HOW PARENT AND CHILD ATTENTION-DEFICIT/HYPERACTIVITY DISORDER SYMPTOMS PREDICT PARENTING BEHAVIOUR IN MOTHERS AND FATHERS: SELF-REPORT AND OBSERVATIONAL MEASURES

by

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Abstract

Parents of children with Attention-Deficit/Hyperactivity Disorder (ADHD) are known to engage in more negative and fewer positive parenting behaviours with their sons than controls. Further, parents who themselves have ADHD have greater difficulty in parenting. However, people with ADHD are also known to have difficulty accurately reporting on their behaviour, and may not be reliable reports of their parenting. Further, the vast majority of research on parenting in ADHD is exclusively with mothers. It is not known the extent to which research on mothers extends to fathers. In this study, I investigated whether ADHD symptoms in mothers and fathers interacted with ADHD symptoms in their sons in the association with positive and negative parenting problems and whether results differed when parenting behaviour was self-reported or observed. I found that observations of parenting were not related to parental ADHD symptoms. When parenting was self-reported, both mothers' and fathers' ADHD symptoms were related to parenting. However, only mothers’ ADHD symptoms continued to be related to their self-reports of parent behaviour when other family variables were controlled. This suggests that the pattern of associations of family ADHD symptoms with parenting is different for mothers and fathers, and that there may be discrepancies in perceptions of parenting as no associations were found when parenting was observed.
Preface

This thesis is based on a subset of a larger investigation directed by Dr. Charlotte Johnston. The ideas presented in this thesis are the work of the author, and they were developed through discussion and collaboration with his advisor, Dr. Johnston. The larger investigation on which this thesis was based was designed by Dr. Johnston. The observational coding system described in this study was developed by the author. The author had primary responsibility for all aspects of the research presented here.

The research presented in this thesis was approved by the UBC Behavioural Research Ethics Board, under certificate number H10-02159.
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For my family
Introduction

Attention Deficit/Hyperactivity Disorder (ADHD) is a condition that is characterized by inattentive and/or hyperactive and impulsive behaviours (American Psychological Association, 2000). Factor analytic studies repeatedly suggest that ADHD symptoms can be categorized into two independent, but highly correlated clusters: inattention, and hyperactivity/impulsivity (e.g., Collett, Crowley, Gimpel, & Greenson, 2000; Hudziak et al., 1998; Martell, Roberts, Gremillion, von Eye, & Nigg, 2011). Inattention symptoms include distractibility, difficulty maintaining attention, and forgetfulness. Hyperactivity/impulsivity symptoms include fidgeting, difficulty waiting one's turn, and interrupting others.

ADHD has a childhood onset, affects 3-7% of children, and is associated with a variety of negative outcomes, including deficits in academic, cognitive, and social performance (e.g., Gadow et al., 2004; Gathje, Lewandowski, & Gordon, 2008). Children with ADHD are more likely than control children to have developmental difficulties such as learning disabilities, language disorders, and motor coordination difficulties. In addition, they have more conflictual and stressful family lives than control children and many children with ADHD have severe peer relationship problems (Barkley, 2006; Mikami, 2010).

Although ADHD is often thought of as a childhood disorder, there is mounting evidence that it is not restricted to children and often persists into adulthood (Kessler et al., 2006). Current estimates are that approximately 4% of adults have elevated levels of ADHD symptoms (Faraone & Biederman, 2005; Kessler et al., 2006). But this figure may be conservative as the appropriate adult diagnostic criteria have yet to be extensively validated (Mick, Faraone, Biederman, & Spencer, 2004; Pinkhardt et al., 2009). It is estimated that 50-80% of children with ADHD will experience symptoms as adults (Barkley, Fisher, Smallish, & Fletcher, 2006; Faraone,
Biederman, & Mick, 2006) and will continue to be significantly impaired by those symptoms, with lower education and employment status, as well as diminished self-care, social role functioning, and cognitive functioning compared to siblings or control individuals (Barkley, Murphy, & Fischer, 2008; Johnston, 2002; Kessler et al., 2006; Mannuzza et al., 2011). In addition, women with ADHD report a sense of lower parenting self-efficacy, and higher parenting dissatisfaction (Banks, Ninowski, Mash, & Semple, 2008).

ADHD is a highly heritable disorder with over half of the adults with ADHD having at least one child who also meets diagnostic criteria (Biederman et al., 1995; Faraone et al., 2005; Kessler et al., 2006; Minde et al., 2003). Further, 25-50% of children with ADHD have a parent with the disorder (Biederman et al., 1995; Chronis et al., 2003). In combination with the marked functional impairments in children and adults with ADHD symptoms, the heritable nature of the disorder suggests a pattern of negative interactions between parents and children with ADHD symptoms that could create, maintain, or exacerbate maladaptive behaviours in both the parent and the child. In addition, it is likely that these interactions between parent and child are both reciprocal (i.e., the causal relationship is from parent to child, as well as from child to parent) and transactional; that is, the reciprocal relationship develops, and changes over time (Johnston & Mash, 2001; Sonuga-Barke & Halperin, 2010).

In the present study, I examined the extent to which levels of ADHD symptoms in the child and parent interact to predict positive and negative parenting behaviours. Positive parenting behaviours include involvement in the child's life, and the use of positive reinforcement or praise. Negative parenting behaviours include inconsistent discipline, over-reactivity to child misbehaviour, and permissiveness towards child misbehaviour. I investigated this pattern for
both mothers' and fathers' interactions with their children, and evaluated whether these patterns
differed across self-report and observational measures of positive and negative parenting.

**ADHD and Parenting**

Parents of children with ADHD report and display greater difficulty effectively
controlling their child's behaviour and exhibit diminished emotional responsiveness to their
children in comparison to parents of non-ADHD children (Deault, 2010; Healey, Gopin,
Grossman, Campbell, & Halperin, 2010; Seipp & Johnston, 2005). These two dimensions of
parenting behaviours are often considered to be the primary factors in effective parenting
(Darling & Steinberg, 1993; Rothbaum & Weisz, 1994). A diminished ability to control their
child's behaviour is not surprising for parents faced with the challenging behaviour of children
with ADHD as neither impulsive nor distractible behaviours are easily modifiable by parents.
Similarly, emotional responsiveness, defined as a parent's ability to assess and adapt to their
child's behaviour and react appropriately, may be especially difficult when a child has high levels
of ADHD symptoms. Such children exhibit disorganized and inconsistent behaviour that is an
obstacle to effective parental monitoring and appropriate responding.

It is difficult to disentangle to what extent these parental difficulties are related
specifically to the child's ADHD symptoms, as ADHD in children is often comorbid with
conduct problems (Hinshaw, 1987) and the research addressing this question is somewhat
inconsistent. Studies sometimes find no difference in parenting behaviour between groups of
parents of children with only ADHD symptoms versus children with both ADHD and comorbid
can be understood as...
relationship between child ADHD and parenting behaviours, it is necessary to account for
comorbid child conduct problems when investigating questions related to ADHD symptoms and
parenting. By assessing comorbid child conduct problems, I was better able to determine the
extent to which the results I found were specific to child ADHD symptoms, and not other
externalizing behaviours.

The association between child ADHD symptoms and parenting behaviour has been more
widely studied than the association between parental ADHD symptoms and parent or child
behaviour. However, initial studies suggest that parents with high levels of ADHD symptoms
report more child-rearing difficulties than parents with lower levels of ADHD symptoms
(Barkley, Knouse, & Murphy, 2011) and their symptoms have unique associations with
parenting behaviours above and beyond child disruptive behaviours (Chen & Johnston, 2007;
Chronis-Tuscano et al., 2008; Humphreys, Mehta, & Lee, 2010; Murray & Johnston, 2006);
details of which will be presented in subsequent sections of this paper. It is easily argued that the
symptoms of ADHD in adults are antithetical to effective parenting. Impulsive, hyperactive, and
inattentive behaviours are not the basis for an interactional style that it is conducive to the goals
of a parent: effective behavioural control and emotional responsiveness. Parenting has been
described as a skill primarily of self-regulation (Sanders, 2008) and demands that parents be able
to accept partial or delayed reinforcement. People with high levels of ADHD symptoms are
motivated by high-intensity, immediate reinforcements and have difficulty inhibiting this desire,
or engaging in tasks in which reinforcement might be delayed (Luman, Oosterlaan, & Sergeant,
2005). Parents are often in situations in which they must interact with their child or make
decisions that are not immediately reinforcing, and may be reinforcing only at some unknown
point in the future. Parents with ADHD symptoms may have a diminished ability to make these
kinds of decisions, and they may not engage in these types of situations with their children in adaptive ways. Some parents with ADHD have remarked that they find typical parental tasks boring, and that they have difficulty maintaining their attention on such tasks; this may result in inadequate supervision, and feelings of frustration or anxiety (Weiss, Hechtman, & Weiss, 2000).

In summary, in contrast to studies of parenting in families of children with ADHD, less empirical work has been conducted on the associations between the level of adult ADHD symptoms and parenting. The work that has been done suggests that both child and parent levels of ADHD symptoms have associations with parenting behaviour.

**Reciprocal Effects of Child and Parent ADHD Symptoms**

In addition to the evidence that child and parent ADHD symptoms are both associated with parenting behaviour, unique parenting difficulties may arise as a result of the interaction of parent and child levels of ADHD symptoms (Weiss et al., 2000). The symptom expressions of parents and children do not occur in isolation and each is likely to be affected by the other person's ADHD symptoms. A parent with high levels of ADHD may have difficulty maintaining their attention to routine parenting tasks and exhibit inconsistent parenting behaviour. A child with ADHD may already be predisposed to exhibit dysregulated, unpredictable behaviour. Once exposed to the parent's ADHD symptoms, the child's behavioural difficulties may become exacerbated, increasing the strain on the parent, making it increasingly difficult to effectively parent the child. Parent and child ADHD symptoms can enter a cycle whereby the parent's symptoms maintain or exacerbate child symptoms (or, perhaps, under certain circumstances ameliorate them), and the child's symptoms reciprocate, influencing the parent's symptoms (Johnston & Mash, 2001; Sonuga-Barke & Halperin, 2010).
In summary, the effect of ADHD symptoms on parent and child behaviours is complex. The reciprocal and transactional nature of parent-child interactions makes it difficult to identify singular influences of either parent or child ADHD symptoms, and it is possible that the two sets of symptoms interact in either positive or negative feedback loops.

**Differences Between Mothers and Fathers as Parents**

The research on the different roles of mothers and fathers with regard to child-rearing is primarily focused on the quality and quantity of father versus mother involvement with their child. That is, what kinds of things do mothers and fathers do with their children, and how much do they do them? In an attempt to synthesize disparate findings, Lamb, Pleck, Charnov, and Levine (1985; 1987) identified three forms of parental involvement: engagement (in which a parent engages in a direct, one-to-one interaction with the child), accessibility (in which a parent is available to a child, but does not interact directly), and responsibility (in which a parent engages in tasks to support the child, independent of the child's involvement, such as buying clothes, scheduling appointments, and planning meals). Under these definitions, the average father of a two-parent household spends 57% less time than the mother in engagement, approximately 33% less time being accessible, and very little time engaged in responsibility tasks (Pleck, 1997). The quality of parent-child interactions also is different between mothers and fathers. As a proportion of time spent with the child, mothers are most often primarily caretakers, while fathers are typically playmates (Lamb, 1981a; 1981b; 1997). That is, although mothers spend more time playing with their children in comparison to fathers, fathers spend more time playing as a proportion of the total time they spend interacting with their child. Consistent with these findings, Lamb and Goldberg (1982) found that, despite being equally competent caregivers, caretaking was the most prominent aspect of the average mother-child
relationship, whereas play was the most prominent aspect of the average father-child relationship.

In addition to these differences in the quality and quantity of fathers' and mothers' involvement with their children, fathers also appear to provide a unique contribution to child outcomes above and beyond the influence of mothers. Leidy et al. (2011) found that father involvement, level of positive parenting, monitoring, and consistent discipline were positively associated with beneficial child outcomes even after controlling for maternal parenting behaviours and marital quality. In addition, father involvement in a child's life can have an indirect effect on parenting behaviours. For example, when parents disagree on how to raise their child, increased father involvement predicts higher maternal over-reactivity to child ADHD symptoms (Arnold, O'Leary, & Edwards, 1997).

The above findings suggest that it is important to include fathers when attempting to fully understand parent-child interactions and child functioning. Fathers make unique contributions to child outcomes and have interactions with their children that are both qualitatively and quantitatively different from mothers.

With regard to children with high levels of ADHD, evidence also supports differences in mothers’ and fathers’ interactions with their children. Children with high levels of ADHD symptoms are more compliant with their fathers than their mothers (Danforth, 1991), and their mothers', but not fathers', parenting behaviours have been found to be associated with child social skills (Kaiser, McBurnett, & Pfiffner, 2011). In a longitudinal study, Lifford, Harold, and Thapar (2008) found that mother, but not father, reports of child ADHD symptoms significantly predicted parental rejection of the child. These results are consistent with the transactional nature
of parent-child interactions, but also suggest that the nature of these transactions may be different in mother-child and father-child relationships.

Mothers and fathers also differ in ways other than how they behave towards their child. For example, when their child has ADHD, fathers have a more distorted and negative view of their child's symptoms than mothers (Chen, Seipp & Johnston, 2008). In particular, fathers are more likely to attribute their child's ADHD symptoms to internal, but unstable and specific causes, a view that is inconsistent with seeing ADHD as a chronic disorder. That is, fathers believe that ADHD symptoms, when they occur for their child, are more likely to be specific to a particular situation and not likely to reoccur in the future. Similarly, fathers’ internal attributions for their child's symptoms are significantly associated with negative reactions to these symptoms, perhaps because fathers (in contrast to mothers) see the symptoms as relatively controllable and changeable by the child.

Fathers also seem to have a differential effect on children's peer relationships compared to mothers. Hurt, Hoza, and Pelham (2007) found that when boys with high levels of ADHD symptoms felt well integrated into their family, high paternal warmth was associated with more peer acceptance, less peer rejection, and less problematic social behaviour. In addition, high paternal power assertion was associated with less peer acceptance. In contrast, maternal warmth and power assertion were found to have no relation to child peer relationships. This finding is consistent with research showing that high levels of positive parenting behaviour in fathers are associated with more positive child outcomes (Lamb, 2000).

**Fathers with high levels of ADHD symptoms.** So far in this paper, ADHD has been presented as a disorder that persists throughout the lifespan and results in unique parenting challenges when it is present in either a parent, the child, or both. However, the previous
discussion – and other research – also alludes to differences across mothers and fathers with regard to the effects that the level of ADHD symptoms may have on parenting behaviours (e.g., Ellis & Nigg, 2009; Mokrova, O’Brien, Calkins, & Keane, 2010). Much of the research on adult ADHD symptoms and parenting has included only mothers (Deault, 2010), despite the fact that ADHD symptoms are more prevalent in adult males (Kessler et al., 2006). This difference may reflect the practical difficulties involved in having fathers participate in research. The result is a literature on parental ADHD that focuses primarily on mothers, with research methods usually biased towards assessment of caretaking behaviours, and responsibility-type involvement with the child (e.g., parent interaction tasks that include laundry folding, cleanup, or homework completion); typically mother-oriented tasks.

Although father involvement seems to be an almost universally positive contributor to child outcomes when paternal ADHD symptoms are low or non-existent (Lamb, 2000; Leidy et al., 2011), this does not seem to be the case when fathers are experiencing high levels of ADHD symptoms. Arnold and colleagues (1997) found that when fathers have low levels of ADHD symptoms, the degree to which they are involved in their child's life predicted more effective parenting practices. However, involvement predicted less effective parenting practices when father ADHD symptoms were high. Specifically, when fathers reported high levels of ADHD symptoms and their level of involvement with the child was high, they were more likely to display negative parenting behaviours as a response to their child's misbehaviour. Ellis and Nigg (2009) found that father involvement did negatively predict child ADHD symptoms, although this relationship became marginal when father ADHD symptoms were controlled. This result is consistent with Arnold et al. (1997), suggesting that, unlike mothers, fathers' ADHD symptoms moderate the relationship between paternal involvement and child ADHD symptoms.
Psychogiou, Daley, Thompson, and Sonuga-Barke (2007) also found evidence for high levels of paternal ADHD symptoms predicting negative parenting behaviour in families of children with ADHD and called this a "similarity-misfit" (this is in contrast to a "similarity-fit" which is when positive outcomes occur due to the similarity in parent-child psychopathology). In a community sample of 312 children, parents reported on their child's ADHD symptoms, their own ADHD symptoms, and measures of their parenting behaviour, compiled as positive and negative. Positive parenting behaviour included items related to involvement with the child and the use of positive reinforcement, and negative parenting included behaviours such as inconsistent discipline and poor monitoring of child behavior. They found that, even after controlling for paternal antisocial and depressive symptoms, when fathers had high levels of ADHD symptoms, there was a significant relationship between child ADHD symptoms and negative paternal parenting. However, when fathers had low levels of ADHD symptoms, the relationship between child ADHD symptoms and negative paternal parenting was marginal. No interaction between child ADHD and father ADHD symptoms was observed in the prediction of positive paternal parenting.

Given the findings of Psychogiou et al. (2007), in the current study, I expected to find an interaction between levels of child and paternal ADHD symptoms when predicting negative father parenting behaviours. Specifically, I predicted that child ADHD symptoms would predict higher negative parenting. However, I expected an even higher level of negative parenting in fathers with high levels of ADHD symptoms compared to fathers with low levels of ADHD symptoms when interacting with their children with ADHD. As the current research does not support similarity-fit/misfit effects for positive parenting behaviour, I predicted only main effects
of father and child ADHD symptoms on fathers' behaviour such that increased ADHD symptoms by either father and child would be associated with fewer positive parenting behaviours.

**Mothers with high levels of ADHD symptoms.** To the extent that they exist, the findings in the literature of the effect of ADHD on the parenting ability of fathers are almost universally negative. Indeed, even behaviours that are usually indicators of positive parenting (e.g., involvement) seem to be associated with negative outcomes in fathers with high levels of ADHD symptoms (Arnold et al., 1997). The research on mothers is more mixed. In a study of 70 children with ADHD and their mothers, Chronis-Tuscano and colleagues (2008) investigated whether mothers of children with ADHD would exhibit more negative and less positive parenting behaviour when they had higher levels of ADHD symptoms themselves. The authors found that mothers with higher levels of ADHD symptoms reported more inconsistent discipline, lower levels of involvement with their children, and lower levels of positive parenting. Similarly, Murray and Johnston (2006) investigated the relationship between parenting behaviour and maternal ADHD status in a sample of 60 mothers of children with ADHD. They found that mothers with ADHD disciplined their children less consistently, were more permissive of their child's negative behaviour and were poorer monitors of their child's behaviour than mothers without ADHD. Unlike Chronis-Tuscano and colleagues (2008), Murray and Johnston (2006) did not find any associations between maternal ADHD and positive parenting behaviour among mothers of children with ADHD.

In addition, maternal ADHD symptoms are associated with higher levels of self-reported parenting stress and lower parenting self-confidence (Banks et al., 2008; Barkley et al., 2008). Indeed, the relationship between maternal ADHD symptoms and lower parenting self-confidence is present even in the absence of difficult child behaviours. Ninowski, Mash, and Benzies (2007)
found that first-time expectant mothers with high levels of ADHD symptoms had more negative expectations of their ability to perform as parents than mothers with low levels of ADHD symptoms.

Despite the evidence for maternal ADHD symptoms being a detriment to effective parenting behaviour, other research suggests that ADHD symptoms in mothers are not related to self-reported positive parenting behaviours (Murray & Johnston, 2006), or to observed parenting responsiveness (Chen & Johnston, 2007). There also is evidence that under certain circumstances, maternal ADHD symptoms may confer benefits to children with ADHD symptoms that are not seen among typical mothers. In the same way that Psychgiou et al. (2007) found evidence for a similarity-misfit between father and child ADHD symptoms, they also found support for a similarity-fit between mother and child ADHD symptoms. That is, for mothers of children with high levels of ADHD symptoms, having high levels of maternal ADHD symptoms was associated with lower levels of negative parenting behaviours. Within the same sample, this effect seemed to be robust, as fathers' reports of their wives' ADHD symptoms demonstrated the same similarity-fit relationship between mother-child ADHD symptoms and negative parenting behaviours.

Other studies provide further support of the buffering effect of maternal ADHD symptoms. Children with high levels of ADHD symptoms are more likely than children with low levels of ADHD symptoms to struggle academically (Gathje et al., 2008), but, unlike children without ADHD symptoms, children with ADHD symptoms who have mothers with high levels of ADHD symptoms do not see a further deterioration in their academic functioning (Biederman Faraone, & Monuteaux, 2002). Similarly, in a study investigating how mother and child ADHD symptoms affect social relationships, Griggs and Mikami (2011) found that child social problems
did not intensify when both mother and child were experiencing high levels of ADHD symptoms compared to when only the mother had high levels of ADHD symptoms. In addition, maternal and child ADHD symptoms interacted to predict child prosocial behavior such that when mothers and their children both had high levels of ADHD symptoms, the child exhibited more prosocial behavior compared to when his mother had low levels of ADHD symptoms. Further, in observed mother-child interactions, mothers with high levels of ADHD symptoms were frustrated and annoyed less often when their child had high levels of ADHD symptoms than when their child had low levels of ADHD symptoms. The presence of a similarity-fit phenomenon between mothers and children with ADHD symptoms also is supported by evidence that there are no differences in reports of positive parenting between mothers with high and low levels of ADHD symptoms (Murray & Johnston, 2006) and, unlike fathers, mothers' ADHD symptoms are not correlated with lower parental involvement (Ellis & Nigg, 2009).

It is somewhat difficult to predict expectations regarding a similarity-fit/misfit hypotheses for mothers and children with ADHD, as the research is somewhat mixed. However, because this study aimed to replicate Psychogiou et al. (2007), I predicted that results would be consistent with that study. I expected main effects of mother and child ADHD symptoms such that increases in either would be associated with increased levels of negative parenting behaviour, and decreased levels of positive parenting behaviour. However, I also predicted an interaction between child and mother level of ADHD symptoms in predicting negative mother behaviours. In particular, mothers with low levels of ADHD symptoms whose children have low levels of ADHD symptoms would have the lowest level of negative parenting. I also expected a similarity-fit relationship such that when the mother and child both had high levels of ADHD symptoms, there would not be more negative parenting behaviour than when only the child had
high ADHD symptoms. For positive parenting behaviours, I expected only main effects of maternal and child ADHD symptoms associated with fewer positive parenting behaviours.

**Possible covariates.** Parents with high levels of ADHD symptoms often experience symptoms associated with other psychological conditions (Johnston & Mash, 2001; Pfiffner & McBurnett, 2006). Consistent with previous research (e.g., Banks et al., 2008; Psychogiou et al., 2007; Semple, Mash, Ninowski, & Benzies, 2011), in this study, comorbid psychological symptoms in parents are assessed and controlled in order to test unique links between ADHD symptoms and parenting behaviour.

**Explaining and Addressing the Conflicting Evidence Regarding Parental ADHD Symptoms and Parenting: Self-reports and Observations of Parenting Behaviour**

The validity of self-report measures of parenting have been questioned (Morsbach & Prinz, 2006; Perepletchikova & Kazdin, 2004), as parenting questionnaires often contain items that are sensitive in nature and may be susceptible to parents responding in ways that they perceive to be socially desirable. Parents may perceive items on self-report measures as suggesting that particular parenting behaviours are unacceptable and they may fail to endorse such items even if they do engage in or believe in the acceptability of such parenting behaviours (Morsbach & Prinz, 2006). Previous research has suggested that socially desirable responding occurs when respondents are asked sensitive questions (Schaeffer, 2000), and there is reason to expect that the quality of a parent's behaviour would also be susceptible to this issue. Findings that utilize self-report measures of parent behaviour have also been found to be susceptible to influences due to the wording of individual items, (Morsbach & Prinz, 2004, as cited in Morsbach & Prinz, 2006), and self-report measures in general are influenced by a variety of structural factors such as the level of detail in the items (Catania, Binson, Canchola, Pollack, &
Hauck, 1996), format of the self-report (Fendrick & Kim, 2001), and the choice of the scale for response options (Tourangeau & Smith, 1996).

As noted above, some previous research has suggested that parental ADHD symptoms may be beneficial – or at least not harmful – to parenting, but other research indicates that the relation between parental ADHD symptoms and parenting is unequivocally negative. One potential explanation for these seemingly incompatible views is that people may be poor reporters of their own parenting behavior. ADHD is a disorder that is associated with difficulties in self-awareness (Barkley, 1997; Barkley et al., 2011; Wender, 1995), and inaccurate positive perceptions of the self (Knouse, Bagwell, Barkley, & Murphy, 2005). This lack of insight may be influencing the results of existing research regarding parental ADHD symptoms and parenting, as the majority of studies exclusively utilize self-report measures of parenting.

Knouse and colleagues (2005) found that adults with ADHD symptoms were involved in more driving-related incidents than adults without ADHD symptoms, yet still self-reported a similar level of driving performance. Similarly, Prevatt et al. (2012) found that college students with ADHD symptoms overestimated their performance as good workers and effective drivers compared to their peers without ADHD symptoms. Others' reports of adult women's ADHD symptoms have also been found to be more closely associated than self-reports with actual levels of competence in several domains of functioning (Jiang & Johnston, 2011). In a recent series of studies, Lui and Johnston (in press) found that parents self-reported significantly more positive parenting behaviour when their own level of hyperactivity/impulsivity symptoms were high compared to when they were low, even after controlling for observed parenting behaviour. No such relationship was found for self-reported inattention symptoms in the parents. This suggests that, at least for parent with higher levels of hyperactivity/impulsivity symptoms, they may be
over-estimating their own levels of positive parenting behaviour. Thus, it is reasonable to suspect that self-report instruments of parenting behaviour may not be sufficient for assessing parenting behaviours in adults with ADHD symptoms.

**Using multiple informants and measures in ADHD research.** In response to the difficulties associated with using self-report measures with people with ADHD symptoms, a recent review of the parenting and child ADHD literature has highlighted the importance of using multiple informants and measures when conducting studies with this population (Deault, 2010). Using observational measures of parents' behaviours instead of, or in addition to relying on self-reports, could add important information regarding the relation between parental ADHD symptoms and parenting. However, only a few studies have directly observed parenting behaviours in adults with ADHD symptoms. Chronis-Tuscano and colleagues (2008) found that maternal ADHD symptoms were related to lower positive and higher negative observed parenting behaviours. In contrast, Chen and Johnston (2007) did not find any relationships between observed maternal responsiveness and maternal ADHD symptoms. The current study hoped to help resolve this discrepancy by investigating the extent to which associations between parent and child ADHD symptoms and parenting obtained using self-reports of positive and negative parenting behaviours were consistent with the associations derived from observations of those same parenting behaviours. That is, do parent and child ADHD symptoms interact to predict self-reports of positive and negative parenting behaviours? And, in what ways, if any, does this pattern change when parenting behaviours are observed? The results of Psychogiou et al. (2007) would suggest that self-reports of parenting behaviour would provide evidence for a similarity-fit in mothers (maternal ADHD symptoms has a buffering effect on the negative impact of having a child with ADHD on parenting behaviours), and a similarity-misfit in fathers
paternal ADHD symptoms exacerbate the negative impact of having a child with ADHD on parenting behaviours). As there has been little research directly comparing observational and self-report measures in the assessment of parenting behaviours in this population, it is unknown whether or not to predict consistent results across both types of measurement – although previous research on the pitfalls of self-report with people with ADHD symptoms (e.g. Barkley, Fischer, Smallish, & Fletcher, 2002; Barkley et al., 2011) suggests that some differences might be expected.

Goals for the Current Study

In sum, there were two main purposes to the current study. The first goal was to replicate the work by Psychogiou et al. (2007) regarding the similarity-fit/ misfit of parent and child ADHD symptoms. I predicted that parental ADHD symptoms, as measured by each of the two dimensions of inattention and hyperactivity/impulsivity, would interact with child ADHD symptoms when predicting parenting behaviour.

I predicted that fathers of children with high levels of ADHD symptoms would have more negative parenting behaviours than fathers of children with low levels of ADHD symptoms. However, I predicted that fathers who also had high levels of ADHD symptoms would have even more negative parenting behaviours towards their children with high ADHD symptoms compared to fathers with low levels of ADHD symptoms. For mothers, I predicted that, overall, mothers with higher levels of ADHD symptoms would exhibit more negative parenting than mothers with low levels of ADHD symptoms. But when the child had high levels of ADHD symptoms, this effect would be diminished, or reversed. The research did not support predictions of a similarity-fit/similarity-misfit model for positive parenting behaviours, so I
predicted only main effects of parental and child ADHD symptoms on reducing positive parenting behaviours.

The lack of observational research focused on parental ADHD and parenting has left open a number of important questions, including to what extent parents' self-reports of their parenting behaviours may over-estimate the positivity of these behaviors. By gathering self-reports and observational data, I intended to investigate under what circumstances results from the two types of measures diverged and/or converged.

Method

Participants

Participants in this study were 56 two-parent families of 6-12 year old boys where both parents participated. Recruitment was conducted in a manner that encouraged fathers' participation. For example, recruiting materials specifically mentioned the important role that fathers play in the development of their child. In addition, the times available for families to come to the lab were flexible (e.g., evenings and weekends), so as not to interfere with parents' work hours. In order to include families whose members had a range of ADHD symptoms, participants were recruited from a variety of sources. Four families with members expected to be low in ADHD symptoms were recruited through newspaper and community advertisements. Fifty-two families were recruited through referrals for child ADHD to the Provincial ADHD Program of the Women's and Children's Health Center and child psychiatrists in private practice. Consistent with research that indicates between 25-50% of children with ADHD have a parent who is also high in ADHD symptoms (Biederman et al., 1995; Chronis et al., 2003), 8 mothers and 9 fathers in the 52 families also met diagnostic criteria for ADHD.
Means and standard deviations of demographic and analytic variables can be found in Table 1. Parents were mostly Caucasian (65% of mothers, 79% of fathers), with the remainder a combination of Asian (20% of mothers, 19% of fathers), and other (15% of mothers, 2% of fathers) ethnicities. The majority of parents were at least high school graduates (98% of mothers and 87% of fathers) and the average household in this study earned between $75,000 and $99,999 per year. In this sample, 41 married, biological families; 8 divorced, biological families; 5 married, adoptive families; and 2 biological mother, step-father families participated.

**Procedure**

Once a family indicated that they were interested in participating in the study, a research assistant contacted them by telephone. On the phone, the research assistant explained the nature of the study, and if both parents agreed to participate, demographic information about each parent and their child was obtained and a time for the family to visit the lab was scheduled.

If a child with an ADHD diagnosis was typically taking stimulant medication for his ADHD symptoms, his parents were asked to take him off of his medication for at least 24 hours prior to participation in the study, if possible. Because many children with ADHD take medication before they go to school, and it wears off as they arrive home (Chronis, Pelham, Gnagy, Roberts, & Aronoff, 2003), the typical interactions that parents have with their children with ADHD are when the child is unmedicated. As such, the child being unmedicated not only allowed for a more accurate assessment of the impact of ADHD symptoms on behaviour, it allowed for more representative interactions between parent and child. If the child was taking nonstimulant medication (e.g., antidepressants) for either ADHD or another psychological or medical condition, he was not asked to stop taking those medications as doing so may be medically contraindicated. In this study, 40 children, 2 mothers, and 3 fathers were typically
taking medication for their ADHD symptoms. Both mothers, 2 fathers, and 13 children had taken
their medication within the 24 hours before participation. Four of these 13 children were unable
to be taken off of their long-acting medication; the remainder were on stimulant medication
during study participation.

Once in the lab, informed consent was obtained from the parents and assent was obtained
from the child. Families then filled out questionnaires and the interactions between the parents
and the child were recorded. In order to observe parenting behaviours, the child interacted with
each parent separately in a playroom in two situations: free play and household chores. These
situations were chosen to create interactions that were appropriate for both genders of parents, as
previous research has suggested that different kinds of parent-child activities are differentially
characteristic of mothers and fathers (Lamb, 1981a; 1981b; 1997). In addition, these situations
were designed to elicit positive parenting behaviours (in the play situation) and negative
parenting behaviours (in the chore situation). The play situation involved the parent and child
playing with various toys and games with no explicit instructions given for how to interact. The
toys were selected in an attempt to tap into the strengths of people with ADHD, including toys
that required imagination and creativity, such as blocks and a drawing easel with paper. This was
an attempt to elicit spontaneous, creative play that might not be seen if only more structured
activities were present. In the chore situation, the parent instructed the child to complete a series
of tasks that might be typical in the home environment such as folding laundry and unpacking
groceries with the goal of eliciting negative child behaviour and, therefore, the opportunity to
measure parents’ responses to such behavior.

Each parent engaged in both 10 minute interactions (play and chores) with the child. The
order of presentation for the questionnaires and observational measures was counterbalanced
within and across mothers and fathers. There were two parallel sets of play materials and chore instructions so that the child did not have to repeat activities with the second parent, and the order of the situations as well as which parent was first to interact with the child, was counterbalanced across families.

Upon completion, parents received $75.00 and the child received a t-shirt. This study received ethics approval from the University of British Columbia's Behavioural Research Ethics Board.

Measures

Parent ADHD symptoms. Each parent completed the Current Symptoms Scale (CSS; Barkley & Murphy, 1998, 2006), a screening measure for ADHD symptoms in adults. The CSS is an 18 item measure assessing current ADHD symptoms on a four point Likert-type scale (1 = \textit{Never or Rarely}, and 4 = \textit{Very Often}) and the questions are keyed to DSM-IV criteria with two subscales (Inattention, Hyperactivity/Impulsivity). The CSS has consistently exhibited good psychometric properties, including significant predictive validity (Murphy & Barkley, 1996a) and inter-rater reliability (Murphy & Barkley, 1996b). A recent item analysis by Gomez (2011) found the CSS to be a useful screening measure of ADHD in adults, with most items providing good discriminability and the measure was reliable across different levels of ADHD symptoms. A psychometric analysis of the CSS by Ladner, Schulenberg, Smith, and Dunaway (2011) found high internal consistencies for both subscales, and reliability did not differ between men and women. Further, they found the CSS to have excellent convergent validity, correlating .58 to .87 with other, much longer self-report rating scales. In this study, internal consistencies of $\alpha$=.87 and $\alpha$=.77 were found for mothers' inattention and hyperactivity/impulsivity subscales, respectively.
For fathers, $\alpha=.83$ and $\alpha=.89$ for inattention and hyperactivity/impulsivity symptoms, respectively.

**Child ADHD symptoms.** Mothers and fathers each reported on child ADHD symptoms on the ADHD Rating Scale-IV (ADHD-IV; DuPaul, Power, Anastopoulos, & Reid, 1998). The ADHD-IV is based on DSM-IV criteria and assesses the 18 symptoms of ADHD across two 9-item subscales: inattention and hyperactivity/impulsivity. The ADHD-IV has acceptable psychometric properties including inter-rater reliability, test-retest reliability, internal consistency, factor structure, convergent validity, and discriminant validity (Zhang, Faries, Vowles, & Michelson, 2005). Child inattention and hyperactivity/impulsivity symptoms were combined into a single variable assessing ADHD in order to provide additional power for the regression models. Mother and father reports of child ADHD symptoms correlated .63. Alphas for both mother and father reports were .94. Scores from mothers and fathers were averaged to provide the measure of child ADHD symptoms. The internal consistency of this composite variable was $\alpha=.96$.

**Measures of Parenting.** Parenting was assessed using both parent self-report and observations of parenting during the parent-child interactions. The observations were made using a coding system developed for this study in which observers rated parent and child behaviour on 8-point rating scales once per minute. This measure was based on the coding system developed by Wells et al. (2006) for coding the quality of interactions between mothers and their children with a diagnosis of ADHD. In that study, Wells et al. (2006) used a 9-item, 6-point observational coding system that assessed various dimensions of the parent-child relationship. Dimensions included the parent’s behaviour management, annoyance, positive reinforcement, and warmth.

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1 When the child ADHD variable was split into its component subscales and the regressions re-run, the pattern of results does not change, and no additional interactions emerged. Therefore, to reduce the number of predictors used in analyses, the total ADHD score for children was used.
This system was found to have good internal consistency and interrater reliability, with alphas ranging from .81 to .97; as well as ICCs ranging from .54 to .85 at baseline. In addition, coders rarely disagreed by more than 2 points on the 6-point scale (6% of the intervals) and the measure demonstrated good construct and convergent validity. Given the similarities between the observational dimensions in Wells et al. (2006) and this study (e.g., positive reinforcement, annoyance with child behaviours), it was logical to use their observational measure as a point of departure; especially because both studies investigated questions related to parent-child relationships in children with ADHD symptoms.

For this study, coders were six undergraduates and one graduate student, and all were blind to the level of ADHD symptoms of the participants. The undergraduate coders were also blind to the study hypotheses. Three coders rated the child's behaviour and the other four coders rated the parents' behaviour. Coders were trained by the first author until an acceptable level of inter-rater reliability had been achieved, at which point the coding teams continued coding independently and each team met once per week to discuss issues, maintain reliability, and prevent observer drift. One-third of each coder’s output was double-coded by another coder in order to check for reliability. The coders were not aware of which videos were double-coded or by whom.

**Negative parenting behaviour.** Parents reported on their own negative parenting behaviour using the Parenting Scale (PS; Arnold, O'Leary, Wolff, & Acker, 1993). The PS is a 10-item self-report measure of the effectiveness of parenting strategies in discipline situations. It utilizes a 7-point Likert scale and items load onto two subscales: over-reactivity (OVR) and laxness (LAX). The OVR subscale is a 5-item scale of a parent's tendency to respond disproportionately negatively to their child's behaviour (e.g., "When my child misbehaves...", 1 =
I speak to him calmly to 7 = I raise my voice and yell). The LAX subscale is a 5-item scale that addresses permissive parenting (e.g., "When my child does something I don't like..." 1 = I do something about it every time it happens to 7 = I often let it go). The psychometric properties of the PS have been repeatedly demonstrated with good internal consistency, test-retest reliability, and concurrent validity (Arnold et al., 1993; Prinzie, Onghena, & Hellinckx, 2007; Reitman et al., 2001). In addition, the PS has been shown to be valid when used with parents of children with ADHD (Harvey, Danforth, Ulaszek, & Eberhardt, 2001). In this study, for fathers, OVR $\alpha=0.85$ and LAX $\alpha=0.70$. For mothers, OVR $\alpha=0.67$ and LAX $\alpha=0.77$.

Self-reported negative parenting behaviour also was assessed with the Alabama Parenting Questionnaire (APQ; Shelton, Frick, & Wootton, 1996). The APQ is a 32-item, 5-point (0 = never to 4 = always) scale assessing positive and negative parenting practices in parents of children aged 6-13. It has been used in other studies of parents of children with ADHD (e.g., Chronis-Tuscano et al., 2008; Psychogiou et al., 2007) and has been shown to discriminate between clinical and non-problem families (Clerkin, Marks, Policaro, & Halperin, 2007). A confirmatory factor analysis by Essau and colleagues (2006) replicated the original factor structure and found the APQ to have good internal consistency and construct validity. The inconsistent discipline subscale was administered as a measure of negative parenting. The inconsistent discipline subscale is a 6-item scale that assesses the consistency with which a parent disciplines their child (e.g., "You threaten to punish your child and then do not actually punish him/her") and has shown acceptable internal consistency, good temporal stability, and good discriminant validity (Shelton et al., 1996). In this study, reliability for the inconsistent discipline subscale of the APQ was $\alpha=0.74$ for mothers and $\alpha=0.82$ for fathers. As over-reactivity, laxness, and inconsistent discipline were conceptualized as components of a negative parenting
construct, these self-reported subscales were standardized and averaged to create a negative parenting variable for both mothers and fathers. Internal consistencies for this composite variable were .81 for mothers and .86 for fathers. Because the negative parenting variable is a standardized composite of three subscales from two separate measures, the composite score means are zero. As a result, Table 1 reports the average mother and father scores on the three component scales.

In order to maximize its comparability between the questionnaire measures (i.e., the APQ and PS), the observational coding system was developed to reflect the same constructs as those assessed by the APQ and PS. If the child exhibited any negative behaviour during the chore task, (e.g., noncompliance, complaining) parents were rated on the degree to which their response to this behaviour was lax (e.g., ignoring behavior, coaxing or pleading child to stop) or over-reactive (e.g., raising voice, making critical or sarcastic comments, demonstrating exasperation). Similarly, if the child was inattentive, hyperactive, or impulsive during an interval, the degree of over-reactivity displayed by the parent was assessed. Due to the brevity and structure of the observational situations, I was unable to create an observational dimension that would parallel the inconsistent discipline subscale of the APQ. A composite observed negative parenting variable was created from the average of the coder ratings of the parents’ over-reactive and lax responses to child behaviour. Since the over-reactivity and laxness dimensions of the observational measure were contingent upon the presence of negative child behaviour in an interval, scores were calculated as the sum of parental over-reactivity or laxness across the 10 intervals, divided by the number of opportunities that the parent had to be over-reactive or lax (i.e., the number of intervals in which the child engaged in noncompliant, negative or ADHD
behaviour). This was done in order to not erroneously rate parents as high on one of these dimensions simply because their child engaged in more negative or ADHD-like behaviour.

Reliability of the observational measure was assessed as an intraclass correlation coefficient (ICC) of the agreement of the observers' ratings. Consistent with results of Wells et al. (2006), coders were said to be in agreement if their ratings were within one point of each other on the 6-point scale. The ICC for the composite negative parenting observational variable was .73 for mothers and .60 for fathers.

**Positive parenting behaviour.** Two subscales of the APQ were used as measures of positive parenting: the involvement and positive parenting subscales. The involvement subscale is a 10-item measure that assesses the extent to which a parent spends time interacting with, and engaging in activities related to their child (e.g., "You help your child with his/her homework). The positive parenting subscale is a 6-item scale that measures how often a parent reinforces their child for demonstrating positive behaviour (e.g., "You reward or give something extra to your child for obeying you or behaving well"). Both subscales have shown excellent internal consistency, and test-retest reliability, good construct validity, and good convergent validity (Shelton et al., 1996). Praise and involvement were seen as components of a positive parenting construct and the self-reported positive parenting and involvement subscales were combined. The internal consistency of this variable was .85 for mothers and .91 for fathers.

Observations of positive parenting were made during the play situation. Parents were rated on the extent to which they were involved with their child (e.g., playing together, playing separately, parent not playing at all) and the extent to which they exhibited genuine praise or approval towards the child's non-negative behaviour. Ratings on the praise and involvement
dimensions were combined to create an observed positive parenting variable for both mothers and fathers. The ICCs for this variable were .98 for mothers and .98 for fathers.

**Comorbidity.** In order to ensure that ADHD symptoms were not better accounted for by symptoms characteristic of other psychological constructs, other psychological symptoms were assessed for both parents and children. Parents completed the Brief Symptom Inventory (BSI; Derogatis, 1993). The BSI is a 53-item self-report measure on a 5-point Likert scale (0 = *not at all*, and 4 = *extremely*). For this study, three of the BSI's nine subscales were included: Depression, Anxiety, and Hostility. These scales were selected as they represent the most common psychological problems seen in parents of children with ADHD (Johnston & Mash, 2001; Pfiffner & McBurnett, 2006). The Depression subscale assesses depressive symptoms (e.g., "Feeling lonely even when you are with people"); the Anxiety subscale assesses to what extent a person feels afraid or nervous (e.g., "Feeling nervous when you are left alone"); the Hostility subscale assesses the extent to which a person feels annoyed or irritated and gets into arguments with others (e.g., "Temper outbursts that you could not control"). The BSI has good psychometric properties (Boulet & Boss, 1991; Derogatis & Melisaratos, 1983; Hayes, 1997) including high test-retest reliability and internal consistency for parents of children with ADHD (Seipp & Johnston, 2005). In this study, \( \alpha \)s for the depression subscale were .80 for mothers and .91 for fathers; \( \alpha \)s for the anxiety subscale were .62 for mothers and .78 for fathers; and \( \alpha \)s for the hostility subscale were .62 for mothers and .86 for fathers. Although the internal consistencies of mothers' reports of anxiety and hostility were lower than expected, for the sake of consistency with father reports, these variables were included in the mothers' regression models and interpreted cautiously.
The presence of comorbid child symptoms was assessed with the Child Behavior Checklist for Ages 6-18 (CBCL/6-18; Achenbach & Rescorla, 2001). The CBCL/6-18 is a 118 item parent-report measure of child emotional and behavioural difficulties on eight subscales rated on a 3-point scale (0 = not true, and 2 = often true). The CBCL/6-18 has excellent psychometric properties (Achenbach & Rescorla, 2001). As externalizing child behaviours are likely to be related to parenting behaviour in children with ADHD (Johnston & Mash, 2001) and conduct problems are often comorbid in children with ADHD (Hinshaw, 1987), the externalizing subscale of the CBCL/6-18 (which is the sum of the Rule-Breaking Behavior and Aggressive Behavior subscales) was utilized as a measure of comorbid externalizing symptoms. Both the mother and the father of the child completed the CBCL/6-18. The correlation between mother and father CBCL/6-18 externalizing scale scores was $r=.80$, so the average of their scores was used as the child's externalizing behaviour score.

**Data Analytic Plan**

Before conducting analyses, I checked for assumption violations in the variables, covariates, and regression models. In order to determine whether my sample was consistent with previous research, I ran descriptive statistics, investigated whether mothers and fathers differed on average on any variable, and analyzed the bivariate relationships between study variables. The primary analysis consisted of hierarchical linear regressions to determine whether parent and child ADHD symptoms interacted to predict parenting behaviour. Ideally, hierarchical linear modeling (HLM) would be used to analyze these data, as it would be able to account for shared family-level variance and disentangle it from individual parent differences. However, HLM requires either very large sample sizes in order to be adequately powered and/or a large number of groups (Woltman, Feldstain, MacKay, & Rocchi, 2012), neither of which were possible for
this study. Because of this, disaggregated OLS regressions were conducted with the understanding that the regression coefficients obtained in this manner are likely overestimated.

In total, eight regressions were conducted: four regressions predicting maternal parenting behaviours from maternal ADHD symptoms and child ADHD symptoms, and four regressions predicting paternal parenting behaviours from paternal ADHD symptoms and child ADHD symptoms. Two of the regressions predicted positive maternal – or paternal – parenting behaviour (one based on self-reports of negative parenting and one based on observations) and two predicted negative maternal – or paternal – parenting behaviour (one based on self-reports of positive parenting and one based on observations). Step 1 of each regression entered covariates of parent depression, hostility and anxiety; Step 2 added child externalizing behaviours; Step 3 added parent and child ADHD symptoms; and Step 4 added the interactions between parent and child ADHD symptoms. To test the effects of each dimension of parental ADHD symptoms, models were first run with the interaction of parent inattention and child ADHD at Step 4, and a second time replacing this with the interaction of parent hyperactivity/impulsivity and child ADHD.

**Results**

Means and standard deviations of study variables can be found in Table 1. As would be expected given that the recruitment strategy focused primarily on families of children referred for ADHD assessment and treatment, parent-reported child ADHD symptoms were high, with the average child ADHD score at the 94th percentile as compared to the norms for the ADHD-IV Rating Scale (DuPaul et al., 1998). Similarly, according to the norms for the CSS (Barkley, 2011) mothers' and fathers’ self-reported hyperactivity (75th percentile and 80th percentile,
respectively), impulsivity (75th percentile and 80th percentile, respectively)\(^2\), and inattention (78th and 81st percentile, respectively) symptoms were also high. In this sample, 52 (93%) families had children who met diagnostic criteria for ADHD.

Table 1.

**Descriptive Statistics**

<table>
<thead>
<tr>
<th></th>
<th>M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SES</td>
<td>46.7 (11.4)</td>
</tr>
<tr>
<td>Externalizing CBCL/6-18 – Combined Mother and Father Ratings</td>
<td>13.3 (9.04)</td>
</tr>
<tr>
<td>Child Age (months)</td>
<td>115.3 (22.8)</td>
</tr>
<tr>
<td>ADHD – Combined Mother and Father ratings</td>
<td>1.71 (.60)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Mothers M (SD)</th>
<th>Fathers M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Age</td>
<td>42.53 (.64)</td>
<td>44.55 (6.51)</td>
</tr>
<tr>
<td>Parent Inattention</td>
<td>1.56 (.48)</td>
<td>1.63 (.48)</td>
</tr>
<tr>
<td>Parent Hyperactivity/Impulsivity</td>
<td>1.52 (.43)</td>
<td>1.69 (.60)</td>
</tr>
<tr>
<td>Negative Parenting - Self-Report (LAX)</td>
<td>2.66 (.99)</td>
<td>2.66 (.92)</td>
</tr>
<tr>
<td>Negative Parenting - Self-Report (OVR)</td>
<td>3.68 (.98)</td>
<td>3.48 (1.23)</td>
</tr>
<tr>
<td>Negative Parenting - Self-Report (ID)</td>
<td>1.46 (.62)</td>
<td>1.36 (.63)</td>
</tr>
<tr>
<td>Negative Parenting – Observations</td>
<td>.41 (.61)</td>
<td>.26 (.38)</td>
</tr>
<tr>
<td>Positive Parenting - Self-Report</td>
<td>3.22 (.46)(^a)</td>
<td>2.86 (.60)(^a)</td>
</tr>
<tr>
<td>Positive Parenting – Observations</td>
<td>27.8 (5.65)</td>
<td>27.36 (5.65)</td>
</tr>
<tr>
<td>BSI – Depression</td>
<td>.43 (.51)</td>
<td>.63 (.82)</td>
</tr>
<tr>
<td>BSI – Anxiety</td>
<td>.52 (.47)</td>
<td>.52 (.53)</td>
</tr>
<tr>
<td>BSI – Hostility</td>
<td>.60 (.42)</td>
<td>.65 (.63)</td>
</tr>
</tbody>
</table>

*Note:* Values with the same superscript are significantly different from one another at \(p<.05\); LAX = Laxness as measured by the Parenting Scale; OVR = Over-reactivity as measured by the parenting scale; ID = Inconsistent discipline as measured by the Alabama Parenting Questionnaire; BSI = Brief Symptom Inventory; CBCL/6-18 = Child Behavior Checklist for Ages 6-18; SES = Socioeconomic Status was calculated according to the procedures outlined in Hollingshead, 1975.

One parent (1%) met clinical criteria (American Psychological Association, 2000) for primarily inattentive ADHD, 5 parents (4%) met clinical criteria for primarily hyperactive/impulsive ADHD symptoms, and 9 parents (8%) met clinical criteria for combined

\(^2\)Although hyperactivity and impulsivity symptoms are reported elsewhere in this paper as a single scale, norms for these symptoms are only available separately.
ADHD symptoms. The number of parents meeting clinical criteria for ADHD did not change when using the revised adult criteria in the DSM-5 (American Psychiatric Association, 2013). 

Child externalizing behaviour on the CBCL6/18 as reported by mothers, was in the borderline clinical range, with an average T-score of 62. Parental BSI scores were elevated compared to nonpatient adults, with mothers' average depression, anxiety, and hostility scores at the 55th, 75th, and 78th percentile, respectively. Fathers' average BSI scores for depression, anxiety, and hostility were at the 68th, 65th, and 70th percentile, respectively. Elevated levels of depression, anxiety, and hostility are common in adults with ADHD symptoms and in parents of children with ADHD (Johnston & Mash, 2001; Pfiffner & McBurnett, 2006), and the higher BSI scores are not surprising given the high levels of ADHD symptoms present in the parents in this sample.

Because norms do not exist for the PS, APQ, or observational measure of parenting, interpretation of the raw parenting scores is difficult; however, both mothers and fathers engaged in very few observed negative parenting behaviours, and they demonstrated similar levels of observed positive parenting with their sons.

Comparing mothers and fathers indicated that mothers reported significantly more positive parenting than fathers, *t*(110)=3.58, *p*<.001. However, this was the only significant difference of all comparisons conducted between mother and father ADHD symptom and parenting measure scores (*ps* > .12).

**Bivariate Correlations**

Tables 2 and 3 present the inter-correlations among dependent variables, predictor variables, and psychological comorbidity covariates for mothers and fathers, respectively.
### Table 2.
**Correlations among predictor variables, criterion variables, and covariates for mothers**

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
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</thead>
<tbody>
<tr>
<td>1. Mothers’ Inattention</td>
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<tr>
<td>2. Mothers’ Hyperactivity/Impulsivity</td>
<td>.58***</td>
<td></td>
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<tr>
<td>3. Child ADHD</td>
<td>-.07</td>
<td>&lt;.001</td>
<td></td>
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<tr>
<td>4. Negative Parenting - Self-Report</td>
<td>.27*</td>
<td>.02</td>
<td>-.06</td>
<td></td>
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<tr>
<td>5. Negative Parenting – Observations</td>
<td>.03</td>
<td>-.02</td>
<td>.04</td>
<td>.16</td>
<td></td>
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<tr>
<td>6. Positive Parenting - Self-Report</td>
<td>.005</td>
<td>.24</td>
<td>.20</td>
<td>-.01</td>
<td>-.15</td>
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<tr>
<td>7. Positive Parenting – Observations</td>
<td>-.02</td>
<td>.09</td>
<td>.08</td>
<td>-.10</td>
<td>-.20</td>
<td>.22</td>
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<tr>
<td>8. Mothers’ BSI – Depression</td>
<td>.24</td>
<td>.12</td>
<td>.15</td>
<td>.19</td>
<td>-.01</td>
<td>.22</td>
<td>.11</td>
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<tr>
<td>9. Mothers’ BSI – Anxiety</td>
<td>.41***</td>
<td>.58***</td>
<td>.05</td>
<td>.13</td>
<td>.03</td>
<td>.06</td>
<td>-.001</td>
<td>.31*</td>
<td></td>
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<tr>
<td>10. Mothers’ BSI – Hostility</td>
<td>-.02</td>
<td>.06</td>
<td>-.01</td>
<td>.39**</td>
<td>.31*</td>
<td>.15</td>
<td>.05</td>
<td>.31*</td>
<td>.29*</td>
<td></td>
</tr>
<tr>
<td>11. CBCL/6-18 – Child Externalizing Behaviour</td>
<td>-.09</td>
<td>-.16</td>
<td>.36**</td>
<td>.15</td>
<td>.07</td>
<td>.09</td>
<td>.26*</td>
<td>.17</td>
<td>-.01</td>
<td>.05</td>
</tr>
</tbody>
</table>

*Note.* BSI = Brief Symptom Inventory; CBCL = CBCL/6-18: Child Behavior Checklist for Ages 6-18; SES = Socioeconomic Status was calculated according to the procedures outlined in Hollingshead, 1975

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

### Table 3.
**Correlations among predictor variables, criterion variables, and possible covariates for fathers**

<table>
<thead>
<tr>
<th></th>
<th>1.</th>
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</thead>
<tbody>
<tr>
<td>1. Fathers’ Inattention</td>
<td></td>
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<tr>
<td>2. Fathers’ Hyperactivity/Impulsivity</td>
<td>.74***</td>
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*Note.* BSI = Brief Symptom Inventory; CBCL = CBCL/6-18: Child Behavior Checklist for Ages 6-18; SES = Socioeconomic Status was calculated according to the procedures outlined in Hollingshead, 1975

*p<.05, **p<.01, ***p<.001
Looking first at relations among ADHD symptoms in family members, and the relations between these ADHD symptoms and measures of parenting, contrary to what might be expected given the heritable nature of ADHD (Kessler et al., 2006), mother and son ADHD symptoms were not significantly correlated. However, father inattention and hyperactivity/impulsivity symptoms were significantly related to their son's ADHD symptoms.

Contrary to my predictions, no measure of positive or negative parenting in mothers or fathers was significantly related to the level of ADHD symptoms in their child. However, consistent with predictions, both mothers' and fathers' own inattention symptoms were positively and significantly related to their self-reports of negative parenting. However, parent ADHD symptoms were not significantly related to any other measure of positive or negative parenting, which was contrary to what I had expected.

Consistent with previous research (Johnston & Mash, 2001; Pfiffner & McBurnett, 2006), I found that higher levels of depression, anxiety, and hostility in parents were often significantly related to ADHD symptoms in both parents and children, and to negative parenting. In particular, depression in fathers, and anxiety in both mothers and fathers, were significantly related to more parent ADHD symptoms. For fathers only, anxiety and hostility also were related to higher levels of child ADHD symptoms. With regard to relations between these parental comorbidities and parenting behavior, hostility was related to both self-reported and observed negative parenting in mothers and fathers. For fathers, depression was related to self-reported and observed negative parenting, while anxiety was only related to observed negative parenting. Parent depression, anxiety, and hostility were not related to any measure of positive parenting. As expected, child externalizing behaviour was related to child ADHD, fathers' hyperactive/impulsive symptoms, fathers' self-reported negative parenting, and fathers' hostility. In addition, child externalizing
behaviour was related to mothers' observed positive parenting behaviour although, surprisingly, in a positive direction.

These results are partially consistent with what would be expected from previous research, including demonstrated relationships among adult ADHD symptoms, other psychological problems, and parenting; and relationships between parent ADHD symptoms and self-report measures of parenting behaviour. Somewhat surprisingly, no relationships were found between parenting and child ADHD, perhaps due to the restricted range of child ADHD symptoms in this sample.

**Regression Analyses**

Checking regression assumptions indicated that several of the models contained influential outliers, non-normal distributions or heteroscedasticity. As a result, robust regression models were calculated, and all reported statistics were bootstrapped. The ADHD symptom measures for both parents and children were centred prior to the creation of the interaction terms. Inclusion of child age, SES, parental biological relationship and parent and child medication status as possible control variables in the regression models did not change the pattern of results, so the models are presented without these variables.

**Negative parenting.** Regression models predicting mothers' self-reported and observed negative parenting can be found in Table 4. For both self-reported and observed negative parenting, at Steps 1 and 2, mother and child comorbid psychopathologies were entered as predictors. At each step, mothers' hostility was positively related to self-reported and observed levels of negative parenting, however mothers' depression, anxiety, and child externalizing behaviour were not significantly related to either self-reported or observed negative parenting. Mother and child ADHD symptoms were entered at Step 3 of the models.
Table 4.
Regression models predicting mothers’ negative parenting

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<tr>
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Note: CBCL/6-18: Child Behavior Checklist for Ages 6-18; IA: Interaction with parent inattention; HI: interaction with parent hyperactivity/impulsivity; IA = Inattention; HI=Hyperactivity/Impulsivity

*=p<.05; **=p<.01; ***=p<.001; +++.05<p<.10
and the amount of variance accounted for increased significantly for self-reports of negative parenting, with maternal inattention as a significant, unique positive predictor of self-reported negative parenting. The inclusion of mother and child ADHD symptoms did not account for significant additional variance in mothers’ observed negative parenting. Finally, in models that entered the interaction between child ADHD and mothers' inattention or the interaction between child ADHD and mothers’ hyperactivity/impulsivity symptoms at Steps 4 and 4a, there was no significant increase in the amount of variance accounted for by these interactions between mother and son ADHD symptoms. Overall, these regression results confirmed my hypothesis that mothers' ADHD symptoms would be related to negative parenting, at least for self-reports of parenting, and this effect was independent of the contribution of hostility to negative parenting. However, the absence of a main effect of child ADHD and of significant interactions between mother and child ADHD symptoms were contrary to my predictions and do not support similarity fit/misfit predictions.

Regression models predicting fathers' self-reported and observed negative parenting can be found in Table 5. Step 1 of the models entered comorbid parent psychopathology, and fathers' levels of depression, anxiety, and hostility did not significantly, uniquely predict self-reported or observed levels of negative parenting at Step 1. However, when child externalizing behaviour was entered in Step 2 of the models, it was a significant predictor of fathers' self-reported negative parenting (although the change in the amount of variance accounted for was not significant at the .05 level), but not observed levels of negative parenting. Entering the main effects of father and son ADHD symptoms at Step 3 did not significantly increase the variance accounted for in either the self-reported or observed models predicting negative parenting. Finally, the interaction terms between parent and child
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<td>Step 4</td>
<td>Step 4a</td>
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</table>

*Note: CBCL/6-18: Child Behavior Checklist for Ages 6-18; IA: Interaction with parent inattention; HI: interaction with parent hyperactivity/impulsivity; IA = Inattention; HI=Hyperactivity/Impulsivity

* = p < .05; + = .05 < p < .10
ADHD symptoms in Steps 4 and 4a were not significant. These results were contrary to my prediction of main effects for both father and son ADHD symptoms as well as the expected interaction effect between father and son ADHD symptoms as predictors of negative parenting behavior. Overall, these results suggest that mothers' own levels of inattention are uniquely associated with self-reported negative parenting, whereas the bivariate relation between father inattention and negative parenting does not survive control of other forms of psychopathology, particularly child externalizing behavior. Contrary to the predicted interactive effects of parent and child ADHD symptoms, there was no support for either similarity fit or misfit in the analyses of negative parenting behavior. Finally, in contrast to the results for self-reports of parenting, ADHD symptoms were not significantly predictive of observed parenting (although maternal hostility was predictive of observed negative parenting).

**Positive parenting.** Regression models predicting mothers' self-reported and observed positive parenting can be found in Table 6. At Steps 1 and 2, mothers' BSI scores and child externalizing behaviour were not significantly associated with self-reported positive parenting. For observed positive parenting, child externalizing behaviour was a marginally significant predictor at Step 2, but in an unexpected positive direction. When mother and child ADHD symptoms were entered at Step 3 of the models, the amount of variance accounted for increased significantly in the self-report model and maternal hyperactivity/impulsivity was a significant, and again positive predictor of self-reported positive parenting. The addition of mother and child ADHD symptoms at Step 3 did not account for significant additional variance in the model for observed positive parenting. At
Table 6.
Regression models predicting mothers’ positive parenting

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<th>Step 4a (HI)</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4 (IA)</th>
<th>Step 4a (HI)</th>
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</table>

\(R^2\) | .06 | .06 | .21 | .21 | .23 | .01 | .09 | .13 | .14 | .13 |
\(\Delta R^2\) | <.01 | .15* | <.01 | .02 | .08+ | .04 | .01 | <.01 |

*Note:* CBCL/6-18: Child Behavior Checklist for Ages 6-18; IA: Interaction with parent inattention; HI: interaction with parent hyperactivity/impulsivity; IA = Inattention; HI=Hyperactivity/Impulsivity

\*\(p<.05; \texttt{=}=.05<.10\)
Steps 4 and 4a, mother and child ADHD symptoms did not significantly interact in predicting either the self-report or observational model of positive parenting. The lack of significant interactive effects is consistent with previous research that has not found evidence for a similarity-fit/misfit between mother and child ADHD symptoms and positive parenting (Psychogiou et al., 2007), however, the absence of main effects of child ADHD symptoms and the positive links between both maternal hyperactive/impulsive symptoms and child externalizing behavior and positive parenting are contrary to my expectations.

Regression models predicting fathers' self-reported and observed positive parenting can be found in Table 7. At Steps 1 and 2, neither father BSI scores nor child externalizing behaviour significantly, uniquely predicted self-reported or observed positive parenting. Adding father and son ADHD symptoms to the regression models at Step 3 did not significantly increase the amount of variance predicted in either self-reported or observed positive parenting behaviours. Finally, including the interaction terms at Step 4 and 4a also did not significantly predict unique variance in fathers’ positive parenting. As with mothers, the absence of significant interaction terms in the prediction of positive parenting behaviour by fathers is consistent with previous findings. However, contrary to expectations, neither father nor son ADHD symptoms were significantly related to positive parenting.

Overall, these results fail to support any similarity fit or misfit in understanding positive parenting, although mothers' hyperactivity/impulsivity symptoms were positively related to their own reports of positive parenting, whereas this relation was not found for fathers. In contrast to the relations found with measures of negative parenting, comorbidities in parents and children were less consistently predictive of measures of positive parenting.
Table 7.
Regression models predicting fathers' positive parenting

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<th>Step 4 (IA)</th>
<th>Step 4a (HI)</th>
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</tbody>
</table>

| $R^2$                  | .03    | .03    | .06    | .07         | .08          | .002   | .009   | .09    | .10         | .10          |
| $\Delta R^2$           | <.001  | .03    | .01    | .02         | .007         | .081   | .01    | .01    |             |              |

Note: CBCL/6-18: Child Behavior Checklist for Ages 6-18; IA: Interaction with parent inattention; HI: interaction with parent hyperactivity/impulsivity; IA = Inattention; HI=Hyperactivity/Impulsivity
Discussion

In this study, I set out to investigate a similarity-fit and/or similarity-misfit between parent and child ADHD symptoms in predicting parenting behavior. I did not find any evidence for a similarity-fit or a similarity-misfit for positive or negative parenting in mothers or fathers when parenting behaviour was self-reported or when it was observed. There are several possibilities of why such effects, which have been found in previous research (e.g., Biederman et al., 2002; Griggs & Mikami, 2001; Psychogiou, 2007), were not found here. One possibility is the extremely restricted range of child ADHD symptoms. The majority (93%) of children in this sample met diagnostic criteria for ADHD, so all analyses were conducted within this relatively homogenous group of symptomatic children. If, in actuality, a similarity-fit or -misfit effect is occurring, it would almost certainly be obscured by the under-representation of children with low levels of ADHD symptoms in this sample. With this in mind, the main effects of mothers' ADHD symptoms on their parenting self-reported parenting behaviour suggest that, among children with high levels of ADHD symptoms, when mothers have more hyperactive/impulsive or inattentive symptoms, they report more positive and negative parenting behaviour, respectively. This means that, at least at the high end of the continuum of child ADHD symptoms, high levels of mothers' inattention symptoms were associated with higher levels of negative parenting, and higher levels of mothers' hyperactivity/impulsivity symptoms were associated with higher levels of positive parenting. It is possible that with the addition of more children with lower levels of ADHD symptoms, significant interactions between parent and child ADHD symptoms may emerge. However, given that relatively few studies have examined the similarity-fit hypothesis, it is also possible that this hypothesis is incorrect and that parental ADHD symptoms do not, in interaction with child ADHD, confer a parenting benefit.
The restricted range of child ADHD symptoms is likely also why my hypothesized main effects of child ADHD on positive and negative parenting behaviour did not emerge for mothers or fathers. For main effects to be detected in this sample, there would have had to have been significant variability in both parenting behaviour and child ADHD symptoms. It is likely that the high levels of child ADHD symptoms again restricted the ability to detect such relationships. I expect that including more children with lower levels of ADHD symptoms would have increased the variability of child ADHD such that parent behaviour towards their children would differ systematically with the level of child ADHD symptoms.

**Negative parenting**

Consistent with my hypothesized main effects of negative parenting and parent ADHD symptoms, I found that mother and father inattention symptoms were both positively related to self-reports of negative parenting. For mothers, this relationship survived the inclusion of other parent and child psychological symptoms and is consistent with previous research that has found that mothers with ADHD symptoms report more negative parenting on the APQ (Murray & Johnston, 2006). As noted above, these results clearly do not support a similarity-fit for mothers' negative parenting, unlike previous work that has found such an effect (Psychogiou et al., 2007). If anything, my results suggest a similarity-misfit for mothers' negative parenting in that among this sample of primarily ADHD boys, having a mother with more inattention was related to higher levels of negative parenting. Previous research has not investigated the similarity-fit/misfit hypothesis separately for the two dimensions of parental ADHD symptoms, and it is possible that when inattention and hyperactivity/impulsivity symptoms are investigated separately, as they were in this study, the similarity-fit between mother and child ADHD symptoms and negative parenting disappears. Although fathers’ inattention was also related to
more negative parenting, controlling for child externalizing problems in the regression reduced this relationship to nonsignificance. The fact that the bivariate relationship between inattention and negative parenting was accounted for by child externalizing problems only for fathers may be due to a difference in the ways that mother and father inattention symptoms are related to their parenting. Perhaps fathers are more likely than mothers to see their own negative parenting behaviour as closely linked to, or even caused by, their child's externalizing behaviour, and thus, those child behaviours serve to explain the association between fathers' inattentive symptoms and their negative parenting behaviour. Mothers' inattention symptoms, on the other hand, may be more directly related to their negative parenting behaviour such that inattentive mothers may attribute their negative parenting behaviour to internal characteristics such as their own symptoms.

The significant main effect of maternal inattention, and the significant bivariate relationship between father inattention and more negative parenting are consistent with previous research linking parent inattention symptoms to negative parenting (Chen & Johnston, 2007; Harvey, Danforth, Eberhardt-McKee, Ulaszek, & Friedman, 2003), but which has not demonstrated this relationship for hyperactivity/impulsivity symptoms (Chen & Johnston, 2007). It is not entirely clear why inattention symptoms are related to negative parenting while hyperactivity/impulsivity symptoms are not. Perhaps the nature of inattention symptoms (e.g., organizational difficulties, following through with one's intentions) work to set parents up to react in a negative fashion to difficult child behavior. For example, parents who have difficulty remembering and following through with tasks may be more inconsistent in their discipline because they have more difficulty remembering and implementing consequences for their child's misbehaviour. Parents with high levels of inattention may also be more permissive due to their
organizational difficulties. Deficits in planning and follow-through with consequences may cause such parents to resort to over-reactive or permissive parenting as means to gain child compliance and reduce their child's negative behaviour.

The observational measure of parenting was utilized in this study in an attempt to balance the drawbacks of self-report measures of parenting (Morsbach & Prinz, 2006; Perepletchikova & Kazdin, 2004). By including an observational measure, I intended to speak to the similarities and differences in the information provided by multiple raters of parenting behaviour. For negative parenting, the results indicated that, unlike the self-reports, observations did not reveal any relationships between negative parenting and parent or child ADHD symptoms. It is possible that the observational procedures or measure were not adequately capturing negative parenting behaviour. For example, the chore task might not have been sufficiently frustrating to elicit variability in either child noncompliance or negative parenting. Evidence for this possibility can be seen in the low frequency of observed over-reactivity and laxness; parents were rarely negative with their child and the intensity of that negativity was quite mild. In fact, the low ICCs for the observed negative parenting variable are likely due to this low frequency of observed negative parenting – and, in particular, low observed over-reactivity. In addition to the possibility of the chores being insufficiently challenging, the low frequency of negative parenting behavior may be due to parents’ reactivity to being observed, or because these parents were well-equipped to respond to their child's negative behaviours. Turning to the observational measure itself, even though this measure was designed to mirror the self-reported APQ and PS subscales, the observational measure may not have captured the wider range of parenting behaviours that are included on the self-report scales. If this is the case, the addition of more or broader dimensions to the observational measure may be needed. For example, in a recent study of the relationship
between maternal ADHD symptoms and observed parenting behaviour, Zisser and Eyberg (2012) found that mothers with high levels of inattention symptoms were more impatient with their children than mothers with low levels of inattention symptoms. These results suggest that the observational measure used in the current study may be lacking important dimensions, such as impatience, that might better capture the relationship between parental ADHD and parenting. It is important to note that observations of negative parenting were significantly correlated with other forms of parental psychopathology, suggesting that measure insensitivity may not fully account for the lack of relationship with parental ADHD symptoms.

An alternate explanation for the failure to find significant relationships between parental ADHD symptoms and the observational measure of parenting may reflect a true meaningful difference between the self-report and observational measures of parenting. For example, the correlations between parent inattention and self-reported negative parent behaviour are likely inflated by rater variance, as parents were the raters for both measures. In addition, we know that the validity of self-report measures for parenting behaviour can be compromised (Morsbach & Prinz, 2004, as cited in Morsbach & Prinz, 2006), suggesting increased caution when interpreting results that rely wholly on self-report measures.

**Positive parenting**

For positive parenting, I found that mothers' hyperactive/impulsive symptoms were related to higher levels of self-reported positive parenting, whereas there was no such relationship for fathers. Although these results show a relationship between maternal ADHD and positive parenting, they are inconsistent with my hypothesis as the direction of this effect is opposite to my prediction. Given that the children in this sample all had high levels of ADHD symptoms, the positive association between maternal ADHD and positive parenting could be
supportive of a similarity-fit hypothesis in that it suggests that, for mothers of children with high levels of ADHD symptoms, having higher levels of hyperactivity/impulsivity symptoms is related to more positive self-reports of positive parenting. If true, this would again not be in support of my initial hypothesis as I had not predicted a similarity-fit or -misfit for mother and child ADHD symptoms on positive parenting behaviour. However, the positive effect of maternal ADHD symptoms on positive parenting has been hinted at in previous research (e.g., Psychogiou, Daley, Thompson, & Sonuga-Barke, 2008), and maternal hyperactivity/impulsivity symptoms in particular have been shown to be related to increased self-reported levels of positive parenting (Lui & Johnston, in press). Perhaps mothers who are more hyperactive or impulsive are also more energetic, playful, and gregarious than mothers with lower levels of these symptoms and are less frustrated by these same behaviours in their own children. In contrast, inattention symptoms in adults, as in this study, have not previously shown to be associated with positive parenting behaviour (Lui & Johnston, in press). This makes intuitive sense, in that inattentive symptoms are characterized by carelessness, disorganization, and forgetfulness. It is difficult to imagine how such characteristics could be an asset to positive parenting behaviour. High energy and impulsivity, on the other hand, may confer benefits to positive parenting in play situations with younger children. From this perspective, it seems reasonable to expect that, between the two symptom dimensions, hyperactivity/impulsivity symptoms would be the ones driving any similarity-fit effects.

Unlike the results of Lui and Johnston (in press) however, we did not find the same relationship between fathers' hyperactive-impulsive symptoms and self-reports of positive parenting behaviour. It isn't clear why this effect was not found for fathers. Previous researchers have suggested that fathers with high levels of hyperactivity/impulsivity symptoms might feel
annoyed or overwhelmed by child ADHD symptoms (Psychogiou et al., 2007), although why this might be true for fathers and not mothers is unknown. The results of this study do not suggest that fathers' hyperactivity/impulsivity symptoms are a detriment to their positive parenting behaviour; instead, the results suggest that mothers' hyperactivity/impulsivity symptoms are an asset. Perhaps the increased amount of time that mothers spend playing with their children (Lamb, 1981a; 1981b; 1997) may equip them to be more uninhibited or competent playmates than fathers, and mothers play may thus benefit from higher levels of activity or spontaneity.

Another possibility is that there is no real difference in the relationship between hyperactive-impulsive symptoms and positive parenting across mothers' and fathers' positive parenting. Although not significant, in the regressions, the relationship between parent hyperactivity/impulsivity symptoms and observed positive parenting was positive and moderate for both mothers and fathers ($\beta=.26-.28$).

Turning to observed positive parenting, no relationships between parent or child ADHD symptoms and observed positive parenting were observed. Similar to the possibilities discussed above regarding observations of negative parenting, the play situation might not have elicited sufficient positive parenting behaviours. This insensitivity of the observational procedure may have been exacerbated by difficulties in the operationalization of observed involvement (one of the two dimensions forming the observed positive parenting variable). We considered parents who were physically closer, more engaged in play, and more talkative with their child to be more involved. However, anecdotally, many parents of the more difficult children seemed to be much more vigilant towards their child (perhaps due to that child's more challenging behaviour) and many parents of easier children were less vigilant, and hence coded as less involved. As a result,
the ability of this dimension to capture the positive parenting aspects of "involvement" as they have been conceptualized in the parenting literature is suspect. For many parents, it is likely we were measuring involvement, but for others, our involvement dimension may have been more akin to monitoring and, for some parents, may have been driven more by a parent's confidence in their child's ability to independently stay on task rather than a desire to be involved with their child.

Although there are potential drawbacks to the observational measure used in this study, it is important to consider these drawbacks in light of the limitations of self-report measures. Self-report measures in general have been shown to be susceptible to socially desirable responding, especially when behaviours to which participants may be sensitive are being assessed (Morsbach & Prinz, 2006), and measures of parenting behaviour in particular have been shown to be vulnerable to this kind of bias (Morsbach & Prinz, 2004, as cited in Morsbach & Prinz, 2006). Research on parenting behaviour has shown that parents with ADHD symptoms report higher levels of positive parenting than what is observed (Lui & Johnston, in press). This finding highlights that research on parenting behaviour with parents with ADHD symptoms may be particularly vulnerable to parental over-estimation of positive parenting behaviour. In such a case, it is reasonable to assign observational measures of parenting behaviour, even in light of their drawbacks, equal consideration to self-reports.

**Comorbidities**

Parent ADHD symptoms are likely to co-occur with other psychological symptoms (Johnston & Mash, 2001; Pfiffner & McBurnett, 2006). Accounting for these other symptoms is crucial in establishing any unique relationships between parent ADHD symptoms and parenting behaviour. The finding that maternal hostility was the only BSI scale among mothers and fathers
to be uniquely associated with negative parenting in the regression models is surprising. This is likely due to the high inter-correlations among hostility, depression, and anxiety scores. The overlap among these variables was considerably lower for mothers than fathers, suggesting the possibility that, for fathers especially, these variables were measuring the same or very similar constructs. If this is the case, when put into the regression equations, the overlap in these variables would have reduced the ability of any one score to uniquely predict negative parenting. This explanation is consistent with the fact that all three paternal BSI variables were related bivariately to at least one measure of negative parenting. For mothers, this degree of overlap was much smaller, with hostility being more strongly related to negative parenting at the bivariate level than depression or anxiety, resulting in a significant association with negative parenting in the regression analysis. It is important to note that the pattern of relationships among the BSI subscales and the parenting measures supports the validity of my results overall. Among the bivariate relationships between parental BSI and child CBCL/6-18 symptoms and parenting behaviour, the self-report and observational measures of parenting were divergent in terms of significance in only 3 of 16 instances. The consistency that is seen among the relationships between the reports of parent psychopathology on the BSI and both the self-report and observational measures of parenting suggests that the differences that are seen between them in their relationships with ADHD symptoms may be true differences.

**Strengths**

This study had several significant strengths. First, the presence of the observational measure provided important benefits to this study. The observational measure may be capturing a different dimension of, or perhaps a more accurate picture of, parenting behavior than the self-report measures. The fact that the results for the observational and self-report measures
systematically agree in some instances provides greater confidence that the instances in which they disagree may be true differences. For instance, observations of mothers' negative parenting were sensitive enough to detect a relationship with hostility symptoms, the same as was seen for the self-report parenting measure, and these relationships maintained even after controlling for other parent and child psychological symptoms. The shared rater variance that is present in the self-report measures of ADHD symptoms and parenting may be inflating the relations between these measures, and we know that most people, but perhaps especially those with ADHD, can be unreliable reporters of their own behaviour (Barkley et al., 2002; Barkley et al., 2011). Parenting behaviour might also be a particularly sensitive subject to report on for parents of children with behavioural difficulties, and it is reasonable to suspect that people with a combination of all of these factors would be susceptible to bias when reporting their parenting behaviour. Although similar self-presentation effects are likely occurring in the observational measure, the high face validity of the self-report measures of positive and negative parenting is likely to make them more susceptible to self-presentation biases.

Second, the inclusion of fathers in this study was also a significant strength. Although mothers and fathers look similar in terms of the relationships among ADHD symptoms and parenting at the bivariate level, the regressions reveal important differences. When other parent and child psychological symptoms were controlled in the prediction of self-reported negative parenting, the effects of maternal hostility and inattention remained significant, which was not the case for fathers. Instead, child externalizing behaviour uniquely predicted fathers' reports of negative parenting. This suggests that when parents are thinking about their own difficulties in parenting, mother-centred factors (e.g., hostility, inattention symptoms) are important for mothers, but child-centred factors may be more important for fathers. It may be that fathers,
perhaps reflective of a general tendency to be less nurturing than mothers (Starrels, 1994), are more reactive to negative child behaviour than mothers. If so, associations between father-centred factors (e.g., ADHD and other psychological symptoms) and parenting behaviour may be overwhelmed by the stronger relationship between child misbehaviour and fathers' parenting. The relative importance of mother-centred factors in parenting behaviour was also found in the self-reports of positive parenting where mothers', but not fathers', hyperactivity/impulsivity symptoms were related to their reports of positive parenting. These results underscore the continuing need to understand fathers as qualitatively different from mothers and to include them in any study of parenting. Unfortunately, we were unable to conduct HLM analyses due to the limited sample size. However, being able to do so would allow for direct comparisons between mothers and fathers and, in future studies, would be ideal for investigating mother-father differences.

Overall, mothers' ADHD symptoms, unlike fathers, were uniquely associated with both positive and negative parenting behaviours. Parent ADHD symptoms were predictive of parenting behaviour in mothers, but in fathers, child externalizing behaviour was more predictive of fathers' negative parenting than his own ADHD, depressive, hostile, or anxious symptoms. My results support previous research (e.g., Arnold et al., 1997, Leidy et al., 2011) that suggest that fathers' parenting behaviour is qualitatively different from mothers. Although mean levels of both positive and negative parenting behaviour were comparable between mothers and fathers, the underlying relationships between parenting behaviour and other parent and child variables differ for mothers and fathers. This result emphasizes the importance of fathers and their unique contributions to family dynamics. Future research is needed to continue to investigate how child and parent psychological symptoms are differentially related to parenting in mothers and fathers.
Limitations

A number of limitations in this study should be mentioned. First, the absence of a sufficient number of children and families with low levels of ADHD symptoms significantly restricted my ability to find main effects of child ADHD and interaction effects between parent and child ADHD symptoms. Since these interaction terms were the focus of this study, it is important in the future to recruit families with members with a wide range of ADHD symptoms. Second, the sample size was lower than anticipated and there are a number of marginally significant correlations and betas that might have reached significance if a larger sample had provided more power. Third, although there may be an interaction between child gender and parenting behaviours, the focus of this study was on determining whether or not parenting behaviours were affected by the interaction between the level of ADHD symptoms in the parent and child. By restricting the sample to include only sons, I was able to more easily address this question. Nevertheless, it is important to keep in mind that all of the results found in this study are restricted to parenting of sons. In particular, it is not possible to disentangle the effects of parent-child ADHD symptom similarity from the effects of parent-child gender similarity or differences. Fourth, reliability was low for several parent measures, in particular, the alphas for mothers' OVR score on the PS, mothers' anxiety and hostility scores on the BSI, and the ICC for fathers’ observed negative parenting. It is unclear why internal consistency was low for mothers' on several of the self-report measures, but the limited reliability does suggest caution in interpreting the results from these measures. As noted above, the low ICC for fathers' observed negative parenting is likely due to the rarity of negative parent behaviour observed in the chore task, and supports the need for more challenging observational situations or sensitive observational code categories.
Conclusions

In conclusion, I found that parent perceptions of their own negative parenting are related to their own levels of inattention symptoms. For mothers, this relationship was maintained even after controlling for mother and child psychological symptoms, and maternal hostility emerged as another factor that was associated with self-reported negative parenting by mothers. For fathers, the inclusion of child aggression in the regression equation eliminated the relationship between fathers' inattention symptoms and their negative parenting behaviour. The inclusion of an observational measure revealed that when parent behaviours are observed, the associations between parent ADHD symptoms and parenting behaviour disappear suggesting that self-report and observational measures may be capturing different information. Maternal ADHD symptoms had differential relationships with negative and positive parenting behaviours such that inattention symptoms predicted more negative parenting, while hyperactive/impulsive symptoms predicted more positive parenting. I did not find any evidence of a similarity-fit in my sample composed of a majority ADHD boys, with the exception of increased maternal hyperactivity predicting more positive parenting. In fact, my results suggest, in contrast to Psychogiou and colleagues (2007), that there may be a similarity-misfit in mothers with ADHD such that, among sons with ADHD, mothers with more inattention symptoms engage in more negative parenting than mothers without ADHD. Finally, the results suggested that mothers' parenting behaviour is different from fathers' in that mothers' parenting is associated with their own psychological symptoms, whereas fathers' parenting was not and, in the case of negative parenting, was associated with their sons' externalizing behaviour.

Clinical Implications
The results of this study have several implications for clinical work. First, they suggest that both mothers and fathers should be included in work with families with ADHD. Further, the different pattern of associations between parent ADHD and parenting behaviour for mothers and fathers suggests that clinicians may need to consider different therapeutic approaches for mothers and fathers of children with ADHD. In particular, mothers may benefit from investigation of how their own psychological symptoms are related to their parenting, while fathers may benefit more from an exploration of how their child's behaviour is related to their parenting. Second, parent ADHD symptoms in this study had differing patterns of association with positive versus negative parenting, suggesting that parenting behaviour should not be considered as a homogenous construct and families may benefit from therapeutic techniques that focus on the relationship between maternal positive parenting and mothers' hyperactive/impulsive symptoms and different approaches that focus on the relationship between maternal negative parenting and parents’ inattention symptoms. Finally, this study suggests that clinicians should be cautious when relying on parent self-reports of their own parenting to guide treatment, and would benefit from the inclusion of observational and/or collateral reports of parenting behaviour and a constant awareness that parenting self-reports are parent perceptions of their own behaviour and may not be wholly accurate reports of parenting behaviour.
References


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