THE RELATIONSHIP BETWEEN PARENTAL SELF-EFFICACY, CHILD INATTENTIVE AND HYPERACTIVE/IMPULSIVE SYMPTOMS AND EARLY SCHOOL FUNCTIONING

STACEY KOSMERLY

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Faculty of Social Sciences
University of Ottawa

Contents

Abstract

As early as school-entry, children with symptoms of attention deficit hyperactivity disorder (ADHD) face academic disadvantage and are at risk for cumulative and long-term academic difficulties. It is important to identify factors that contribute to better school functioning in these at-risk children, particularly during the foundational academic years, in order to inform early prevention and intervention efforts. Theory and research highlight the important role of parents in children's overall early academic functioning. The current line of research examined parents' belief in their ability to help their child learn, i.e., self-efficacy, as a relevant and potentially robust and malleable correlate to children's early academic functioning. Chapter 1 outlines self-efficacy theory and previous research on parental self-efficacy and child outcomes to provide rationale for this proposed relationship. Next, the two studies in this line of research are presented. Study 1 (Chapter 2) examines the relationship of parental self-efficacy, when considered alongside child inattentive and hyperactive/impulsive symptoms, to kindergarten teacher ratings of children's academic enabler skills. Study 2 (Chapter 3) examines the relationship of parental self-efficacy and child inattentive and hyperactive/impulsive symptoms to parental involvement and the quality of the parent-teacher relationship in kindergarten. Chapter 4 discusses implications of findings in terms of the potential multi-system level benefit of having a parent that believes in their capacity to help their child learn as their child transitions into school. Finding suggest that inattentive and hyperactive/impulsive symptoms are negatively related to parental self-efficacy in this young, non-clinical sample. Findings also suggest that parental self-efficacy, when considered along with child inattentive or hyperactive/impulsive symptoms contributes to variance in some indicators of early school

functioning (e.g., academic enablers, home-based parental involvement, perceived quality of the parent-teacher relationship). Limitations and future directions are also discussed.

Chapter 1

General background

ADHD

Attention-deficit/hyperactivity disorder (ADHD) is a neurodevelopmental disorder characterized by pervasive patterns of inattention, excess motor activity, and impulsivity that are inconsistent with the individual's developmental level (American Psychiatric Association, 2013). Difficulties related to mood regulation and social functioning are also common (Daley et al., 2009). ADHD symptoms occur across multiple settings and significantly interfere with functioning (American Psychiatric Association, 2013). Even when inattentive and hyperactive/impulsive behaviours occur at subclinical levels, they are associated with poor short and long-term outcomes, including poor academic achievement, weak social skills , and deficits in other areas of functioning (Duncan et al., 2007; Schmiedeler & Schneider, 2014; Spira & Fischel, 2005). When ADHD symptoms persist into adulthood (which occurs approximately 66% of the time: Turgay et al., 2012), they are associated with increased chances of high school dropout, unemployment, relationship difficulties, substance abuse, and incarceration (American Psychiatric Association, 2013).

In addition to core inattentive and hyperactive/impulsive symptoms, many individuals with ADHD develop comorbid conditions. It is estimated that between 25% and 75% of children with ADHD develop comorbid behavioural disorders, such as oppositional defiant disorder or conduct disorder; comorbid anxiety disorders (estimated comorbidity rate is 33%); or comorbid learning disorders (estimated that 45% children with ADHD experience learning disorders in reading, writing, and/or math) (Daley et al., 2009; DuPaul et al., 2013; Masi & Gignac, 2015). The presence of comorbid conditions exacerbate the level of impairment faced by individuals with ADHD and increases risk for short and long-term negative social, academic, and occupational outcomes (Biederman et al., 2006).

Symptoms of ADHD can occur in children as early as two years of age (American Psychiatric Association, 2013), and typically become more stable at around age six to eight years old (Harpin, 2005). The mean age of diagnosis for ADHD is six years old (Kessler et al., 2005) and symptoms commonly persist throughout the child's lifespan (Turgay et al., 2012). Children with more severe ADHD symptoms are more likely to be detected and diagnosed earlier in life (at approximately age four) and those with less severe symptoms may go undetected altogether, or may not be detected until they reach adolescence or adulthood (Kessler et al., 2005).

Specific symptom presentations of ADHD tend to change between early and later life, with hyperactivity symptoms being least stable over time (Lahey et al., 2005). Indeed, children who initially present with the predominantly hyperactive subtype of ADHD early in life often later shift to a combined inattentive and hyperactive/impulsive pattern of symptoms over time, and eventually to a predominantly inattentive presentation in late adolescence and adulthood (Semeijn et al., 2016). Although symptoms of inattention and hyperactivity/impulsivity present similarly in young children (two to five year old) as they do in older children, they are often mistakenly perceived to be difficult to distinguish from developmentally typical behaviours in this young group (Gadow et al., 2001). This may explain why ADHD is rarely diagnosed in children before age six (Egger et al., 2006). Even with these diagnostic challenges, approximately 2% of two to five-year-old children meet full diagnostic criteria for ADHD (Lavigne, Lebailly, Hopkins, Gouze, & Binns, 2009; Schlack, Hölling, Kurth, & Huss, 2007; Wichstrøm et al., 2012).

Across the lifespan, ADHD is more commonly diagnosed in males than in females (CDC, 2019; Gershon, 2002; Kessler et al., 2006). Generally it has been stated that males are more likely to present with hyperactivity and impulsivity symptoms, whereas females tend to present

with more inattentive symptoms (Rucklidge, 2010). Overall, however, these gender differences are not always consistent (Rucklidge, 2010; Simon et al., 2009) and may be age-dependent or rooted in referral biases. For instance, few gender differences in symptom presentation or severity of impairment have been observed between three to six-year-old boys and girls with ADHD (Martel, 2013), particularly in community versus clinic referred samples (Gadow et al., 2001). Further, there is a burgeoning body of research on potential referral biases favoring males that may in part explain differences in reported prevalence and presentation of ADHD across genders (Gershon, 2002; Rucklidge, 2010). For instance, teachers have been shown to be more likely to report more ADHD symptoms in boys (particularly boys who also exhibit oppositional behaviours) than girls (Jackson & King, 2004). Clinicians (e.g., child psychologists, psychiatrists) have also been shown to be more likely to diagnose ADHD when shown a vignette with a male client than when shown the same vignette wherein the client is female (Bruchmüller et al., 2012). For the above reasons, child ADHD symptoms are considered as separate (inattentive and hyperactivity/impulsivity symptoms, respectively) and dimensional (as opposed to categorical) variables in the current studies.

ADHD symptoms and academic functioning

Academic difficulties are perhaps the most common challenges faced by children with ADHD symptoms (Frazier et al., 2007; Polderman et al., 2010). A meta-analysis by Frazier and colleagues (2007) found that children and adolescents with ADHD do more poorly in elementary and high school overall than their neurotypical peers. This association seems to be robust, demonstrating a moderate to large effect size (d = .71), and holding true across all academic subject and for all forms of measurement of academic performance (e.g., standardized testing, GPA, years of education) (Frazier et al., 2007). Underachievement in reading, writing and

mathematics can be predicted from the severity of ADHD symptoms, even when executive functioning skills have been statistically controlled (Barry et al., 2002). ADHD symptoms have also been found to be associated with academic difficulties even in the absence of comorbid learning disorders (Mayes et al., 2000) or behavioural problems (e.g., conduct disorder) (Rapport et al., 1999).

The associations between ADHD and academic difficulties have further been observed at the symptom-specific level. A systematic review by Polderman and colleagues (2010) observed that both inattentive and hyperactive/impulsive symptoms were associated with lower academic achievement, although the association between academic achievement and hyperactive/impulsive symptoms became less salient when other traits (e.g., intelligence, comorbidity, and socioeconomic status) were considered (Polderman et al., 2010). Overall, it seems inattentive symptoms more frequently appear to be related to negative academic outcomes across the full academic lifespan (DuPaul et al., 2004; Ogg et al., 2016; Pham, 2016; Polderman et al., 2010; Rogers et al., 2011). For example, in a study of school-aged children, parent and teacher ratings of inattentive symptoms, but not hyperactive or impulsive symptoms, predicted overall reading ability (Pham, 2016). Inattentive symptoms have frequently been linked to difficulties in reading (Grigorenko et al., 2011; Pham et al., 2011; Rogers et al., 2011) and mathematics (Duncan et al., 2007). As early as their first year of school, children with inattentive symptoms are more likely to experience difficulties with academic achievement (Tymms & Merrell, 2011).

It has been observed that the presence of inattentive or hyperactive/impulsive symptoms in early life increase children's risk for poor long-term academic outcomes. For instance, preschool and kindergarten-aged children with inattentive or hyperactive/impulsive symptoms have been shown to be more likely to experience greater difficulties across all areas of academic

functioning in high-school years (Mcgee et al., 1991; Washbrook et al., 2013). One study found that young children (ages four to six years old) with inattentive symptoms scored lower on measures of reading, spelling and mathematics than controls when assessed eight years later (Massetti et al., 2008). A meta-analyses by Duncan and colleagues (2007) similarly found that inattentive symptoms at school-entry predicted later reading and mathematics scores in both boys and girls of varying socioeconomic backgrounds. A longitudinal study by Barkley and colleagues (2006) followed children with hyperactivity symptoms for thirteen years and found that these children showed significantly lower academic achievement and attainment than controls, and over one third had failed to complete high school (Barkley et al., 2006). Other authors have similarly documented relationships between childhood hyperactivity symptoms and lower academic attainment and achievement long-term (Currie & Stabile, 2006).

When ADHD symptoms begin in early childhood, school failure, grade retention, and school drop-out are more likely to occur in adolescence (Barkley et al., 1990; Scholtens et al., 2013). Children with early ADHD symptoms are then more likely to enter adulthood with a paucity of occupational opportunities, be unemployed, and face socioeconomic disadvantage (Vitaro et al., 2013). They are also more likely to grow up to have children of their own who face similar attentional and academic deficits, perpetuating intergenerational patterns of impairment (Johnston, Mash, Miller, & Ninowski, 2012; Starck, Grünwald, & Schlarb, 2016; Takeda et al., 2010). Taken together, these serious short- and long-term consequences suggest that high levels of inattention or hyperactivity symptoms early in childhood represent a serious developmental risk factor. If we are to improve evidence-based prevention and intervention efforts for children with these symptoms, it is therefore imperative that we understand the factors that contribute to

academic functioning during these formative academic years (Polanczyk et al., 2007; Rowland et al., 2002).

The present research was designed with this overarching aim in mind. First, school functioning will be defined and the factors that contribute to school functioning in young children will be explored. The importance of parents in contributing to school functioning in these early years will be highlighted. Next, the current chapter will provide rationale for the present body of research, which focuses on the relationship between parents' self-efficacy beliefs and certain indicators of academic functioning in children with varying levels of inattentive and hyperactive/impulsive symptoms.

School functioning

The factors that define children's school functioning, particularly in very young children, have long been debated. Idealists/nativists once believed that the skills needed for a child to be ready to enter and function in school were entirely biologically pre-determined and emerged when a child reached a certain chronological age, with little to no influence of external factors (High, 2008). Empiricists/environmentalists meanwhile suggested that these skills were completely exogenous, representing a child's knowledge of basic concepts learned from adults (High, 2008). In the 1990's researchers began to re-evaluate these perspectives, only to discover that a child's readiness to enter and function in school was neither defined by a set of fully innate nor externally derived skills, but rather by an evolving set of skills that develop through interaction between a child's innate abilities and their environment (Boivin & Bierman, 2013; High, 2008; Janus & Offord, 2007; Kagan, 1992). Thus, a modern "interactional relational" perspective emerged. Within this contemporary view, it became recognized that children must exhibit basic core academic and cognitive skills *and* possess the social and emotional skills

needed to effectively implement these skills in the classroom environment to be ready for and to function in school (High, 2008; Janus & Offord, 2007). Further, it was clear that these skills were dynamic and developed in interaction with the child's environment.

It is now widely accepted that school readiness and early school functioning involves interactive/relational processes between the child and their environment as a child transitions into kindergarten (Boivin & Bierman, 2013). Beyond academic skills, the quality of the relationships and interactions between the child, the school, and the home during this time period set the precedent for the child's later relationships within the school (Christenson, 1999; Henrich & Blackman-Jones, 2006; Powell, Son, File, & San Juan, 2010; Ramey & Ramey, 1999). Dynamic interactions between the child's core skills and their foundational relationships with their environment influence a child's adaptation to the classroom and therefore shape their later school functioning (Boivin & Bierman, 2013; High, 2008; Janus & Offord, 2007; Kagan, 1992).

In an attempt to summarize this process, Rimm-Kaufman and Pianta (2000) built on previous ecological models of child development (e.g., Bronfenbrenner's Ecological Systems Model, 1977) to create the *Ecological and Dynamic Transaction Model of Transition* (Figure 1). This model suggests that relationships between child, parent/family, teacher, peer, and neighborhood factors contribute directly and indirectly to a child's adjustment to kindergarten. Rimm-Kaufman and Pianta's (2000) model differs from other ecological systems models in that it highlights that relationships between factors change over time as a child transitions into school, contributing more or less at different time points, and these relationships influence children's later relationships in school.

Rimm-Kaufman and Pianta (2000) highlight that the transition between preschool and kindergarten is a sensitive developmental period that sets the stage for children's later academic

functioning and success. They argue that children's academic skills and competency alone do not fully define a "successful transition" into school. According to their model (2000), positive relationships and interactions between the school and home should also be considered measurement of a child's "successful transition", given that these early relationships set the precedent for the child's later relationships within the school (Christenson, 1999; Henrich & Blackman-Jones, 2006; Powell, Son, File, & San Juan, 2010; Ramey & Ramey, 1999) and have also been associated with children's long term academic achievement (Compher, 1982).

The variables chosen in the present line of research stem from this dynamic and interactive definition of school functioning. The first study (Chapter 2) in this line of research examines academic enablers, that is, the attitudes and behaviours that support a student's learning (DiPerna & Elliott, 2002), as the outcome/dependent variables. Academic enablers are commonly considered to be a component of academic competence and include the child's motivation, classroom engagement, study skills, and interpersonal skills (DiPerna & Elliott, 2000, 2002; Ogg et al., 2016). Academic enablers play an important and influential role in children's development core academic skills and, in turn, their academic achievement (DiPerna & Elliott, 1999, 2000, 2002; DiPerna, Volpe, & Elliott, 2005). These skills were selected as indicators of academic functioning in the current body of research because they have consistently demonstrated a positive relationship with academic outcomes across the academic lifespan (DiPerna et al., 2007; Dobbs et al., 2006; Dobbs-Oates & Robinson, 2012; Fantuzzo et al., 2007; McClelland et al., 2006).

The second study in this line of work explores elements of the relationship between home and school as dependent variables. More specifically, it looks to parent involvement in children's education and the quality of the parent-teacher relationship as indicators of early academic

functioning. These constructs were chosen as indicators of school functioning because both parental involvement and the quality of the parent-teacher relationship seem to be robust predictors of positive academic-related outcomes in children, often accounting for greater variance in child outcome than sociodemographic factors (Castro et al., 2015; Dawson & Wymbs, 2016; Hoover-Dempsey et al., 2005; Jeynes, 2005, 2007; Kohl et al., 2000; Mautone et al., 2015; Rimm-Kaufman et al., 2003; Serpell & Mashburn, 2012).

Focus on the role of parents

The present line of research focused on the role of parents as environmental influences on a child's early academic functioning. There were several reasons for this focus. First, within ecological models of development, parents represent one of the most proximal environmental factors with which children interact prior to entering the school system. Parents represent a bridge (i.e., the mesosystem) between the two crucial systems (i.e., family/home and school) in the child's environment during the child's period of transition into school (Tekin, 2016), suggesting they may play an influential role in both systems. Second, it is widely accepted that parents exert a significant influence on their child's early learning (Tekin, 2016). In fact, research suggests that parents exert the greatest influence on children during the early years of development (Deater-Deckard, 2000; Leve & Fagot, 1997; Shankoff & Phillips, 2000). Accordingly, early education intervention initiatives based on ecological models of child development have suggested a focus on parent factors (Reynolds & Shlafer, 2010). The present line of research followed this logic in proposing that parents' beliefs in their ability to help their child learn, or *parental self-efficacy*, as potential influential factor related to early school functioning in children with varying degrees of inattentive and hyperactive/impulsive symptoms.

Below is a review of the rationale for selecting parental self-efficacy as a factor to consider in terms of its relation to early child academic functioning.

Parental involvement in child education: The role of parents' self-efficacy beliefs

When discussing parent factors related to children's academic functioning, the literature has often focused on the concept of parental involvement in children's learning. This term generally describes parents' engagement in behaviours aimed to promote children's learning (e.g., homework support, attending school activities, etc.), as well as parents' beliefs related to their ability to help their child learn (Hoover-Dempsey et al., 2005). Hoover-Dempsey and colleagues (2005) proposed a model of parental involvement in children's learning that suggests that parents' beliefs contribute to their involvement behaviours and subsequently to child outcomes. More specifically, Hoover-Dempsey et al.'s (2005) model suggests that some key parent beliefs predict their involvement behaviours. These include parents' beliefs in their ability to positively influence their child's learning (i.e., self-efficacy), their beliefs regarding their role in their child's learning (i.e., role beliefs), and their perceptions related to having the resources (e.g., time and energy) to become involved in their child's learning. The influence of these beliefs on parental involvement behaviours have been shown empirically (Englund et al., 2004; Hoover-Dempsey et al., 1992; Reed et al., 2000), with some evidence suggesting that parental self-efficacy related to their child's learning, in particular, promotes higher levels of parental involvement in the home (Anderson & Minke, 2007).

Parents with greater feelings of efficacy related to helping their child learn have been found to be more likely to be actively involved in their child's education during elementary school years through to adolescence (Eccles & Harold, 2013; Hoover-Dempsey et al., 1992, 2001; Shumow & Lomax, 2002; Sung et al., 2012). Although little research has examined

parents' feelings of efficacy during the transition into school, a Canadian study by Pelletier and Brent (2002), found that parents who reported greater self-efficacy were also more involved in their child's learning in the context of a pre-Kindergarten early education program. Some evidence suggests that increasing parents' feelings of efficacy through interventions may have beneficial effects on parenting practices associated with better academic outcomes. For instance, Primevera (2000) studied the effects of a program designed to increase parents' feelings of efficacy related to helping their child with early literacy skills, and found that parents who felt more efficacious post-intervention were more likely to engage in literacy activities with their child. In fact, intervention studies targeting more general parental self-efficacy (as opposed to learning-specific self-efficacy), have posited that parental self-efficacy may be an "active ingredient" of parent-based interventions, in that it mediates parental buy-in, engagement, and adherence to interventions (Dekovic et al., 2010).

Self-efficacy theory

Based in social learning theory, Bandura (1977) defined self-efficacy as one's "conviction that one can successfully execute the behaviour required to produce the outcome" (p. 193). Bandura (1977) proposed that an individual's self-efficacy, that is, their cognitive self-evaluation of how able they are to engage in the activities needed to produce a desired outcome, influence their initiation of the behaviours related to that outcome and their persistence with these behaviours in the face of obstacles. Bandura's theory (1977) suggests that self-efficacy is developed through experiences and observations of success and failure, feedback from others, and internal experiences (e.g., affect) related to one's performance (Bandura, 1977; 1986). Therefore, self-efficacy is not proposed as a linear path between cognition (e.g., perceived ability to engage in behaviours required to achieve the desired outcome) and behaviour. Rather, self-

efficacy is theorized to develop through dynamic interactions between cognitions, affect, and behaviour. One's internal representation of the behaviours required to achieve the desired outcome and one's ability to mentally self-evaluate their ability to accomplish these behaviours must be developed through experiences, observations and the emotions that come with these experiences and observations. One's initial self-efficacy beliefs beget behaviours and experiences that maintain or increase self-efficacy and can increase one's likelihood of persevering in the face of challenge. Self-efficacy is also malleable: in the absence of initial self-efficacy beliefs, experiences of overcoming challenge and proving oneself wrong can also increase one's self-efficacy beliefs.

To illustrate, if a parent wanted to help their child learn to ride a bicycle (desired outcome), they would develop an internal model of the expected behaviours needed to accomplish this outcome and mentally evaluate their perceived capacity to effectively perform these tasks. This internal model of the tasks needed and their own ability to perform these tasks may have developed through their own experience of learning to ride a bicycle, observations of others teaching or being taught to ride a bicycle, or experiences of teaching their child comparable skills. Once the parent has an internal model, if their self-assessment were such that they felt able to meet their own expectations about the behaviours required to teach their child to ride a bicycle, the parent would be more likely to initiate bicycle-related behaviours with their child and hopefully also receive positive feedback (e.g., their child learns) that then begets further self-efficacy. Even if the parent faced challenges in teaching their child, if they truly believed "I have the ability to do the things needed to teach my child to ride a bike" they would likely persist despite obstacles. If a parent did *not* believe in their own ability to teach their child to ride a bicycle, however, they would be less likely to initiate tasks related to biking and more

likely to give up in the face of obstacles. If this parent was somehow provided opportunities to have a positive experience related to teaching a child to ride a bike (e.g., they happen to witness their neighbor having a positive experience teaching a child to ride or their child has one good day on the bike) then this parent stands to increase their self-efficacy, and in turn, their engagement in bike-related behaviours.

Parental self-efficacy

As has been demonstrated, self-efficacy theory offers a lens through which to understand human behaviour. Self-efficacy is increasingly being explored within the wider parenting and education literature. Within the parenting literature, parental self-efficacy is used to describe parents' belief in their ability to perform their roles as parents competently and effectively (Teti & Gelfand, 1991); within the education literature, parental self-efficacy is discussed more specifically as it related to parents' belief in their ability to positively effect change in their child's learning (Hoover-Dempsey et al., 2005). Bandura's (1977) theory would suggest that, given their similar nature, there is likely some overlap between parent's self-efficacy related to their parenting role and related to helping their child learn. However, recognizing the unique tasks involved in parenting versus parenting with the aim of helping a child learn, the present study specifies research on learning-specific self-efficacy where possible. A review of parental self-efficacy as it relates specifically to helping children learn is presented in the subsequent sections of this paper.

In general, parental self-efficacy is associated with various parenting behaviours that may contribute to a child's early environment, and in turn, more positive outcomes for children. For example, greater parental self-efficacy has been associated with parenting competence, warmth, sensitivity, and responsiveness and attunement to one's child (Coleman & Karraker, 2003;

Donovan & Leavitt, 1985; Dumka et al., 2010; Izzo et al., 1999; Jones & Prinz, 2005; Unger & Wandersman, 1985), as well as with lower levels of parenting stress (Coleman, 1989). Greater parental self-efficacy is related to greater parent engagement and efforts to prevent negative social, emotional, behavioural, and educational outcomes in children (Elder et al., 1995; Jones & Prinz, 2005; Peterson et al., 1990; Shumow & Lomax, 2002; Wells-Parker et al., 1990). Following from Badura's (1977) theory, parents with greater self-efficacy beliefs are more likely to "rise to the occasion" to help their child when their child is faced with challenges and are more likely to interpret challenges and failures related to helping their child as temporary or minor setbacks (Ardelt & Eccles, 2001). This serves to maintain their willingness and motivation to continue to exert effort in the future (Ardelt & Eccles, 2001). Parents with greater self-efficacy are also more likely to accept and show interest in their children's concerns (Dumka et al., 2010) and to seek out information and take active steps to cope with their child's concerns (Spoth & Conroy, 1993; Wells-Parker et al., 1990).

There is a substantial body of research on the influence of parental self-efficacy on child outcomes in social, emotional, and academic domains (Jones & Prinz, 2005). For instance, parental self-efficacy has been linked to children's social competence (Junttila & Vauras, 2014), peer rejection (Secer et al., 2012), behavioural difficulties (Bogenschneider et al., 1997; Bor & Sanders, 2004; Sanders & Woolley, 2005; Tripp et al., 2007; Weaver et al., 2008), emotion regulation abilities and emotional-adjustment (Coleman & Karraker, 2003; Hill & Bush, 2001); academic difficulties (Monika Ardelt & Eccles, 2001; Jiménez et al., 2009; Primavera, 2000), and school grades (Bogenschneider et al., 1997). In their 2005 review, Jones and Prinz summarize research that has observed direct, indirect, transactional, and bidirectional relationships between parental self-efficacy, parenting behaviours, parent outcomes, child

factors, and child outcomes. Although further longitudinal research is needed to more definitively understand the nature and direction of the relationship between these variables, theory and research does suggest parental self-efficacy is worth exploring as it relates to understanding parents' role in child learning. Given its correlates to both parenting behaviour and child outcomes, could be argued that if parental self-efficacy could be fostered in parents of children with inattentive and hyperactive/impulsive symptoms, these parents might be better able to take on their role as parent and to support their child's early learning. It is also possible, however, that low parental self-efficacy, in addition to the presence of inattentive or hyperactive/impulsive symptoms, could exacerbate children's risk for poor school functioning.

Parenting and ADHD symptoms

It is well-established that parenting a child with ADHD poses unique challenges for parents (Deault, 2010), even when their child's symptoms are subclinical (Lifford et al., 2009). Parents of a child with ADHD are more likely to report higher levels of stress (Harrison & Sofronoff, 2002) and fewer rewarding interactions with their child (De Wolfe, Byrne, & Bawden, 2000; Deault, 2010). These parents are more likely to report feeling threatened and challenged by the act of parenting (Finzi-Dottan et al., 2011) and are more likely to view their children's negative behaviours as intentional (Barkley, 1990), difficult to control, and stable over time (Johnston & Freeman, 1997). For these, and other reasons, it is perhaps not surprising that parents of children with ADHD tend to report lower feelings of efficacy in their parenting skills (Finzi-Dottan et al., 2011; Maniadaki et al., 2005; Mash & Johnston, 1983; Mikami et al., 2010).

In part related to these beliefs, parents of children with ADHD are also more likely to employ less effective parenting practices than parents of typically developing children. For example, parents of children with ADHD have been found to be more likely to be overprotective

(Chang et al., 2013) and more controlling of their child (Rogers et al., 2009) than parents of typically developing children. These parents are also less more likely to exhibit hostility, to be less warm towards their child, and to be inconsistent in their use of punishment (Cussen et al., 2012; Ellis & Nigg, 2009; Tripp et al., 2007). These less-than-optimal parenting practices can exert a bi-directional effect on children's ADHD symptoms: longitudinal studies have found a link between greater use of negative parenting practices and increased ADHD symptomology in children over time (Demmer et al., 2017; Keown, 2012; Lifford et al., 2008; Shelleby & Ogg, 2020). This bidirectional effect seems to be most evident when children are young (four to five years old; (Demmer et al., 2017; Shelleby & Ogg, 2020). One could posit that supporting parents of children with ADHD symptoms, especially during their child's formative years of development, may therefore have positive effects for their child's symptoms and functioning over time.

Indeed, most interventions for children's symptoms of ADHD have recognized the influence of parents (Daley et al., 2014). According to a meta-analysis of randomized control trials of behavioural interventions for ADHD, Daley and colleagues (2014) found that interventions that included a parent component had the greatest efficacy. Further, behavioural parent training - one of the most commonly studied and employed interventions for child ADHD - adopts a model wherein parents take on the primary role in supporting their child's management of symptoms (Pfiffner & Haack, 2014).

Despite the high volume of studies recognizing the relationship between parents and their child's inattentive and/or hyperactive/impulsive symptoms and the importance of parents in ADHD symptom management, we are only just beginning to conduct research on the role of parents in the education of children with inattentive and/or hyperactive/impulsive symptoms. A

recent nationally representative survey of American families was the first of its kind to compare parents of children (kindergarten to Grade 12) with ADHD to parents of children without ADHD on various parental involvement activities (Montes & Montes, 2020). Parents of children with ADHD were less likely to participate in or volunteer at school or classroom events (including fundraisers) and were more likely to attend parent-teacher conferences and meetings with guidance counselors (Montes & Montes, 2020). Parents of children with ADHD were at least three times more likely to receive notes and phone calls from their child's school about their child (Montes & Montes, 2020). Parents of children with ADHD were also more likely to help with and check their child's homework and more likely to talk to their child about time management (Montes & Montes, 2020).

There is a small but growing body of evidence that parental involvement may influence child ADHD symptoms and improve academic outcomes in children with ADHD symptoms. A 2020 study by Shelleby and Ogg observed that child ADHD symptoms may have a negative effect on parental involvement. In this study, ADHD symptoms were measured in children at age five and found to predict level of parental involvement at age nine; parental involvement measured when the child was five years old did not however, predict child ADHD symptoms at age nine (Shelleby & Ogg, 2020). In terms of the effects of parental involvement on academic functioning in children with ADHD, a longitudinal study by Latimer and colleagues (2003) followed children with and without ADHD from elementary to secondary school and found preliminary evidence that parenting factors contribute to better overall and academic functioning for children with ADHD. Another study followed students with and without ADHD as they transitioned from high school to young adulthood and found that both groups of students

experienced less impairments after high school when their parents had been more involved in their education during high school (Howard et al., 2016).

Parental self-efficacy and ADHD symptoms

Interestingly, some of the few existing seminal studies related to parental involvement and ADHD have highlighted the significance of parents' self-efficacy beliefs when examining parental involvement in families of children with ADHD. In a study of parents of eight to twelve-year-old children with and without ADHD, Rogers and colleagues (2009) observed that parents of children with ADHD reported significantly lower feelings of efficacy in their ability to help their child learn than parents of children without ADHD. Despite both parent groups reporting similar levels of home involvement behaviours, similar beliefs about the importance of their role in their child's education, and similar levels of knowledge and skill for helping their child learn, parents of children with ADHD reported lower self-efficacy related to helping their child learn (Rogers et al., 2009).

A similar study of parents of adolescents observed that parents of adolescents with ADHD also reported significantly lower self-efficacy beliefs related to their ability to help their child learn as compared to parents of non-ADHD adolescents (Musabelliu et al., 2018). In this study, parents of adolescents with ADHD reported this lower level of self-efficacy even though adolescents with and without ADHD reported no differences between their parents' level of involvement in their schooling (Musabelliu et al., 2018). Although research in this domain is limited, what these studies seem to suggest is that perhaps parents of children with ADHD experience lower self-efficacy in their ability to help their child learn despite seemingly possessing the knowledge and skill they would need to support their child's learning.

Given that parents of children with ADHD are more likely to view their children's negative behaviours as fixed, intentional, and difficult to control (Johnston & Freeman, 1997), and that these parents are more likely to experience more calls and letters home from their child's school (Montes & Montes, 2020) it is not surprising that parents of children with ADHD are more likely to lack a feeling of efficacy in their ability to parent and help their child learn. In spite of these challenges, a recent study of parents of school-aged children (ages eight to twelve years old) observed not only a direct relationship between parental self-efficacy and children's school achievement (i.e., reported grades), but also an interaction effect between child inattentive and hyperactive symptoms and parental self-efficacy and their relationship to the child's school achievement (Ferretti et al., 2019). More specifically, a significant gap in reported grades was only observed between children with lower versus higher levels of inattentive or hyperactive/impulsive symptoms if the child also had a parent who reported lower feelings of learning-related self-efficacy (Ferretti et al., 2019). This study in particular, when considered within the broader theoretical and research literature outlined above, supports the current body of work's investigation of both the direct relationship between parental self-efficacy around supporting learning and child school outcomes, and the relationship between the interaction between child inattentive or hyperactive/impulsive symptoms and parental self-efficacy and child school outcomes.

Previous research in the broader parenting domain has observed direct relationships between parental self-efficacy and child outcomes (Jones & Prinz, 2005). It is therefore possible that parental self-efficacy related to learning is directly related to measures of children's school functioning, irrespective of the child's inattentive and/or hyperactive/impulsive symptoms. Following from Bandura's (1977) theory and the interactive effect between parental self-efficacy

and child inattentive and/or hyperactive/impulsive symptoms on academic achievement observed by Ferretti et al. (2019), it is also possible that parents who feel more efficacious provide a buffer for children with inattentive and/or hyperactive/impulsive symptoms, such that their school functioning is supported. Indeed, it has been observed that parents' feelings of efficacy in their ability to help their child learn seems to influence the quality of the relationship between the home and school environments in school-aged children with ADHD (Mautone et al., 2015) and parental attendance and adherence to family-school interventions for children with ADHD (Clarke et al., 2015). Alternatively, an interactive effect of parental self-efficacy and child inattentive and/or hyperactive/impulsive symptoms on school functioning could also suggest an additive risk of poor school functioning for children with inattentive and/or hyperactive/impulsive symptoms and a parent with low self-efficacy.

Rationale for current studies

Taken together, the reviewed body of literature suggests that parents, and particularly parents' self-efficacy beliefs, hold potential to influence parent behaviour and child outcomes. Given that children with symptoms of ADHD are entering the school system already facing academic disadvantage and at-risk for cumulative and long-term difficulties with academic functioning, it is vital to explore factors that could add to or mitigate this risk, particularly during this critical developmental period. Parents' sense of efficacy in their role as a parent and in their ability to support their child's learning seems to be an influential and malleable factor related to outcomes in children. Moreover, it appears that parental self-efficacy exerts a strong and wide influence on various child factors and parenting beliefs and behaviours that contribute to a child's school functioning, and recent research has begun to explore this variable in direct relation to child school functioning, as well as in interaction with child inattentive and

hyperactive/impulsive symptoms and how these interactions relate to child school functioning. Based on the reviewed theory and research it is possible that parental self-efficacy holds potential as an impactful target of intervention for children at risk for school difficulties, like children with inattentive and hyperactive/impulsive symptoms.

Overview of current studies

The present research aimed to examine the relationship between parental self-efficacy related to helping children learn and early school functioning in children with varying levels of inattentive or hyperactive/impulsive symptoms. Based on Rimm-Kaufman and Pianta's (2000) conceptualization, school functioning should be defined as not only a child's academic skills and competency, but also by relationships between influential factors within the child's environment that support the child's adaptation to the classroom. The present study, therefore, examined various outcomes associated with early school functioning in the kindergarten year (i.e., teacher-reported academic enablers, parent-reported involvement and quality of the parent-teacher relationship) as dependent variables in its analyses.

The same sample was used for both studies in the current body of work. Families of children who would be entering the school system in the following year were recruited from the community (non-clinical sample) for this research project. Families of children with and without attentional problems were encouraged to participate. Children's inattentive and hyperactive/impulsive symptoms measured via parent-report questionnaire and considered as dimensional variables. The first study in this line of work (Chapter 2) examined the relationship of parent's learning-related feeling of efficacy (independent variable) to teacher ratings of child academic enablers in kindergarten (dependent variable). It was hypothesized that parents' feelings of efficacy in their ability to help their child learn (e.g., "I know how to help my child

with learning") during the kindergarten year would be meaningfully related to children's interpersonal skills, engagement, and motivation in the kindergarten classroom, even when considered alongside inattentive or hyperactive/impulsive symptoms. During the kindergarten year, parents reported on their child's inattentive or hyperactive/impulsive symptoms and their own feelings of efficacy related to being able to help their child learn, and children's teachers reported on the child's possession of academic enablers in the kindergarten classroom. Multiple regression analyses were conducted to test the above hypothesis. Indeed, results suggested that parental feelings of efficacy (independent variable) seemed meaningfully related to children's academic enablers (dependent variable), even when considered alongside either inattentive or hyperactive/impulsive symptoms as additional independent variables.

The second study in this line of work (Chapter 3) examined the relationship of learning-related parental self-efficacy measured in the child's preschool year (independent variable 1) and child inattentive or hyperactive/impulsive symptoms (independent variable 2) to parent involvement (i.e., home-based involvement, school-based involvement, and home-school communication) and the quality of the parent-teacher relationship (dependent variables) in kindergarten. It hypothesized that parental self-efficacy related to learning in preschool would be meaningfully related to parent-report measures of involvement and the quality of the parent-teacher relationship in kindergarten, even when child preschool inattentive or hyperactive/impulsive symptoms were also considered as independent variables in the model. Given previous research that has suggested the interaction between inattentive or hyperactive/impulsive symptoms and parental self-efficacy may be important to consider when exploring academic outcomes (Ferretti et al., 2019), interactions were also explored as an independent variable in these regression models. Findings showed partial support for this

hypothesis, in that regression analyses revealed parental self-efficacy to be a significant predictor, carrying more weight that inattentive or hyperactive symptoms, of some early home-school relationship outcome variables. Interaction effects were not observed to be statistically meaningful in the current models.

Overall findings highlight the possible utility of parental self-efficacy as potentially malleable factor that relates to academic functioning in children with ADHD symptoms. The discussion (Chapter 4) outlines research, theoretical, and practical implications of this body of research, emphasizing the importance of further study and development of programming that focuses on supporting parents in supporting their children.

Chapter 2

Inattentive and hyperactive/impulsive symptoms, parental self-efficacy and academic enablers in kindergarten

Abstract

Children with inattentive and hyperactive/impulsive symptoms enter the school system with academic disadvantage and are at-risk for cumulative and long-term difficulties. Parents' sense of efficacy in their ability to support their child's learning seems to be an important and potentially malleable factor related to academic outcomes, and therefore holds potential as an impactful target of intervention for children at-risk for school difficulties. The present study examined the influence of learning-focused parental self-efficacy, when considered along with child inattentive or hyperactive/impulsive symptoms, on kindergarten teachers' ratings of children's academic enablers (i.e., student interpersonal skills, classroom engagement and motivation). Negative relationships were observed between parent ratings of child inattentive or hyperactive/impulsive symptoms and parental self-efficacy. Positive relationships were observed between parental self-efficacy and teacher ratings of child academic enablers. Regression analyses found that models that included child inattentive or hyperactive/impulsive symptoms (respectively) and parent-reported feelings of efficacy accounted for between 13% and 17% of variance in kindergarten teachers' ratings of children's academic enablers. Findings are discussed in terms of their implications for School Psychology practice and the development of early interventions for children and their families.

Attention-deficit/hyperactivity disorder (ADHD) is the most commonly occurring childhood psychiatric disorder worldwide (Wichstrøm et al., 2012). Worldwide prevalence estimates range from 5% to 11% (American Psychiatric Association, 2013; Polanczyk et al., 2007; Visser et al., 2014). According to the Centers for Disease Control, this prevalence rate has increased substantially (42%) from 2003 to 2011 (Visser et al., 2014). ADHD is characterized by multiple symptoms of inattention and/or hyperactivity/impulsivity that interfere with functioning in more than one setting (American Psychiatric Association, 2013). Inattentive and/or hyperactive/impulsive symptoms can occur in children as early as age two-years old (American Psychiatric Association, 2013), typically becoming more stable around age 6 to 8-years-old (Harpin, 2005). Symptoms commonly persisting into elementary school years (von Stauffenberg & Campbell, 2007) and even adulthood (Newton-Howes, 2004). Functional impairments associated with inattentive and/or hyperactive/impulsive symptoms include deficits in social skills and poor academic achievement (Duncan et al., 2007; Schmiedeler & Schneider, 2014; Spira & Fischel, 2005). Academic achievement and school functioning represent major challenges faced by children with inattentive and/or hyperactive/impulsive symptoms and often predict various short- and long-term negative outcomes (Frazier et al., 2007).

The study of factors that support academic functioning in children with ADHD symptoms is paramount to develop effective prevention and intervention strategies to for School Psychologists to support student learning (Polanczyk et al., 2007; Rowland et al., 2002). The purpose of the current study is to examine the relationship between parent's feelings of efficacy in their ability to help their child learn, when considered alongside inattention and/or hyperactivity/impulsivity symptoms, and kindergarten children's academic enablers. Academic enablers are "the behaviors that interact with instruction to enable the learning and productive

use of academic skills" (DiPerna & Elliott, 2000, p. 5). The importance of viewing inattention and hyperactivity/impulsivity symptoms as continuous variables when researching early childhood is first provided, followed by a summary of a) the research on academic challenges associated with these symptoms, b) the literature on academic enablers, and c) the theory and research that highlight the value of examining parent factors in relation to academic competence and inattentive and/or hyperactive/impulsive symptoms.

ADHD symptoms as continuous variables

Although ADHD is defined categorically for clinical purposes, there are several reasons why considering inattentive and hyperactive/impulsive symptoms as dimensional variables is of value in research, particularly in early childhood. First, there are challenges associated with studying ADHD as a categorical variable in young children. Symptoms of inattention and hyperactivity and impulsivity present similarly in young children (i.e., two- to five-year-old) as they do in older children (Gadow et al., 2001), although symptoms are often mistaken as developmentally typical behaviours in young children. Thus, ADHD is rarely diagnosed before age six (Egger et al., 2006). There is epidemiological evidence that most inattentive and hyperactive/impulsive symptoms rarely occur in developmentally typical two to five-year-old children (Egger et al., 2006), and that the presence of inattentive or hyperactive/impulsive behaviours in early childhood, even if they do not meet full diagnostic criteria for ADHD, are indicative of functional impairment and often eventual development of an ADHD diagnosis (Lahey et al., 2004; von Stauffenberg & Campbell, 2007). Together, this evidence suggests that the presence of inattentive or hyperactive/impulsive symptoms in this young population is relevant when examining their influence on academic functioning.

ADHD symptoms and academic functioning

Academic difficulties are among the most common challenges associated with ADHD (Frazier et al., 2007). Even when children only present with subclinical symptoms of inattention or hyperactivity/impulsivity, they are at greater risk for short- and long-term academic challenges (Duncan et al., 2007; Schmiedeler & Schneider, 2014; Spira & Fischel, 2005). Research on the relationship between academic functioning and ADHD symptoms has largely concentrated on school-aged children (Daley & Birchwood, 2010; Frazier et al., 2007). Indeed, there is a robust body of research suggesting that children and adolescents with inattentive and/or hyperactive/impulsive symptoms are more likely to do more poorly in school overall than controls (see meta-analysis by Frazier, Youngstrom, Glutting, & Watkins, 2007). Many researchers have noted a strong relationship between inattentive symptoms, in particular, and more negative academic outcomes in elementary and high school children (DuPaul et al., 2004; Ogg et al., 2016; Pham, 2016; Rogers et al., 2011).

Despite this large body of research on academic functioning in older children with inattentive and/or hyperactive/impulsive symptoms, research on the early school years and inattentive and/or hyperactive/impulsive symptoms remains nascent. The transition from preschool into kindergarten represents a critical developmental period wherein children begin to acquire the foundational skills necessary for learning and functioning in the classroom (Rimm-Kaufman & Pianta, 2000). Available research suggests that from the time they enter the classroom, children with symptoms of inattention and/or hyperactivity/impulsivity are more likely to experience deficits in foundational learning skills (e.g., numeracy, literacy, and problem-solving abilities: Barbaresi et al., 2007; Ogg et al., 2016) and in cognitive functioning (e.g., executive functioning, working memory: Daley & Birchwood, 2010; Friedman-Weieneth,

Harvey, Youngwirth, & Goldstein, 2007), which impair their ability to perform academically and build more complex language and mathematic skills (Peisner-Feinberg et al., 2001; Romano et al., 2010; Weigel et al., 2006). By their first year of school, children who exhibit inattentive symptoms, in particular, are more likely to experience difficulties with academic achievement (Tymms & Merrell, 2011). Even when inattentive or hyperactive/impulsive symptoms do not persist to a full diagnosis of ADHD, the developmental loss of skill acquisition is associated with long-term academic challenges (Egger et al., 2006).

These early academic challenges often have long-term implications (Frazier et al., 2007; Massetti et al., 2008; Schmiedeler & Schneider, 2014; Washbrook et al., 2013). Several studies have found that academic difficulties in young children with inattentive and/or hyperactive/impulsive symptoms predict greater difficulties across all areas of academic functioning in high-school years (Mcgee et al., 1991; Washbrook et al., 2013). One study found that children with inattentive symptoms at ages 4- to 6-years-old scored lower on measures of reading, spelling and math than controls when assessed eight years later (Massetti et al., 2008). Children who exhibit inattentive or hyperactive/impulsive symptoms in their early school years have also been shown to experience lower levels of motivation for school throughout their elementary and high school years, and are less likely to complete high school than their peers (Vitaro et al., 2013). Given the short and long-term consequences, it is imperative to study factors that may contribute to academic competence in children with inattentive or hyperactive/impulsive symptoms during these formative years to inform evidence-based academic interventions.

Academic enablers

Academic competence is commonly considered to include two components: academic skills and academic enablers (DiPerna & Elliott, 2002; Ogg, Volpe, & Rogers, 2016). Academic skills are those skills typically taught in the classroom, including math, literacy, and critical thinking skills (DiPerna & Elliott, 2002). Academic enablers are defined as the attitudes and behaviours that support a student's learning by allowing a student to participate in, and benefit from, instruction (DiPerna & Elliott, 2002). DiPerna and Elliott's (2000, 2002) line of research has identified four dimensions of academic enablers: motivation, engagement, study skills, and interpersonal skills. Indeed, research on this multidimensional definition of academic competence has found that academic enablers play an important and influential role in the development of core academic skills and, in turn, academic achievement (DiPerna & Elliott, 1999, 2000, 2002; DiPerna, Volpe, & Elliott, 2005). Academic enablers measured at the end of a child's preschool year have even been found to be related to children's academic and social competence in Grade 1 (McWayne & Cheung, 2009). One study found that these attitudes and behaviours that support learning accounted for a substantial proportion of variance in six- to seventeen-year-old students' academic achievement, even after controlling for student intelligence scores (Schaefer & McDermott, 1999). In fact, an abundance of research has consistently demonstrated a positive relationship between academic enablers and various academic outcomes in preschool (Dobbs, Doctoroff, Fisher, & Arnold, 2006; Dobbs-Oates & Robinson, 2012; Fantuzzo et al., 2007; McClelland et al., 2007), kindergarten (DiPerna, Lei, & Reid, 2007; McClelland, Acock, & Morrison, 2006) and later school years (Schaefer & McDermott, 1999; Stipek et al., 2010). In light of this body of research, and given the potentially malleable nature of these behaviours and attitudes, researchers and clinicians have been

encouraged to consider academic enablers in the study and support of academic functioning (Colomer et al., 2017; DiPerna & Elliott, 2002).

Interactions between academic enablers and inattentive and hyperactive/impulsive symptoms offer insight into possible mechanisms that underlie academic difficulties in children with these symptoms. In general, school-aged children with symptoms of inattention or hyperactivity/impulsivity, including those with ADHD diagnoses, are rated lower than controls on measures of academic enablers (Demaray & Jenkins, 2011; Ogg et al., 2016; Volpe et al., 2006). The presence of inattentive or hyperactive/impulsive symptoms have been observed to predict lower academic enablers in preschool-aged children (Domínguez Escalón & Greenfield, 2009). Ogg and colleagues (2016) observed a direct negative pathway between inattentive symptoms and motivation, engagement and interpersonal skills in kindergarten children.

Despite the generally negative relationship between ADHD symptoms and academic enablers, there also appears to be evidence that academic enablers mediate the relationship between ADHD symptoms and academic difficulties in children (Domínguez Escalón & Greenfield, 2009; DuPaul et al., 2004). Volpe and colleagues (2006) attempted to model the specific pathways by which academic enablers effect both reading and math achievement in first to fourth graders with clinically diagnosed ADHD. The researchers observed that, after controlling for prior academic achievement, motivation and study skills accounted for the most variance in reading and math skills for children with ADHD (Volpe et al., 2006). Similarly, a study by Demaray and Jenkins (2011) found that motivation and study skills emerged as full mediators of the relationship between inattentive and hyperactive/impulsive symptoms and academic achievement (i.e., reading skills and teacher-rated overall academic achievement) in third- to fifth-grade children. Engagement and interpersonal skills were found to partially

mediate the relationship between inattentive and hyperactive/impulsive symptoms and overall teacher-rated academic achievement (Demaray & Jenkins, 2011). Overall, although the exact nature and direction of the relationship between ADHD symptoms and academic enablers is less clear, there appears to be evidence that academic enablers play an important role in the relationship between ADHD symptoms and academic functioning.

The role of parents

Although it is recognized that complex, dynamic, and bi-directional interplay between parents and their child that contribute to child development (Aken et al., 2007; Dennis, 2006; Neitzel & Stright, 2004), the current paper focuses on the role of parents. Ecological systems models of development, such as *Bronfenbrenner's Ecological Systems Model* (1977), posit that the systems surrounding a child (e.g., home/parent system, school/teacher system, neighborhood, etc.) and the interaction within and between these systems influence a child's development. Parents represent a bridge (i.e., the mesosystem) between two crucial systems (i.e., family/home and school) during the child's early school years (Tekin, 2016). Indeed, research would suggest that parents exert the greatest influence on children during the early years of development (Deater-Deckard, 2000; Leve & Fagot, 1997; Shankoff & Phillips, 2000).

In the general education literature, parents are recognized a crucial influential environmental agents in children's early education (Fan & Chen, 2001). Parent involvement in children's education is known to be an important predictor of children's academic achievement (Kim & Hill, 2015). With regards to ADHD, most interventions for children's symptoms of ADHD have also been developed within an ecological framework that recognizes the vital influence of parents (Daley et al., 2014). Behavioural parent training, one of the most commonly studied and employed interventions for child ADHD, adopts a model wherein parents take on the

primary role in supporting their child's management of symptoms (Pfiffner & Haack, 2014). Indeed, according to a meta-analysis of randomized control trials of behavioural interventions for ADHD, Daley and colleagues (2014) found that interventions that included a parent component had the greatest efficacy. Despite strong evidence for the importance of parents in both education and ADHD symptom management, research on the role of parents in academic development and achievement in children with symptoms of ADHD is nascent (Deault, 2010).

One longitudinal study followed children with and without ADHD from elementary to secondary school and found preliminary evidence that parenting factors contribute to better academic functioning in children with ADHD (Latimer et al., 2003). Another longitudinal study of older students observed that both students with and without ADHD experienced less impairments after high school when their parents had been more involved in their education during high school (Howard et al., 2016). These studies imply that parental involvement may positively contribute to academic functioning in children with ADHD symptoms, although it is also possible that ADHD symptoms negatively impact parental involvement. A recent study by Shelleby and Ogg (2020) observed that child ADHD symptoms (measured at age five) were negatively related to parental involvement in education at age nine, but parental involvement at age five did not predict child ADHD symptoms at age nine (Shelleby & Ogg, 2020). This leads us to inquire about the factors that predict a parent's involvement in their child's education, particularly in children with inattentive and/or hyperactive/impulsive symptoms.

Parental self-efficacy

Hoover-Dempsey and colleagues developed *The Model of Parental Involvement* (Hoover-Dempsey et al., 2005; Hoover-Dempsey & Sandler, 1997) in an effort to understand the factors that predict parental involvement in children's education. This model proposes that,

among other factors, parents' belief in their ability to positively influence their child's learning (i.e., self-efficacy) is an important contributing factor in their decision to become involved in their child's education (Hoover-Dempsey et al., 2005). Indeed, there is a growing body of evidence that self-efficacy beliefs are related to parental involvement behaviours (Anderson & Minke, 2007; Englund et al., 2004; Hoover-Dempsey et al., 1992; Reed et al., 2000).

The overall academic literature suggests that in general, parents who feel more efficacious in their ability to help their child learn tend to be more actively involved in their child's education during elementary school years through to adolescence (Eccles & Harold, 2013; Grolnick & Slowiaczek, 1994; Hoover-Dempsey et al., 1992, 2001; Shumow & Lomax, 2002; Sung et al., 2012). In terms of the early years, available data has observed that parents who report greater self-efficacy to be more involved during their child's pre-kindergarten education (Pelletier & Brent, 2002). There is also initial evidence that intervention programs designed to increase parents' feelings of efficacy related to helping their child with early literacy skills may increase parents' likelihood to engage in literacy activities with their child (Primavera, 2000).

Bandura's (1977) theory of self-efficacy proposes that an individual's perception of their own ability to engage in a behaviour that will affect change (i.e., self-efficacy) contributes to their initiation of the behaviour, effort and task persistence in the face of obstacles. Within the general parenting literature, research has shown that parents with stronger self-efficacy beliefs are more likely to engage in behaviours that support their children, even when their children face challenges (Ardelt & Eccles, 2001). For instance, parents with greater self-efficacy have been observed to be more likely to accept and show interest in their children's concerns (Dumka et al., 2010), to seek out information and take active steps to cope with these concerns (Spoth & Conroy, 1993; Wells-Parker et al., 1990), and to interpret challenges related to their child in a

more favourable light, which may maintain their willingness to continue to exert effort towards addressing the concern (Ardelt & Eccles, 2001). From this, it could be argued that fostering parent self-efficacy beliefs, particularly early in a child's educational journey, may increase parent involvement and support of their child's learning, even in parents of children with ADHD symptoms.

Parental self-efficacy and ADHD

Bandura (1977) proposed that self-efficacy beliefs are developed in transaction with the environment over time, through experiences and observations of success and failure, feedback from others, and internal experiences related to one's performance. Theory therefore argues that parental self-efficacy beliefs develop via reciprocal interaction between parent and child (Jones & Prinz, 2005). Child inattentive and/or hyperactive/impulsive symptoms are known to be reciprocally related to parenting practices (Rogers et al., 2009a) and this reciprocal relationship may also be true for parental self-efficacy. Inattentive and/or hyperactive/impulsive symptoms would arguable may make it more challenging for parents to support their child's learning, and therefore, it is perhaps not surprising that parents of children with ADHD more likely to lack confidence in their ability help their child learn (Ferretti et al., 2019; Musabelliu et al., 2018; Rogers et al., 2009).

Formative studies of parental involvement in children with ADHD have observed that parents of school-aged (eight to twelve-year-old) and adolescent children with ADHD report significantly lower self-efficacy beliefs related to their ability to help their child learn as compared to parents of non-ADHD children (Rogers et al., 2009) and adolescents (Musabelliu et al., 2018). Notably, in the study of school-aged children, parents of children with ADHD reported lower self-efficacy despite reporting similar levels of home involvement behaviours,

similar beliefs about the importance of their role in their child's education, and similar levels of knowledge and skill related to being able to help their child learn as the parents of non-ADHD children (Rogers et al., 2009). Parents of adolescents with ADHD reported lower levels of self-efficacy even though there were no differences in perceived level of parental involvement reported by the adolescents with and without ADHD (Musabelliu et al., 2018).

In spite of evidence of a negative relationship between ADHD symptoms and parental self-efficacy, there is mounting evidence that the presence of parental self-efficacy beliefs in parents of children with inattentive and/or hyperactive/impulsive symptoms may be related to more positive academic outcomes for children. A recent study of parents of school-aged children (ages eight to twelve years old) observed that parents' perceived ability to help their child learn both directly related to academic achievement (i.e., reported grades) and mediated the relationship between their child's inattentive and/or hyperactive/impulsive symptoms and reported academic achievement (Ferretti et al., 2019). This suggests that parental self-efficacy may add to or reduce risk of poor academic functioning in children with inattentive and/or hyperactive/impulsive symptoms. Other studies have observed that parents' feelings of efficacy in their ability to help their child learn seems to relate to the quality of the relationship between the home and school in school-aged children with inattentive and/or hyperactive/impulsive symptoms (Kim & Hill, 2015; Mautone et al., 2015), as well as to the likelihood that parents will attend and adhere to family-school interventions for their child (Clarke et al., 2015). Therefore, it could be proposed that the possession of parental self-efficacy beliefs, even if faced with challenges, like inattentive and/or hyperactive/impulsive symptoms, may support more positive academic outcomes in children. Alternatively, it is possible that a lack of parental self-efficacy,

in addition to child inattentive and/or hyperactive/impulsive symptoms may further contribute to risk for poor academic outcomes in children.

The present study

The present study examines the relationship between parents' feelings of efficacy related to helping their child learn and children's inattentive or hyperactive/impulsive symptoms to children's academic enablers in kindergarten, as well as the relationship between the interaction of parental self-efficacy and child inattentive and/or hyperactive/impulsive symptoms on academic enablers. Based on the literature related to self-efficacy, it was hypothesised that parental self-efficacy would positively relate to academic enablers and that inattentive symptoms would negatively relate to all dimensions of academic enablers. In light with previous research (Ogg et al., 2016), a positive relationship between hyperactivity symptoms and motivation and classroom engagement is expected. Given that previous research (Ferretti et al., 2019) observed both direct relationships between a) inattentive and hyperactive/impulsive symptoms, and b) parental self-efficacy and academic achievement, as well as c) an interaction effect between these variables and academic outcomes, the current study also explored the relationship between the interaction of inattentive and/or hyperactive/impulsive symptoms and parental self-efficacy to academic enablers.

Methods

Participants

The sample size for the present study was established based on Green's (1991) formula for estimating statistical power for multiple regression analyses, $N = 50 + 8$ (# of independent variables).

Parents. Seventy-six parents participated in the study during their child's kindergarten year. Parents ranged in age from 28 to 52 years old (M = 38.87 years, SD = 4.97 years). Most parents identified as being biological mothers (92.1%, n =70). Two adoptive mothers (2.6%), one grandmother (1.3%), and three biological fathers (3.9%) participated as the primary parent in this study. Most parents self-identified as being Caucasian (77.6%, n = 59), while twelve (15.8%) identified as other races (e.g., Aboriginal, Black, Asian, Middle Eastern, etc.), and five (6.6%) identified as being mixed race (i.e., Caucasian and Aboriginal, Caucasian and Latino)[1].

Most parents who participated identified as being heterosexual (98.7%, n = 75), one identified as bisexual (1.3%, n = 1). Most parents were married (86.8%, n =66), while some reported living common-law with a partner (3.9%, n = 3), being separated (6.6%, n = 5), or being single (2.6%, n = 2). Most families reported having two adults living in the home (88.2%, n = 67), and most families reported having two children (60.5%, n = 46). Eighteen percent (n = 14) of families reported having a single child, and 21.5% (n = 16) reported three or more children in the home.

In terms of highest level of education achieved, many of the parents who participated in this study reported completing a Bachelor's (35.5%, n = 27) or a professional/graduate degree (42.1%, n = 32). Some had completed a trade-school diploma (18.4%, n = 14) or a high school diploma (3.9%, n = 3).

Parents who participated represented a broad range of occupations (e.g., public servants, teachers and professors, health care workers, engineers, lawyers, and homemakers). Most parents (61.8%, n =47) reported working between 21-40 hours per week, while 21.1% (n = 16) reported working more than 40 hours per week, and 17.1% (n = 13) reported working 20 hours per week

[1] Demographic data were missing for 2 families

or less. The majority of families reported earning an annual household income greater than $100 000 (55.3%, *n* = 42), while 27.6% (*n* = 21) reported earning between $75 000- $100 000, 10.5% reported earning between $45 000-$75 000 (*n* = 8), and 6.5% (*n* =5) reported earing $45 000 or less annually.

All families reported speaking English, although only 84.2% (*n* = 64) reported speaking English in the home. Two families (2.6%) reported speaking French at home. Three families reported being bilingual in the home (3.9%) speaking English and French. The remaining 7 families (10.4%) reported speaking other languages at home (e.g., Tamil, Arabic, etc.).

Compared to 2016 Census data (Ottawa, 2016), the current sample appeared to be representative of the community population from which they were drawn (Ottawa, ON, Canada) with respect to ethnicity, education, occupation, and annual household income.

Children. Thirty-six boys (47%) and forty girls were part of the study. Children ranged in age from 3.98 to 6.15 years old (*M* = 4.76 years, *SD* = 0.49 years) in their kindergarten year. Two children (2% of the sample) were identified by their parents as having been previously diagnosed with ADHD at the time of the study. This is consistent with the prevalence estimates for ADHD generally observed in preschool populations (Lavigne, Lebailly, Hopkins, Gouze, & Binns, 2009; Schlack, Hölling, Kurth, & Huss, 2007; Wichstrøm et al., 2012).

Teachers. Data were available from 76 of the children's kindergarten teachers.

Procedure

Various methods (e.g., posters in the community, in-person recruitment at parenting expos/events, online advertisement on parenting websites, social media groups, etc.) were used to recruit a diverse community sample. Study advertisements targeted parents of children who would be starting school the coming Fall of that year and offered as compensation for their

participation a school readiness assessment and brief report completed by a clinical psychologist. As the study was being conducted by the ADHD and Development Laboratory at the University of Ottawa, the study advertisements explicitly stated that families of children with and without attention difficulties were welcome to participate.

Families were contacted by email in the winter of their child's kindergarten year to participate in online questionnaires. They were also given the opportunity to share their child's teacher's contact information, and teachers were contacted to complete online or mail-in questionnaires about the child's classroom functioning. Only families who spoke English (as research to measures were written in English) and whose children had not previously received a diagnosis of autism spectrum disorder or an intellectual disability were eligible to participate. These inclusion and exclusion criteria were consistent with those outlined by other authors (e.g., (Musabelliu et al., 2018; Ogg et al., 2016).

Measures

The ADHD Rating Scale-IV —Preschool Version (Mcgoey et al., 2007) is an 18-item measure of ADHD symptoms in young children. The ADHD Rating Scale-IV was developed with a United States national sample of three to five-year-old children (3:0 to 5:11 year-olds) and includes parent-rating and teacher-rating versions. In the present study, only the parent version of the ADHD Rating Scale-IV was used. On this scale, parents rate their child's behaviours over the past six months on a 4-point Likert scale ranging from 0 (*rarely or never*) to 3 (*very often*). Continuous scores for total ADHD symptoms, inattention symptoms, and hyperactive/impulsive symptoms are calculated by taking the sum of scores within each symptom category. Only inattentive and hyperactive/impulsive subscale scores were used for the purpose of the present study. Possible scores on each of these subscales range from 0 to 27. Higher scores represent

more symptoms/more severe symptoms within that category. Gender-specific and overall normative data and cut off values are available (see McGoey et al., 2007). Based on the overall cut-off scores outlined by McGoey et al. (2007), scores > 9 on the inattentive subscale and >10 on the hyperactive/impulsive subscale correspond to the 80th percentile or higher relative to the norming sample. In the current sample, 28% of children scored above the 80th percentile for inattentive symptoms in the kindergarten year and 29% scored above the 80th percentile for hyperactive symptoms in the preschool (T1) year. The ADHD Rating Scale-IV has shown good construct validity (strong correlation to the Conners Parent Rating Scales for ADHD) and demonstrated good internal consistency in the norming sample (α = 0.86 to 0.96; McGoey et al., 2007). The scale showed similar internal reliability in the current sample (α = 0.86 to 0.90).

The Parental Involvement Project Questionnaire - Self-Efficacy Subscale (PIPQ-SE; Walker, Wilkins, Dallaire, Sandler, & Hoover-Dempsey, 2005) was used as a specific measure of parents' efficacy related to their involvement in their child's learning. The PIPQ scale is based on the seminal, multi-level theory of parent involvement in children's education, posited by the authors (Hoover-Dempsey et al., 2005; Hoover-Dempsey and Sandler, 1997) and revised over the course of several studies of parents of school-aged children from socioeconomically diverse schools in a United States (Walker et al., 2005). The items reflecting the self-efficacy subscale of the PIPQ were developed based on previously designed scales of teacher self-efficacy and refined over the course of three studies of large samples of parents (Hoover-Dempsey, Bassler, & Brissie, 1992; Walker et al., 2005). The PIPQ-SE is considered a reliable (e.g., related to teacher perceptions of parental self-efficacy; Hoover-Dempsey et al., 2005) and theoretically sound measure of parental self-efficacy in supporting children learn (Walker et al., 2005). The PIPQ-SE has been shown to exhibit good internal consistency in past studies. (α = 0.74; Rogers et al.,

2009). Using a 6-point bipolar Likert scale ranging from 1 (*disagree very strongly*) to 6 (*agree very strongly*), parents report on their perceived ability to be involved in and affect change in their child's education (e.g., "I don't know how to help my child succeed in learning"). In the current study, language of the 5-item scale was altered slightly to reflect a younger child/student sample (e.g., preschool to kindergarten). Negatively worded items were reversed scored and the sum of items was used. Possible scores ranged from 5 to 30, with higher scores reflecting greater self efficacy, and lower scores reflecting lower self-efficacy. In the present sample, the PIPQ-SE also showed good internal consistency ($\alpha = 0.84$).

The Academic Competence Evaluation Scales - Teacher Record Form (ACES; DiPerna & Elliott, 2000) is a standardized, clinical teacher-rated questionnaire that assesses academic enablers in children. The interpersonal skills, engagement and motivation subscales were used in the present study. Kindergarten teachers rated children's skills and behaviour on a 5-point unipolar Likert scale ranging from 1 (*never*) to 5 (*almost always*). On the 10-item interpersonal skills subscale, teachers rated the child's classroom cooperation and communication with peers; scores ranged from 10 to 50. For the 8-item engagement subscale, teachers rated the child's attention to lessons and level of participation in the classroom (e.g., speaking up when called on); scores ranged from 8 to 40. For the 11-item motivation subscale, teachers rated the child's level of initiative and persistence on learning activities, as well as the frequency with which the child sought out challenges and attempted to improve; scores ranged from 11 to 55. The ACES has been validated for the assessment of students from kindergarten to college (DiPerna & Elliot, 2000). The ACES has been shown to exhibit good internal consistency, test-retest reliability and is a valid indicator of academic performance and achievement (DiPerna & Elliot, 1999; 2000; 2002). In the present study, internal consistency for subscale scores ranged from $\alpha = 0.92$ to 0.95.

Results

Data analytic plan

The current study used a correlational, cross sectional design. It aimed to use bivariate correlations and a series of multiple regression analyses to test the stated hypotheses. To preserve statistical power, and given previous research that has demonstrated the value of separating inattentive and hyperactive/impulsive symptoms (Ogg et al., 2016), the present study examined inattentive and hyperactive/impulsive symptoms as separate, dimensional variables. Two separate interaction variables were calculated between 1) parental self-efficacy and inattention symptoms (PIPQ-SE*Inattentive) and 2) parental self efficacy and hyperactive/impulsive symptoms (PIPQ-SE*Hyperactive). Data was first mean centered in order to prevent issues related to multicollinearity. These interaction variables aimed to provide data as to whether the nature of the relationship between symptoms and parental self-efficacy to academic enablers differed by interaction between these variables. These interaction variables, as well as parental self-efficacy, inattentive symptoms, and hyperactive/impulsive symptoms were used as independent variables in regression models. Teacher-rated academic enablers (interpersonal skills, classroom engagement, and motivation) were examined as separate outcome variables in regression analyses. For a visual model of the regression analyses, see Figure 2 in the appendices.

Given the size of the current sample, which did not support the separation of gender for the current planned analyses, and that gender differences in ADHD symptom presentation less common young children (Rucklidge, 2010), child gender was not included in the main data analyses. The relationship between child gender, child age, and variables of interest was, however, explored in additional correlation analyses.

Data Treatment

Initial missing values analyses revealed 7% of data were missing from the dataset. Data was missing completely at random, as indicated by non-significant Little's MCAR tests: $\chi^2(634) = 544.80$, $p = 0.99$ (Little, 1988). Since data were missing completely at random and the proportion of missing data was relatively small (e.g., less than 10%) (Scheffer, 2002), a single imputation method using the expectation maximization method was used to impute the missing data (Enders, 2001).

Visual examination of data plot and Shapiro-Wilks tests of normality were used to assess for normality. Only the ACES interpersonal subscale showed moderate skew. For this variable, a two-stage approach for transformation (Templeton, 2011) was applied, which resulted in a non-significant skew. Scatterplots were generated and the assumption of homogeneity of variance. was observed in the data.

Analyses

Correlations. Preliminary bivariate correlation analyses were first conducted to examine relationships between variables of interest. Results are presented in Table 1. As hypothesized, parental self-efficacy was negatively related to inattentive symptoms ($r = -.47$, $p < .001$) and hyperactive/impulsive symptoms ($r = -.30$, $p < 0.001$). Parental self-efficacy was positively related to all academic enablers: interpersonal skills ($r = .39$, $p < .001$), classroom engagement ($r = 0.36$, $p < .001$), and motivation ($r = .36$, $p < .001$). Varied relationships were observed between various academic enablers and inattentive and hyperactive symptoms. Specifically, a negative relationship was observed between inattentive symptoms and interpersonal skills ($r = -.28$, $p < 0.05$), and motivation ($r = -.27$, $p < .05$). Hyperactive/impulsive symptoms were also negatively related to interpersonal skills ($r = -.32$, $p < .05$).

Correlation analyses were also conducted between child gender and all variables of interest. Consistent with what has been observed in other young samples (Rucklidge, 2010), gender was not observed to be statistically significantly related to inattentive or hyperactive/impulsive symptoms in this young sample. Statistically significant correlations were observed between child gender and interpersonal skills (r = .34, p < 0.001), classroom engagement (r = .23, p < .05), and child motivation (r = .23, p < .05), suggesting that girls were more likely to score higher on academic enablers than boys in the current sample.

[INSERT TABLE 1 HERE]

Interaction effects

An exploratory series of enter-method multiple linear regression analyses were first conducted to examine the effects of parent reported inattentive or hyperactive/impulsive symptoms in the kindergarten year, learning-related parental self-efficacy (PIPQ-SE) in the kindergarten year, and the interaction between these independent variables (PIPQ-SE*Inattentive/Hyperactive) on each of the academic enabler subscales. The interaction variables did not emerge as significant contributors to variance in any of the models tested. The interaction variables were subsequently removed from the analyses.

The predictive effects of parent-reported inattentive symptoms and learning-related parental self-efficacy in kindergarten on academic enablers

The first regression model examined the relationship between inattentive symptoms and parental self-efficacy to teacher-rated child interpersonal skills. The model was observed to be statistically significant (R^2 = .17, F(2, 74) = 7.40, p = .001*), with parental self-efficacy emerging as significantly contributing to weight in variance (PIPQ-SE: β = .33, t(73) = 2.76, p <.05*; inattentive symptoms: β = -.13, t(73) = -1.0, n.s). The second regression model entered

inattentive symptoms and parental self-efficacy as statistical predictors of teacher-rated child classroom engagement. The model was observed to be statistically significant (R^2 = .13, F(2, 74) = 5.78, p < .05*). Parental self-efficacy significantly contributed to variance in the model (PIPQ-SE: β = .38, t(73) =3.13, p < .05*.; inattentive symptoms: β = .03, t(73) = .27, , n.s.). The third regression model entered inattentive symptoms and parental self-efficacy as statistical predictors of teacher-rated child motivation. The model was observed to be statistically significant (R^2 = .14, F(2, 74) = 6.15, p < .05*). Again, parental self-efficacy significantly contributed to variance in the model (PIPQ-SE: β = .30, t(73) = 2.47, p < .05*.; inattentive symptoms: β = -.13, t(73) = -1.06, n.s.. Therefore, models with inattentive symptoms and parental self-efficacy as predictors accounted for between 13% to 17% of variance in academic enablers. Results presented in Table 2.

[INSERT TABLE 2 HERE]

The predictive effects of parent-reported hyperactive symptoms and learning-related parental self-efficacy in kindergarten on academic enablers

Another series of three multiple linear regression analyses were conducted to examine the predictive effects of parent reported hyperactive symptoms and parental self-efficacy related to helping child learn (PIPQ-SE) on each of the academic enabler subscales. The first regression model in this series entered hyperactive/impulsive symptoms and parental self-efficacy as statistical predictors of teacher-rated child interpersonal skills. The model was observed to be statistically significant (R^2 = .19, F(2, 74) = 0.18, p < .001*). Both parental self-efficacy and hyperactive symptoms emerged as a salient predictors of interpersonal skills (PIPQ-SE: β = .32, t(73) = 2.96, p < .05*; hyperactive symptoms: β = -.22, t(73) = -2.06, p < .05*). The second regression model in this series entered hyperactive/impulsive symptoms and parental self-

efficacy as predictors of teacher-rated child classroom engagement. The model showed statistical significance (R^2 = .15, F(2, 74) = 6.35, p < .05*). Parental self-efficacy meaningfully contributed to variance in classroom engagement scores (PIPQ-SE: β = .40, t(73) = 3.56, p < .05*; hyperactive symptoms: β = .12, t(73) = 1.03, n.s.). The third regression model in this series entered hyperactive/impulsive symptoms and parental self-efficacy as statistical predictors of teacher-rated child motivation. The model was observed to show statistical significance (R^2 = .13, F(2, 74) = 5.53, p < .05*). Parental self-efficacy meaningfully contributed to variance in motivation scores (PIPQ-SE: β = .35 t(73) = 3.10, p < .05*.; hyperactive symptoms: β = -.03, t(73) = -.23, n.s.). Therefore, models with hyperactive/impulsive symptoms and parental self-efficacy as independent variables accounted for between 13% to 19% of variance in academic enablers. Parental self-efficacy appeared to contribute to more variance than did symptoms in all models. Results presented in Table 2.

Discussion

The present study explored the relationship between parental self-efficacy, when considered along with inattentive or hyperactive/impulsive symptoms (known correlates to academic failure) to dimensions of academic competence in young children. Results showed a positive relationship between parental self-efficacy and all dimensions of academic enablers. Results also showed a negative relationship between inattentive and hyperactive/impulsive symptoms and parental self-efficacy ratings. Predictive models with either child inattentive or hyperactive/impulsive symptoms and parent feelings of efficacy accounted for between 13% and 19% of variance in kindergarten teachers' ratings of children's academic enablers. In each of these predictive models, learning-related parental self-efficacy was observed to contribute to more variance in academic enablers than did child symptoms.

In the current study, teacher-rated child interpersonal skills in kindergarten were observed to be negatively related to both inattentive and hyperactive/impulsive symptoms. This is consistent with previous work (Ogg et al., 2016; Volpe et al., 2006). Current findings show a minor difference from previous research with kindergarten (Ogg et al., 2016) and elementary school children (Demaray & Jenkins, 2011) that have unanimously observed a negative relationship between inattentive symptoms and all dimensions of academic enablers (i.e., interpersonal skills, classroom engagement, and motivation). In the current sample, motivation was observed to only be negatively related to inattentive symptoms, and classroom engagement was not found to be related to either inattentive or hyperactive/impulsive symptoms. This is inconsistent with previous work that has observed a positive relationship between hyperactivity symptoms and both motivation and engagement in young children (Ogg et al., 2016). Past research on academic enablers and inattentive or hyperactive/impulsive symptoms in young children have focused on modeling paths to academic outcomes (e.g., literacy skills) in children (Ogg et al., 2016). The current study examined academic enablers in and of themselves as indicators of academic outcomes in young children, although it is possible that models including inattentive or hyperactive/impulsive symptoms, academic enablers, parental self-efficacy in predicting other academic outcomes, such as literacy skills, may have yielded different results.

Findings from the current study sit well within the existing research and theory that suggest parental self-efficacy seems to be related to children's overall and academic functioning (Ardelt & Eccles, 2001; Pelletier & Brent, 2002; Primavera, 2000). In the current study, there was a positive relationship between parental self-efficacy and teacher ratings of student interpersonal skills, classroom engagement and motivation. Moreover, models that included parental self-efficacy, along with symptoms of inattention and hyperactivity/impulsivity, which

have typically been observed to be negatively related to academic enablers (Demaray & Jenkins, 2011; Volpe et al., 2006), emerged as significantly related to academic enablers. Although current findings highlight that other variables are certainly at play when it comes to academic enablers relative to parental self-efficacy and child inattentive or hyperactive/impulsive symptoms, current findings support the notion that perhaps more research on the role of parental self-efficacy on academic functioning in young children with inattentive or hyperactive/impulsive symptoms may be warranted.

Within the literature, little is known about the direct relationship between parental self-efficacy and academic enablers. Current correlational findings could be interpreted in at least two ways: 1) parents with greater self-efficacy may support stronger academic enablers in children, even with ADHD symptoms are accounted for; or, 2) parents of children rated as possessing stronger academic enablers are more likely to possess stronger self-efficacy, even with child symptoms are accounted for. Each of these interpretations is explored below.

First, it is possible that having a parent who feels confident in their ability to support their child's learning during their child's early academic years may support greater academic enablers, even for children with inattentive or hyperactive/impulsive symptoms. Social learning theory (Bandura, 1977) and systems-oriented models of learning and development (Bronfenbrenner, 1977; Rimm-Kaufman & Pianta, 2000) highlight the importance of relationships and interactions in fostering learning and the skills that support learning. Parents represent one of the most proximal systems in which children develop during the early years (Bronfenbrenner, 1977). Accordingly, interactions between parent and child create opportunities for parents to model beliefs and attitudes that may foster greater feelings of efficacy towards learning in children, which translates into greater motivation and engagement in learning (Schunk & Zimmerman,

2006). Therefore, it is possible that parents who feel confident in their ability to help their child learn at the outset of their child's schooling model strong learning skills that foster academic enablers in their children. Indeed, one intervention study observed that families of preschoolers who participated in a series of workshops aimed to increase parents' feelings of efficacy related to supporting their child's literacy, reported more literacy activities as a family following the intervention; children also exhibited stronger literacy skills and an increased interest in books post-intervention (Primavera, 2000). Primavera's (2000) study fits well with the current findings, suggesting that supporting parents in their sense of efficacy may have an impact on children's learning and the family system as a whole.

It is also possible that parent behaviours related to stronger self-efficacy beliefs foster academic enablers. Based in social learning theory (Bandura, 1977), Ardelt & Eccles (2001) argue that efficacy can beget effort: parents who feel more efficacious in their ability to support their children's learning are more likely to put in effort towards supporting their children's learning, even in the face of challenges. This effort may translate into academic enablers. Indeed, Hoover-Dempsey and colleagues' (2005) model of parental involvement suggests that parents' self-efficacy beliefs play a key role in parents' engagement in involvement behaviours. Studies have observed a direct relationship between parental involvement and academic enablers, such as engagement in the classroom and motivation, in high school students (Al-Alwan et al., 2014; Fan & Williams, 2010; Marchant et al., 2001; Steinberg, Lamborn, Dornbusch, & Darling, 1992). It could therefore be postulated that perhaps there is an indirect path from parental self-efficacy to modeling of learning behaviours to increased parental involvement to improved academic enablers in children.

The cross-sectional nature of the current study, however, do not allow for us to draw conclusions regarding the direction of relationship between variables. Therefore, a *second* possible interpretation of findings from the current study could be that parents of children who are rated as possessing stronger academic enablers feel more efficacious in their ability to support their child's learning, even when child ADHD symptoms are considered. Self-efficacy beliefs are cultivated via experiences of success and failure, as well as feedback from the environment (Bandura, 1977). It is established that academic enablers change over time, even within the development period of one academic year (Domínguez et al., 2010). It is possible parents of children who enter the school system possessing stronger academic enabler skills are more likely to feel confident in their capacity to help their children learn than parents whose children possess weaker academic enablers at school onset. Self-efficacy theory suggests that experiences of success then foster further feelings of efficacy (Bandura, 1977), therefore parent whose child possesses stronger academic enablers may foster more experiences of success for a parent in their efforts to help their child learn or may illicit more positive feedback from their child's teacher.

Parents of children with ADHD symptoms typically report lower self-efficacy beliefs (Musabelliu et al., 2018; Rogers et al., 2009). Results of the current study similarly observed a negative relationship between degree of parent-reported child inattentive and hyperactive/impulsive symptoms and parents' feelings of efficacy related to helping their child learn. The unique contribution of the current study is that parental self-efficacy seems to relate to children's academic enablers even when the influence of these inattentive or hyperactive/impulsive symptoms are considered in this young sample. The correlational nature of the current study does not allow for inferences about causality to be made, however findings

suggest that perhaps further research on the potential role of parental self-efficacy on academic functioning in children with ADHD symptoms may be warranted. Although the interactions between child symptoms and parental self-efficacy were not independently observed to meaningfully account for variance in academic enablers in the current study, within the literature, both parental self-efficacy (Ferretti et al., 2019) and academic enablers (Demaray & Jenkins, 2011) have been observed to act as mediators between ADHD symptoms and academic achievement. Further research, ideally including a cross lagged design, should explore the relationships between inattentive and hyperactive/impulsive symptoms, parental self-efficacy, academic enablers, and eventually, academic achievement.

To the best of our knowledge, this is the first study to examine the relationship between parents' feelings of efficacy related to helping their child learn and inattentive and hyperactive/impulsive symptoms in such a young sample. When considered alongside previous studies (Musabelliu et al., 2018; Rogers et al., 2009), current findings suggest that parents of children with higher degrees of inattention and hyperactivity/impulsivity symptoms experience a lower sense of efficacy related to helping their child learn as early as their child's first year of school or perhaps even before their child's inattentive or hyperactive/impulsive symptoms become severe enough to meet the diagnostic threshold for ADHD. Further longitudinal research would be needed to determine the exact relationship between the developmental course of parents' self-efficacy relative to children's inattentive and hyperactive/impulsive symptoms and the length of time a child spends in the school system. Given our current understanding of the development of self-efficacy (i.e., experiences of success beget further self-efficacy) and in light of current findings, it seems prudent to turn our attention towards the development of early

programs to support parents in feeling confident in their abilities to help their child learn, so that families can set their children up to be most likely to succeed.

Implications for practice

This study represents a small first step in a line of research that would be needed to determine the exact nature of the relationships between parental self-efficacy, inattentive or hyperactive/impulsive symptoms and academic competence in young children. It seems parental self-efficacy is related to early academic competence skills, and, in some models within the current study, parental self-efficacy accounted for more weight in variance of academic enablers than did parent-reported inattentive or hyperactive/impulsive symptoms, which are typically associated with challenges in academic and social skills (Duncan et al., 2007; Schmiedeler & Schneider, 2014; Spira & Fischel, 2005). It could be argued that fostering confidence and competence in parents as they support their child's learning during their child's transition into school, could possibly support stronger academic enablers irrespective of inattentive or hyperactive/impulsive symptoms. Well-researched programs that support parental self-efficacy by teaching parents' skills for managing specific child behaviour problems, such as Triple P (Sanders & Woolley, 2005), already exist for behaviour problems. These models support parents in supporting their child. It is possible that the development of similar programs that target building skills and confidence in parents around their ability to help their child learn, specifically as their child enters school, could have positive effects on children's development of academic skills.

Limitations and future research

There are several additional limitations to the current study. First, as noted earlier, the correlational and cross-sectional design of the current study do not allow for the drawing of

conclusions regarding the direction of the relationships between variables or causality. Future research should consider a fully cross-lagged longitudinal design following families from preschool to Grade 1. A larger sample size and the addition of measures of academic achievement would also allow for moderation or path analyses to be conducted so that stronger and more specific inferences about direction and nature of the relationships between variables could be made.

This study consisted of a small sample of families who represent a relatively high socioeconomic status (as evidenced by high levels of post-secondary education and household incomes greater than $75,000 annually). This study data was conducted in Ottawa, ON, which, according to 2016 census data, is the city with the highest number of scientists, engineers, and individuals with a graduate school education (PhD) per capita (City of Ottawa, 2016). The median annual household income in Ottawa, ON, is cited as $102 000. Therefore, although it seems that the sample for the current study may be representative of the average family in Ottawa, ON, it is unclear how well results generalize to populations from less affluent and educated areas. Socioeconomic status has been shown to be related to parental self-efficacy (Kikas & Mägi, 2015), academic achievement (Burkan & Lee, 2002), and teacher-ratings of child academic functioning (Hauser-Cram et al., 2003). It is possible that parents from this demographic group differ from less educated and more economically disadvantaged families in important ways, such as their beliefs about the value of education, their time and financial resources for helping their child learn, and their overall levels of stress (Hoover-Dempsey et al., 2005). Therefore, the influence of parental self-efficacy on academic competence might differ in more social disadvantaged families. Further research is needed in order to assess the generalizability of these findings.

The current study drew from a community sample and relied on parent-report of inattentive and hyperactive/impulsive symptoms. Further research should include other informants or clinical interview data to corroborate rating of inattentive and hyperactive/impulsive symptoms and to avoid any rater bias between parent ratings of symptoms and self-efficacy. Furthermore, it is unclear at this time how well current findings generalize to a clinical sample of children with ADHD. Future research with clinical samples is needed.

The size of the current sample did not allow enough statistical power for comparisons to be made between boys and girls in the present analyses. Rarely are gender differences in ADHD symptom presentation or severity of impairment observed in young, community-referred samples (Gadow et al., 2001; Martel, 2013). Consistently, the current study did not find statistically significant correlations between gender and inattentive or hyperactive/impulsive symptoms in this young community sample. Other authors have observed that teachers are more likely to rate girls higher on measures of academic enablers than boys (Elliott et al., 2004), and indeed the current study observed the same trend. Future research should consider the effect of gender on the relationship between parental self-efficacy, ADHD symptoms, and academic enablers.

Chapter 3

Interactions between home and school during the transition into kindergarten: The relationship to parental self-efficacy and child inattentive or hyperactive/impulsive symptoms

Abstract

The transition into the classroom represents a significant developmental milestone for children. As early as school-entry children with inattentive or hyperactive symptoms are at risk for cumulative and long-term difficulties. Parents' sense of efficacy is strongly linked to parenting beliefs and behaviours that contribute to a child's school functioning, including parental involvement. The present study examined the relationships between parent-reported inattentive or hyperactive/impulsive symptoms and parental self-efficacy in preschool to various outcomes associated with a successful transition into school (i.e., parental involvement and the parent-teacher relationship). A community sample of parents (mostly mothers) of preschool children completed self-report measures of feelings of self-efficacy and their child's ADHD symptoms in preschool, and their involvement behaviours and the parent-teacher relationship in kindergarten. Results reveal a negative relationship between parental self-efficacy and child inattentive and hyperactive symptoms. Regression analyses revealed parental self-efficacy to be a significant predictor, above inattentive or hyperactive/impulsive symptoms, of some early home-school relationship outcome variables (home-based involvement and perceived joining with their child's teacher). Results are discussed in terms of their contribution to understanding factors that may contribute to academic risk or resilience in young children.

Keywords: inattention, hyperactivity, parental involvement, parent-teacher relationship, parental self-efficacy

ADHD and academic functioning

Attention-deficit/hyperactivity disorder (ADHD) is one of the most common childhood disorders worldwide (Wichstrøm et al., 2012), affecting approximately 5% of children (American Psychiatric Association, 2013; Polanczyk et al., 2007). The core characteristics of ADHD include deficits in attention and/or excess motor activity and impulsivity that occur in multiple settings and significantly interfere with daily functioning (American Psychiatric Association, 2013). Children can present with signs of inattention, hyperactivity and impulsivity as early as age 2.5 years (Harpin, 2005). Approximately 2% of preschool-aged children meet full diagnostic criteria for ADHD (Polanczyk et al., 2007). Some children outgrow their symptoms, however as many as 30-60% continue to experience symptoms in adulthood (Newton-Howes, 2004).

Children with symptoms of ADHD are more likely to experience academic difficulties across their academic lifespan (Daley & Birchwood, 2010). As early as preschool, children with symptoms of ADHD are more likely to demonstrate deficits in foundational learning skills (Barbaresi, Katusic, Colligan, Weaver, & Jacobsen, 2007) and in cognitive functioning (Daley & Birchwood, 2010; Friedman-Weieneth et al., 2007), which impair their ability to perform academically and build language and mathematic skills (Peisner-Feinberg et al., 2001; Romano et al., 2010; Weigel et al., 2006). Thus, before they even enter the classroom, children with symptoms of ADHD are already likely to be behind their peers with respect to foundational learning skills (DuPaul, McGoey, Eckert, & VanBrakle, 2001; Massetti et al., 2008). These early academic difficulties predict long-term academic and occupational challenges for children (Mcgee et al., 1991; Washbrook et al., 2013), thus it is important to understand factors that might support these children during their foundational academic years.

The transition into school

The transition into kindergarten represents a critical developmental period wherein children begin to acquire the skills necessary for later school success (Rimm-Kaufman & Pianta, 2000). Beyond academic skills, the quality of the relationships and interactions between the child, the school, and the home during this time period sets the precedent for the children's later relationships within the school (Christenson, 1999; Henrich & Blackman-Jones, 2006; Powell, Son, File, & San Juan, 2010; Ramey & Ramey, 1999). It is now widely accepted that a child's development of "readiness" for school evolves through the dynamic interactions between the child's core skills and their foundational relationships with their environment (Boivin & Bierman, 2013; High, 2008; Kagan, 1992; Janus & Offord, 2007).

Rimm-Kaufman and Pianta (2000) proposed a model for understanding the dynamic processes and systems involved in a child's transition into school. Building on previous ecological models of child development (e.g., Bronfenbrenner's Ecological Systems Model, 1977), Rimm-Kaufman and Pianta's (2000) *Ecological and Dynamic Transaction Model of Transition* posits that the relationships between factors related to the child and their systems (e.g., the family, teachers, peers, etc.) contribute directly and indirectly to a child's adjustment as the child enters kindergarten. Implicit in this model is the notion that factors related solely to the child (i.e., academic skills, competency) do not fully account for a "successful transition" into the school system. Indeed research has demonstrated that factors related to the child account for less than a quarter of variance in predicting academic adjustment and outcome (La Paro & Pianta, 2000). Rather, Rimm-Kaufman and Pianta (2000) propose that child-factors, system-factors, and relationships between child- and system-factors all contribute to the transition into school.

Defining the relationship between home and school: Parent involvement behaviours and the quality of the parent-teacher relationship

Following Rimm-Kaufman and Pianta's (2000) model, it could be argued that a successful transition into school can be quantified, at least in part, by relationships between the child's home (i.e., parents) and school systems. The relationship between the home and the school can be operationalized in various ways. For instance, some researchers discuss the relationship between the home and school in terms of parents' involvement behaviours (e.g., Epstein et al., 1997; Hoover-Dempsey et al., 2010; Pomerantz et al., 2007), while others focus on the quality of the parent-teacher relationship (e.g., Clarke et al., 2009; Kim et al., 2013; Sheridan et al., 2012). Parent involvement behaviours can take many forms, such as home-based academic activities (e.g., reading with their child, educational games), school-based activities (e.g., volunteering at school events and field trips), and communications between the home and school (e.g., phone calls, conferences, letters to and from home and school). The quality of the relationship between the child's parent and teacher can be conceptualized as feelings of cohesion (e.g., affiliation, support, dependability, shared expectations and beliefs about the child) and bi-directional communication between parties (e.g., mutual sharing of information and feelings) (Vickers & Minke, 1995).

Benefits of parental involvement and strong parent-teacher relationship

Empirically, there is a substantial body of research that highlights the importance of the relationship between the home and the school as measured via parental involvement and the quality of the parent-teacher relationship (Castro et al., 2015; Clarke et al., 2009; Fantuzzo et al., 2000, 2004; Hoover-Dempsey & Sandler, 1997; Kohl et al., 2000). Meta-analyses of studies on parental involvement in children's education demonstrate a positive relationship between

parental involvement and children's academic success that seems to be present across age groups, genders, ethnicities, and economic status (Castro et al., 2015; Fan & Chen, 2001; Jeynes, 2005, 2007; Ma et al., 2016). Parent involvement in their child's education as early as during kindergarten has shown to predict children's literacy, early mathematics skills, and approaches to learning, above the contribution of other family factors (e.g., child gender, maternal education, speaking other languages at home, household income) (Berthelsen & Walker, 2008). Beyond just academic skills, Hoover-Dempsey, Whitaker, and Ice (2010) outline the ways in which parental involvement positively influences children's development of foundational skills needed for school adjustment and learning, such as positive attitudes and beliefs about school and themselves as learners (e.g., sense of competence), self-regulatory skills (e.g., sense of responsibility, homework completion), motivation (e.g., autonomy, sense of personal control), and ability to access support from peers and teachers.

The quality of the relationships between parents and teachers have also been shown to be associated with various positive short and long-term outcomes, such as academic competence, social skills, homework completion, and the student-teacher relationship (Clarke et al., 2009; Dawson & Wymbs, 2016; Hughes & Kwok, 2007; Mautone et al., 2015; Serpell & Mashburn, 2012). In fact, some authors have even observed the quality of the parent-teacher relationship to be more strongly associated with positive child outcomes than amount of parent involvement (Kohl et al., 1994). Overall, parental involvement and the quality of the parent-teacher relationship seem to be robust predictors of positive academic-related outcomes in children, often accounting for greater variance in child outcome than sociodemographic factors (Castro et al., 2015; Dawson & Wymbs, 2016; Hoover-Dempsey et al., 2005; Jeynes, 2005, 2007; Kohl et al., 2000; Mautone et al., 2015; Rimm-Kaufman et al., 2003; Serpell & Mashburn, 2012).

Influences on parental involvement and parent-teacher relationship

Hoover-Dempsey and Sandler (1997) proposed a theoretical model outlining the factors that contribute to parents' decision to become involved in their children's education. This model proposes that parents' personal motivators (e.g., their perception of their role in their child's learning, and their perception of their ability to help their child learn, i.e., self-efficacy), contextual motivators (e.g., invitations from the school, the teacher, and the child to become involved in the child's learning), and contextual factors (e.g., time and resources, skills and knowledge, cultural beliefs) influence a parent's decision to become involved in their child's education. The influence of these factors on parents' actual involvement behaviours have also been demonstrated empirically (for review, see Hoover-Dempsey et al., 2010).

Self-efficacy

Hoover-Dempsey and colleagues (2005) have proposed a model for understanding factors that influence a parent's decision to become involved in their child's learning. According to their model, parent self-efficacy beliefs, that is, parents' perceived ability to positively affect change in their children's learning, contribute to parent involvement (Hoover-Dempsey et al., 2005). Bandura's (1977) theory dictates that self-efficacy beliefs are developed through experiences and observations of success and failure, feedback from others, and internal experiences related to one's performance. The presence of positive self-efficacy beliefs influence an individual's choice of activities, effort expenditure, and task persistence (Bandura, 1986; Jerusalem & Mittag, 1995).

There is a paucity of research on parental self-efficacy during a child's transition into school. Based on Bandura's (1977) theory we can hypothesize that parents who enter the school system with prior positive experiences of helping their child learn would be more likely to engage in behaviours that further foster feelings of efficacy (e.g., becoming involved in their

child's school, developing a stronger relationship with their child's teachers) and that also support their child's successful transition into school. Conversely, parents who enter the school system with lower self-efficacy (perhaps due to negative feelings or experiences related to helping their child learn before their child enters school) may be less likely to engage in practices that would foster greater feelings of efficacy (Ardelt & Eccles, 2001). Bandura's theory (1977) also suggests that experiences of persistence despite challenges can result in enhancement of self-efficacy beliefs. Applied to the transition into the classroom, we can hypothesize that a parent who is supported in helping their child learn, despite challenges, as their child enters the school system, might be able to develop new skills and a sense of efficacy that begets further positive parent involvement behaviours.

Indeed research has demonstrated a relationship between parent's beliefs in their ability to help their child at school and parental involvement behaviours (Bandura et al., 1996; Eccles & Harold, 1996; Green et al., 2007; Grolnick et al., 1997; Waanders et al., 2007). Similarly, researchers have shown relationships between parents' feelings of efficacy related to helping their child learn and the quality of the parent-teacher relationship (Kim et al., 2013; Pelletier & Brent, 2002). Available research on these relationships during the period of transition into the school system (preschool to kindergarten years) is limited. One Canadian study observed that parents who reported greater self-efficacy were also more involved in their child's learning in the context of a preschool early education program (Pelletier & Brent, 2002). Another study by Kim and colleagues (2013) found that parents' self-efficacy beliefs predicted the quality of the parent-teacher relationship in kindergarten to Grade 3 students. Overall, there seems to be relationship between self-efficacy beliefs and development of positive behaviours and relationships that would, in theory, support a successful transition into school. It seems a worthwhile to investigate

self-efficacy beliefs during a child's early years as a potentially malleable factor that could positively contribute to a child's transition into school.

Parental involvement, parent teacher-relationship, and parental self-efficacy in children with ADHD

Generally, there is a paucity of research on parental involvement and the quality of the parent-teacher relationship in families of children with symptoms of ADHD symptoms. Preliminary evidence from longitudinal studies suggests that, for children with ADHD, parent factors contribute to better academic functioning (Latimer et al., 2003) and parental involvement during high school contributes to less impairment in young adulthood (Howard et al., 2016). Despite the apparent benefit of parental involvement, data suggests that the presence of child inattentive and/or hyperactive/impulsive symptoms is negatively related to involvement behaviours (Shelleby & Ogg, 2020). Specifically, Shelleby and Ogg (2020) observed that inattentive and/or hyperactive/impulsive symptoms measured at age five predicted level of parental involvement at age nine, but parental involvement measured when the child was five years old did not predict child inattentive and/or hyperactive/impulsive symptoms at age nine.

Available data shows differences in the involvement behaviours of parents of children with ADHD compared to parents of children without ADHD (Montes & Montes, 2020; Musabelliu et al., 2018; Rogers et al., 2009). A recent American survey was the first to describe and compare specific parental involvement activities in parents of children (kindergarten to Grade 12) with and without ADHD (Montes & Montes, 2020). Parents of children with ADHD reported being less likely to participate in their child's classroom or to volunteer at their child's school and being more likely to attend parent-teacher conferences, to meet with guidance counselors, and to help their child's homework than parents of children without ADHD (Montes

& Montes, 2020). In Rogers and colleagues' (2009) study, parents of children (ages eight to twelve years old) with ADHD reported having less time and energy to devote to involvement activities and being less involved in their child's learning at home than parents of non-ADHD children.

It is possible that self-efficacy beliefs may explain some of the differences in involvement behaviours observed between parents of children with and without ADHD. A seminal study on parental involvement in children with ADHD observed that parents of children with ADHD reported significantly lower feelings of efficacy in their ability to help their child learn than parents of children without ADHD, even though these parents reported similar beliefs about the importance of their role in their child's education and comparable levels of knowledge and skill as the parents of children without ADHD (Rogers et al., 2009). In a similar study, parents of adolescents (ages thirteen to eighteen years old) with ADHD reported significantly lower self-efficacy beliefs related to their ability to help their child learn as compared to parents of non-ADHD adolescents, despite adolescents reporting their parents to be equally involved across groups (Musabelliu et al., 2018).

Parents of children with ADHD report receiving more requests from their child's teacher to become involved (Rogers et al., 2009) and receiving more notes and phone calls from their child's school than parents of non-ADHD children (Montes & Montes, 2020). It has also been reported that parents of children with ADHD tend to be more likely to view their children's negative behaviours as fixed, intentional, and difficult to control (Johnston & Freeman, 1997). It is therefore possible that parents of children with ADHD may be less likely to have early experiences of success in helping their child learn (despite their apparent level of skill and

efforts), which may contribute to negative feelings (i.e., frustration, fatigue and hopelessness) and lower feelings of efficacy.

With regards to the parent-teacher relationship, a systematic review of qualitative studies on the relationship between parents of children with ADHD and their child's teacher observed that parents of children with ADHD are more likely to perceive themselves as facing multiple hurdles (Gwernan-Jones et al., 2015). This study found that parents of children with ADHD experience feelings that can interfere with their self-efficacy, such as feeling criticized by their child's teacher, feeling different from other parents, and feeling like they did not have a voice at their child's school. Other authors have found that that parents' feelings of efficacy in their ability to help their child learn influenced the quality of the relationship between the home and school environments in school-aged children with ADHD (Mautone et al., 2015). Kim et al. (2013) found that parents' feelings of efficacy in their ability to help their child learn predicted the quality of the parent-teacher relationship in young children (kindergarten to Grade 3), even when children exhibited externalizing behaviours (such as hyperactivity).

Overall, parental self-efficacy seems to be an important correlate to various factors that contribute to a child's academic success. In fact, according to a recent study, it may even mediate the relationship between inattentive or hyperactive/impulsive symptoms and academic achievement in school-aged (eight to twelve-year-old) children (Ferretti et al., 2019). Yet parents of children with ADHD tend to experience lower feelings of parenting efficacy in general (Finzi-Dottan et al., 2011; Maniadaki et al., 2005; Mash & Johnston, 1983; Mikami et al., 2010) and specifically related to helping their child learn (Musabelliu et al., 2018; Rogers et al., 2009), which may affect their involvement in their child's school and in building a strong home-school collaboration.

The present study

The present study explored the relationship between parents' feelings of self-efficacy related to helping their child learn during the preschool year, their involvement behaviours and the quality of their relationship with child's teacher during the kindergarten year. Moreover, the present study also examined the robustness of parental self-efficacy as an early predictor of these home-school relationship variables by examining both the unique and interaction effects of parental self-efficacy and child inattentive or hyperactive/impulsive symptoms measured in preschool on parental involvement behaviours and the parent-teacher relationship in kindergarten.

Based on the above literature, it was hypothesized that parental feelings of efficacy related to their ability to support their child's learning during the preschool year would predict 1) parental involvement behaviours and 2) better perceived quality of parent-teacher relationships during the kindergarten year. There is some evidence that parental self-efficacy may mediate the link between inattentive and/or hyperactive/impulsive symptoms and academic achievement (Ferretti et al., 2019). Given the dearth of literature on these topics, the current study also explored whether parental self-efficacy would interact with child inattentive and/or hyperactive/impulsive symptoms in models predicting parental involvement behaviours and parent-teacher relationship quality.

Methods

Participants and procedure

Families were recruited from the community during their child's preschool year and followed longitudinally until the child's kindergarten year. Diverse recruitment methods (e.g., posters in the community, in-person recruitment at parenting expos/events, online advertisement on

parenting websites and social media groups, etc.) were used in attempt to obtain a robust and representative sample of families. Study advertisements targeted parents of children who would be starting school the coming Fall of that year and offered as compensation for their participation a school readiness assessment and brief report completed by a clinical psychologist. As the study was being conducted by the ADHD and Development Laboratory at the University of Ottawa, the study advertisements explicitly stated that families of children with and without attention difficulties were welcome to participate.

Phase 1. The initial assessment (T1) involved families of children in their preschool year visiting a university laboratory. Parents completed questionnaires assessing the variables of interest (e.g., child ADHD symptoms, parent feelings of efficacy). One hundred and fifteen families participated in the first phase of this study.

Phase 2. Families who consented to being contacted for the second phase of the study were contacted the following year (kindergarten, T2). Families were asked to complete an online battery of questionnaires and, with parental consent, online questionnaires were sent to the child's kindergarten teacher. Parents and teachers who participated in this second phase of the study did so during the later half (after January) of the child's kindergarten year. This was to allow time for the child's adjustment to being in kindergarten and for teachers to build a relationship with the child before completing online questionnaires. A total of 76 families completed the second phase of the study between 2017 and 2018.

Attrition. Of the 115 parents participated in first phase of the study, 76 (66%) went on to participate in Phase 2. This rate of attrition is consistent with what has been reported in previous studies (e.g., Littman et al., 2010). Independent sample *t*-tests between completers (n = 76) and non-completers (n = 38) did not reveal significant differences between groups in terms of key

demographic variables (e.g., average household income, highest level of parent education, parent marital status), parent-reported inattentive or hyperactive/impulsive symptoms during the preschool (T1) year, or in parental self-efficacy in the preschool year. Statistics reported below reflect the 76 families who participated in Phase 2.

Inclusion and exclusion criteria. Since study tasks were in English, only families who spoke English were eligible to participate. Families of preschool-aged children with a diagnosis of autism spectrum disorder or an intellectual disability were also not considered eligible for the present study. These inclusion and exclusion criteria were consistent with those outlined by other authors (e.g., Musabelliu et al., 2018; Ogg et al., 2016)

Both parents were encouraged to participate in the study when possible. For the purposes of the present analyses, only data from the primary parent are included. The primary parent was defined as either A) the only parent who participated in one or both phases of the study, or 2) the parent who completed the measures related to the child's behaviour. In most cases the biological mother was identified as the primary parent.

Parents. Parents ranged in age from 27 to 50 years old at the onset of the study (M = 37.82 years, SD = 4.90 years). Most parents identified as being biological mothers (92.1%, n =70). Two adoptive mothers (2.6%), one grandmother (1.3%), and three biological fathers (3.9%) participated as the primary parent in this study. Most parents self-identified as Caucasian (77.6%, n = 59), while 15.8% (n = 12) self-identified as other races (e.g., Aboriginal, Black, Asian, Middle Eastern, etc.) and 6.6% (n = 4) identified as being mixed race (i.e., Caucasian and Aboriginal, Caucasian and Latino).

Most parents who participated identified as heterosexual (98.7%, *n* = 75). Most parents were married (86.8%, *n* =66), while some reported living common-law with a partner (3.9%, *n* = 3), being separated (6.6%, *n* = 5), or being single (2.6%, *n* = 2).

Most families reported having two adults (88.2%, *n* = 67) living in the home, and most families reported having two children (60.5%, *n* = 46). Approximately eighteen percent (*n* = 14) of families reported having a single child, and 21% (*n* = 16) reported three or more children in the home.

In terms of highest level of education, many of the parents who participated in this study completed a Bachelor's (35.5%, *n* = 27) or a professional/graduate degree (42.1%, *n* = 32). Some had completed a trade school diploma (18.4%, *n* = 14), or a high school diploma (3.9%, *n* = 3).

Parents who participated represented a broad range of occupations, including public servants and office workers, teachers and professors, health care workers, engineers, and lawyers. Most parents (61.8%, *n* = 47) reported working between 21 to 40 hours per week, while 21.1% (*n* = 16) reported working more than 40 hours per week, and 17.1% (*n* = 13) reported working 20 hours per week or less. The majority of families reported earning an annual household income greater than $100 000 (55.3%, *n* = 42), while 27.6% (*n* = 21) reported earning between $75 000- $100 000, 10.5% reported earning between $45 000-$75 000 (*n* = 8), and 6.6% (*n* =5) reported earning $45 000 or less annually.

Children. Children were recruited during their preschool year (the year prior to entering kindergarten). Children ranged in age from approximately two and a half to five years old (*M* = 3.61 years, *SD*= .44 years) at the time of the first assessment, and between four and six years old (*M* = 4.76 years, *SD*= .49 years) at the time of the second assessment. The sample consisted of 40 girls (57%) and 36 boys (43%).

Measures

***Parental Involvement Project Questionnaire Self-Efficacy* (PIPQ-SE; Walker et al., 2005).** The PIPQ was developed based on the Hoover-Dempsey theory which organizes the psychological and contextual factors that influence a parent's involvement in their child's education (e.g., Hoover-Dempsey et al., 2005; Walker et al., 2005). The PIPQ Self-Efficacy Subscale (PIPQ-SE) was used for the present study. The PIPQ-SE consists of five items that examine parents' feelings of competence in their ability to be involved and affect change in their child's learning. Using a 6-point bipolar Likert scale ranging from 1 (*very strongly disagree*) to 6 (*very strongly agree*), parents reported on their feelings of efficacy related to their involvement in their child's learning. Scores are calculated by reversing the coding of negatively worded items and taking a sum. Possible scores range from 5 to 30, with higher scores representing greater feelings of efficacy. For the purposes of the present study and with the PIPQ-SE author's permission, some items of the PIPQ-SE were re-worded for the preschool (T1) assessment period to reflect this developmental period. For instance, "I know how to help my child in school" was changed to, "I know how to help my child learn". The PIPQ-SE has been shown to exhibit good internal consistency in previous studies (α = 0.74; Rogers et al., 2009), reliability, and validity (Walker et al., 2005). The PIPQ-SE also demonstrated good internal consistency in the present sample, with Cronbach's alphas of .84 and .79 in Phases 1 and 2, respectively.

***ADHD IV Rating Scale-IV - Preschool Version* (McGoey et al., 2007).** The ADHD Rating Scale-IV is a commonly used parent-report measure of ADHD symptoms in young children (Mahone & Schneider, 2012). The ADHD Rating Scale-IV was normed on a large, nationally (United States of America) representative sample of three to five-year-old children. In the present study, parents rated their child's behaviour over the past six months on a 4-point

Likert scale ranging from 0 (*rarely or never*) to 3 (*very often*). Total ADHD symptoms, inattentive symptoms, and hyperactivity/impulsivity symptoms subscales scores were generated; higher scores on any subscale represent greater ADHD symptomatology. Based on the overall cut-off scores outlined by McGoey et al. (2007), scores > 9 on the inattentive subscale and >10 on the hyperactive/impulsive subscale correspond to the 80th percentile or higher relative to the norming sample. In the current sample, 36% of children scored above the 80th percentile for inattentive symptoms in the preschool (T1) year and 38% scored above the 80th percentile for hyperactive symptoms in the preschool (T1) year. Parents completed this measure during the preschool (T1) and kindergarten (T2) years, respectively. Scores were compared across timepoints to assess for change (see Results section below). The ADHD Rating Scale-IV has shown good construct validity (strongly correlated to the Conners Parent Rating Scales for ADHD) and demonstrated good internal consistency in the norming sample (α = 0.79 to 0.96;), and in the current sample of parents (α = 0.79 to 0.93).

Family Involvement Questionnaire **(FIQ; Fantuzzo et al., 2000).** The FIQ is a parent-report measure of family involvement in activities related to their child's education. This scale was originally developed with a sample of urban children in kindergarten to first grade and has since been used in studies of preschool children (Fantuzzo et al., 2004; Waanders et al., 2007). The FIQ is It is comprised of 3 subscales: school-based involvement, home-based involvement, and home-school conferencing. The 9-item *school-based involvemen*t subscale reflects parents' involvement in activities at their child's school, such as volunteering, attending field trips, and involvement in school decision-making and policy. The 13-item *home-based involvement* subscale reflects parents' behaviours that support and promote their children's learning at home, such as provision of learning materials at home, involvement in community learning-programs,

and shared reading or other educational activities. Finally, the *11-item home-school conferencing* subscale reflects the frequency with which parents perceive themselves to engage in communication behaviours with their child's school, such as talking to school personnel about their child's educational difficulties and accomplishments or discussing ways to promote their child's learning at home. Parents reported on a 4-point Likert scale (*1- Rarely, 2- Sometimes, 3- Often, 4- Always*) the frequency with which they have engaged in various involvement behaviours during their child's kindergarten year. Sums for each subscale were generated, with higher scores reflecting a higher degree of perceived involvement. Each subscale of this measure has shown good psychometric properties in prior studies (e.g., Cronbach's α = .81 - .85; Fantuzzo et al., 2000; Mautone et al., 2015). The subscales of the FIQ showed good internal consistency in the present sample (school-based subscale: α = 0.73, home-based subscale: α = 0.82, and home-school conferencing subscale: α = 0.87).

***Parent-Teacher Relationship Scale-II* (PTRS-II; Vickers & Minke, 1995).** The PTRS-II is a 20-item measure of the quality of the relationship between parents and teachers. Using a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*), parents rated statements about their relationship with their child's kindergarten teacher (e.g., "we see this child differently"). The PTRS-II consists of two subscales, joining (15-items) and communication (5-items). The joining subscale assesses parents' sense of affiliation, support, and shared expectations/beliefs with their child's teachers, as well as parents' perceived ability to depend on their child's teacher. The quality of communication subscale reflects parents' perceptions of the quality of their communication of emotions and information with their child's teacher. Sum scores are generated for each subscale, with higher scores reflecting a stronger perception of parent-teacher relationship. The PTRS-II has shown good construct validity (Sheridan et al.,

2012) and internal reliability in previous research (Cronbach's α = 0.86 for the joining, α = 0.98 quality of communication subscale; Vickers & Minke, 1995). In the present study, parent scores resulted in Cronbach's alphas of 0.92 for the joining subscale and 0.85 for the quality of communication subscale.

Results

Data analytic plan

The current study used a longitudinal and correlational design. Independent variables (parental self-efficacy and child ADHD symptoms) were measured at both preschool (T1) and kindergarten (T2) time points. T-tests were used to assess for change in independent variables from preschool (T1) to kindergarten (T2). Independent variable data from preschool (T1) was used in the regression models if statistically significant differences between time points were not observed. Overall, bivariate correlations and a series of multiple regression analyses were used to test the stated hypotheses. To preserve statistical power, and given previous research that has demonstrated the value of separating inattentive and hyperactive/impulsive symptoms (Ogg et al., 2016), the present study examined inattentive and hyperactive/impulsive symptoms as separate, dimensional variables. Two separate interaction variables were calculated between 1) parental self-efficacy and inattention symptoms (PIPQ-SE * Inattention) and 2) parental self efficacy and hyperactive/impulsive symptoms (PIPQ-SE * Hyperactive). Data was first mean centered in order to prevent issues related to multicollinearity. These interaction variables were intended to provide data as to whether interaction effects between symptoms and parental self-efficacy played a role in the outcome variables: parent involvement and the perceived quality of the parent-teacher relationship. These interaction variables, as well as parental self-efficacy, inattentive symptoms, and hyperactive/impulsive symptoms, were used as independent variables in the regression analyses. Parents' ratings of involvement (home-based, school-based, and home

school communication) and perceived quality of the parent-teacher relationship (joining and quality of communication) were used as separate outcome/dependent variables in regression analyses (note: dependent/outcome variables were all only measured at T2). For a visual model of the planned regression analyses, see Figure 3 in the appendices.

Data Treatment

Missing values analysis was conducted on relevant raw data from T1 and T2, revealing 8.34% total missing data. Given that data were missing completely at random, as indicated by a non-significant Little's MCR $\chi^2 = 4635.94$, DF = 19510, $p = 1.00$ (Little, 1988), and the proportion of missing data was relatively small (e.g., less than 10%) (Scheffer, 2002), a single imputation method (28 iterations) using the expectation maximization method was used to impute the missing data (Enders & Bandalos, 2001).

Data was assessed visually (plots) and using the equation Skew/S.E. Skew for normality. Some variables of interest showed statistically significant skew (e.g., z skew score +/-1.96). Skewed data were treated using the Winsorization method (Duan, 1999) to correct skewness. All moderated regression analyses below were conducted using both the original and the transformed Winsorized data. Results did not show significant differences in terms of direction or magnitude of relationships, suggesting that the observed results are robust. Therefore, to simplify interpretation, results of original data are presented below. Additionally, a less conservative non-adjusted alpha level was used due to the exploratory nature of this study (Rubin, 2017).

Preliminary Analyses

Parent and child gender differences. Preliminary analyses were conducted to examine potential differences in variables of interest related to parent and child characteristics. Bivariate correlations and analyses of variance (ANOVAs) revealed no statistically significant

relationships between parent gender and any variables of interest, nor any differences between mother and father-reported data for variables of interest. Therefore, all parent data (mothers and fathers) is used in the following analyses.

Statistically significant relationships were observed between child gender and parent-reported preschool (T1) symptoms of hyperactivity (r = -.25, $p < 0.05$; girls M = 7.70 [SD = 4.30], boys M = 10.25 [SD = 5.79]. No other statistically significant relationships were observed between child gender and variables of interest. Given that this was the only gender difference observed and the size of the present sample, data for both boys and girls used in order to conserve statistical power for all the following analyses.

No significant relationships were observed between child age and inattentive symptoms or hyperactive symptoms at either time point (T1 or T2).

ADHD symptom ratings over time. Paired-sample t-tests were used to assess for differences in parent reports of child ADHD symptoms between time points. Inattentive symptoms were reported to be statistically higher at preschool (T1) than in kindergarten (T2). See Table 3 for results. Previous research has highlighted that early inattentive symptoms, more so that hyperactive symptoms, are more indicative of later ADHD diagnosis or level of impairment (Curchack-Lichtin et al., 2014). For the purpose of the following predictive analyses, preschool (T1) inattentive and hyperactive/impulsive symptoms were used for all longitudinal analyses.

[INSERT TABLE 3 HERE]

Change in parental self-efficacy over time. Paired sample t-tests were conducted to compare learning-related parental self-efficacy (PIPQ-SE) during preschool (M = 23.32, SD = 4.46; scores ranging from 10 to 30) and kindergarten time points (M = 22.88, SD =3.85; scores

ranging from 12 to 28). No statistically significant change in scores across time points were observed [t (76) = .95, p =.34]. For the purpose of the following predictive analyses, preschool (T1) PIPQ-SE scores were used for all longitudinal analyses.

***Relationship between variables*.** Preliminary bivariate correlation analyses were first conducted to examine relationships between variables of interest (Table 4). Preschool (T1) inattentive symptoms (r = -.41, p < 0.001**) and preschool (T1) hyperactive symptoms (r = -.59, p < 0.001**) were observed to be statistically significantly negatively related to preschool parental self-efficacy (T1). Kindergarten (T2) inattentive symptoms (r = -.45, p < 0.001**) and kindergarten (T2) hyperactive symptoms (r = -.30 p < 0.001**) were observed to be statistically significantly negatively related to kindergarten parental self-efficacy (T2). Preschool (T1) inattentive or hyperactive symptoms were not observed to be statistically significantly related to home-based involvement (T2), school-based involvement (T2), home-school communication (T2), parent perceived joining with their child's kindergarten teacher (T2), or parent perceived quality of communication with their child's teacher (T2). Kindergarten inattentive symptoms (T2) were observed to be statistically significantly related to T2 home-school conferencing (r = .24, p < 0.05*). Kindergarten hyperactive symptoms were observed to be statistically significantly related to T2 home-school conferencing (r = .24, p < 0.05*) and to T2 parent perceived joining with their child's kindergarten teacher (r = -.23, p < 0.05*). Preschool parental self-efficacy (T1) was observed to be statistically significantly related to T2 home-based involvement (r = .28, p < 0.05*), and T2 parent perceived joining with their child's kindergarten teacher (r = .29, p < 0.001*). Kindergarten parental self-efficacy (T2) was observed to be statistically significantly related to T2 home-based involvement (r = .48, p < 0.001*), T2 school-based involvement (r =.31 , p < 0.001**), T2 parent perceived joining with their child's

kindergarten teacher (r = .43, p < 0.001**), and T2 parent perceived quality of communication with their child's kindergarten teacher (r = .23, p < 0.05*).

[INSERT TABLE 4 HERE]

Interaction effects

A set of exploratory enter-method multiple linear regression analyses were first conducted to examine the effects of T1 parent-reported inattentive and hyperactive/impulsive symptoms, T1 learning-related parental self-efficacy (PIPQ-SE), and the interaction between these independent variables (T1PIPQ-SE*T1 Inattentive/Hyperactive) on each of the indicators of school functioning assessed. The interaction variables did not emerge as significant contributors to variance in any of the models. The interaction variables were subsequently removed from the analyses.

Parental self-efficacy during preschool and parental involvement behaviours during kindergarten (Table 4). A series of six multiple regression analyses were conducted. The models included either 1) T1 inattentive symptoms and T1 parent self-efficacy, or, 2) T1 hyperactive symptoms and T1 parental self-efficacy as independent variables. Parent-reported involvement behaviours (T2 home-based involvement, T2 school-based involvement, T2 home-school communication) were each used as separate dependent variables.

The model that explored the relationship between T1 parental self-efficacy and T1 inattentive symptoms showed statistically significance [F (2, 74) = 3.08, p =.05*, R^2 = .08], with parental self-efficacy emerging as a salient predictor of home-based involvement (T1 PIPQ-SE: β = .28, t(73) = 2.29, p < .05*; inattentive symptoms: β = .01, t(73) =.06, n.s..). The model that explored the relationship between T1 parental self-efficacy and T1 hyperactive/impulsive symptoms showed statistically significance [F (2, 74) = 5.65, p <.05*, R^2 = .13], with parental

self-efficacy emerging as a salient predictor of home-based involvement (T1 PIPQ-SE: β = .27, $t(73) = 3.20$, $p < .05$*; hyperactive symptoms: $\beta = .27$, $t(73) = 2.18$, $p < .05$*). In these models, parent-reported self-efficacy beliefs carried more weight than inattentive or hyperactive symptoms in parent-reported home-based involvement in kindergarten.

[INSERT TABLE 5 HERE]

No statistically significant effects were observed in the models that examined the relationships of T1 inattentive symptoms and T1 parental self-efficacy to T2 school-based involvement or home-school conferencing; or the models that examined the relationships of: T1 hyperactivity symptoms and T1 parental self-efficacy to T2 school-based involvement or home-school conferencing. This suggests that other factors that were not measured in the current study likely need to be considered to explain the relationship between the current variables of interest (symptoms and parental self-efficacy) and these outcomes.

Parental self-efficacy during preschool and the parent-teacher relationship in kindergarten. Another series of multiple regression analyses examined parent-teacher relationship variables as outcomes. The multiple regression model examining the predictive effects of T1 child inattentive symptoms and T1 parental self-efficacy on T2 parent ratings of joining with their child's kindergarten teacher was observed to be statistically significant [F (2, 74) = 4.00, $p < .05$*, $R^2 = .10$; T1 PIPQ-SE: $\beta = .25$, $t(73) = 2.02$, $p < .05$*); inattentive symptoms: β = -.12, $t(73)$ = -.97; n.s.). The model examining the predictive effects of T1 hyperactive symptoms and T1 parental self-efficacy on T2 parent ratings of joining with their child's teacher during the kindergarten year was also observed to be statistically significant [F (2, 74) = 3.73, $p <.05$*, $R^2 = .09$]. In this model, T1 parental self-efficacy accounted for more

variance in perceived T2 parent-teacher joining than did T1 child hyperactivity symptoms (T1 PIPQ-SE: β = .26, $t(73) = 2.18$, $p < .05$*; hyperactive symptoms: β -.08, $t(73) = -.68$, n.s.).

No statistically significant predictive effects were observed for T1 child inattentive symptoms and T1 parental self-efficacy or T1 child hyperactive/impulsive symptoms and T1 Parental self-efficacy on parents' perceived quality of communication with their child's kindergarten (T2) teacher.

Discussion

The present study examined the relationship between parents' feelings of learning-related self-efficacy, child ADHD symptoms in preschool, and early indicators of a successful transition into kindergarten (i.e., parent involvement behaviours and the quality of the parent-teacher relationship). Findings suggest that, in some cases, parents' early (preschool) feelings of efficacy related to helping their child learn play a small, but meaningful, role in predicting some outcome variables related to a successful transition into school, when considered along with early child inattentive and hyperactive/impulsive symptoms. Series of multiple regression analyses observed that parent-reported self-efficacy and child inattentive and hyperactive/impulsive symptoms in preschool accounted for 8%-13% of variance in home-based parent involvement during kindergarten and in perceived joining and the quality of communication with the child's kindergarten teacher. Strikingly, in these models, parental self-efficacy accounted for more variance in outcome than did inattentive and hyperactive/impulsive symptoms. Furthermore, looking at data from a cross-sectional view, parent self-efficacy in kindergarten was found to be meaningfully positively correlated to home-based involvement, school-based involvement, parent perceived joining with their child's teacher, and quality of communication with their child's teacher in kindergarten. Findings are interpreted in terms of their support of the argument

that parental self-efficacy may be worth further exploration as a potentially meaningful resiliency factor to target in early academic interventions for children with inattentive and/or hyperactive/impulsive symptoms.

The present study observed a significant negative correlation between parent-reported child inattentive and hyperactive/impulsive symptoms and parental self-efficacy at both time points. This finding is consistent with previous studies, which have found parents of school-aged children and adolescents with ADHD to report lower learning-related parental self-efficacy than parents of typically developing children (Musabelliu et al., 2018; Rogers et al., 2009). Research has identified various challenges associated with parenting a child with ADHD symptoms that could result in parents feeling less confident in their skills (Deault, 2010; Finzi-Dottan et al., 2011; Lifford, Harold, & Thapar, 2009; Maniadaki, Sonuga-Barke, & Kakouros, 2005; Mash & Johnston, 1983; Mikami, Jack, Emeh, & Stephens, 2010). For example, parents of children with ADHD symptoms are more likely to report higher levels of stress (Harrison & Sofronoff, 2002) and fewer rewarding interactions with their child (De Wolfe, Byrne, & Bawden, 2000; Deault, 2010). Parents of children with ADHD are more likely to perceive their child's inattentive and hyperactive/impulsive behaviours as intentional, difficult to control, and stable over time than parents of typically developing children (Barkley, 1990; Johnston & Freeman, 1997). It is possible that these negative attributions may in part explain the negative relationship between children's inattentive or hyperactive/impulsive symptoms and parents' feelings of confidence in their abilities to help their child learn, even in this young sample.

In the current sample, parent reports of self-efficacy remained stable between the preschool and kindergarten year. Given the variability of scores observed at both time points, it seems unlikely that this lack of change can be explained by a floor or ceiling effect. It is possible

that the measure of self-efficacy used in this study was not sensitive enough to detect changes over a short (1 year) time window, it is also possible that changes in the child's learning environment and demands (i.e., school entry) during this time period did not significantly shift parents' self-efficacy beliefs. Available cross-sectional data from the present sample and from samples of elementary school-aged children (Rogers et al., 2009) and adolescents with ADHD (Musabelliu et al., 2018) suggests that parents of children with ADHD report lower self-efficacy related to helping their children learn across their child's academic career (e.g., preschool to high school). While long-term longitudinal studies would be needed in order to confirm this observation, these findings would be consistent with self-efficacy theory (Bandura, 1977). Specifically, self-efficacy theory submits that positive self-efficacy beliefs motivate effort and perseverance in the face of obstacles, thereby perpetuating further positive beliefs and effort (Bandura, 1977; 1986; Coleman & Karraker, 1998). Although in theory, a positive experience related to a task, even in the face of obstacles, could increase one's self-efficacy (Bandura, 1977), generally, negative self-efficacy beliefs may be more likely to predict further decline. Therefore, if parents of children with elevated ADHD symptoms are entering the school system feeling less capable of helping their children learn, these parents may be less likely to exert effort to take steps to help their children learn, therefore making themselves less likely to have positive experiences that could begat an increase in self-efficacy beliefs over time (Bandura, 1977; 1986; Coleman & Karraker, 1998).

Theory would suggest that lower self-efficacy beliefs in parents would predict lower efforts related to helping their children learn (e.g., involvement behaviours) (Bandura, 1977; Hoover-Dempsey & Sandler, 2005). The present study and available research on parents of children with ADHD show mixed support for this theory. The present study observed that parent self-efficacy

in preschool was meaningfully related to parent-reported involvement in home-based learning activities in kindergarten, even when early child inattentive and hyperactive/impulsive symptoms were considered. Parental self-efficacy was also meaningfully correlated to parent-reported school-based involvement during kindergarten in the current study. Contrary to hypotheses however, statistical models that observed the relationship between school-based involvement and preschool parental self-efficacy when considered along with child inattentive or hyperactive/impulsive symptoms were not statistically significant, and nor were models predicting home-school conferencing. Other authors have similarly observed a differential relationship between parental self-efficacy and home-based involvement, as compared to other forms of involvement. For example, Anderson and Minke (2007) found parental self-efficacy to be directly related to home-based involvement activities, but not to school-based involvement activities, in a sample of urban school-aged children and their families. Further, Primevera (2000) studied the effects of a program designed to increase parents' feelings of efficacy related to helping their child with early literacy skills, and found that parents who felt more efficacious post-intervention were more likely to engage in home-based literacy activities with their child.

It is possible that other parent-factors beyond just self-efficacy beliefs are important to consider when trying to understand parental involvement in school-based activities or home-school conferencing in such a young sample of families of children with varying levels of inattentive and/or hyperactive/impulsive symptoms. For instance, parent time and energy has been found to play a major role in predicting school-based involvement in parents of children with special needs (Fishman & Nickerson, 2015). Surely previous studies have observed that parents of children with ADHD are more likely to report having less time and energy to support their child's learning than parents of children without ADHD (Rogers et al., 2009). Parents of

children with ADHD are also known to receive more calls and notes home and requests from their child's school for involvement (Montes & Montes, 2020; Rogers et al., 2009), which is generally known to be another major predictor of parent involvement activities (Fishman & Nickerson, 2015). Yet, perhaps because parents of children with ADHD symptoms are more likely to feel judged or criticized by their child's school (Gwernan-Jones et al., 2015), these notes home and requests do not seem to have the desired effect of getting parents more involved in school-based activities (Montes & Montes, 2020; Rogers et al., 2009).

This brings us to the importance of the home-school relationship. Indeed, research and school policies have highlighted the importance of fostering strong parent-teacher relationships in order to increase parental involvement in children's education and improve academic outcomes for children (Daniel, 2015; Knopf & Swick, 2008). During this developmental period of transition from preschool to kindergarten, communication between parents and teachers is most often parent-initiated (Rimm-Kaufman & Pianta, 1999). It seems logical that parents who feel more confident in their ability to help their child learn would be more likely to initiate communications with their child's teacher that could foster quality parent-teacher partnerships (Clarke et al., 2009). In the current study, learning-related parental self-efficacy measured in the preschool year seemed to be particularly meaningful to parent perceptions of the quality of the parent-teacher relationship in kindergarten. Parents who experienced more self-efficacy related to helping their child learn in preschool were more likely to report a sense of affiliation with their child's kindergarten teacher, even when their child's early inattentive or hyperactivity/impulsivity symptoms were considered. These findings are consistent with those of Kim et al. (2013), who observed that parents' self-efficacy was related to the quality of their relationship with their

child's teacher in kindergarten to Grade 3 children, even when child behavioural problems were considered.

Parents of children with ADHD are more likely to experience strained relationships with their children's teachers (Mautone et al., 2011, 2015), which could result in a decline in self-efficacy beliefs. Self-efficacy theory begets that experiences of negative feedback (e.g., from a child's teacher) or affect associated with a task (e.g., trying to support their child's learning) can weaken self-efficacy beliefs, and in turn further efforts to engage in that task (Bandura, 1977). Previous research found that parents of school-aged children with ADHD are generally more likely to perceive the school as less inviting and welcoming and to feel criticized by their child's teachers (e.g., Gwernan-Jones et al., 2015; Rogers et al., 2009). Although the lack of a fully cross-lagged or experimental design in the current study do not allow for concrete conclusions about the direction of the relationship between variables, it is possible that early interventions that support parental self-efficacy before children enter the school system would prepare parents for more favorable perceptions of their child's teacher from school outset, even if their child is at risk for ADHD. Parents who feel more efficacious as their child transitions into school may therefore be more willing to engage in behaviours that maintain good relationships with their child's teachers over time (e.g., seeking opportunities to receive encouragement or observe teacher strategies), which could result in greater support for their child's learning, both at home and at school. From this ecological perspective, targeting parental self-efficacy may offer broad and robust benefits to all children, including those at risk for developing more severe difficulties with inattention and/or hyperactivity.

Limitations and future research

The present study aimed to describe learning-related parental self-efficacy during the transition into school, and to explore its potential as a predictor for foundational elements of early school success (e.g., parental involvement and the quality of the parent-teacher relationship) when inattentive and hyperactive/impulsive symptoms are also considered. The current study drew from a community sample and followed families for one year during their child's transition into kindergarten. The nature of the selected sample and the short assessment follow-up period limit the conclusions that can be drawn from current findings in some ways.

Parents who participated in the present study reported a relatively high socioeconomic status (as evidenced by high levels of post-secondary education and household incomes greater than $75, 000 annually). Socioeconomic status has been related to parental self-efficacy (Kikas & Mägi, 2015), parental involvement behaviours (Berthelsen & Walker, 2008; Fantuzzo et al., 2000; Fishman & Nickerson, 2015; Kohl et al., 2000), and parent-teacher relationships (Hughes & Kwok, 2007). It is possible that parents from this demographic group differ from less educated and more economically disadvantaged families in important ways, such as their beliefs about the value of education, their time and financial resources for helping their child, and their overall levels of stress (Hoover-Dempsey et al., 2005).

Despite active efforts to recruit both mothers and fathers for the current study, the sample consisted of primarily mothers. This pattern of parental participation is commonly observed in research on parental involvement (e.g., Rogers et al., 2009). Preliminary comparison of means tests (*t*-tests) were used to explore differences between mothers and fathers in the current sample. Although no statistically significant differences were observed, further research with larger samples of both mothers and fathers would be required in order to examine

differences between mothers and fathers related to self-efficacy, involvement, and parent-teacher relationships.

Despite drawing from a non-clinical community sample, in the current study, parent-reports of child ADHD symptoms on the ADHD-IV Rating Scale Preschool Version (Mcgoey et al., 2007) were relatively high compared to samples of preschool-aged children in validation studies of this scale. Indeed, between 36% and 38% of children in the current study scored above the 80th percentile relative to the norming sample on this measure. Despite this distribution of inattentive and hyperactive/impulsive symptoms, studies examining clinical populations of young children with ADHD are needed in order to assess whether findings generalize to a clinical sample.

Despite these limitations, however, the present study advances our understanding of learning-related parental self-efficacy during the transition into school and how this relates to inattentive and hyperactive symptoms, parental involvement, and the parent-teacher relationship in a community sample. Future research should employ a fully cross-lagged design and follow families for a longer time window (e.g., from preschool to Grade 1) in order for more solid conclusions regarding the direction of relationships between parental self-efficacy, parental involvement, the quality of the parent-teacher relationship, and child inattentive or hyperactive symptoms can be made.

It is worth noting that a recent study observed an interaction effect between parental self-efficacy, ADHD symptoms, and academic outcomes in school-aged children (Ferretti et al., 2019). Specifically, it was observed that there was less of a gap in academic achievement for children with inattentive or hyperactive/impulsive symptoms if their parents reported more confidence in their ability to help their child learn and felt more responsible for helping their

child learn (Ferretti et al., 2019). Although the current study did not observe interaction effects between parental self-efficacy and child inattentive or hyperactive/impulsive symptoms on the school functioning variables studied in this non-clinical sample, it is possible that future research using clinical samples or examining other academic variables may observe different results. Indeed parental self-efficacy was fond to be related to some of the school functioning variables studied here, and perhaps future research should explore the role of this variable as a moderator between inattentive and hyperactive/impulsive symptoms and academic achievement.

Existing interventions for children with behaviours problems support parental self-efficacy by teaching parents' skills for managing specific child behaviour problems (Sanders & Woolley, 2005). Findings from the current study suggest that parental self-efficacy was related to home-based involvement and the quality of the parent-teacher relationship. It is possible that early academic intervention programs that support parents with skills to support their child's learning could enhance parents' home-based involvement and the quality of the parent teacher relationship.

Chapter 4: Conclusion

It has previously been stated that there is a need for research examining the role of parents in the academic functioning of children with ADHD symptoms (Deault, 2010). The current studies contribute to this need by exploring the relationship between parents' beliefs in their ability to help their child learn and early academic functioning in children with varying levels of inattentive and hyperactive/impulsive symptoms. Overall findings suggest that parental self-efficacy is indeed related to some aspects of children's early school functioning, even when inattentive and hyperactive/impulsive symptoms are considered. More specifically, although parental self-efficacy did not unanimously emerge as being meaningfully related to all academic outcome variables studied (e.g., school-based involvement, home-school conferencing) with multiple regression models, it was observed to play a statistically significant role in explaining some variance in academic enablers, home-based parental involvement, and parents' perception of the quality of the parent-teacher relationship. In fact, in some models, parental self-efficacy accounted for more variance in academic outcomes than did inattentive or hyperactive/impulsive symptoms.

Contribution to research

Findings add to the growing body of research that is seeking to understand factors that may contribute to academic success in children with inattentive or hyperactive/impulsive symptoms. First, the current studies are among the few studies to investigate the relationship between academic enablers and inattentive and hyperactive/impulsive symptoms in such a young sample. The patterns of relationship between specific academic enablers and ADHD symptoms observed in the current research were not fully consistent with previous research. Although the negative relationship between interpersonal skills and both inattentive and hyperactive/impulsive symptoms that was observed in the current sample is similar to findings in previous work (Ogg et

al., 2016; Volpe et al., 2006), the lack of significant relationship between ADHD symptoms and classroom engagement and between motivation and hyperactive/impulsive symptoms in the current study did not fit with prior research. Indeed, previous work has observed a positive relationship between hyperactivity symptoms and both motivation and engagement in young children (Ogg et al., 2016). These differences suggest that further research is needed to clarify the relationships between specific academic enablers and ADHD symptoms, perhaps to inform whether interventions that target specific academic enablers would be worthwhile to enhance academic achievement in young students with ADHD symptoms.

Second, findings add to burgeoning body of literature on parental involvement and parent-teacher relationship quality in children with ADHD symptoms. Recent research has outlined some differences in the involvement behaviours of parents of children with ADHD compared to parents of children without ADHD (Montes & Montes, 2020) and a recent study found that level of child ADHD symptoms measured at age five negatively predicted later parental involvement (Shelleby & Ogg, 2020). The absence of a significant direct relationship between ADHD symptoms and parental involvement in the current young sample could imply that there may be a window of time (perhaps before ADHD symptoms become more severe or before academic difficulties start to develop) wherein there is no relationship between ADHD symptoms and parental involvement. This absence of a relationship in early years could indicate a potential opportune time to intervene before parents of children with ADHD symptoms develop less helpful patterns involvement. Evidence from the regression models in the current studies also suggest that parental self-efficacy could positively relate to some parental involvement behaviours even when inattentive and hyperactive/impulsive symptoms are present. This offers some support to Hoover-Dempsey and colleagues' (2005) theory of factors that

predict parental involvement and offers tentative evidence that perhaps self-efficacy may be a mechanism by which to increase some forms of parental involvement in children with ADHD symptoms. Fully cross-lagged longitudinal studies will be needed to clarify the direction of the relationship between ADHD symptoms, parental-self efficacy, and involvement over time, although it is possible that factors, like parental self-efficacy, may be able to support parent involvement in parents of children with ADHD symptoms.

In terms of the parent-teacher relationship, currently, there is little data on the quality of parent-teacher relationships in kindergarten children with ADHD symptoms. There is however, evidence that parents of school-aged children with ADHD tend to report difficulties in the relationship with their child's teacher (e.g., feeling criticized by their child's teacher, feeling unsupported) (Gwernan-Jones et al., 2015; Rogers et al., 2009). Current findings add to this body of research; they did not observe statistically significant direct relationships between parents' perception of the quality of the parent-teacher relationship and child ADHD symptoms in this young sample. It is possible that child inattentive and hyperactive/impulsive symptoms may not influence parents' perception of the quality of the parent-teacher relationship until later in children's school development. It is also possible that ADHD symptoms do not play a significant role in the parent-teacher relationship when they occur in subclinical levels (e.g., in a community sample). Further research is needed to better understand the relationships between ADHD symptoms, parent-teacher relationship quality, and academic performance, as well as the developmental course of these relationships. Studies with clinical population of children with ADHD would also be needed to explore the generalizability of current findings. Such information would facilitate the development of supports for parents and teachers of children

with ADHD symptoms and help inform when such supports would be most likely to positively effect children's academic experience.

Finally, findings add to the body of research on learning-related parental self-efficacy in parents of children with ADHD symptoms. They illustrate that as early as preschool, there seems to be a negative relationship between parent-reported child ADHD symptoms and parents' feeling of efficacy related to helping their child learn. This pattern has previously been observed in parents of school-aged (Rogers et al., 2009) and adolescent children with ADHD (Musabelliu et al., 2018). It is possible that parents of children with ADHD symptoms may indeed experience lower feelings of efficacy related to helping their child learn across their child's development (e.g., from preschool to high school) and even when their child's ADHD symptoms are subclinical. It is also possible that parents who report lower efficacy also report more inattentive and hyperactive/impulsive symptoms in their children. Further research with multiple informants or clinical assessment of ADHD symptoms would be needed to clarify our interpretation of findings.

Contribution to theory

Theory dictates that children develop within an ecological system and that parents are an important and meaningful part of this system (Bronfenbrenner, 1977; Rimm-Kaufman & Pianta, 2000). Research is in its nascency with regards to understanding the systems that influence academic functioning in young children with ADHD symptoms (Deault, 2010). The current body of research adds to our understanding the systems that surround children with varying levels of ADHD symptoms as they transition into school. Findings from the current studies support existing ecological theories of child development in that parents' beliefs did indeed relate to factors at other levels of the child's ecological system. Parental self-efficacy was found to be

related to factors related to the child (e.g., academic enablers), the home (e.g., home-based parental involvement), and the mesosystem between the home and school (e.g., the parent-teacher relationship). These relationships seemed to exist regardless of ADHD symptoms in the child. Further research is needed to clarify the nature (direct, indirect, or transaction) and direction of these relationships. It is however possible that factors related to the parent, such as parental self-efficacy, may hold more influential weight within a child's ecological system than do the child's ADHD symptoms. Parental self-efficacy was selected as a key variable in the current studies because of a body of literature that suggested it is a potentially malleable belief that can exert wide-ranging influence on parenting behaviours (e.g., involvement) (Hoover-Dempsey et al., 2005) and child outcomes (Jones & Prinz, 2005). Therefore, should further research corroborate that parental self-efficacy holds significant weight in influencing the overall academic functioning of children with ADHD symptoms, there is potential for developing interventions related to parental self-efficacy that have far-reaching benefit for children and their families.

In theory, from an ecological perspective, a parent who is supported in feeling more efficacious will not only exert a positive impact on their child, but on all their children (in multi-child homes), on their children's teachers, and on other parents in their community. According to social learning theory (Bandura, 1977), self-efficacy begets further positive efforts and behaviours, and is a socially contagious variable. Parents who model self-efficacy in learning to their children are more likely to have children who feel confident in their ability to learn (Jones & Prinz, 2005; Schunk & Zimmerman, 1996). Friends and relatives of parents who model self-efficacy around learning are also more likely to feel inspired to take steps towards developing self-efficacy themselves, therefore changing entire family-systems and community networks.

Finally, teachers too would likely benefit from parental self-efficacy, in that they might feel more supported by parents, have amore positive relationship with parents, and therefore have more capacity and resources to help more children learn. Although it could be argued that these proposed implications may be idealistic, it could equally be argued that they are not outside the realm of possibility. They highlight the possible value and importance of further research on the potentially influential variable: parental self-efficacy.

Implications for practice

Findings from the current and previous (Musabelliu et al., 2018; Rogers et al., 2009) studies show a negative relationship between level of child inattentive and hyperactive/impulsive symptoms and parental self-efficacy related to helping children learn. The current findings show that this negative relationship is reported even before the child has entered the school system. This may mean that parents who report more ADHD symptoms in their child are entering into the school system with their child already feeling less secure in their capacity to help their children learn. According to social learning theory (Bandura, 1977), individuals with lower self-efficacy are less likely to take as active efforts towards a task. Applied to the current findings, it is possible that parents entering the school system already feeling less capable of helping their children learn, may be less likely to take active steps towards supporting their children. Given that children with inattentive and hyperactive/impulsive symptoms are more likely to experience academic difficulties (Frazier et al., 2007; Polderman et al., 2010) and parents of these children are more likely to receive feedback from their child's school (Montes & Montes, 2020) that could elicit negative emotions, thus making parents even more likely to feel less efficacious in their abilities to support their child's learning, this could be of major concern. Children with inattentive and hyperactive symptoms seem to require more support with learning from their

parents than do typically developing children (Deault, 2010). It will be important to develop ways to support these parents early on, so they are more likely to take active steps towards supporting their children from the outset of schooling.

The importance of parents has previously been highlighted in general ADHD interventions, such as behaviour training (Pfiffner & Haack, 2014), but researchers and clinicians are beginning to also recognize the value of parental self-efficacy, specifically. It has been observed that higher parenting self-efficacy is related to parents' intention to seek treatment for their child's ADHD symptoms (Maniadaki et al., 2006) and to perceive treatments as more effective (Jiang et al., 2014). This has led authors to extrapolate that maybe parents who feel more efficacious may be more likely to adhere to parent-based interventions for ADHD.

In terms of existing interventions that target parental self-efficacy, one parent-based intervention, the Confident Parent program, has been developed for parents of preschool-aged children with externalizing symptoms, like hyperactivity/impulsivity (Mouton et al., 2018). This program has been observed to be related to decreases in child externalizing symptoms (Mouton et al., 2018). Based on Bandura's social learning theory (Bandura, 1977), the Confident Parent program is an 8-week parent intervention that aims to empower parents in recognizing their existing knowledge, capability, and positive parenting behaviours (Mouton et al., 2018). The Confident Parent program uses unconditional positive regard from group leaders, validation and praise from fellow-parents/group members, and cognitive strategies, such as reframing negative thoughts and beliefs about their parenting abilities, to foster self-efficacy in parents (Mouton et al., 2018).

Previous research and current findings seem to suggest that the development, application, and testing of a similar program targeting parents' feelings of efficacy related to

helping their child learn could be of benefit to young children with and without symptoms of ADHD. Programs that offer parents models of healthy parental involvement in their child's learning, that validate parents' efforts towards helping their child learn, and that help parents challenge their negative thinking patterns and beliefs related to helping their child learn could support learning-related parent self-efficacy. Beyond just clinical intervention programs, the development of less structured peer support groups could also be of benefit. For example, daycares or schools could offer parent support groups, wherein parents who have previously developed skills for supporting their children's learning could offer modeling, guidance, and support to new parents whose children are entering the school system. Other options to support parental self-efficacy could potentially include more opportunities for parents to come together to help their children learn. For instance, if schools or daycares hosted learning hubs wherein parents meet to help their children with homework together, to expose parents to each other as models for how to support their child's learning. Essentially, finding from the current studies, along with the body of literature reviewed, seem to suggest that interventions, whether formal or informal, that allow parents opportunities to observe models of healthy learning support, validate and recognize parents' efforts, and reduce negative thoughts and emotions related to helping their children learn would likely be of particular benefit for parents of children with ADHD symptoms, who are known to feel less efficacious, more stressed, and less welcome in school environments.

Limitations and future research

The following outlines some of the limitations of the current studies that should be addressed in future research.

Sample. It is perhaps unsurprising that the recruitment and retention of families for longitudinal research is challenging (Hurwitz et al., 2017). The present research originally set out to recruit a large (N >120) and diverse sample of families and expected up to 40% attrition from Phase 1 to Phase 2 (this estimate was based on previous research, e.g., Littman et al., 2010). The current research employed multiple different recruitment methods (e.g., online ads, social media, community posters, community partnerships, in-person recruitment at local parent expos, etc.) over the course of three years (2015 to 2018) to try to ascertain this sample size. Although the target sample size was indeed met for Phase 1 (preschool year) recruitment, data cleaning (i.e., removing outliers, incomplete cases, exclusion criteria, etc.) and attrition resulted in a final complete dataset that was lower than anticipated (only 76 families for both phases of the study). This final sample size limited the statistical analyses that could be performed with adequate statistical power on the current data. Green's (1991) formula for estimating the sample size needed to obtain moderate statistical power for multiple regression analyses is N = 50 + 8 (# of independent variables). According to this formula, any research questions relying on Phase 2 data were limited to statistical analyses with only three independent variables (more specifically, two independent variables and an interaction variable) in order to maintain sufficient statistical power.

Given the semi-exploratory nature of the present research, less conservative approaches to statistical interpretation were applied (i.e., non-adjusted alpha levels, multiple regression analyses using an interaction variable versus moderated regression analyses). Results give further evidence to suggest that parental self-efficacy is a meaningful variable in predicting various elements of early school adjustment in young children at risk for developing ADHD. Future

research is needed to test the robustness of these relationships (e.g., larger sample sizes, more varied samples, applying more conservative techniques in interpreting statistical results). Indeed, the presence of statistically significant models in the current studies, despite the smaller sample size, suggests that the relationships observed are robust and worthy of further exploration. However, more complex statistical models or analyses that considered child or parent demographic variables were not possible in the current studies.

In terms of child demographics, there is debate in the literature as to whether there are gender differences in the academic difficulties faced by children with ADHD (Graetz et al., 2005). Although some authors have observed that boys diagnosed with ADHD, especially if hyperactive symptoms are present, are more likely to experience academic difficulties than their female counterparts (Graetz et al., 2005), many studies have not observed any difference in level of academic impairment between school-aged boys and girls with any subtype of ADHD (Biederman et al., 2005; Currie & Stabile, 2006; Duncan et al., 2007; Hartung et al., 2002). It has also been suggested that child gender may influence parenting practices and parenting self-efficacy (Bogenschneider et al., 1997; Jones & Prinz, 2005), although research on this topic is limited. Future research with larger samples of both boys and girls should consider whether there are differences in the relationships between parental self-efficacy, child ADHD symptoms, and academic functioning when child gender is also accounted for.

In terms of parent demographics, families who participated in the current studies were largely highly educated (at least a bachelor's degree), from a higher socioeconomic status (> $100,000 annual household income) and listed the child's mother as the primary parent/participant. Like ADHD symptoms, socioeconomic status is a known risk for poorer academic outcomes (Sirin, 2005) and there is some evidence that the outcome variables tested

(i.e., parental involvement, parent-teacher relationship) are particularly important to foster in children of families of a lower socioeconomic status (Benner et al., 2016; Fantuzzo et al., 2000). Furthermore, the limited available research on parental involvement and parental self-efficacy related to child ADHD symptoms has observed different relationships between mothers versus fathers (Musabelliu et al., 2018; Rogers et al., 2009). It will be important, therefore, for further research to examine the influence of socioeconomic status and parent gender on the relationships between parental self-efficacy, child ADHD symptoms and academic functioning observed in the current studies.

In order to obtain a larger, more representative sample, future research should employ a larger research team, a longer recruitment window, and perhaps include more strategic and targeted recruitment methods (e.g., participant compensation, ads that explicitly target fathers). This larger sample that would make it possible to conduct more complex statistical procedures and to examine the effects of various demographic characteristics or covariates on the relationships studied.

Data. Conclusions regarding the direction of the relationships observed in the current studies are limited by the study design. The first study in this line of research includes only cross-sectional and correlational data, thus firm conclusions regarding the direction of the relationships between parental self-efficacy, ADHD symptoms, and academic enablers cannot be made. The second study in this body of work relied on a partial cross-lagged longitudinal correlational design. Given that outcome variables measured in that study (e.g., parent involvement measures and parent-teacher relationship variables) were not assessed at both time points, it is difficult to make strong inferences regarding the direction of relationship between parental self-efficacy, child symptoms, and parental involvement/ the quality of the parent-

teacher relationship. Future research should employ a full cross-lagged, longitudinal design, so that structural equation modeling can interpret paths between variables, and the direction of paths between variables, more confidently.

The self/parent-report nature of the data also limits the conclusions that can be drawn from the current studies. Parents were asked to report on their child's ADHD symptoms, their involvement behaviours, their relationship with the child's teacher, as well as their own feelings of efficacy related to helping their child learn. Although it is possible that relationships observed between child symptoms, interactions with the school and parents' feelings of efficacy are truly representative of a transactional relationship between these variables (Jones & Prinz, 2005), it is also possible that rater-bias may account for some variance in these relationships. For instance, it is possible that parents who feel more confident in their abilities may also *rate* themselves as having a strong relationship with their child's teacher, but the child's teacher might have a different perspective on the parent's involvement.

It is possible that the use of multi-informant data (teacher and parent-report) would have strengthened confidence in the relationships observed in the current studies. The literature clearly documents, however, that there are frequently discrepancies between informants (parents versus teachers) on measures of child ADHD symptoms (Chen et al., 2017), parental involvement (Lawson, 2003), and the quality of the parent-teacher relationship (Acar & Ucus, 2017). These discrepancies between informants seem to be influenced by various factors, such as parent-reported distress, socioeconomic status, and level of child externalizing problems (Chen et al., 2017; Takeda et al., 2016). An alternative would be to collect data from a group of children who have been clinically assessed and diagnosed as well as a control group and to compare groups on measures of parental self-efficacy. Indeed, further study with clinical samples would be

important in order to explore whether current findings generalize to clinical samples of families of children with ADHD.

There is no perfect method for measuring the constructs studied. Bandura (2006) has written a guide for the development of scales for the measurement of self-efficacy, which, in kind, highlights the challenges associated with measuring this construct. The measure used to assess self-efficacy in the current study was selected because it is a frequently used task-specific (i.e., helping children learn) measure of self-efficacy (Musabelliu et al., 2018; Rogers et al., 2009) with solid theoretical underpinnings and psychometric properties (Hoover-Dempsey et al., 2005; Walker, Wilkins, Dallaire, Sandler, & Hoover-Dempsey, 2005). Despite this being the best (to the author's knowledge) available measure of learning-specific parental self-efficacy beliefs at the time of study development, this measure is short (five items) and reflects parents' confidence in their general ability to support their child's learning (as opposed to their confidence in their ability to effectively perform the more specific *tasks* of learning support, such as helping the child with reading). Next steps for research would be develop a more comprehensive and even more task-specific self-efficacy measure. Indeed, Bandura (2006), has suggested that self-efficacy measures hold the most value when they are tailored to the specific tasks demands of the domain of self-efficacy being measured. A new parental self-efficacy measure should include items that reflect parents' feelings of confidence in their ability to positive effect change in their child's learning via their engagement in specific tasks that map on to dimensions of parent involvement (e.g., tasks related to home-based involvement, such as homework help; tasks related to school-based involvement, such as participation in classroom activities, etc.). The measure may also want to consider specific items related to the parents confidence in their ability to develop a strong positive and collaborative relationship with their

child's teacher and/or the parents' confidence that their ability to form such a positive relationship with their child's teacher may positively effect their child's academic functioning. Even further, perhaps, given the unique challenges of parenting a child with inattentive and/or hyperactive/impulsive symptoms, a self-efficacy measure should be designed targeting parents' confidence in their ability to effectively engage in the tasks required to support the learning of a child with these symptoms.

Beliefs versus behaviours. Finally, the relationship between self-efficacy and parenting behaviour is well established (Coleman & Karraker, 1998). The relationships observed in the present line of research offer preliminary evidence that parental self-efficacy may be related to various parenting behaviours (e.g., involvement) that positively affect children's early school functioning. Future research would be needed to examine the specific behavioural correlates of parental self-efficacy that likely mediate the relationships between parental self-efficacy and academic outcomes in children (e.g., reading with children, homework help, learning-based play, etc.). Identifying the specific parenting practices related to self-efficacy in helping children learn will inform the development of guidelines and recommendations for parents and schools (i.e., what to do to help you child learn, what to do to feel more confident in you ability to help your child learn) and of assessment tools (e.g., self-assessment tools for knowing if you are doing a good job supporting your child's learning, tools for teachers to assess parents so as to better support parents).

Summary

In light of the risk for short- and long-term negative academic outcomes in children with inattentive or hyperactive/impulsive symptoms (Frazier et al., 2007b; Polderman et al., 2010), there is a need to explore factors that might mitigate risk. In 2010, Deault pointed out that there

is a need for more research on the role of parents in the academic functioning in children with ADHD symptoms, specifically. The current studies aimed to contribute to this need by examining the relationship between learning-related parental self-efficacy at school onset and a broad range of early indicators of academic functioning in children with varying levels of inattentive and hyperactive/impulsive symptoms. It could be argued that findings offer hope within a generally pessimistic body of literature on the risk for negative academic outcomes for children with ADHD symptoms: it is possible that parents may carry some weight in these academic outcomes, even when considered beside child inattentive or hyperactive/impulsive states, and therefore more might be able to be done to improve outcomes for these children. These interpretations are of course qualified by the limitations of the current study. Future research will be important to increase our confidence in these conclusions and test theories related to the role of parental self-efficacy in supporting the academic functioning of children with ADHD symptoms.

Appendix

Figure 1.

Rimm-Kaufman & Pianta (2000) Ecological and Dynamic Transaction Model of Transition

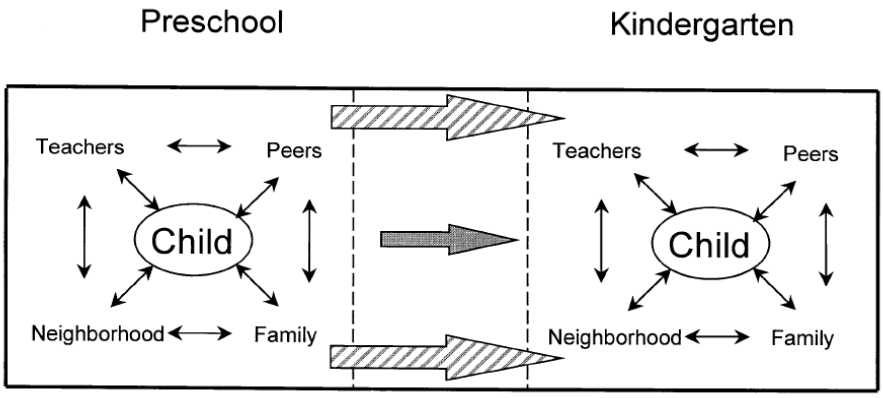


Figure 2.

Sample visual model of planned analyses (Chapter 2)

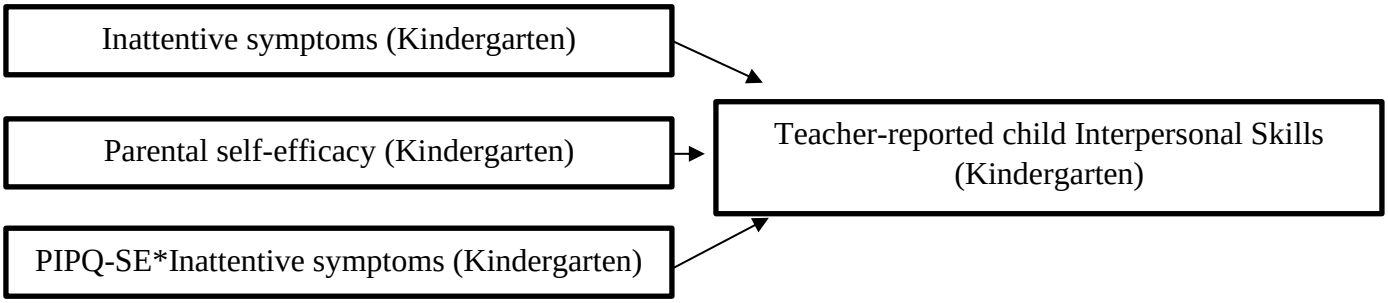


Figure 3.

Sample visual model of planned analyses (Chapter 3)

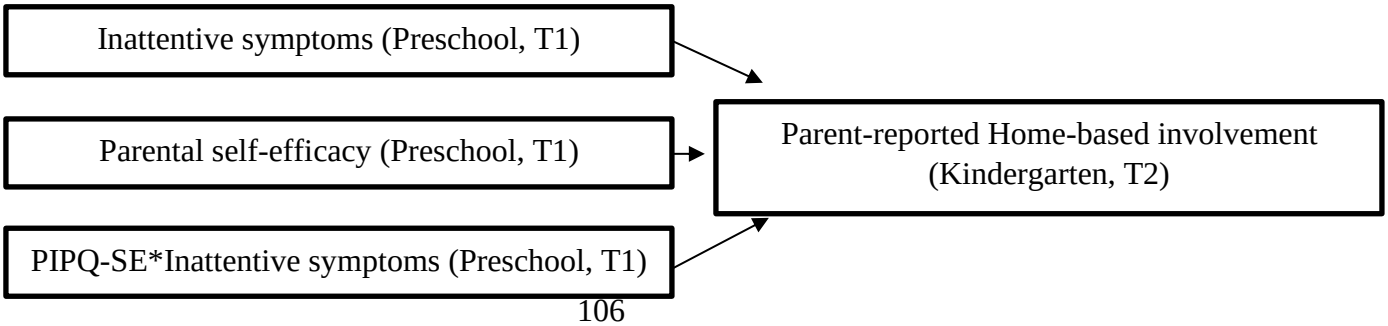


Table 1

Correlations, descriptors, and Cronbach alphas of the variables included in the models

		1	2	3	4	5	6
1. Inattention		1					
2. Hyperactivity		.73**	1				
3. Parental self-efficacy		-.47**	-.30**	1			
4. ACES Interpersonal		-.28*	-.32**	.39**	1		
5. ACES Engagement		-.14	-.01	.36**	.53**	1	
6. ACES Motivation		-.27*	-.13	.36**	.69**	.74**	1
	M	6.51	8.08	22.87	42.45[2]	27.82	37.97
	SD	4.93	6.21	33.79	7.79	7.32	9.97
	α	.86	.90	.84	.92	.92	.95

**p < .05; **p < .001*

Table 2

Linear regressions predicting academic enablers from hyperactive symptoms and parental self-efficacy

Outcome variable	R^2	*F (df)*	*p*	Model Predictors	*β*	*p*
Interpersonal	.17	7.40 (2, 74)	.001*	Inattentive	-.13	ns
				PIPQ-SE	.33	.01*
Interpersonal	.19	9.18 (2, 74)	<.001*	Hyperactive	-.22	.04*
				PIPQ-SE	.32	.004*
Engagement	.13	5.78 (2, 74)	.005*	Inattentive	.03	ns
				PIPQ-SE	.38	.003*
Engagement	.15	6.35 (2, 74)	.003*	Hyperactive	.12	ns
				PIPQ-SE	.40	.001*
Motivation	.14	6.15 (2, 74)	.003*	Inattentive	-.13	ns
				PIPQ-SE	.30	.02*
Motivation	.13	5.53 (2, 74)	.006*	Hyperactive	-.03	ns
				PIPQ-SE	.35	.003*

**p < .05; **p < .001*

[2] Original means presented here for qualitative purposes. Transformed *M* = .0016, *SD* = .92

Table 3

Parent-reported ADHD symptoms in preschool and kindergarten year

	Preschool (*SD*)	Kindergarten (*SD)*	*t*	*sig*
Total ADHD sym.	16.34 (8.14)	14.58 *(10.35)*	2.25	.03*
Inattentive sym.	7.47 (3.57)	6.51 (4.93)	2.45	.02*
Hyperactive sym.	8.87 (5.17)	8.08 (6.21)	1.55	n.s.

**p <.05*

Table 4

Bivariate correlations, means and standard deviations of variables

	1	2	3	4	5	6	7	8	9	10	11
1. T1 Inattention	1										
2. T1 Hyperactiv.	.73**	1									
3. T2 Inattention	.72**	.59**	1								
4. T2 Hyperactiv.	.59**	.71**	.73**	1							
5.T1Parental SE	-.47**	-.39**	-.26*	-.22	1						
6. T2 Parental SE	-.37**	-.23*	-.45**	-.30**	.53**	1					
7. T2 Home-based	-.11	.11	-.07	.13	.28*	.48**	1				
8. T2 School-based	-.09	-.09	-.13	-.13	.03	.31**	.44**	1			
9. T2 Home-school	.15	.12	.24*	.24*	.12	.09	.37**	.29*	1		
10. T2 P-T Joining	-.22	-.18	-.211	-.23*	.29**	.43**	.33**	.44**	.23*	1	
11. T2 P-T Commun. Quality	-.05	-.01	.03	.02	.22	.23*	.36**	.35**	.45**	.74**	1
M	7.47	8.87	6.51	8.08	23.32	22.88	39.39	18.19	22.79	61.75	18.77
SD	3.57	5.17	4.93	6.21	4.46	3.84	5.82	4.58	6.59	9.35	3.82

*p <.05; ** p <.001*

Table 5

Moderated regression predicting indicators of school functioning kindergarten

Outcome variable	R^2	*F (df)*	*p*	Model Predictors	*β*	*p*
Home-Based	.08	3.08 (2, 74)	.05*	Inattentive	.01	ns
				PIPQ-SE	.28	.03*
Home-Based	.13	5.65 (2, 74)	<.05*	Hyperactive	.26	.03*
				PIPQ-SE	.38	.002*
School-Based	.09	.33 (2, 74)	ns	Inattentive	-.10	ns
				PIPQ-SE	-.01	ns
School-Based	.01	.33 (2, 74)	ns	Hyperactive	-.10	ns
				PIPQ-SE	-.09	ns
Home-School	.06	2.42 (2, 74)	ns	Inattentive	.24	ns
				PIPQ-SE	.22	ns
Home-School	.05	1.91 (2, 74)	ns	Hyperactive	.20	ns
				PIPQ-SE	.20	ns
P-T Joining	.10	4.00 (2, 74)	< .05*	Inattentive	-.12	ns
				PIPQ-SE	.25	.05*
P-T Joining	.09	3.73 (2, 74)	<.05*	Hyperactive	-.08	ns
				PIPQ-SE	.25	.03*
P-T Comm.	.05	1.91(2, 74)	ns	Inattentive	.09	ns
				PIPQ-SE	.25	.04*
P-T Comm.	.05	2.11 (2, 74)	ns	Hyperactive	.09	ns
				PIPQ-SE	.25	.04*

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

Appendix item A: Copy of study advertisement.

Will your child be starting school next year?

Want to receive a **free school readiness assessment** from a registered clinical psychologist?

The University of Ottawa's ADHD and Development Lab is looking for families to participate in a study. We welcome children with or without attention problems.

If you and your family are interested in participating in this study, **please call the ADHD and Development Lab at 613-562-5800 ext. 4457 or email adhd.lab@uottawa.ca for more information.**

*Your contact information will be kept confidential and will not be shared with any third parties.

Appendix item B: Copies of measures used.

Parental Involvement Project Questionnaire - Self-Efficacy Subscale (PIPQ-SE; (Walker, Wilkins, Dallaire, Sandler, & Hoover-Dempsey, 2005)

Please indicate with a check mark how much you AGREE or DISAGREE with each of the following statements:

		Disagree very strongly	Disagree	Disagree just a little	Agree just a little	Agree	Agree very strongly
1	I know how to help my child with learning.						
2	I don't know how to help my child succeed in learning.						
3	I don't know if I'm getting through to my child.						
4	I don't know how to help my child learn.						
5	I feel successful about my efforts to help my child learn.						

ADHD Rating Scale IV - **Preschool Version**

Child's Name: _____ **Sex**: M F **Age**: _____

Completed By: _____ **Relationship**: _____

Circle the number that best describes the child's behavior over the past 6 months.		Rarely or never	Some-times	Often	Very often
1.	Fails to give close attention to details (i.e. rushes through activities, makes careless mistakes)	0	1	2	3
2.	Fidgets with hands or feet or squirms in seat (taps hands or feet)	0	1	2	3
3.	Has difficulty sustaining attention in tasks or play activities	0	1	2	3
4.	Leaves seat in classroom, during meals, or in other situations in which remaining seated is expected	0	1	2	3
5.	Does not seem to listen when spoken to directly (tunes you out)	0	1	2	3
6.	Runs about or climbs excessively in situations in which it is inappropriate	0	1	2	3
7.	Does not follow through on instructions or fails to finish tasks (i.e. "go upstairs, get your shoes and socks"; has difficulty with transitions)	0	1	2	3
8.	Has difficulty playing quietly (alone or in groups)	0	1	2	3
9.	Has difficulty organizing tasks and activities (i.e. choosing an activity, getting materials, doing steps in order)	0	1	2	3
10.	Is "on the go" or acts as if "driven by a motor"	0	1	2	3
11.	Avoids tasks that require sustained mental effort (i.e. puzzles, learning ABC's, writing name)	0	1	2	3
12.	Talks excessively	0	1	2	3
13.	Loses things necessary for tasks or activities (i.e. mittens, shoes, backpack)	0	1	2	3
14.	Blurts out answers before questions have been completed	0	1	2	3
15.	Is easily distracted	0	1	2	3
16.	Has difficulty awaiting turn	0	1	2	3
17.	Is forgetful in daily activities (i.e. forgets papers, forgets directions)	0	1	2	3
18.	Interrupts or intrudes on others	0	1	2	3

Adapted and reprinted with permission from Guilford Press.

(Mcgoey et al., 2007)

Family Involvement Questionnaire (FIQ; Fantuzzo et al., 2000)

Parents asked to respond to items a 4-point Likert format (1 = rarely, 2 = sometimes, 3 = often, 4 = always).

School-Based Involvement

I volunteer in my child's classroom
I participate in parent and family social activities with (he teacher
I participate in planning classroom activities with the teacher
I go on class trips with my child
I talk with other parents about school meetings and events
I participate in planning school trips for my child
I meet with other parents from my child's class outside of school
I hear teachers tell my child how much they love learning
I participate in fundraising activities in my child's school
I feel that parents in my child's classroom support each other

Home-Based Involvement

I spend time working with my child on number skills
I spend time working with my child on reading/writing skills
I talk to my child about how much I love learning new things
I bring home learning materials for my child (videos, etc.)
I spend time with my child working on creative activities
I share stories with my child about when I was in school
I see that my child has a place for books and school materials
I take my child places in the community to learn special things (i.e., zoo, museum)
I maintain clear rules at my home that my child should obey
I talk about my child's learning efforts in front of relatives
I review my child's school work
I keep a regular morning and bedtime schedule for my child
I praise my child for school work in front of the teacher

Home-School Conferencing

I talk to the teacher about how my child gets along with his/her classmates at school
I talk with my child's teacher about classroom rules
I talk to my child's teacher about his/her difficulties at school
I talk with my child's teacher about school work to practice at home
I talk to my child's teacher about my child's accomplishments
I talk to my child's teacher about his/her daily routine
I attend conferences with the teacher to talk about my child's learning or behavior
The teacher and I write notes about my child or school activities
I schedule meetings with administration to talk about problems or to gain information
I talk with my child's teacher on the telephone
I talk with my child's teacher about personal or family matters

Parent-Teacher Relationship Scale-II **(PTRS-II; Vickers & Minke, 1995)**

Scale items

Feelings of affiliation and support:

- We trust each other.
- It is difficult for us to work together.
- Communication is difficult between us.
- We feel uncomfortable with each other.
- We cooperate with each other.
- We treat each other with respect.
- We listen to each other even when we disagree.

Dependability and availability of both parties:

- When there is a problem with this child, this parent/teacher is all talk and no action.
- When promises are made, they are kept.
- When there is a behavior problem, I have to solve it without help from this parent/teacher.
- When things aren't going well, it takes too long to work them out.

Shared expectations/beliefs about child and each other:

- We understand each other.
- We see this child differently.
- We agree about who should do what regarding this child.
- This parent/teacher expects too much of me.

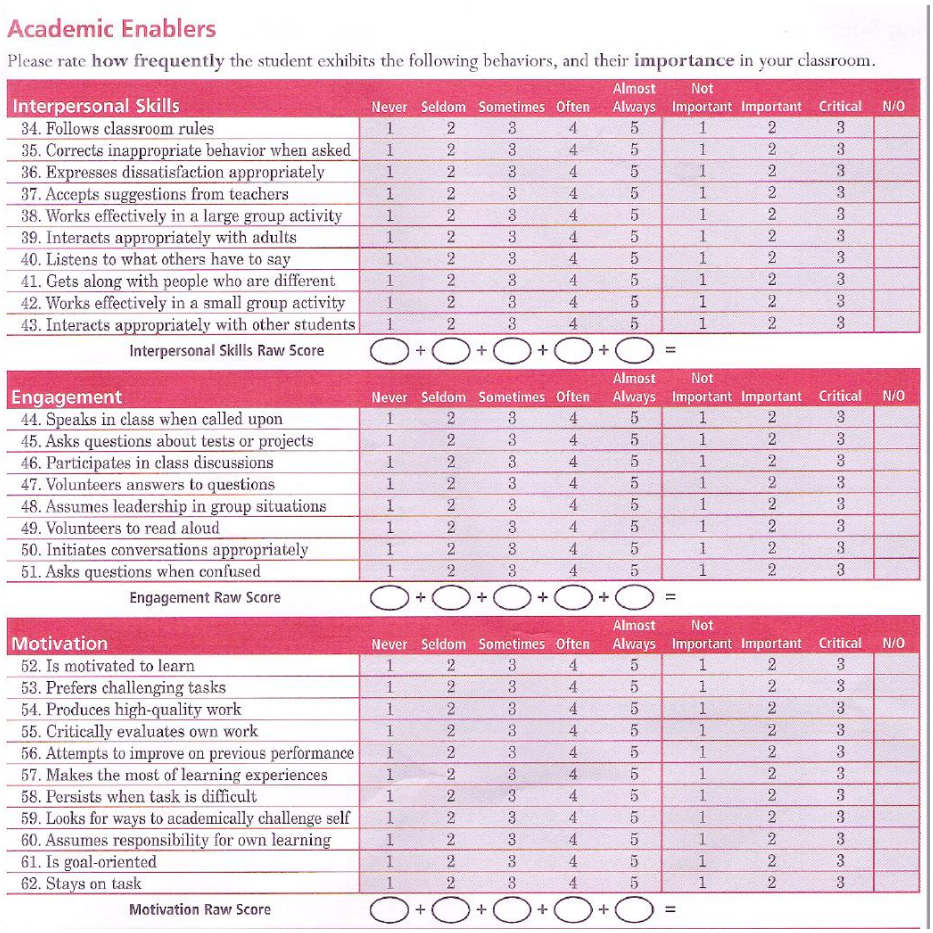
Sharing of emotions:

- Part of our relationship includes talking about feelings.
- We tell each other when we are concerned.
- We tell each other when we are worried.

Sharing of information:

- We make suggestions to each other.
- We ask each other's opinion about this child's progress.

The Academic Competence Evaluation Scales - Teacher Record Form (ACES; DiPerna & Elliott, 2000).



Academic Enablers

Please rate **how frequently** the student exhibits the following behaviors, and their **importance** in your classroom.

Interpersonal Skills	Never	Seldom	Sometimes	Often	Almost Always	Not Important	Important	Critical	N/O
34. Follows classroom rules	1	2	3	4	5	1	2	3	
35. Corrects inappropriate behavior when asked	1	2	3	4	5	1	2	3	
36. Expresses dissatisfaction appropriately	1	2	3	4	5	1	2	3	
37. Accepts suggestions from teachers	1	2	3	4	5	1	2	3	
38. Works effectively in a large group activity	1	2	3	4	5	1	2	3	
39. Interacts appropriately with adults	1	2	3	4	5	1	2	3	
40. Listens to what others have to say	1	2	3	4	5	1	2	3	
41. Gets along with people who are different	1	2	3	4	5	1	2	3	
42. Works effectively in a small group activity	1	2	3	4	5	1	2	3	
43. Interacts appropriately with other students	1	2	3	4	5	1	2	3	
Interpersonal Skills Raw Score	◯ + ◯ + ◯ + ◯ + ◯ =								

Engagement	Never	Seldom	Sometimes	Often	Almost Always	Not Important	Important	Critical	N/O
44. Speaks in class when called upon	1	2	3	4	5	1	2	3	
45. Asks questions about tests or projects	1	2	3	4	5	1	2	3	
46. Participates in class discussions	1	2	3	4	5	1	2	3	
47. Volunteers answers to questions	1	2	3	4	5	1	2	3	
48. Assumes leadership in group situations	1	2	3	4	5	1	2	3	
49. Volunteers to read aloud	1	2	3	4	5	1	2	3	
50. Initiates conversations appropriately	1	2	3	4	5	1	2	3	
51. Asks questions when confused	1	2	3	4	5	1	2	3	
Engagement Raw Score	◯ + ◯ + ◯ + ◯ + ◯ =								

Motivation	Never	Seldom	Sometimes	Often	Almost Always	Not Important	Important	Critical	N/O
52. Is motivated to learn	1	2	3	4	5	1	2	3	
53. Prefers challenging tasks	1	2	3	4	5	1	2	3	
54. Produces high-quality work	1	2	3	4	5	1	2	3	
55. Critically evaluates own work	1	2	3	4	5	1	2	3	
56. Attempts to improve on previous performance	1	2	3	4	5	1	2	3	
57. Makes the most of learning experiences	1	2	3	4	5	1	2	3	
58. Persists when task is difficult	1	2	3	4	5	1	2	3	
59. Looks for ways to academically challenge self	1	2	3	4	5	1	2	3	
60. Assumes responsibility for own learning	1	2	3	4	5	1	2	3	
61. Is goal-oriented	1	2	3	4	5	1	2	3	
62. Stays on task	1	2	3	4	5	1	2	3	
Motivation Raw Score	◯ + ◯ + ◯ + ◯ + ◯ =								

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