# Mismatched: ADHD symptomatology and the teacher-student relationship

# Abstract

The goal of this study was to investigate the relationship between children with attention-deficit/hyperactivity disorder (ADHD) symptoms and their teachers, and to examine whether this relationship was associated with children's academic motivation. The sample comprised 35 children with clinically elevated levels of ADHD symptoms and 36 children with no ADHD symptoms between the ages of 6 and 10. Children with symptoms of ADHD and their teachers reported impairments in both the emotional and collaborative aspects of their relationships, particularly for girls in the ADHD group. For children in the ADHD group, a self-reported close bond in the teacher–student relationship was associated with increased academic motivation. These findings were significant after controlling for co-occurring behaviour problems and academic impairments. These findings suggest that the symptoms of ADHD may interfere with teacher–student relationship and may serve as a barrier in student's academic achievement.

# Introduction

Children with attention-deficit/hyperactivity disorder (ADHD) experience significant difficulties within the school environment (DuPaul and Stoner 2003). In addition to typical underachievement (Massetti et al. 2008), they often demonstrate low classroom engagement and motivation (Volpe et al. 2006). Many such academic difficulties appear to be evident even for students whose ADHD symptoms are below the clinical threshold for a diagnosis (Luo et al. 2009). Despite the well-documented learning

and school-related difficulties experienced by students with ADHD symptoms, even those who do not have a formal diagnosis, the teacher–student relationship has not been well studied in relation to ADHD symptomatology. Yet studies conducted with more typically developing students points to the quality of the teacher–student relationship as an important source of security and stability that serves to enhance students' well-being, academic competence, and sense of belonging (e.g., Hamre and Pianta 2001; Hughes, Cavell, and Willson 2001; Murray and Greenberg 2006). Using the classroom working alliance model (Toste, Bloom, and Heath 2014), the current study compared teachers' and students' ratings of the teacher–student relationship in children with high- and lowlevels of ADHD symptomology and examined if the quality of this relationship accounts for variance in students' academic motivation.

#### **Teacher-student relationships**

The importance of a positive relationship between teacher and student is well documented in a robust body of literature. Broadly speaking, children with close, supportive, and non-conflictual relationships with their teachers feel secure, motivated, and capable of learning in the classroom setting (Furrer and Skinner 2003; Hamre and Pianta 2005; Toste, Heath, and Dallaire 2010). Conversely, students who have weaker social bonds with their teachers are more likely to feel alienated and disengaged, exhibit aggressive behaviours, and have poor school-related outcomes (Hughes, Cavell, and Willson 2001; Klem and Connell 2004). Numerous investigations have demonstrated that the quality of the teacher–student relationship is associated with overall school adjustment across various developmental stages (e.g., Baker 1999; Hamre and Pianta

2001; Wu, Hughes, and Kwok 2010). However, the majority of these studies have utilised teacher reports and thus, have not considered students' perceptions of the teacher–student relationship (e.g., Pianta 2001; Koepke and Harkins 2008).

# **Teacher and student perceptions**

The almost exclusive reliance on teacher ratings of the teacher–student relationship has been partly due to the young age of the students in the samples, leading the researchers to rely on the teachers' report as more reliable (e.g., Hamre and Pianta 2001, 2005; Pianta 1999). Yet, evidence has emerged in recent years suggesting that teacher and student perceptions of the relationship are not always congruent and, moreover, that student ratings differentially predict school-related outcomes (Rey et al. 2007; Toste, Heath, and Dallaire 2010; Toste, Bloom, and Heath 2014). Students' perceptions of the teacher–student relationship predict their classroom behaviour, academic achievement, and overall school satisfaction, pointing to the importance of measuring both teachers' and students' reports of teacher–students relationship quality (Toste, Bloom, and Heath 2014).

# **Gender differences**

In addition the need to include the student's own perspective regarding the student teacher relationship, it is important to consider the role of gender in student–teacher relationships as there have been noted gender differences in interactions between teachers and students. For instance, girls typically report a stronger sense of relatedness to their

teachers compared to boys, whose interactions with teachers are characterised by more conflict and less closeness (Hamre and Pianta 2006; Koepke and Harkins 2008). A study by Furrer and Skinner (2003) demonstrated that boys benefited academically from strong feelings of relatedness to their teachers as compared to girls. They also reported that boys' feeling of connectedness to their teachers was a stronger predictor of academic motivation and achievement than for girls. Related studies have found that teachers are more likely to use loud reprimands in reaction to boys' aggressive behaviour (Serbin et al. 1973) and to respond less frequently to girls' problem behaviour (Keenan and Shaw 1997), which may influence perceptions of the relationship.

# Students with problem behaviours

Researchers have found that the presence of emotional and/or behavioural difficulties is associated with less adaptive teacher–student relationships. For instance, youth with clinically high levels of externalising behaviour reported lower trust in relationships with their teachers than did similarly matched students without behaviour problems (Murray and Zvoch 2011). Murray and Zvoch (2011) also found that for the behaviour problem group, relationship quality predicted school adjustment. One study on children with emotional, behavioural, and learning disorders, broadly defined, suggested that students' own perceptions of alienation from their teachers accounted for significant variance in their externalising behaviours (Murray and Greenberg 2006).

Importantly, a positive teacher–student relationship may be protective for students who are at-risk for poor adjustment due to their behaviour difficulties. In a large longitudinal study, for children with high levels of behavioural difficulties, negativity in

the teacher–student relationship in kindergarten (marked by conflict and dependency) predicted academic and behavioural outcomes through eighth grade (Hamre and Pianta 2001). Another study by Hamre and Pianta (2005) found that kindergarteners that were deemed to be functionally at-risk (based on measures of cognitive, behavioural, and academic indicators) had less conflict with their first grade teachers if their kindergarten teachers were emotionally supportive. Similarly, Buyse et al. (2008) found that children with internalising or externalising behaviours who had emotionally supportive teachers were no longer at risk for developing less close or more conflictual relationships with their teachers later on in their schooling. This growing body of research suggests that close teacher–student relationships may be particularly beneficial for behaviourally at-risk children.

#### ADHD and the classroom environment

Mounting evidence now suggests that the core symptoms of ADHD, even at subclinical levels, can have an adverse impact on children's school functioning (Adams and Snowling 2001; Breslau et al. 2009). Manifested in a classroom setting, it is clear how symptoms of ADHD would interfere with learning and school adjustment. In comparison to typically developing children, students with ADHD symptoms show significantly more off-task behaviour (Kofler, Rapport, and Alderson 2008) and shorter attentive states during classroom teaching (Rapport et al. 2009). They appear less engaged in the learning environment (Junod et al. 2006) and show avoidance for working collaboratively with their peers (Zentall and Beike 2012). Carlson et al. (2002) found that children with ADHD have motivational impairments characterised by preference for easy

work, less enjoyment for learning, and less perseverance. Volpe et al. (2006) found that ADHD negatively influenced children's motivation for schoolwork, which predicted their study skills and subsequent achievement. These findings have been consistently demonstrated in studies that report that children with ADHD often employ less effortful learning strategies and are less motivated to achieve compared with typically developing students (Egeland, Johansen, and Ueland 2010).

Despite these well-documented difficulties within the classroom setting, only one known study to date has examined classroom climate and relatedness for children specifically with ADHD. Rogers and Tannock (2013) used child self-report to assess children's perceptions of the degree to which their needs within the classroom were being met. Specifically, they asked children if their classroom environments (including the teacher) supported their need for autonomy, if they felt competent in the academic realm, and if they felt connected to their teachers. The findings showed that – after controlling for conduct problems, academic ability, and age – children with ADHD felt less related to their teacher, perceived their classrooms and teachers as less autonomy-supportive, and felt less competent at school than their non-ADHD peers. Overall, it appeared that students with ADHD felt that their teachers' were not meeting their needs as learners.

Related research has demonstrated that many teachers lack accurate information about ADHD (Arcia et al. 2000), do not have confidence in their ability to teach children with ADHD-type behaviours (Ohan et al. 2011; Taylor and Larson 1998), report children with ADHD as more effortful and stressful to teach (Atkinson, Robinson, and Shute 1997; Greene et al. 2002), and are more likely to perceive a child with ADHD less

favourably with regards to intelligence, personality, and behaviour (Batzle et al. 2010). Taken together, the aforementioned studies suggest that the relationships of children with ADHD and their teachers may be at-risk for a persistent pattern of negative interactions, which may further adversely affect the learning experiences of children with ADHD. This may have significant consequences considering the role of these relationships in predicting student outcomes.

# **Classroom working alliance**

The research evidence is clear: a strong teacher student relationship is important for all students, and may be particularly so for students with behavioural and emotional problems. However, the majority of previous work has been limited to teacher-report, has not examined this topic in children with ADHD, and has focused primarily on the affective nature of the teacher-student relationship. Recently, a new model for studying the teacher-student relationship was proposed by Toste, Bloom, and Heath (2014). Borrowing from Bordin's seminal work on the therapeutic alliance (1979), Toste and colleagues have reconceptualised the teacher-student relationship to encompass the complex interactions that take place within the classroom context. The classroom working alliance model extends the concept of the teacher-student relationship beyond an emotional connection, positing that relationships in the classroom are also built on and influenced by work- and learning-related interactions (Toste, Heath, and Dallaire 2010). Like the therapeutic working alliance, the classroom too can be understood as an environment that should foster strong and positive working relationships. As such, an elaborated definition that recognises the complexities of classroom environments and

teacher-student interactions is important in understanding the teacher-student relationship.

The therapeutic alliance is conceptualised as a tripartite model consisting of three interdependent components: bond, task, and goal (Bordin 1979). The aspect of bond represents the emotional component of a relationship and includes positive attachments based on mutual trust, liking, respect, and caring – elements that have been well elaborated in the teacher–student relationship literature. Task can be envisioned as the understanding and agreement of task relevance, and willingness to complete tasks that relate to goals. Finally, goal is considered the degree to which both parties develop shared objectives, and how they consider the client's individual needs.

The internal structure of the classroom working alliance inventory (CWAI) has been studied in order to examine the utility of these three indicators in understanding relationships between teachers and students (Toste, Bloom, and Heath 2014). Although three indicators have been used to represent the therapeutic alliance, it truly represents two key elements of relationship: emotional connection and collaboration. Bond represents the ability to connect with one another, and mutual liking, trust, and respect that the teacher and student have for one another. Whereas it may be possible to separate the evaluation of tasks and goals in a counselling setting, these elements are often intertwined with the classroom. For example, the perception of collaboration can be enhanced when a student understands the relevance of assigned tasks and how they will help him/her learn, agrees with the teacher about what is important to work on, feels that the teacher understands what he/she wants to learn at school, and sees that the teacher

accurately recognises his/her areas of difficulty. The interactions that support task agreement will also likely support a perspective of shared goals, and vice versa. For this reason, a two-factor model of classroom working alliance has been argued to more accurately represent the reality of classroom interactions and the development of teacher–student alliance (Toste, Bloom, and Heath 2014).

# **Objectives of the present study**

A plethora of research suggests that the symptoms of ADHD interfere with the development of healthy relationships. Likewise, there is a clear incompatibility between the symptoms of ADHD and the behaviours required for effective classroom functioning. Taken together, these separate but related bodies of research suggest that students with ADHD may be at a heightened risk for poor-quality relationships with their teachers, and the associated negative outcomes. Although the teacher–student relationship has been studied for children with broadly defined behaviour problems, most studies to date have grouped types of behaviour or learning difficulties together (e.g., ADHD, oppositional defiant disorder, conduct disorder, learning disabilities (LD)), despite an abundance of research suggesting that these different disorders may differentially affect academic and relational outcomes. There is a clear need to look specifically at ADHD and its unique influence on the teacher–student relationship if we are to find ways to improve the school experience of children with ADHD.

Given that many evidence-based academic interventions for children with ADHD are implemented by classroom teachers, or at least require some degree of engagement by the

teacher (DuPaul, Weyandt, and Janusis 2011), a better understanding how these children and their teachers work together is crucial for ensuring the success of interventions. The classroom working alliance provides an optimal framework from which to delve deeper into the classroom functioning of children with ADHD by considering both the emotional connection and the collaborative aspects of the relationship from the perspective of both the student with ADHD and their teacher. To this end, the present study sought to explore the working alliance between teachers and students with and without ADHD by addressing the following three research questions.

- Do ratings of teacher-student working alliance differ for boys and girls with high ADHD versus low ADHD? Do co-occurring conduct or academic problems affect these associations?
- 2. Does ADHD affect teacher- and student-reports of the teacher-student working alliance differently?
- 3. For children with and without ADHD symptoms, does the teacher–student alliance affect student's academic motivation? Specifically, are the emotional or collaborative elements of teacher–student alliance related to students' reports of academic motivation?

#### Method

# **Total sample**

In light of the research suggesting that impairments in school functioning are evident for those below the clinical threshold for a diagnosis of ADHD (Adams and Snowling 2001; Breslau et al. 2009), a community sample was recruited for this study, rather than a clinical sample of children with a diagnosis of ADHD. The sample was

recruited from two public elementary schools in a large Canadian city. Consent forms and information sheets were sent home to all parents of children in grades one through four (n = 224) and a response rate of 52% was achieved (n = 117). There were 56 males and 61 females and the students ranged in age from 6 years, 5 months to 11 years, 4 months (M = 7.94, SD = 1.03). All children were proficient in English.

# **Screening of ADHD symptoms**

Upon receipt of the completed consent forms, teachers completed the strengths and weaknesses of ADHD-symptoms and normal behaviour scale – teacher form (SWAN-T) for each participating student. The SWAN-T asks teachers to rate students relative to those of the same age on multiple dimensions using a 7-point scale (0 = far below average, 1 = below average, 2 = slightly below average, 3 = *average*, 4 = *slightly above average*, 5 = *above average*, 6 = *far above average*) on symptoms of ADHD (i.e., 'gives close attention to detail and avoids careless mistakes', 'modulates motor activity', 'reflects on questions'). Lower SWAN-T scores indicate more ADHD symptomology.

#### **Stratified sample**

After screening all 117 children, the teacher SWAN data were examined in order to stratify the sample. Students scoring in the high and low ranges of the SWAN-T were selected for additional testing. The ADHD symptom subgroup (n = 35, 75% male) was created by selecting children whose average SWAN-T score was in the bottom 25th percentile (indicating most teacher responses in the 'slightly below average' to 'far below average' ranges). The non-ADHD subgroup (n = 36, 37% male) was created by selecting those children whose average SWAN-T scores were above the top 25th percentile

(indicating teacher responses mostly in the 'slightly above average' to 'far above average' ranges). As such, the ADHD symptom group had significantly higher SWAN-T scores than the non-ADHD symptom group, t = 54.98, p < .01. It is noteworthy that this sample was not a clinical sample of children diagnosed with ADHD.

#### Measures

# **Teacher-student relationship**

Students and teachers completed the classroom working alliance inventory (CWAI; Heath et al. 2007). The CWAI was adapted from the working alliance inventory (WAI; Bordin 1979), a tool used to assess the strength of the collaborative relationship between the therapists and their client on subscales of bond, task, and goal (Bordin 1979). The CWAI assesses the teacher–student relationships from both teacher and student on the same dimensions. It is a 12-item questionnaire with responses scored on a 5-point scale (1 = never, 2 = rarely, 3 = sometimes, 4 = often, 5 = always). The bond scale items focus on the mutual trust, respect, and liking between the teacher and the student. The collaboration scale consists of the task subscale (whether the student feels that the tasks assigned by the teacher are important for their individual learning 'What I am doing in school helps me learn better in the areas that I have difficulty') and the goal subscale (whether the student feels that they can collaborate with their teacher to achieve classroom objectives).

Students with a high average CWAI-S score (answering mostly 'often' and 'always') were more satisfied with their relationship with their teacher. The CWAI has been used in several studies and has been shown to have adequate psychometric properties (Toste, Heath, and Dallaire 2010; Toste, Bloom, and Heath 2014). This scale has coefficients ranging from .76 to .91, with a recent study presenting evidence for the construct validity of a two-factor model of the CWAI (Toste, Bloom, and Heath 2014).

#### Motivation

The self-regulation questionnaire – academic form (SRQ-A: Ryan and Connell 1989) was used to assess children's academic motivation. There are two parallel versions of this scale available – one for typically developing elementary and middle school students, and one for students with LD. Because students in the present study were younger than the norming sample for this scale, the LD version was used as it contains less complicated wording. For the present study, the intrinsic motivation scale was used 'School work is important to me,' 'I like to do well at school' and 'I find my school work interesting.' The SRQ-A has been used in previous research with good psychometric properties (Deci et al. 1992; Grolnick, Ryan, and Deci 1991).

# **Academic functioning**

The Woodcock–Johnson III tests of achievement (WJ-III; Woodcock, McGrew, and Mather 2001) is a widely used individually administered norm-referenced achievement test. A composite score was used as a control variable for this study, which consisted of the letter-word identification and calculation subtests. Psychometric research

on the WJ-III has yielded good reliability and content, construct, and criterion validity are all well supported (Woodcock, McGrew, and Mather 2001).

# **Conduct problem**

The strengths and difficulties questionnaire (SDQ; Goodman 1997) is a standardised measure of social, emotional, and behavioural functioning. For the present study, only the conduct problems subscale was used to assess co-occurring behavioural problems. For each of the five scale items, teachers responded on a scale from 0 (not at all), 1 (a little, sometimes), or 2 (very much, all the time). Previous research with the SDQ has shown to be valid and reliable as a clinical tool for screening for psychiatric conditions (Goodman 1997).

# **Demographics**

Each student's parent completed a short background form providing demographic information about themselves and their child, including child age, parental education, previous medical/psychological diagnoses of child, languages spoken at home, and family's ethnicity.

# Procedure

Students in the stratified subsample of students with high and low levels of ADHD symptoms were tested individually in a quiet room in each school. The testing was done individually with a researcher (either a certified psychologist or a trained psychology university student) and questionnaire items were read aloud to the child with an accompanying visual response card. They were allowed as much time as needed and

were encouraged to ask questions about vocabulary, content, or procedures and the confidentiality of their responses was emphasised (in particular, it was stressed that their teachers would not have access to their responses). Teachers completed the CWAI individually and returned the forms to the researchers.

# Results

# **Descriptive statistics**

The ADHD symptom group and the non-ADHD symptom group did not differ significantly on age (t (69) = 1.09, p = .28), family socioeconomic status as defined by highest of parents' education (t (69) = 1.95, p = .08), nor were there significant differences between the groups on family ethnicity (Caucasian, other:  $\chi^2$  (1) = .05, p = .81) or languages spoken in the home (English, French, other:  $\chi^2$  (2) = .03, p = .98). Although the groups did not differ on previous psychological/medical diagnoses (yes, no:  $\chi^2$  (1) = 1.12, p = .42), it is noteworthy that two children in the ADHD symptom group had a previous diagnosis of ADHD and one had a previous diagnosis of LD.

The ADHD symptom group contained significantly more boys than girls ( $\chi^2$  (1) = 8.82, *p* < .01). The ADHD participants showed more conduct problems as rated by their teachers (*t* (65) = 4.02, *p* < .01), and scored lower on a standardised test of academic achievement (word reading and math calculation composite) (*t* (65) = 2.59, *p* < .05).

#### **Multivariate analyses**

In light of existing literature and the preliminary analyses described previously, two sets of multivariate analysis of covariance (MANCOVA) were conducted assessing

ADHD status (ADHD/non-ADHD) by child gender (boy/girl) for the dependent variables of child- and teacher-reported bond and collaboration, while covarying children's conduct problems and academic achievement. The homogeneity of variance tests indicated the observed covariance matrices of the three dependent variables were equal across groups for both sets of analyses.

# **Teacher ratings**

Results from the MANCOVA showed no main effect for the covariates conduct problems and academic achievement; thus, these were dropped from the analyses. An overall multivariate effect was found for ADHD status (Wilk's  $\lambda = .89$ , F(3,62) = 9.39, p< .01), explaining 19% of the variance in teacher-reported teacher-student relationship. There was no main effect for gender (F(3,62) = 1.12, p = .33), nor was there an interaction effect for ADHD status by gender (F(3,62) = .62, p = .54). As presented in Table 1, the univariate analyses yielded significant differences between the ADHD and non-ADHD participants on teacher-reported bond and collaboration. That is, if students have ADHD, regardless of the child's gender, teachers reported feeling less connected to them on an emotional level and felt that they were not working as well toward shared tasks and goals in the classroom relative to those students without ADHD.

#### Student ratings

Results from the MANCOVA showed no significant main effects for conduct problems nor for academic achievement, so these were dropped as covariates. Results yielded a main effect for ADHD status (Wilk's  $\lambda = .84$ , F(3,62) = 6.32, p < .01), accounting for 16% of the variance in the student-reported alliance. There was no main

effect for gender (F(3,62) = 2.05, p = .14), but there was an interaction effect of ADHD status by gender (F(3,62) = 2.93, p = .05). As presented in Table 2, the univariate analyses show that students with ADHD had lower scores on both bond and collaboration. When the interaction with child gender is considered, the results reveal that girls with higher levels of ADHD symptoms report feeling significantly less emotionally connected with their teachers and that they have a less collaborative partnership with their teachers compared to girls without ADHD symptoms (shown in Figures 1 and 2) while ADHD boys did not differ from their non-ADHD male peers.

#### **Regression analyses**

Linear regression was used to examine if the teacher–student alliance was associated with students' motivation for learning. Specifically, student and teacher reports of bond and collaboration were regressed on students' self-reported endorsement of internal motivation. This was done separately for the ADHD and non-ADHD groups to determine if the pattern of associations were different for the two groups of children. Because this analysis is exploratory, the independent variables of bond and collaboration were entered simultaneously to determine which variable accounted for most of the variance in motivation. Due to our limited sample size, we combined the boys and girls in each group.

Regression results are presented in Table 3. For those in the ADHD group, a selfreport of a close bond with their teacher was significantly associated with more academic motivation. The teacher report was not significantly associated with self-reported

motivation. By contrast, in the non-ADHD group, both self-report and teacher-report of a strong partnership (i.e., collaboration) was associated with more internal motivation.

# Discussion

The goal of this study was to explore the quality of the classroom working alliance for students with high levels of ADHD symptomatology. Teacher and student perceptions of the affective and collaborative aspects of the teacher–student relationship were assessed for children in a community sample with high and low levels of ADHD symptoms. We examined these associations separately for boys and girls, and also considered the role of co-occurring conduct and academic problems. Further, we examined if the teacher–student relationship was associated with internal motivation for children with and without ADHD.

To summarise, the findings revealed important differences between children with and without ADHD symptoms with respect to their reported classroom working alliance. The ADHD group had lower scores on teacher–student bond and collaboration than the non-ADHD group, according to both teacher- and student-reports. From the teachers' perspective, the gender of the child did not significantly affect the relationship. However, according to students themselves, girls in the ADHD group were significantly more likely to report a weaker bond and less collaboration in their relationship with their teachers than the non-ADHD group. Conduct problems and academic difficulties did not significantly affect these differences. For the ADHD group, a strong bond was associated with more internal motivation; whereas it was collaboration between teachers and

students that was associated with internal motivation for the typically developing students.

Teachers reported that they felt less of an emotional connection (i.e., bond) with ADHD students and found them more difficult to work with (i.e., collaboration) compared to non-ADHD students. These differences were evident regardless of whether the students were boys or girls. Importantly, these group differences were not influenced by the students' co-occurring conduct and academic difficulties. Moreover, because of the sub-clinical nature of this sample (only two students in the ADHD symptom group were formally diagnosed with ADHD), one can assume that the teachers were not responding to the diagnosis or label of ADHD, but rather the core symptoms themselves. This is a clear indication that independent of labelling issues, co-occurring behaviour problems, or underlying academic impairment, the core symptoms of ADHD represent a fundamental barrier for teachers bonding and working collaboratively with students.

When asked themselves, children with high levels of ADHD symptoms reported a weaker emotional connection and less collaboration with their teachers compared to non-ADHD students. This finding is consistent with Rogers and Tannock (2013) study that found that children with ADHD reported feeling less related to their teachers. However, the present study also examined the role of child gender and found that girls from in the ADHD group reported lower scores on the self-report measure of teacher–student bond and collaboration compared to girls without ADHD. This is in contrast to studies of typically developing children that have found that girls have more positive relationships with their

teachers compared to boys (Furrer and Skinner 2003; Koepke and Harkins 2008). Research suggests that both boys and girls with ADHD are more likely than the controls to overestimate the quality of their relationships with parents and peers, a phenomenon known as the positive illusory bias (Owens et al. 2007). This present study suggests that these altered self-perceptions may not be the case for girls' perceptions of their relationships with their teachers. However, research on the positive illusory bias also suggests that children with the inattentive subtype of ADHD (which is more common in girls) are less likely than children with combined type ADHD (which is more common in boys) to overestimate their scholastic competence (Owens and Hoza 2003). A more indepth investigation of ADHD subtype and gender is needed to explore these relationships further, and to determine the positive illusory exists for children's perceptions of their relationships with their teachers.

The majority of research on teacher–student relationships examines the emotional side of the relationship – the degree to which teachers or students feel that there is a liking, trust, closeness, or a general absence of conflict (e.g., Baker 1999; Birch and Ladd 1997). The present study suggests that students with ADHD and their teachers perceive this emotional bond as particularly weak, possibly putting these students at further risk for maladjustment and poor outcomes at school. In addition, children's report of their emotional bond with their teacher was associated with an endorsement of motivation for the ADHD group, but not the comparison group. That is, for children with high ADHD symptoms, feeling a weaker bond with their teacher was associated with less internal motivation for learning. This suggests there may be an interaction between ADHD and a weak teacher–student bond such that both together lead a child to be less interested and

intrinsically engaged in their schoolwork. The motivational impairments in children with ADHD are well documented, but the present study suggests that the child's feelings of closeness with their teacher may be associated with these motivational impairments. This finding is somewhat different from a recent study by Toste, Bloom, and Heath (2014) who found that the collaborative aspects of the teacher–student relationship were highly predictive school satisfaction for children with broadly defined high-incidence disabilities. Further research is needed examining the symptoms of ADHD in relation to the teacher–student relationship and various domains of school functioning.

While the emotional connection between students and their teachers is clearly important, the classroom working alliance framework posits that the emotional connection is just one element in a complex working relationship between teachers and students. Using this framework, Toste, Bloom, and Heath (2014) argue that when a relationship is defined exclusively as an emotional connection, we may overlook potential difficulties because relationships between teachers and students are also built on and influenced by interactions regarding academic tasks and goals. In this study, both student and teacher ratings of the teacher–student collaboration were rated as significantly lower in children with ADHD than the comparison group.

The collaborative nature of the teacher–student relationship may be particularly relevant for classroom-based interventions for children with ADHD, since many of these students have adapted or modified curricula that frequently require individual teacher–student interaction around behavioural goals and learning tasks. Teachers of students with ADHD

may be required to modify their instruction for their ADHD students, implement antecedent- or consequence-based behavioural techniques, or encourage students to use self-regulation strategies (DuPaul, Weyandt, and Janusis 2011). For example, a teachermediated strategy that encourages students with ADHD to monitor and evaluate their own behaviour involves both students and teachers completing daily evaluations of the students' work and/or behaviour using a Likert scale (e.g., from poor to excellent) (Reid, Trout, and Schartz 2005). Students then receive reinforcement based on their evaluations and the degree to which teacher and student evaluations match. Although teachers and students with ADHD may have more frequent task or goal-related interactions, the findings from the present study suggest that they may not be working collaboratively towards the accomplishment of these tasks and goals.

# Limitations and future research

The overarching goal of this study was to examine the relationship between children with elevated ADHD symptoms and their teachers, and to examine whether this relationship was associated with children's academic motivation. Our statistical power was limited by our small sample size, making it difficult to examine differences between boys and girls with ADHD in relation to their academic motivation. Further, our sample was drawn from the community and did not represent a clinical sample of children diagnosed with ADHD. It would be useful to examine the core symptom clusters of ADHD (inattention and hyperactivity/impulsivity) separately since different presentations may affect relationships with teachers differently. Future longitudinal studies with larger

samples, clinical populations, and a range of school outcomes will enhance our understanding of ADHD and the teacher–student relationship.

Despite these limitations, this study is an important first step in beginning to understand the complexities of the teacher–student relationship for students with ADHD. It is well known that ADHD impairs children's relationships with parents (Johnston and Mash 2001) and peers (McQuade and Hoza 2008), so the extension of these interpersonal difficulties to the teacher–student relationship is not surprising. Given the known importance of a quality teacher–student relationship for student achievement and wellbeing over time (e.g., Hughes, Cavell, and Willson 2001), future investigations on this topic are needed if we are to advance our understanding of the school functioning of children with ADHD.

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# **Tables and Figures**

Table 1. Univariate effects for ADHD and non-ADHD participants on teacher-reported bond and

collaboration.

		ADHD group		Non-ADHD	F(3,62)	Effect size	
				group			
	Mean <sup>a</sup>	SD	Mean <sup>a</sup>	SD	ADHD	(η <sup>2</sup> )	
					status		
Bond	4.32	0.09	4.74	0.09	10.34**	0.14	
Collaboration	4.02	0.59	4.63	0.49	15.53**	0.19	
Note: <sup>a</sup> Estimated marginal means; **p < .01.							

Figure 1. Boys' and girls' self-report of teacher-student bond.





Figure 2. Boys' and girls' self-report of teacher-student collaboration.

**Table 2.** Univariate effects for ADHD and non-ADHD participants on student-reported bond and collaboration.

ADHD group	Non-ADHD	F (2,65)	Effect	F (2,65)	Effect
	grou	AD	si	AD	si
	р	HD	Z	HD	Z
		stat	e	stat	e
		us	<b>(Î</b>	us	<b>(Î</b>
			•	X	•
			2	gen	2
			)	der	)

	Mean	SD	Mea	SD				
Bond					2.57	0.04	3.94*	0.06
Boy	4.08	0.97	4	0.87				
<u> </u>	2.00	0.04	1.60	0.41				
Girl	3.98	0.84	4.69	0.41				
Collaborat					12.04**	0.15	5.63**	0.08
10								
n								
Boy	3.92	0.56	4.07	0.54				
Cirl	2 50	0.71	1 20	0.30				
GIN	5.39	0.71	4.39	0.39				
L		1			1	1	1	

Note: <sup>a</sup>Estimated marginal means; \*p < .05; \*\*p < .01.

**Table 3.** Regression analyses with teacher–student alliance variables as predictors of internal

motivation for ADHD and non-ADHD participants.

	ADHD group			Non-ADHD group			
	В	SE(B)	β	В	SE(B)	β	
Teacher report							
Bond	0.18	0.34	0.14	0.79	0.5	0.58	
Collaboration	0.18	0.33	0.15	0.9	0.44	.75*	
Student report							
Bond	0.38	0.27	.50*	0.09	0.13	0.1	

Collaboration	0.03	0.27	0.03	0.8	0.2	.62**	

Note: \*p < .05; \*\*p < .01.