has been described as lying at the intersection of self-disclosure and rumination (Rose et al., 2007). In other words, because co-rumination involves a perseverative focus on problems within a dyad, it may lead to feeling understood and more anxious all at once.

Indeed, Rose (2002) found co-rumination to be positively associated with friendship quality and internalizing symptoms.

The friendship literature suggests that children tend to befriend peers who are similar to them. In turn, their shared characteristics may become magnified within the context of high quality friendships (Berndt, 1999). As such, adolescents with ADHD and comorbid anxiety symptoms may associate with other youth with similar presentations. A by-product of this association and social perspective taking abilities may include suffering vicarious distress when faced with the concerns of close others (Kessler & McLeod, 1984, Rose et al., 2007).

### 3.4.3 Limitations and Implications

Current findings should be considered in light of several important limitations. Friendship quality was assessed through self-report only. Although youth are able to provide reliable information about their friendships and behaviour (e.g., Ladd et al., 1996; Riley, 2004), partners in friendship dyads often have conflicting views regarding their relationship (e.g., Normand et al., 2013). Moreover, children and adolescents with ADHD tend to under-report on problem areas in their lives, especially as it pertains to their social competence (e.g., Colomer, et al., 2016; Owens et al., 2007). Future studies should employ a multi-method (e.g., observations of naturalistic or contrived interactions among friends), multi-informant (e.g., both members of the dyad, parents, and teachers) assessment of friendship stability, interpersonal competence, and friendship quality.
The current study did not collect information on the attributes of both relationship partners involved in the friendship dyad. Although research suggests that children and adolescents with ADHD are more likely to befriend peers with behavioural and socio-emotional concerns (Hoza et al., 2005b; Marton et al., 2015; Maya-Beristain, 2017; Normand et al., 2011), the assumption that co-rumination occurred within the friendships of the current sample is purely speculative. Close friendships have been shown to mitigate the effects of peer rejection and buffer future negative outcomes (Hoza, 2007; Mrug et al. 2001; Normand et al. 2007). However, it is assumed that the protective effect of friendships occur primarily, if not exclusively, for children who have high quality, stable friendships with well-adjusted peers (Hartup & Stevens 1997, Mikami, 2010). Subsequent research should investigate the extent to which negative socialization (e.g., co-rumination, deviancy training) occurs within the context of the friendships of adolescents with ADHD, and evaluate its impact on overall adjustment.

The present study includes male and female participants, and provides preliminary information about pertinent correlates of friendship quality in adolescents with and without ADHD. However, many relevant issues remain to be explored. Future studies, with larger samples, should examine the distal social context (e.g., culture, ethnicity, socioeconomic status), proximal environmental conditions (family structure, parental influences, peer groups, school climate), and additional child characteristics (e.g., emotion regulation, aggression), and their varying contributions to friendship quality. Finally, this study used a cross-sectional design which precludes the inference of causality. Subsequent studies in this line of research should investigate these associations longitudinally. This may help to elucidate the potential cascade effects of the adaptive and maladaptive behaviours over time.

These limitations notwithstanding, the findings of the present study contribute to our limited understanding of the friendships of adolescents with ADHD. It highlights the importance of attending to the potentially exacerbating or attenuating effects of specific co-occurring symptoms (e.g., oppositionality, anxiety) on friendship quality. It provides preliminary evidence of social skills and social perspective taking as potential mechanisms underlying the association between ADHD, co-morbid psychopathology, and friendship quality. Accordingly, it may inform interventions designed to improve the social functioning of individuals with ADHD, and in particular, it suggests that improving empathic understanding and engagement levels should be considered as potential targets of these interventions. Although more research is needed to
establish the efficacy and effectiveness of mindfulness-based cognitive therapy, initial results suggest it is an example of a promising intervention for adolescents with ADHD in terms of increasing their empathy and perspective taking abilities (Haydicky, Shecter, Wiener, & Ducharme, 2015).

The present study also highlights the importance of adopting a careful and nuanced lens when evaluating the role of friendships and social perspective taking on psychosocial functioning. Past studies have documented that close friendships are linked to better psychological adjustment and socially isolated youth are at-risk for a host of adverse outcomes. As a result, youth in friendships characterized by co-rumination may go undetected by parents, teachers, and mental health professionals alike. Although such friendships promote high-quality friendships, regrettably, they are also associated with emotional adjustment difficulties such as anxiety, depression, and substance use (Kessler & McLeod, 1984; Rose, 2002; Rose et al., 2007). Therefore, comprehensive assessments of adolescents with ADHD should include a thorough examination of their social functioning with particular attention devoted to the quality of their interactions with friends. Similarly, parents of adolescents with ADHD are encouraged to monitor their teens’ activities closely and intervene when problems arise.
### Table 3.1 Sample Characteristics and Demographics

| Family Demographics | ADHD | | Comparison | |
|---------------------|------|------------------|------------|
|                     | N    | %                | N          | %            | $X^2(I)$ |
| Parental Education  |      |                  |            |              |         |
| < University Degree | 13   | 28               | 11         | 25           | .12     |
| ≥ University Degree | 33   | 72               | 33         | 75           |         |
| Parental Marital Status | |                  |            |              | .71     |
| 2 caregiver household | 47   | 77               | 45         | 83           |         |
| Other (e.g., single, divorced) | 14   | 23               | 9          | 17           |         |
| Parents Born in Canada |       |                  |            |              | 2.17    |
| Either/Both         | 46   | 78               | 34         | 65           |         |
| Neither             | 13   | 22               | 18         | 35           |         |
| Language Spoken at Home |       |                  |            |              | .96     |
| English             | 45   | 74               | 36         | 67           |         |
| Other (e.g., French, Spanish) | 16   | 26               | 18         | 33           |         |
| Child Characteristics |       |                  |            |              |         |
|                     | n    | $M (SD)$         | n          | $M (SD)$     | $t$     |
| Age                 | 61   | 15.28 (1.54)     | 54         | 15.41 (1.75) | .42     |
| IQ                  | 61   | 106.69 (11.69)   | 54         | 110.31 (8.89)| 1.83    |
| Conners Parent      |      |                  |            |              |         |
| DSM Inattentive     | 61   | 80.38 (8.07)     | 54         | 49.04 (6.26) | 23.04***|
| DSM Hyperactive-Impulsive | 61   | 80.11 (10.74)    | 54         | 48.37 (5.94) | 19.25***|
| DSM Oppositional/Defiant | 61   | 68.07 (12.43)    | 54         | 49.85 (7.15) | 9.46*** |
| DSM Conduct Disorder | 61   | 59.57 (13.69)    | 54         | 48.28 (8.43) | 5.22*** |
| Conners Teacher     |      |                  |            |              |         |
| DSM Inattentive     | 46   | 62.28 (12.41)    | 43         | 51.84 (11.18)| 4.16*** |
| DSM Hyperactive-Impulsive | 45   | 59.78 (14.53)    | 43         | 52.84 (13.63)| 2.31*   |
| DSM Oppositional/Defiant | 46   | 61.78 (18.27)    | 43         | 57.26 (16.06)| 1.23    |
| DSM Conduct Disorder | 43   | 54.33 (14.14)    | 42         | 50.17 (11.33)| 1.49    |
| Conners Self-Report  |      |                  |            |              |         |
| DSM Inattentive     | 61   | 64.56 (10.57)    | 53         | 53.72 (11.15)| 5.32*** |
| DSM Hyperactive-Impulsive | 61   | 63.34 (12.53)    | 53         | 51.85 (10.43)| 5.27*** |
| DSM Oppositional/Defiant | 61   | 54.41 (9.73)     | 53         | 49.21 (8.21) | 3.06**  |
| DSM Conduct Disorder | 61   | 54.05 (11.15)    | 53         | 49.30 (9.41) | 2.43*   |

Note. DSM = Diagnostic and Statistical Manual of Mental Disorders.

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$
Table 3.2  Bivariate Correlations

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Note. Group (Comparison = 0, ADHD = 1); Gender (Male = 0, Female = 1); Friendship Quality calculated by summing scales of Social Support on the NRI-BSV.

* p < .05, **p < .01, ***p < .001; *p = .06
Table 3.3  Hierarchical Regression Predicting Friendship Quality on the scale of Friendship Social Support of the NRI-BSV

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<td>.194*</td>
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* $p < .05$, **$p < .01$, ***$p < .001$
Figures

Figure 3.1  Indirect Effect of Oppositional Behaviour on Friendship Quality through Social Skills

Note. Gender, Age, ADHD status, Age*ADHD status, Friendship Stability were entered as covariates
Figure 3.2  Indirect Effect of Anxiety on Friendship Quality through Social Perspective Taking

\[
\begin{align*}
\alpha &= .11^*, SE = .05 \\
\beta &= .05^{**}, SE = .02 \\
\gamma &= -.01, SE = .01 \\
\gamma' &= -.02^*, SE = .01
\end{align*}
\]

\(b = -.01^{*}(CI .001 to .012)\)

Note. Gender, Age, ADHD status, Age*ADHD status, Friendship Stability were entered as covariates.
Chapter 4
Conclusions and Implications

4.1 Context

Considerable research has shown that friendships are developmentally significant. High quality friendships generally lead to better social, emotional, behavioural, cognitive, and academic outcomes. Children and adolescents with high quality friendships tend to be better adjusted at school and they navigate transitions more easily. They are less lonely, less likely to suffer from depression, and less vulnerable to peer victimization. They are happier, more satisfied with their lives, more socially skillful, and they have a more positive sense of self. Subsequently, they are more likely to engage in positive romantic relationships. Conversely, friendship problems in childhood and adolescence foreshadow future negative outcomes including academic difficulties, psychopathology, substance abuse, and sustained social difficulties (Bagwell et al., 1998; Hoza, 2007).

There is ample evidence that children with ADHD struggle with their peer relations. They are more frequently rejected, stigmatized, and victimized by their peer group than their non-ADHD counterparts. There is also compelling evidence that they have difficulty forming and maintaining high quality friendships. Moreover, the arrival of adolescence brings about new areas of potential impairment for youth with ADHD. These include difficulties in vocational performance (Barkley, Fischer, Smallish, & Fletcher, 2006), romantic relationships (Flory et al., 2006; Rokeach & Wiener, 2018), delinquency (Sibley, Pelham, Molina et al., 2011), and substance use (Molina, Pelham, Gnagy, Thompson, & Marshal, 2007). These difficulties are only exacerbated when friendship problems exist.

The overarching goal of the research presented in this dissertation was to examine friendship quality in adolescents with ADHD. Study 1 investigated two dimensions of friendship quality (i.e., social support and negative interactions) in same- and other-sex friendship dyads, and whether they differed in adolescents with and without ADHD, across age and gender. It was expected that adolescents with ADHD would have lower levels of social support and higher levels of negative interactions than their TD peers. In particular, it was hypothesized that these differences would become more pronounced in late adolescence. In addition, exploratory
analyses were conducted to examine gender differences in friendship quality in youth with and without ADHD. Study 2 examined empirically supported correlates of friendship quality including friendship stability, co-morbid psychopathology (e.g., anxiety, depression, oppositional behaviour, conduct problems) and interpersonal competence (e.g., social perspective taking, social skills). It was predicted that friendship stability would be positively associated with friendship quality. It was expected that oppositional behaviour and conduct problems would have an additive and adverse effect on friendship quality over and above ADHD status. It was not clear whether depression and anxiety would explain unique variance in friendship quality above ADHD status. Finally, it was anticipated that social skills and social perspective taking would be uniquely and positively associated with friendship quality. In addition, post-hoc exploratory analyses were conducted to examine the potentially mediating role of interpersonal competence in explaining the relationship between comorbid psychopathology and friendship quality. Finally, exploratory analyses were conducted to examine the relationship between different domains of social skills (exploratory analyses were conducted to examine the relationship between different domains of social skills (i.e., communication, cooperation, assertion, engagement, self-control, empathy, and responsibility) and friendship quality, after accounting for the variance attributed to ADHD status. Overall, results were in the expected direction with several analyses reaching statistical significance. Small to moderate effect sizes were observed for many of the predictor variables.

In this chapter, key findings of each study will be integrated and discussed in relation to the existing literature. General limitations of this research and, as a corollary, directions for future research will be considered. Finally, clinical implications and existing peer relations interventions will be discussed.

4.2 Conclusions

Several preliminary conclusions can be derived from this research. First, friendship quality is lower across age groups in adolescents with ADHD, but higher across age groups in TD peers. Second, adolescents with and without ADHD report comparably low levels of negative interactions in their friendships, irrespective of age and gender. Third, friendship stability is associated with friendship quality, such that friendships that persist over time are higher in social support. Fourth, interpersonal competence, namely social skills and social perspective taking,
play a central role in predicting friendship quality in youth with ADHD and co-occurring externalizing and internalizing problems. The relationship between co-occurring anxiety symptoms and friendship quality was accounted for by social perspective taking. Furthermore, oppositional defiant behaviour was found to further diminish friendship quality in adolescents with ADHD, but this effect was mitigated by social skills. In particular, empathy and engagement were the two social skills most pertinent to predicting friendship quality, over and above, age, gender, and ADHD status.

4.2.1 Developmental Factors

In study one, age was found to moderate the relationship between ADHD status and friendship quality. Whereas self-reported ratings of friendship social support increased across age groups in the comparison sample, they were lower in the ADHD sample. This finding was particularly robust, as it remained significant even after accounting for the variance attributed to gender, friendship duration, social competence, and co-morbid psychopathology. This is consistent with the finding that college-aged students with ADHD have more difficulty providing emotional support in their friendships than college students without ADHD (McKee, 2014).

Friendships in adolescence are qualitatively different from friendships in childhood. Intimacy, reciprocity, sensitivity, conflict resolution, self-disclosure, and emotional support are the features of greatest importance (Bagwell & Schmidt, 2011). At the same time, research suggests that the manifestation of ADHD symptoms change as these individuals progress through adolescence. Hyperactive-impulsive symptoms decline in adolescence, whereas symptoms of inattention tend to remain stable (Biederman et al., 2000; Willcut et al., 2012). It is therefore plausible to assume that, for adolescents with ADHD, inattentive symptoms may be more detrimental to the formation, stability, and quality of their friendships (Normand et al., 2007). Delays in cortical maturation, particularly in the prefrontal regions important for cognitive processes including attention and executive functioning may be implicated in these peer relations difficulties (Rommelse et al., 2017; Shaw, Eckstrand, Sharp et al., 2007).

Adolescents with attentional difficulties often appear socially withdrawn and uninterested (Hodgens, Cole, & Boldizar, 2000; Mikami et al. 2007; Solanto, Pope-Boyd, Tyron, & Stepak, 2009). They have difficulty developing social skills through observational learning (Hoza, 2007).
They tend to be less attuned to the emotional needs of their friends (Mikami et al., 2007; Normand et al., 2013), and it is more difficult for them to process social cues to help resolve their conflicts equitably (Sibley et al., 2010). Naturally, this constellation of difficulties does not bode well for forming high-quality friendships. By late adolescence, when youth evolve from strictly being a “receiver” of care, to a care “giver” to peers, it is reasonable to assume that adolescents with ADHD, who are more likely to have a blueprint of relationships that is characterized by insecurity, distorted communications, and negative expectations about others (Clarke et al, 2002), are less equipped to become attachment figures for their friends.

4.2.2 Gender

Female adolescents rated their friendships to be more supportive than their male counterparts, irrespective of their ADHD status or age. This is certainly not a new finding. There is considerable evidence documenting that girls emphasize emotional closeness, intimacy, self-disclosure, conflict resolution, and helping behaviors in their friendships (e.g., Bowker, 2004; De Goede, Branje, & Meeus, 2009; Rose & Rudolph, 2006). By contrast, boys are more likely to value friendships based on agentic needs, individual status, competition, and a dominance hierarchy (e.g., Bowker, 2004; Rose & Rudolph, 2006). However, this is one of few existing studies investigating gender differences in friendship quality among adolescents with ADHD. Most of the literature including children and adolescents with ADHD has primarily focused on males (Barkley, 2015). It has been previously speculated that ADHD symptoms may be more impairing to the close friendships of girls relative to boys, as these symptoms are more likely to interfere with the important features that characterize female friendships (Mikami, 2010). In addition, because ADHD is less common in females, a girl with ADHD symptoms may be perceived as more deviant, and her actions as less tolerable, relative to a boy with a similar presentation (Mikami, 2010). Findings in this study, however, suggest that adolescent girls with ADHD, much like TD youth, have friendships that are more supportive than their male counterparts.

One possible explanation for this finding may be related to the construct of co-rumination. In the present study, the more anxious the teen, the higher the self-reported friendship quality. We know from the literature that adolescent girls, irrespective of their ADHD status, are more likely than adolescent boys to have co-occurring anxiety problems and to excessively discuss personal
problems within a friendship (i.e., co-rumination) (Gershon & Gershon, 2002; Rose, 2002). It is possible that higher levels of co-rumination among girls may contribute to higher-quality friendships through self-disclosure processes, but also greater internalizing problems through ruminative processes (Rose, 2002). Of course, future studies examining co-rumination within the friendships of adolescents with ADHD are need to test these assumptions empirically.

4.2.3 Negative Interactions

Adolescents with and without ADHD rated themselves as having comparable levels of negative interactions in their friendships, irrespective of age and gender. This finding is surprising given previous research indicating that children with ADHD report higher levels of conflict and relational aggression in their friendships (Blachman & Hinshaw, 2002; Zucchetti et al., 2015). These discrepant results may be potentially related to developmental factors in adolescent friendship selection. As previously stated, adolescence represents a time of growing autonomy during which parents have less input regarding the selection of their children’s friends. Consequently, adolescents build a social network of friends with whom, for better or worse, they share more attributes, aspirations and achievement goals. In turn, this may result in relationships that are less conflictual than they were in childhood (Claes, 2003). Relatedly, the evidence suggests that youth with ADHD are more likely to befriend other children with ADHD and behavioural problems. (Bagwell et al., 2001; Blachman & Hinshaw, 2002; Normand, 2011). It is therefore possible that adolescents with ADHD and their friends have a shared behavioural tempo (e.g., shared characteristics and social goals) and are more tolerant of negative interactions within their friendships. Future research is needed to replicate these findings and to test these assumptions.

4.2.4 Friendship Stability

All adolescents in the present sample reported having a best friend, with 110 out of 115 participants rating their same-sex friend to be their best friend. Although teens with ADHD have generally been found to have at least one close, reciprocal friendship (e.g., Glass, Flory, & Hankin, 2012; Maya-Beristain, 2017), a study by Hoza et al (2005b) indicated that approximately half of children with ADHD are friendless. In part, this discrepancy may be accounted for by different measurement procedures. Hoza et al’s (2005b) sample consisted of
children and they restricted friendship nominations to peers within the classroom. In the present study and in the Glass et al (2012) study, the participants were adolescents and the methods allowed for friendship nominations in and out of the school context.

Also, contrary to previous research (Blachman & Hinshaw, 2002; Marton et al., 2015; Normand et al., 2013), youth with and without ADHD did not differ on their self-reported friendship stability. Again, these discrepant findings may be the result of methodological variations. The aforementioned studies examined friendship stability in samples of only girls or children (Blachman & Hinshaw, 2002; Marton et al., 2015; Normand et al., 2013). Developmental factors described above may explain the absence of group differences. That is, adolescents have more autonomy in selecting their friends and may therefore choose to become friends with peers with whom they share more attributes (Claes, 2003). When children and adolescents are similar to one another on personal characteristics such as gender, age, ethnicity, and/or interests, their friendships are most likely to be maintained over time (Poulin & Chan, 2010). Moreover, negative dimensions of friendship, such as high levels of conflict, have been linked to lower stability (Bukowski et al., 1994; Poulin & Chan, 2010). In the present sample, adolescents with and without ADHD reported comparably low levels of negative interactions in their friendships, which may also help explain the absence of group differences.

Findings from this study also suggest that over and above various individual level factors (e.g., age, gender, ADHD status, co-morbid psychopathology, and interpersonal competence), friendship stability is predictive of friendship quality, such that friendships that are higher in relationship quality tend to persist over time. Previous research with typically developing youth indicates that friendships stability fosters intimacy and companionship in friendships (Ladd et al., 1996; Poulin & Chan, 2010); this appears to be the case for adolescents with ADHD as well.

4.2.5 Co-morbidity

Co-occurring mental health problems are commonplace among children and adolescents with ADHD. A significant proportion (45%-84%) of youth with ADHD also meet criteria for ODD or CD and nearly half also have a comorbid anxiety or depressive disorder (Barkley, 2015). In general, ADHD and co-occurring psychopathology is associated with greater social impairment than ADHD in isolation (Becker et al., 2015; Booster et al. 2012, Ostrander et al., 2006; Ray et
al., 2017; Wehmeier et al., 2010) However, it is likely that peer difficulties vary across domains of co-occurring psychopathology and previous researchers have proposed that a greater awareness of the ways in which co-occurring mental health difficulties affect peer functioning among youth with ADHD may inform prevention and intervention efforts (Becker et al., 2012).

In the present study, results indicated that parent-rated oppositional behaviour was associated with lower adolescent ratings of their friendship’s quality. Self-reported depression was not associated with friendship quality, and, surprisingly, anxiety symptoms were positively associated with friendship quality, after controlling for ADHD and oppositional behaviour.

A review by Becker et al (2012) found that co-occurring externalizing mental health problems generally coincided with lower levels of social skills and peer acceptance in youth with ADHD. Few studies, however, have examined its impact on friendships specifically. The limited evidence to date suggests that co-morbid externalizing behaviour problems have no additional effect on the number of dyadic friendships (Hoza et al, 2005b), friendship quality/ satisfaction (Normand et al. 2011), or close friendship competence (Bagwell et al. 2001) in children with ADHD. However, previous research suggests that children and adolescents rated high in externalizing behaviour problems are more likely than others to have a best friend who is likewise rated high in externalizing problems (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988). This coupling may result in two friends who are less satisfied with their friendship because these relationships are more likely to be marked by persistent violations of rules during activities and less equitable and sensitive interactions (Normand et al., 2011). However, this remains an empirical question to be tested by simultaneously examining friendship content, friend characteristics, and friendship quality.

Research examining the influence of co-occurring internalizing problems on the social functioning of youth with ADHD is a virtual nonentity. Available studies suggest that anxiety sometimes exacerbates social skills deficits, although this may be attributable in part to co-occurring externalizing behaviour problems, rather than anxiety specifically (Becker et al., 2012; Bowen, Chavira, Bailey, Stein, & Stein, 2008). Existing studies evaluating the effect of co-occurring anxiety on peer acceptance or friendship quality reveal no additive detrimental effect (Bowen et al., 2008; Hoza et al., 2005b, Normand et al., 2011). No studies have examined the effect of depression in relation to these peer domains.
Comorbid anxiety in children with ADHD is associated with less aggression and less impulsivity than in children with ADHD in isolation (Pliszka, 1992; Quay, 1997; Mannassis, Tannock, & Barbosa, 2000). In the present sample, it is possible that co-occurring anxiety symptoms tempered the impulsive and reactive behaviors that are characteristic of children and adolescents with ADHD, in turn preserving the quality of their friendships (Jarrett & Ollendick; 2008). It is also possible that co-occurring anxiety symptoms increased friendship quality through co-ruminative processes discussed in more detail above and in the section on social perspective taking below.

It is probable that the relationship between psychopathology and peer functioning is bidirectional, where difficulties in peer relations and mental health problems are mutually reinforcing and cyclical in nature (Becker et al., 2012). Although co-occurring internalizing and externalizing behaviour problems could make it more difficult to establish positive relationships, the inverse could also be true. Children and adolescents who experience peer relations difficulties are more prone to develop externalizing and internalizing symptomatology compared to those who do not (Parker et al., 2006). Longitudinal research is necessary to better understand this transactional relationship.

### 4.2.6 Interpersonal Competence

Findings from this study suggest that interpersonal competence, namely social skills and social perspective taking, are the meat and potatoes explaining the relationship between comorbid psychopathology and friendship quality in adolescents with ADHD. In the present sample, social skills accounted for the relationship between oppositional behaviour and friendship quality. Similarly, social perspective taking accounted for the relationship between anxiety and friendship quality. These findings are in accordance with the ADHD literature which suggests that the primary skills deficits experienced by children and adolescents with ADHD can be categorized into two broad domains: disruptive/inappropriate social behaviors and socio-cognitive deficits (Gardner & Gerdes, 2015). In turn, these interpersonal deficits are assumed to limit the opportunity to develop positive social relationships (e.g., peer acceptance, high quality friendships and romantic relationships) and increase the frequency of negative relationships (e.g., peer rejection, poor quality friendships and romantic relationships).
4.2.6.1 Social Skills

An important developmental task of early childhood includes developing strategies for self-control and learning to comply with the requests of others. In middle childhood, children are expected to develop moral and prosocial behavior (e.g., helping others, being empathic, and inhibiting aggressive and delinquent behaviors) and then in adolescence, teens are expected to internalize these social norms and exhibit them in the absence of direct supervision (Masten & Coatsworth, 1998). Acceptance within a peer group is often contingent upon this developmental progression of social skills (Murray-Close et al., 2010).

Developmental research, however, has shown that children and adolescents with ADHD demonstrate poorer social skills than their TD peers (Hinshaw, Owens, Sami & Fargeon, 2006; Owens et al., 2009; Murray-Close et al., 2010). Youth with ADHD typically display less sharing, cooperation, and turn-taking than their non-disordered peers (Barkley, 2015). They also tend to express their anger and frustration more than others and they show reduced empathy and guilt (Braaten & Rosen, 2000; Dyck et al., 2001; Marton et al., 2009; Wehmeier et al., 2010). Not surprisingly these social inelegances typically lead to impaired peer relationships.

Thus, the finding that social skills, and in particular empathy and engagement, may account for the relationship between co-morbid externalizing problems and friendship quality is not surprising. Empathy inhibits negative social behaviors (e.g., aggressive or antisocial actions) that have hurtful effects on others and facilitates actions undertaken to benefit others (e.g. Batson, Fultz, & Schoenrade, 1987; Eisenberg, 2010). Those with low empathy often fail to respond to alleviate the distress and discomfort in others (Hare, 1999). On the other hand, adolescents who exhibit high levels of empathy tend to have friendships that are more satisfying, more intimate, and less conflictual than adolescents with lower levels of these social skills (Berndt & Hanna, 1995; Chow et al., 2013; Clark & Ladd, 2000; Davis & Kraus, 1991; Soenens et al., 2007; Shulman, 1995; Smith & Rose, 2011). Similarly, children and adolescents who are disengaged tend to have friendships characterized by high levels of conflict and low levels of intimacy and self-disclosure (Berndt & Hanna, 1995; Shulman, 1995). Because children and adolescents with ADHD and comorbid externalizing problems are predisposed to have difficulty learning socially appropriate behavior (e.g., inhibiting aggression, developing empathy, being engaged), this places them at risk for peer rejection and friendship problems (Murray-Close et al., 2010).
turn, rejection by peers and difficulties in friendship formation may lead to an exacerbation of problems in the original area of functioning, namely externalizing behaviours and poor social skills.

4.2.6.2 Social Perspective Taking

Social perspective taking is associated with affective empathy, social competence, social acceptance, and high quality friendships (Bosacki & Astington, 1999; Rose et al., 2007; Yeates & Selman, 1989). Consistent with predictions and previous research, social perspective taking difficulties were found to play a central role in the peer relationships of children and adolescents with ADHD (Marton et al., 2009; Timmermanis, 2015). In the current study, higher levels of parent-reported social-perspective taking were associated with higher levels of adolescent reported friendship quality, even after accounting for the effects of age, gender, ADHD status, and social skills. This suggests that considering multiple perspectives and coordinating these perspectives with others is pivotal to developing mutually supportive friendships.

Similar to social skills, the relationship between social perspective taking and friendship quality among adolescents with ADHD may be cyclical, such that deficits in social perspective taking may contribute to individuals with ADHD being less likely to experience positive social interactions in which to further develop their social acumen (Bagwell et al., 2001; Murray-Close et al., 2010; Uekermann et al., 2010). In turn, having fewer friends and experiencing higher levels of peer rejection may provide individuals with ADHD fewer opportunities to develop their social perspective taking abilities (Marton et al., 2009; Timmermannis, 2015).

Social perspective taking, however, has also been found to be a double-edged sword, as it is also associated with adjustment trade-offs in the form of greater internalizing distress (Rose, 2002; Rose et al., 2007). When youth with well-developed social perspective-taking skills encounter a friend who is troubled or upset, the tendency to take the friend’s perspective and imagine the upsetting situation from the friend’s point of view increases the likelihood of sharing in their friend’s affective state (Rose, 2002; Rose et al., 2007). Although, this heightened sensitivity may promote high quality friendships (Calmes & Roberts, 2008; Rose et al., 2011), it also may confer a greater risk for internalizing problems.
Indeed, in the current study, social perspective taking, anxiety levels, and friendship quality were positively associated with one another and an analysis established the mediating role of social perspective taking in the relationship between anxiety and friendship quality.

Social perspective taking is one of the only individual characteristics associated with co-rumination (Smith & Rose, 2011). Thus, the relational ability to consider another person’s viewpoint may lead to becoming embroiled in a co-ruminating friendship. Adolescents with social perspective-taking abilities may be unintentionally pulled to co-ruminate because they find it easy to relate to friends’ problems, to speculate about possible causes and consequences, and to understand their friend’s negative affect. However, the current study did not investigate the extent to which negative socialization occurs within the context of the friendships of adolescents with ADHD and this is an important area of future research.

4.3 Limitations and Future Directions

Despite the public health significance associated with peer problems in youth with ADHD, the field has made only circumscribed progress towards understanding the developmental pathways linking ADHD to problems in peer functioning. (Becker et al., 2012; Mrug et al. 2001; Mikami, 2010). Anything but tentative conclusions about friendship quality in adolescents with ADHD at this nascent stage would be impetuous. Many fundamental questions remain unanswered and in this section, I highlight general limitations of the overall research area and suggest directions for future research.

Where possible, future research should aim to limit methodological variability across studies. Investigators should pay careful attention to the effects different respondents can have on study outcomes (e.g., parents, teachers, clinicians, adolescent participants and their friends). For example, current study findings are based on self-reported perceptions of friendship quality. Thus, the degree to which both relationship partners rated the quality of their friendship similarly was not substantiated in this study. Moreover, children and adolescents’ behavior often varies from one setting to another (e.g., home versus school). Therefore, parents and teachers observe children and adolescents in distinct contexts, which may result in divergent ratings of their social competence. For example, parents may be more likely to rate social impairment based on sibling
interactions, whereas teachers may be more likely to rate social impairment based on direct observations of peer interactions (Becker et al., 2012).

Future research should also carefully consider whether to measure psychopathology using categorical diagnoses or dimensional symptomatology. In the current study, participants were categorized into either an ADHD group or a comparison group based on a pre-existing diagnosis from a physician or psychologist. Although there are advantages to classifying behavioral/emotional problems into categories of disorders, there are limitations to this nosology as well. For example, previous editions of the DSM specified the same criterial behaviors for ADHD (and other disorders) irrespective of gender and age. And yet, the base rates for some criterial behaviors and the number of the behaviors required to identify deviance may differ according to age and gender (Achenbach & McConaughy, 1996). Although the most recent edition of the DSM has somewhat recognized this shortcoming, it has only slightly reduced the number of criteria required to meet the diagnosis of ADHD, from six symptoms to five, for older adolescents (age 17 and older) and adults, and it does not take into account a divergent gender manifestation of the disorder (Gershon & Gershon, 2002). Electing to examine psychopathology categorically versus continuously may lead to different findings with respect to social impairment.

Relatedly, the current study did not investigate the relationship between ADHD presentations (i.e., Inattentive, Hyperactive/Impulsive, Combined) and social functioning (e.g., friendship quality, social skills, social-perspective taking). In this study, high intercorrelations were observed for parent ($r = .84, p < .001$), teacher, ($r = .55, p < .001$) and self-report ($r = .73, p < .001$) ratings on the DSM Inattentive and Hyperactive-Impulsive scales of the Conners and most study participants met criteria for an ADHD Combined presentation. Accordingly, differences in ADHD presentations were not examined. Nevertheless, the literature suggests that youth with Inattentive (ADHD-I) and Combined (ADHD-C) presentations may differ in their peer functioning deficits (e.g., Wheeler Maedgen & Carlson, 2000). For instance, children with an ADHD-C presentation are more likely to enact intrusive and aggressive behaviors in their peer encounters, whereas youth with an ADHD-I presentation tend to be less assertive and are more likely to appear socially withdrawn and uninterested (Hodgens et al. 2000; Mikami et al. 2007; Solanto et al. 2009). Relatedly, intervention efforts may differ for youth based on their presentation. For example youth with ADHD-I presentation may require instruction to increase
skills related to engagement and assertion with peers, whereas youth with an ADHD-C presentation may require self-regulation strategies (Pfiffner, Mikami, Huang-Pollock et al., 2007). That being said, there is increasing evidence that ADHD symptoms are often fluid within individuals across their lifespan, rather than stable traits (Epstein & Loren, 2013; Hurtig, Ebeling, & Taanila et al., 2007). Thus, it is perhaps imprudent to attribute specific outcomes to ADHD “subtypes”, when particular symptom presentations may shift across development.

The present study examined predictors of friendship quality using composite indices of social support (e.g., attachment, caregiving, companionship) and negative interactions (e.g., conflict, antagonism, criticism). Future studies with larger samples should examine the relationship between specific features (e.g., intimacy, conflict, companionship) and specific correlates (e.g., social competence, psychopathology, age, and gender). For example, intimacy becomes a critical friendship feature in adolescence while companionship is a particularly important feature of high quality friendships in younger children. Using only a global measure of positive or negative features would make it difficult to identify these potentially important trends (Bagwell & Schmidt, 2011).

The choice of friendship quality measures should also be a careful consideration of future research, as the sensitivity of some measures may be subject to a restriction of range or ceiling effects, particularly in treatment samples (Becker et al., 2012). Although the present study found a group by age interaction effect, participants with and without ADHD tended to rate their friendship quality as moderately high. Similarly, Gardner and colleagues (2015) found that friendship quality did not improve in teens with ADHD following a PEERS intervention. The authors proposed that, in part, this may have been the result of pre-treatment means that were moderately high at baseline, leaving little room for improvement post-treatment. Hence, future researchers should carefully choose measures that are sensitive enough to detect modest changes in social, emotional, and behavioural functioning (Becker, Fite, Luebbe et al., 2013).

The present study provides some preliminary information about individual-level factors that predict friendship quality in adolescents with and without ADHD. In addition, future research should examine child characteristics not explored in the current study (e.g., emotion regulation, aggression, executive functioning, medication status). As well, ecological theories of human development underscore the importance of exploring the relationship between friendship quality
and the immediate context. These include family factors such as attachment style, parenting style, and parental ADHD and proximal factors such as the school environment.

It is widely accepted that early attachment relationships provide blueprints of relating that transfer to and shape subsequent peer relationships (Allen et al., 2007; Main, 1991; Sroufe et al., 2005). The quality of relationships with parents is positively associated with the quality of relationships with peers or friends (Greenberg, Siegel, & Leitch, 1983; Procidano & Smith, 1997; Youngblade, Park, & Belsky, 1993). Given that children and adolescents with ADHD often have conflictual relationships with their parents (Johnston & Mash 2001; Markel & Wiener, 2014; Mikami & Pfiffner, 2008) and are more likely to have insecure attachments (Clarke, Ungerer, Chahoud et al., 2002), it is possible that their contentious relationship places them at a greater risk for difficult relationships with their peers.

Relatedly, there is extensive research demonstrating that parenting styles are differentially associated with their children’s social behavior towards peers (Alink, Cicchetti, Kim, & Rogosch, 2009; Romano, Tremblay, Boulerice, & Swicher, 2005; Steinberg, Lamborn, Darling, et al., 1994). For example, authoritative parenting is positively associated with social skills, emotion regulation, and intimacy in adolescent friendships (e.g., Ladd & Petit, 2002; Sharabany, Eshel, & Hakim, 2008). Along a similar vein, higher autonomy granting by parents is linked with adolescent reports of lower conflict in their friendships (Mounts, 2004). On the other hand, parents who are over-controlling and coercive tend to have children with lower levels of social competence and higher levels of aggression, delinquency, and social withdrawal (Bagwell & Schmidt, 2011; Kawabata et al., 2012; Patterson, 1995, Patterson & Fisher, 2002; Putallaz, 1987). Finally, parents who are overly permissive and who provide inadequate monitoring tend to have children and adolescents who are aggressive in their relationships (e.g., Stocker, 2000).

Preliminary work suggests that maternal ADHD and/or depression symptoms also negatively impact child social competence (Chronis-Tuscano, Raggi, Clarke et al., 2008; Griggs & Mikami, 2011). It is hypothesized that adult ADHD and/or depression may interfere with parenting behaviors relevant to child socialization such as guiding children during peer interactions, scheduling playdates, or modeling of appropriate interpersonal skills (Ladd & Hart 1992). These parental influences are worthy of further exploration and it is likely that parenting programs offer a promising means of preventative care.
A better understanding of the school climate and its contribution to friendship quality is also warranted. Ecological theories of human development have consistently emphasized that schools are a critical context for the development of peer relationships (Crosnoe & Needham, 2004; Eccles & Roeser, 2003). Normative school transitions may result in the need to establish new friendships and to terminate existing ones (e.g., Goodwin, Mrug, Borch, & Cillessen, 2012). The support received from teachers and other students in a safe and orderly school environment also plays an instrumental role in adolescents’ abilities to strengthen their interpersonal skills and to find and maintain supportive friendships (Eccles & Roeser, 2003). For example, teacher acceptance or teacher criticism of student disruptive behaviour is associated with peer rejection in the expected directions (e.g., McAuliffe, Hubbard, & Romano, 2009; Mikami, Griggs, Reuland, & Gregory, 2012). Additionally, placement in special education, rather than inclusion, classrooms can result in peer neglect, rejection, and victimization, and lower quality friendships (Wiener & Tardif, 2004). Future studies should also examine distal factors, such as examining how high- versus low quality friendships forecast well-being differently across societies, cultures, and socio-economic status.

It would be especially pertinent for subsequent research to examine other friendship dimensions not explored in this study. This includes collecting information on the characteristics of the participants’ friends, the mechanisms involved in forming and maintaining friendships, and the content of the interactions among friends (e.g., co-rumination, delinquency experiences of bullying and victimization within friendships).

Finally, one of the primary limitations associated with this study, and the research completed to date, is a focus on correlations and consequences through cross-sectional designs, rather than longitudinal studies investigating potential causal mechanisms and pathways. Subsequent studies in this line of research should employ a developmental model that investigates these associations longitudinally. This may help to explain why individuals beginning on different maladaptive paths may converge on similar patterns of behaviour (i.e., equifinality), or why individuals beginning on the same path may diverge and manifest different behavioural patterns (i.e., multifinality) (Sroufe, 1997). For example, researchers could investigate whether friendship quality improves or deteriorates across development in adolescents with ADHD and the ways in which potential risk and protective factors underlying this association operate over time.
4.4 Clinical Implications

Given the developmental significance of friendships and the well-documented peer relations difficulties of youth with ADHD, a logical next step is to ask whether and how we can implement interventions to assist these youth in establishing successful friendships that may help buffer them from adverse developmental outcomes. Although there is an abundance of research aimed at improving peer relationships in typically developing children, and to a lesser extent adolescents, these intervention programs tend to focus on promoting peer acceptance, rather than helping children make and keep quality friendships (Hoza, 2007; Mikami, 2010; Normand et al., 2011). Treatment approaches for youth with ADHD typically comprise a combination of psychosocial behavioral management and medication. These approaches aim to reduce ADHD symptoms first and peer relations’ difficulties are often seen as secondary. In part, this is because a reduction in ADHD symptomatology is assumed to be indirectly beneficial for peer problems (Mikami & Normand, 2015). While it is true that pharmacological interventions can help reduce undesirable social behaviours in youth with ADHD, it does not necessarily lead to an uptick in prosocial behaviours, nor does it significantly improve peer ratings of likeability and popularity (e.g., Hinshaw, Henker, Whalen et al., 1989; Normand et al., 2011). The few intervention studies aimed at directly improving peer functioning in youth with ADHD have typically included participants in middle childhood and tend to fall under the umbrella of social skills training (SST) and social-cognitive processing programs. These include traditional SST, SST with parent generalization, and SST with a dyadic friendship component. Unfortunately, most of these training programs only assess for intervention effects on peer status and they do not typically examine outcomes related to friendships specifically. To date, the development of friendship-focused interventions remain in the early stages and there are virtually no intervention programs that have been subject to rigorous systematic study with carefully designed randomized control trials (RCTs) for improving the friendships of adolescents with ADHD (Mikami, 2010; Normand et al., 2011).

4.4.1 Social Skills Training Programs

Findings from the current research suggest that social skills are an important factor in predicting friendship quality, even after accounting for the effects of age, gender, ADHD status, and friendship stability. In fact, results from the present sample suggest that social skills may
mitigate the relationship between co-occurring oppositional behaviour and friendship quality. Thus, it makes intuitive sense to consider SST programs as a viable intervention for children and adolescents with ADHD and their nearly ubiquitous co-occurring externalizing behaviour problems. SST programs aim to teach youth appropriate social skills and behaviors in the hopes of promoting acceptance in the peer group at large, and by extension, friendships (La Greca, 1993; Mrug et al., 2001). However, the general consensus in prominent review papers and meta-analyses is that traditional, clinic-based forms of SST interventions are largely ineffective for children with ADHD (de Boo & Prins, 2007; Evans, Owens, & Bundord, 2014; Pelham & Fabiano, 2008). On the basis of these findings, some researchers have concluded that peer problems may be the most intractable domain of impairment in ADHD (Hoza, 2007; Mikami, 2010; Mikami & Pfiffner, 2006).

Two potential factors may explain why traditional SST approaches have had limited efficacy with ADHD populations (Mikami, Jia, & Na, 2014; Mikami & Normand, 2015). First, it has been posited that youth with ADHD are impaired in their performance of socially skilled behaviors rather than in their knowledge of social skills per se (de Boo & Prins, 2007). Unfortunately for children and adolescents with ADHD, most traditional, clinic-based, SST interventions have been constructed on the premise of knowledge deficits. They focus on teaching children and adolescents a number of different social skills in session (e.g., empathy, conflict resolution, attending to social cues, turn-taking). Later, participants are expected to recognize, recall, and successfully enact these learned skills in real world peer interactions. This multi-step process may be unrealistic for children and adolescents with high levels of emotionality, impulsivity, distractibility, and executive functioning difficulties (Barkley, 1997; Mikami, Smit, & Khalis, 2017). Moreover, SST programs may attempt to teach too many aspects of social competence simultaneously (e.g., diverse social skills with peers and adults while at school, on play dates, and in the community). Accordingly, participants often fail to generalize multiple skilled behaviours to real-world situations after treatment has ended and they achieve less gains than they would in an intervention targeting one social skill in a single type of interaction (Abikoff, 2009; Mrug, Hoza, Gerdes et al., 2009; Mikami, 2010; Mikami et al., 2017). Findings from the current study suggest that specifically targeting empathy development and/or engagement skills within the context of a dyad may be the most fruitful means through which to improve friendship quality.
The second barrier identified in traditional SST interventions relates to the tacit assumption that if a child with ADHD performs more socially skilled behavior, then peers will notice that behavior and respond with patience, encouragement, and ultimately, liking and friendship (Mikami et al., 2017). This assumption, however, overlooks research documenting that entrenched reputational biases are difficult to modify for youth with ADHD (Mikami & Normand, 2015). In other words, peer groups tend to retain their negative impressions of youth with ADHD, even when these youth enact more socially skilled behavior. In that regard, disconfirming a negative reputation in the eyes of a single friend may be a more practical objective (Mikami, 2010). Said differently, it is reasonable to assume that a friendship intervention provides a more realistic chance of changing perception biases, by presenting the opportunity for repeated, close, and empathic interactions with a single peer.

Taken together, the above-mentioned findings suggest that changing peer acceptance is a difficult enterprise. Therefore, alternative approaches or modifications to traditional SST models have been implemented to address social impairment in this population. SST programs (e.g., Summer Treatment Programs) now often include a parent component to assist youth in generalizing social skills outside of the treatment setting. Preliminary findings for SST programs with parent involvement are promising (e.g., increased get-togethers, decreased teasing, aggression, defiance), but these results have not yet been replicated (Hoza et al., 2003; Mrug et al., 2001). More recently, Gardner and colleagues (2015) examined the effectiveness of a parent-assisted, friendship-building program (Program for the Evaluation and Enrichment of Relational Skills; PEERS). This 14-week intervention aimed to establish mutual friendships and improve peer relationships in adolescents with ADHD. Initial findings suggest that PEERS is an effective clinical intervention for improving dyadic friendship formation, social knowledge, and frequency of hosted get-togethers in teens with ADHD (Gardner et al., 2015). However, adolescents in this study did not report a significantly higher quality of friendship post-treatment relative to baseline. This may be because adolescents tend to socialize with friends without their parents’ involvement, though the authors suggest that improvement in friendship quality may require additional time to develop beyond the final treatment session. Findings from the present, and other studies suggest that friendship duration is associated with the quality of the relationship. Therefore, it may indeed take longer than 14-weeks to increase the level of intimacy and support.
within a friendship, and it will be important for subsequent intervention studies to measure friendship quality several months post-treatment.

Another modification made to traditional SST programs focuses on helping peers to develop more positive impressions about their classmates with ADHD. In Mikami and colleagues’ (2013) Making Socially Accepting Inclusive Classrooms (MOSAIC) intervention, elementary school teachers are encouraged to help peers see positive characteristics in children with ADHD and alter the negative reputations that many children with ADHD have within their peer group. The goals of this intervention are to help reduce stigma about ADHD, to be more socially inclusive of children with ADHD, and to notice when children with ADHD are making positive behavioral changes (Mikami et al., 2017). Preliminary findings are promising and children with ADHD in MOSAIC classrooms experience improved sociometric preference and more reciprocated friendships, though friendship quality was not measured.

4.4.2 Social-Cognitive Interventions

Research findings suggest that social perspective taking also plays a vital role in predicting friendship quality. Dodge’s Social information Processing Model (Crick & Dodge, 1994) has been particularly influential in describing the peer relations difficulties of children with externalizing behavior problems. This model delineates how children with externalizing tendencies notice and encode social cues, interpret and make attributions about those cues, form social goals, generate potential solutions to the problems at hand, and enact a selected response. Not surprisingly, social cognitive deficits, such as social perspective taking have been implicated as barriers to efficacious peer relations’ interventions for children with ADHD (Mikami et al., 2014). Deficits in social perspective taking may lead to incorrect interpretations in ambiguous situations with peers, difficulty attending to key components of social interactions, and difficulty interpreting peers’ emotions (Crick & Dodge, 1994). In addition, children and adolescents with ADHD are more likely to overestimate their abilities and performance in various domains, including the social arena (Colomer et al., 2016, Kaiser, Hoza, Pelham, Gnagy, & Greiner, 2008; Owens et al., 2007). This positive bias may make it more difficult for children and adolescents with ADHD to adjust their insensitive and disruptive behaviour, even after receiving negative social feedback from their friends, parents, or intervention coaches (McQuade & Hoza, 2008).
Thus, social-cognitive interventions, which focus on improving the underlying cognitive processes that interfere with successful peer relations (Malik & Furman, 1993), offers a worthwhile avenue to explore in remediating friendship difficulties in youth with ADHD.

The Social Cognitive Intervention Program (SCIP) (van Manen, Prins, & Emmelkamp, 2004) was designed to help children diagnosed with ODD and CD to develop problem-solving and self-control skills. Preliminary findings (e.g., reduction in aggressive and disruptive behaviour, increases in self-control, social-cognitive skills, and social skills) suggest that SCIP is a promising intervention and may be worth pursuing in youth with ADHD.

Similarly, Lochman and colleagues (1993) developed an intervention for aggressive boys to help them become more tolerant and accurate of their perceptions of other’s intentions during social encounters. Preliminary findings suggest that participants in this program are likely to respond less angrily, to engage in more prosocial behaviours, and to have more satisfying social relationships. Across transitions to middle school, this program has also produced significant improvements in boys’ social competence, social skills, and social problem solving abilities (Lochman & Wells, 2002). Though these studies did not measure friendships outcomes per se, improvements in socio-cognitive processes, such as social-perspective taking, may be a necessary precursor to forming and maintaining high-quality friendships for teens with ADHD and is worthy of further exploration.

4.4.3 Mindfulness Training Programs

Preliminary evidence suggests that mindfulness-based interventions may address some of the shortcomings of traditional treatment approaches for ADHD, and ameliorate many of the social, emotional and behavioural difficulties experienced by these youth (Bishop, Lau, Shapiro et al., 2004; Burke, 2010). Mindfulness consists of two components: self-regulation of attention, and an open and accepting orientation towards experience. Mindfulness practice involves the deliberate focusing and refocusing of attention on sensations, thoughts and feelings, as they arise on a moment-by-moment basis (Williams, Teasdale, Segal, & Kabat-Zinn, 2007). Thus, it can be thought of as an executive functioning skill. As such mindfulness-based interventions are thought to be a beneficial form of treatment for individuals with ADHD. In particular, MYmind (Haydicky et al., 2015) has shown promise for improving ADHD symptoms and the social
relationships of adolescents with ADHD. MYmind is an eight-week group mindfulness intervention for youth with ADHD and their parents. Treatment components include mindfulness practices (e.g., body scan, sitting meditation), elements of cognitive therapy (e.g., noticing automatic thoughts, exploring connection between thoughts and feelings), and psychoeducation (e.g., understanding ADHD, attention, and mindfulness) delivered in parallel youth and parent groups. Preliminary findings indicate reductions in adolescent inattentiveness, conduct problems and parenting stress, and improvements in adolescent peer relations, empathy, perspective taking abilities, and parental mindfulness, post-treatment and at follow-up (Haydicky et al., 2015).

4.4.4 Implications for Friendship Interventions

To date, we are far from identifying a set of best practices for friendship intervention programs. Most programs with strong empirical support examine peer status as an outcome variable, but do not assess for friendship effects. Research attempts are further complicated by the notion that friendships are multidimensional and treatment efforts may be effective for only specific friendship dimensions (e.g., friendship formation but not friendship quality) (Bagwell & Schmidt, 2011). Clearly more research is needed to bridge this gap.

On the basis of existing work in children with ADHD, friendship interventions require several ingredients to increase their likelihood of efficacy (Mikami, 2010). First, a successful intervention must teach children how to behave in order to strengthen their friendship during specific real-world scenarios, as opposed to merely attempting to broadly enhance social competence in all contexts in a contrived laboratory setting (Mikami, 2010). The developmental literature suggests that reciprocity, intimacy, self-disclosure, and emotional support are instrumental skills for developing close friendships in adolescence. The present study suggests that helping adolescents with ADHD to foster a stable relationship and develop empathy, engagement, and social-perspective taking skills are key components to the development of a high-quality friendship.

Second, any aspiring intervention must give thought to friendship selection. Though friend characteristics were not examined in the present research, the literature suggests that children with ADHD are more likely to have friends with learning and behaviour problems than their typically developing peers (Marton et al., 2012; Normand, 2011). Because of the potential for
deviant peer associations to exacerbate the maladjustment of both children involved in the friendship (Berndt, 1999; Keefe & Berndt, 2006), careful attention to selecting a non-deviant peer pair will be important for youth with ADHD in intervention studies. This concern about negative peer contagion effects (e.g., depression, anxiety, co-rumination, and delinquency) is particularly relevant in adolescence (Mikami, 2010).

Finally, the existing evidence suggests that with younger children, parent involvement should be included in intervention efforts. Parents might be instructed in how to arrange playdates and how to prevent boredom and conflict on their children’s playdates (Frankel, Myatt, Cantwell, & Feinberg, 1997). Parents might also be trained to teach their child a specific friendship skill (e.g., empathy) to increase the probability that the child will generalize skilled behaviors outside of the therapeutic context (Mikami, 2010). Clinically, it makes sense to promote high quality friendships when children are younger, in the hopes that these relationships will persist into adolescence, because it is no longer developmentally appropriate for parents to be directly involved in their teens’ “playdates”.

Nevertheless, parents of adolescents can be educated on how to give constructive feedback to their child in social situations, while providing them with an appropriate level of autonomy in their social relationships (Gonring, Gerdes, & Gardner, 2017). Specifically, parents can support the development of peer-to-peer relationships by assisting in the organization of extracurricular activities in their teens’ school and community (Gardner et al., 2015). Similarly, therapists working with adolescents with ADHD should consider collaborative ways of instruction and/or utilize peer models of instruction to overcome resistance commonly encountered in the therapeutic relationship of adolescents with ADHD (Evans et al., 2008; Mikami, 2010).
References


Appendices

Appendix A: The Network of Relationships Behavioral Systems Version

ID # ____  ____  ____  ____  ____

**Your Close Relationships**

These questions ask you to describe relationships with your mother figure, your father figure, a boy/girlfriend and two friends.

1. Your *mother figure* is: __________________________

2. Your *father figure* is: __________________________

3. Your *boy/girlfriend* is: __________________________  p  mi/y  mi
   How long is/was the relationship? ____ years ____ months (*please fill in numbers*)
   Are you seeing this person now?    A. Yes  B. No

4. Your *same-sex friend* is: ___________________
   How long is/was the friendship? ____ years ____ months (*please fill in numbers*)

5. Out of all of your friends, how would you rank this same-sex friend?
   A. Not very important  C. One of my top 5 friends  E. Best friend
   B. One of my top 10 friends  D. Second best friend
   Are you close friends now?
   A. Yes  B. Friends, but not as close as before  C. No

6. Your *opposite-sex friend* is: __________________
   How long is/was the friendship? ____ years ____ months (*please fill in numbers*)
   Are you close friends now?
   A. Yes  B. Friends, but not as close as before  C. No

7. Out of all of your friends, how would you rank this opposite-sex friend?
   A. Not very important  C. One of my top 5 friends  E. Best friend
   B. One of my top 10 friends  D. Second best friend

8. Sometimes we would also like you to answer the following questions about some *extra person*. If there is a name written in the space below, please answer about this person also.
   Extra Person _______________________
   Relationship _______________________

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9. How much does this person show support for your activities?

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10. How much do you and this person get upset with or mad at each other?

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11. How much do you seek out this person when you’re upset?

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12. How much do you and this person get on each other’s nerves?

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13. How much do you encourage this person to try new things that s/he would like to do but is nervous about?

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14. How often do you and this person point out each other’s faults or put each other down?

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15. How much does this person turn to you for comfort and support when s/he is troubled about something?

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16. How much do you and this person spend free time together?

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17. How much does this person encourage you to try new things that you’d like to do but are nervous about?

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18. How much do you and this person disagree and quarrel?

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19. How much do you turn to this person for comfort and support when you are troubled about something?

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20. How much do you and this person get annoyed with each other’s behavior?

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21. How much do you show support for this person’s activities?

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22. How much do you and this person criticize each other?

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23. How much does this person seek you out when s/he is upset?

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24. How much do you and this person play around and have fun?

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25. How much does this person encourage you to pursue your goals and future plans?

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26. How much do you and this person argue with each other?

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27. How much do you turn to this person when you’re worried about something?

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28. How much do you and this person hassle or nag one another?

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30. How much do you and this person say mean or harsh things to each other?

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31. How much does this person turn to you when s/he is worried about something?

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32. How often do you and this person go places and do enjoyable things together?

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33. Now please tell us who, of all these people, is your best friend?

A. My boy/girlfriend
B. My same-sex friend
C. My opposite-sex friend
D. My extra person __________________
Appendix B: Sample items from the Social Skills Improvement Scales

<table>
<thead>
<tr>
<th>Subscale</th>
<th>Self-report</th>
<th>Parent-report</th>
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</thead>
<tbody>
<tr>
<td>Communication</td>
<td><em>I take turns when I talk with others.</em>&lt;br&gt;<em>I say “thank you” when someone helps me.</em>&lt;br&gt;<em>I look at people when I talk to them.</em></td>
<td><em>Takes turn in conversations.</em>&lt;br&gt;<em>Says “thank you”.</em>&lt;br&gt;<em>Makes eye contact when talking.</em></td>
</tr>
<tr>
<td>Cooperation</td>
<td><em>I pay attention when others present their ideas.</em>&lt;br&gt;<em>I do what the teacher asks me to do.</em>&lt;br&gt;<em>I work well with my classmates.</em></td>
<td><em>Pays attention to your instructions.</em>&lt;br&gt;<em>Follows your directions.</em>&lt;br&gt;<em>Works well with family members.</em></td>
</tr>
<tr>
<td>Assertion</td>
<td><em>I show others how I feel.</em>&lt;br&gt;<em>I let other people know when there’s a problem.</em>&lt;br&gt;<em>I ask for information when I need it.</em></td>
<td><em>Expresses feelings when wronged.</em>&lt;br&gt;<em>Says when there is a problem.</em>&lt;br&gt;<em>Asks for help from adults.</em></td>
</tr>
<tr>
<td>Responsibility</td>
<td><em>I tell people when I have made a mistake.</em>&lt;br&gt;<em>I do my part in a group.</em>&lt;br&gt;<em>I keep my promises.</em></td>
<td><em>Takes responsibility for her/his own mistakes.</em>&lt;br&gt;<em>Is well-behaved when unsupervised.</em>&lt;br&gt;<em>Does what he/she promises.</em></td>
</tr>
<tr>
<td>Empathy</td>
<td><em>I help my friends when they are having a problem.</em>&lt;br&gt;<em>I try to make others feel better.</em>&lt;br&gt;<em>I try to think about how others feel.</em></td>
<td><em>Tries to comfort others.</em>&lt;br&gt;<em>Tries to make others feel better.</em>&lt;br&gt;<em>Tries to understand how others feel.</em></td>
</tr>
<tr>
<td>Engagement</td>
<td><em>I make friends easily.</em>&lt;br&gt;<em>I ask others to do things with me.</em>&lt;br&gt;<em>I ask to join others when they are going things I like.</em></td>
<td><em>Makes friends easily.</em>&lt;br&gt;<em>Invites others to join in activities.</em>&lt;br&gt;<em>Joins activities that are already started.</em></td>
</tr>
<tr>
<td>Self-Control</td>
<td><em>I stay calm when dealing with problems.</em>&lt;br&gt;<em>I stay calm when others bother me.</em>&lt;br&gt;<em>I stay calm when people point out my mistakes.</em></td>
<td><em>Resolves disagreements with you calmly.</em>&lt;br&gt;<em>Tolerates peers when they are annoying.</em>&lt;br&gt;<em>Takes criticism without getting upset.</em></td>
</tr>
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Appendix C: Perspective Taking items from the Interpersonal Reactivity Index

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: A, B, C, D, or E. When you have decided on your answer, fill in the letter on the answer sheet next to the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can. Thank you.

ANSWER SCALE:

A               B               C               D               E
DOES NOT     DESCRIBE ME     DESCRIBES ME
DESCRIBE ME   VERY WELL
WELL

3. I sometimes find it difficult to see things from the "other guy's" point of view. (PT)

8. I try to look at everybody's side of a disagreement before I make a decision. (PT)

11. I sometimes try to understand my friends better by imagining how things look from their perspective. (PT)

15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT)

21. I believe that there are two sides to every question and try to look at them both. (PT)

25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)

28. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)
Appendix D: Parent Consent Letter, Parent Consent Form, Adolescent Consent Letter, Adolescent Consent Form, Parent Consent for Release of Information

PARENT CONSENT LETTER

Dear ____________________:

My name is Dr. Judith Wiener, and I am a professor at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT). Together with my colleague (Dr. Maria Rogers), and my graduate students, I am doing a research project on teenagers with Attention-Deficit Hyperactivity Disorder (ADHD). We are writing to ask you if you would give permission for your son/daughter to take part in this research. For this, we need the participation of teenagers who have been diagnosed with ADHD and teenagers who do not have ADHD. We are asking you and your son/daughter to take part in this research because we believe that your feelings and opinions and theirs are valuable information that can help adolescents with ADHD achieve in school and have healthy relationships with parents and peers.

Purpose of the Research

We want to learn more about the peer and family relationships of adolescents with ADHD. So far, there is very little research on this. We believe that knowing more about the peer and family relations of teens with ADHD is important because it will help us develop strategies for teens to help themselves get along with parents and friends, and suggest strategies for parents, teachers, and other professionals to help the teens. This research has been funded by the Social Sciences and Humanities Research Council.

Description of the Research

If your son/daughter takes part in this research study, the testing session will take about 3 to 4 hours. The session will take place in a quiet room at OISE/University of Toronto. During the session, a research assistant will ask your son/daughter to answer some questions about him/herself, such as the first name of his/her friends, how often he/she spends time with them, and whether he/she has been bullied or bullies others. Other questionnaires will also ask him/her whether or not they have ever been involved in a romantic relationship. If yes, the questionnaire will continue to ask for some details of his/her relationship, such as conflicts or arguments in their relationship, intercourse, birth control, and characteristics they find important in a romantic partner. Lastly, the research assistant will also ask him/her about arguments he/she sometimes has with his/her parents and his/her beliefs about why they happen. You will be asked to fill out a questionnaire about this as well. We will also ask you and your son/daughter about your involvement in his/her education. In addition, the research assistant will ask your son/daughter to listen to some descriptions of social problems that teens often have and ask him/her how he/she would solve them. Sometimes the research assistant asks him/her questions and writes down the answer. Other times, your son/daughter fills out a questionnaire by checking off or circling a number. He/she can read the questionnaires him/herself or ask the research assistant to read them to him/her. He/she will also do some short reading, writing, and math, vocabulary, and problem-solving activities. We will give him/her breaks, including a lunch break if it is lunchtime. We will also send questionnaires to you and your son/daughter’s teacher to fill out and send back to us. The questionnaires will take the teacher about a half hour to fill out. Your questionnaires will likely take about an hour and a half to complete.
Benefits

The main benefit of this study is that it will help us learn more about peer and family relationships of adolescents with ADHD. We want to listen to what your son/daughter and you say and think, and then use that information to help teens with ADHD. A second benefit is that your son/daughter would learn a bit about how research in psychology is done.

Another benefit from this study is that your son/daughter’s answers to the questions from the reading, writing, and math activities and some of the questionnaires that he/she and you and the teacher fill out will let us know what his/her strengths are and what areas require support. About three months after he/she take part in the study and we receive all of the questionnaires back from you and the teacher, we will mail a report to you and your son/daughter about his/her behaviours and his/her skills in reading, writing, and math, and list some strategies that might help him/her achieve in school and behave appropriately at home, in school, and with friends. Although this is not a complete psychoeducational assessment, the report is often useful for developing an individual educational plan (IEP) in high school and for obtaining accommodations in postsecondary institutions.

Potential Harms and Withdrawal

There are no harms associated with taking part in the study. The only thing that might happen is that your son/daughter may feel a little uncomfortable talking about him/herself and how he/she feels about some things. If he/she feels that he/she doesn’t want to answer some of the questions, he/she can tell the research assistant, and talk about it. He/she may also say that he/she wants to stop, skip a question, or that he/she needs a break and wants to continue some other time. Also, if he/she says that he/she will take part in the study and then changes his/her mind that is okay. He/she can decide at any time to stop taking part in the study. The same applies to you – you can withdraw from the study at any time. The only consequence is that if you do not complete the questionnaires, we will not have the information needed to write the report on your son/daughter’s skills described above.

Confidentiality

All of the data will be confidential – it will only be accessed by Dr. Wiener and her research assistants. No information that reveals your identity or that of your son/daughter will be released without consent unless required by law. The information that we collect from you, your son/daughter, and his/her teacher will be analyzed and stored in locked files in a locked office. The questionnaires will not have your name or that of your son/daughter on them. All of the data will be kept at OISE/UT in locked files for 5 years after we publish an article in a journal or book on the research. The report that we write about your son/daughter and the test protocols on which this report is based will be kept for 10 years after his/her 18th birthday. A number code will be used in place of the names. We would need your permission and signed consent if you want to send these scores to another professional.

The results of the questionnaires and activities described above will be used for research purposes only. We will analyze the information, talk about it at conferences, and write about it so that youth, parents, teachers, and other professionals such as doctors and psychologists can learn from what we have found. Because we are working with many teenagers on this project, people hearing our presentations or reading what we write will not know which teenager said what. When we do this, or when we publish our research in academic journals/books, we will only
present group information. We will not tell anyone your son/daughter’s or your name or give any information that could help people know who you are.

We will not be able to provide you with your responses on some of the questionnaires and interviews because they were developed for the purpose of the research. We will not tell your son/daughter the specific answers that you gave to the questions, but, as discussed above, we will write a report about how your son/daughter did and mail it to him/her and you.

The only time that we would have to tell somebody something you or your son/daughter said is if he/she or you say that he/she would do serious harm to him/herself or someone else, or someone is seriously harming him/her or you (for example: abuse, that they are dating someone much older or younger than them, or that you or your child are having suicidal ideations). In that case, as required by law, we would have to make sure he/she gets help by contacting and informing appropriate mental health, child protection, or law enforcement professionals of the clear and imminent danger only. Otherwise, everything he/she, you or the teacher say or write is kept confidential (e.g. information pertaining to your child’s sexual behaviour would not be shared with you or other parties).

**Compensation**

Participation in research is voluntary for both you and your son/daughter. If you and your son/daughter do decide to take part in the study, he/she can choose between getting $30.00 for his/her participation or (for teenagers in high school) the time he/she spends taking part in the study can be counted towards his/her community service hours; we will give him/her a certificate.

**Access to Results**

We will write a summary of the results of the study when we are finished and put it on our website. We will send you the link when it is ready. You and your son/daughter can read this. You may contact Dr. Judith Wiener, ________________ (graduate student) or ________________ (lab manager) with any questions you may have about the study. We will try to answer all of these questions.

Sincerely,

__________________________  __________________________  __________________________
Ph.D. Student            Lab Manager             Judith Wiener, Ph. D
(416) 978-0933           (416) 978-0933         Professor
                                           School and Clinical Child
                                           (416) 978-0935

Department of Human Development and Applied Psychology
Ontario Institute for Studies in Education of the University of Toronto (OISE/UT)
Toronto, Ontario M5S 1V6
PARENT CONSENT FORM

“I acknowledge that the research procedures described above have been explained to me and that any questions that I have asked have been answered to my satisfaction. As well, the potential harms and discomforts have been explained to me and I also understand the benefits of participating in the research study. I know that I may ask now, or in the future, any questions that I have about the study. I have been assured that no information will be released or printed that would disclose my identity without my permission, unless required by law. I understand that I will receive a copy of this signed consent. I understand that participation is voluntary and I can withdraw at any time.”

I hereby consent to take part in this research.

___________________________________
Name of Parent/Guardian

___________________________________
Signature

___________________________________
Date

___________________________________
Name of person who obtained consent

___________________________________
Signature

“I agree to be contacted in the future regarding other studies being conducted by the ADHD Laboratory at OISE/UT.”

___________________________________
Signature

“I agree that the information collected about my son/daughter in this study can be used for future data analysis provided that all identifying is removed and that he/she cannot be identified.”

___________________________________
Signature
Dear:

My name is Dr. Judith Wiener, and I am a professor at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT). My colleague (Dr. Maria Rogers), together with our graduate students are doing a research project on teenagers with Attention-Deficit Hyperactivity Disorder (ADHD). We are writing to ask you if you would like to take part in this research. For this, we need the participation of teenagers who have been diagnosed with ADHD and teenagers who do not have ADHD. We are asking you to take part in this research because we believe that your feelings and opinions and those of your parents are valuable information that can help adolescents with ADHD achieve in school and have healthy relationships with parents and peers.

Purpose of the Research

We want to learn more about the peer and family relationships of adolescents with ADHD. So far, there is very little research on this. We believe that knowing more about the peer and family relations of teens with ADHD is important because it will help us develop strategies for teens to help themselves get along with parents and friends, and suggest strategies for parents, teachers, and other professionals to help the teens. This research has been funded by the Social Sciences and Humanities Research Council.

Description of the Research

If you take part in this research study, the testing session will take about 3 to 4 hours. The session will take place in a quiet room at OISE/University of Toronto. During the session, a research assistant will ask you to answer some questions about yourself, such as the first name of your friends, how often you spend time with them, and whether you have been bullied or bully others. Other questionnaires will also ask you whether or not you have ever been involved in a romantic relationship. If yes, the questionnaire will continue to ask about some details of your relationship, such as conflicts or arguments in your relationship, intercourse, birth control, and characteristics you find important in a romantic partner. Lastly, the research assistant will also ask you about arguments you sometimes have with your parents and your beliefs about why they happen. Your parents will also fill out a questionnaire about this. We will also ask you and your parents about how your parents are involved with your education. In addition, the research assistant will ask you to listen to some descriptions of social problems that teens often have and ask you how you would solve them. Sometimes the research assistant asks you questions and writes down the answer. Other times, you fill out a questionnaire by checking off or circling a number. You can read the questionnaires yourself or ask the research assistant to read them to you. You will also do some short reading, writing, math, vocabulary, and problem-solving activities. We will give you breaks, including a lunch break if it is lunchtime. We will also send questionnaires to your parents and teachers to fill out and send back to us. The questionnaires will take the teacher about a half hour to fill out. The questionnaires for your parents will likely take about an hour and a half to complete.

Benefits

The main benefit of this study is that it will help us learn more about adolescents with ADHD. We want to listen to what you say and think, and then use that information to help other teens...
with ADHD. A second benefit is that you would learn a bit about how research in psychology is
done.

Another benefit about this study is that your answers to the questions from the reading, writing,
and math activities and some of the questionnaires will let us know what your strengths are and
what areas you need to work on. About three month after you take part in the study and we
receive all of the questionnaires back from your parents and teacher, we will mail a report to you
and your parents about your behaviours and your skills in reading, writing, and math, and list
some strategies that might help you achieve in school and behave appropriately at home, in
school, and with friends. Although this is not a complete psychoeducational assessment, the
report is often useful for developing an individual educational plan (IEP) in high school and for
obtaining accommodations in postsecondary institutions.

**Potential Harms and Withdrawal**

There are no harms associated with taking part in the study. The only thing that might happen is
that you may feel a little uncomfortable talking about yourself and how you feel about some
things. If you feel that you don’t want to answer some of the questions, you can tell the research
assistant, and talk about it. You may also say that you want to stop, skip a question, or that you
need a break and want to continue some other time. Also, if you say that you will take part in the
study and then change your mind, that is okay. You can decide at any time to stop taking part in
the study. The only consequence is that we would not have the information we need to write the
report that we described above.

**Confidentiality**

Everything you tell the research assistant in the session will stay between you, the research
assistant, and Dr. Wiener. No information that reveals your identity will be released without
consent unless required by law. The information that we collect from you, your parents, and
teacher will be analyzed and stored in locked files in a locked office. The questionnaires will not
have your name on them. A number code will be used in place of your name. The data will be
kept at OISE/UT in locked files for 5 years after we publish an article in a journal or book on the
research. The report we write about you and the test protocols we use to write it will remain in
the locked files for 10 years after your 18th birthday. We would need your permission and signed
consent and the consent of your parents if you are under 18 if you want to send these scores or
your report to another professional, your school, or postsecondary institution.

The results of the questionnaires and activities described above will be used for research
purposes only. We will analyze the information, talk about it at conferences, and write about it,
so that parents, teachers, and other professionals such as doctors and psychologists can learn
from what we have found. Because we are working with many teenagers on this project, people
hearing our presentations or reading what we write will not know which teenager said what.
When we do this, or when we publish our research in academic journals/books, we will only
present group information. We will not tell anyone your name or give any information that
could help them know who you are.

We will not be able to provide you with your responses on some of the questionnaires and
interviews, because they were developed for the purpose of the research. We will not tell your
parents the specific answers that you gave to the questions, but we will write a report about how
you did and mail it to you and them.
The only time that we would have to tell somebody something you have said is if you tell us that you will do serious harm to yourself or someone else, or someone is seriously harming you (for example if you reveal abuse, that you are dating someone much older or younger than you, or are having suicidal ideations). In that case, as required by law, we would have to make sure you get help by contacting and informing appropriate mental health, child protection, or law enforcement professionals of the clear and imminent danger only. Otherwise, everything else you say is kept confidential (e.g. information pertaining to sexual behaviour would not be shared with your parents or other parties).

**Compensation**

Participation in research is voluntary – you can decide. If you and your parents decide to take part in the study, you can choose between getting $30.00 for your participation or (for teenagers in high school) the time you spend taking part in the study can be counted towards your community service hours; we will give you a certificate.

**Access to Results**

We will write a summary of the results of the study when we are finished and put it on our website. We will send you the link when it is ready. You and your parents can read this.

You may contact Dr. Judith Wiener, ________________ (graduate student) or ________________ (lab manager) with any questions you may have about the study. We will try to answer all of these questions.

Sincerely,

______________  ________________  ________________
Ph.D. Student  Lab Manager  Judith Wiener, Ph. D
(416) 978-0933  (416) 978-0933  (416) 978-0935
Professor
School and Clinical Child Psychology

Department of Human Development and Applied Psychology
Ontario Institute for Studies in Education of the University of Toronto (OISE/UT)
Toronto, Ontario M5S 1V6
ADOLESCENT CONSENT FORM

“I acknowledge that the research procedures described above have been explained to me and that any questions that I have asked have been answered to my satisfaction. As well, the potential harms and discomforts have been explained to me and I also understand the benefits of participating in the research study. I know that I may ask now, or in the future, any questions that I have about the study. I have been assured that no information will be released or printed that would disclose my identity without my permission, unless required by law. I understand that I will receive a copy of this signed consent. I understand that participation is voluntary and I can withdraw at any time.”

I hereby consent to take part in this research.

___________________________________
Name of Adolescent

___________________________________
Signature

___________________________________
Date

___________________________________
Name of person who obtained consent

___________________________________
Signature

“I agree to be contacted in the future regarding other studies being conducted by the ADHD Laboratory at OISE/UT.”

___________________________________
Signature

“I agree that the information collected about me in this study can be used for future data analysis provided that all identifying is removed and that I cannot be identified.”

___________________________________
Signature
Parent Consent Form for the Release of Information

I, ________________________________, give permission for a research assistant from 
(print full name of parent)

Dr. Judith Wiener’s research lab to send a questionnaire to my son/daughter, 
____________________’s teacher to complete. I understand that this questionnaire will provide
information about my son/daughter’s academic and social functioning.

Parent or Guardian Signature: ________________________________
Date: ________________________________

Please complete all forms and give it to your son/daughter to bring in on the date of testing.
Appendix E: Bivariate Correlations by Group

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</table>

**Correlation Coefficients**:

- Values preceded by `*` are significant at the 0.05 level.
- Values preceded by `**` are significant at the 0.01 level.
- Values preceded by `***` are significant at the 0.001 level.
## Bivariate Correlations: Comparison Group

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<td>.584**</td>
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<td>-.006</td>
<td>.039</td>
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<td>.578**</td>
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<td>.382**</td>
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Appendix F: ADHD as a Potential Moderator

To test the hypothesis that the friendship quality is a function of multiple factors, a series of hierarchical regressions were conducted to determine whether ADHD status moderated the relationship between a correlate of interest (i.e., friendship stability, depression, anxiety, oppositional behaviour, conduct problems, social skills, and social perspective taking) and friendship quality. Intercorrelations among the predictor variables are reported in Table 3.2. To avoid potentially problematic high multicollinearity with the interaction term, the variables were centered and an interaction term between ADHD status and the correlate of interest was created. Tests revealed that multicollinearity was not a concern (i.e., all variance inflation factors (VIF) < 3). Statistical assumptions checking for linearity, normality, collinearity, and homoscedasticity were met in all analyses. Results are described below.

Friendship Stability:

In the first step, two variables were included: ADHD status and friendship stability. These variables accounted for a significant amount of variance in friendship quality, $R^2 = .068$, $F(2, 112) = 4.08, p = .02$. Next, the interaction term between ADHD status and friendship stability was added to the regression model. It did not account for a significant proportion of the variance in friendship quality, $\Delta R^2 = .000$, $\Delta F(1, 111) = .052, p = .821$, suggesting that ADHD status did not moderate the relationship between friendship stability and friendship quality.

Depression:

In the first step, two variables were included: ADHD status and self-reported depression level. These variables were not significantly related to friendship quality, $R^2 = .022$, $F(2, 112) = 1.26, p = .288$. Next, the interaction term between ADHD status and depression level was added to the regression model. It did not account for a significant proportion of the variance in friendship quality, $\Delta R^2 = .005$, $\Delta F(1, 111) = .566, p = .454$, suggesting that ADHD status did not moderate the relationship between self-reported depression levels and friendship quality.

Anxiety:

In the first step, two variables were included: ADHD status and self-reported anxiety levels. These variables accounted for a significant amount of variance in friendship quality, $R^2 = .054$,
\( F(2, 112) = 3.19, p = .045 \). Next, the interaction term between ADHD status and anxiety levels was added to the regression model. It did not account for a significant proportion of the variance in friendship quality, \( \Delta R^2 = .002, \Delta F(1, 111) = .247, p = .620 \), suggesting that ADHD status did not moderate the relationship between anxiety levels and friendship quality.

**Oppositional Behaviour Problems:**

In the first step, two variables were included: ADHD status and parent-rated oppositional behaviour. These variables accounted for a significant amount of variance in friendship quality, \( R^2 = .061, F(2, 112) = 3.61, p = .03 \). Next, the interaction term between ADHD status and oppositional behaviour was added to the regression model. It did not account for a significant proportion of the variance in friendship quality, \( \Delta R^2 = .005, \Delta F(1, 111) = .611, p = .436 \), suggesting that ADHD status did not moderate the relationship between oppositional behaviour and friendship quality.

**Conduct Problems:**

In the first step, two variables were included: ADHD status and parent-rated conduct problems. These variables were not significantly related to friendship quality, \( R^2 = .021, F(2, 112) = 1.21, p = .302 \). Next, the interaction term between ADHD status and conduct problems was added to the regression model. It did not account for a significant proportion of the variance in friendship quality, \( \Delta R^2 = .007, \Delta F(1, 111) = .761, p = .385 \), suggesting that ADHD status did not moderate the relationship between conduct problems and friendship quality.

**Social Skills:**

In the first step, two variables were included: ADHD status and parent-rated social skills. These variables accounted for a significant amount of variance in friendship quality, \( R^2 = .079, F(2, 112) = 5.89, p = .004 \). Next, the interaction term between ADHD status and social skills was added to the regression model. It did not account for a significant proportion of the variance in friendship quality, \( \Delta R^2 = .006, \Delta F(1, 111) = .712, p = .401 \), suggesting that ADHD status did not moderate the relationship between parent-rated social skills and friendship quality.
Social Perspective Taking:

In the first step, two variables were included: ADHD status and social perspective taking. These variables accounted for a significant amount of variance in friendship quality, $R^2 = .127$, $F(2, 112) = 8.12, p = .001$. Next, the interaction term between ADHD status and social was added to the regression model. It did not account for a significant proportion of the variance in friendship quality, $\Delta R^2 = .007$, $\Delta F(1, 111) = .923, p = .339$, suggesting that ADHD status did not moderate the relationship between social perspective taking and friendship quality.