

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN PARENTING STRESS AND
ANXIETY DISORDERS IN YOUNG CHILDREN

by

CHRISTINE MARGARET SHUNG-BUN YU

Bachelor of Arts, Simon Fraser University, 2005

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Abstract

Anxiety disorders are the most common mental health disorder among children (Merikangas et al., 2010). If left untreated, anxiety disorders can cause significant impairment in functioning and persist into adolescence and adulthood (Ehrenreich & Santucci, 2009; Öst & Treffers, 2001). Although anxiety disorders are often responsive to psychological intervention and the literature suggests that they can be preventable with early detection and intervention (Hirshfeld-Becker et al., 2010), they often remain undetected and untreated. In order to contribute to early intervention efforts, it is important to understand risk factors associated with childhood anxiety disorders.

Current theoretical models of childhood anxiety underscore the importance of reciprocal interactions between parents, their children, and environmental stressors. Specific factors, such as marital discord and parental anxiety, have been hypothesized to influence the development of anxiety disorders in children (Ginsburg, Siqueland, Masia-Warner, & Hedtke, 2004), and may highlight the association between family environment, parenting, and child anxiety disorders. Parental and family factors account for the intergenerational transmission of anxiety.

Maternal stress has been indicated as a predictor of both internalizing and externalizing problems in children (Bayer, Hiscock, Ukoumunne, Price, & Wake, 2008). A significant body of research links children's externalizing behaviour problems and parenting stress. Research has not focused as much attention on the connection between parenting stress and children's internalizing problems, specifically anxiety disorders. This study proposes to explore the relationship between parenting stress and anxiety disorders in young children through a secondary analysis of data collected from a larger study.

Preface

The collection of data was conducted at UBC's Anxiety Projects Lab by Karen Hamill and Dr. Lynn Miller (UBC Counselling Psychology). In the original study, I was involved in participant recruitment, conducting diagnostic interviews, collecting and entering data, and data analysis. UBC Behavioural Research Ethics Board approval (BREB), H08-02601, Vancouver School Board ethics approval, and West Vancouver School Board ethics approval was required to conduct the research.

In the current study, I am involved in the initial idea development, entering data, data analysis, and final manuscript write-up.

UBC BREB approval for secondary use of data was required to conduct this research: H12-00075.

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Chapter 1

Introduction

Overview

Anxiety disorders (AD) are the most common mental health disorder among children and adolescents, with a median age of initial onset of 6 years (Merikangas et al., 2010). Studies show a prevalence rate of approximately 10% in preschoolers (Egger & Angold, 2006) and a lifetime prevalence of 32% (Merikangas et al., 2010). Childhood AD are associated with a vast range of psychosocial problems, including increased substance use, lower academic performance, adult psychopathology, decreased family cohesion and interpersonal problems (Ehrenreich & Santucci, 2009; Öst & Treffers, 2001). Internalizing problems, such as symptoms of anxiety, in early childhood usually persist into midchildhood (Bayer, Hastings, Sanson, Ukoumunne, & Rubin, 2010). If left untreated, children with anxiety are at an increased risk for other psychopathology, including major depressive disorder and AD in adolescence and adulthood (Ehrenreich & Santucci, 2009; Pine, Cohen, Gurley, Brook, & Ma, 1998). The economic burden of AD also impact society, including costs related to sick leave, unemployment, and remedial education services (Dupont, Rice, Miller, Shiraki, Rowland, & Harwood, 1996; Greenberg et al., 1999). However, AD are often responsive to psychological intervention (Barrett, Dadds, & Rapee, 1996; Kendall, Krain, Henin, 2000). Given the negative trajectory associated with untreated AD, more research contributing to the effectiveness of prevention and early intervention of AD is needed.

Anxiety disorders in young children is a growing field of research (see Egger & Angold, 2006; Schniering, Hudson, Rapee, 2000), however, research attention in the area of prevention and early intervention of AD in early childhood is scant. There have been a limited number of

studies, which have examined the prevention or early intervention of childhood AD in children ranging from 3- to 7-years of age (see Cartwright-Hatton et al., 2011; Hirshfeld-Becker et al., 2008, 2010; Monga, Young, & Owens, 2009; Rapee, Kennedy, Ingram, Edwards, & Sweeney, 2005; Waters, Ford, Wharton, & Cobham, 2009). These few studies suggest that preventative programs and early interventions may help to modify factors hypothesized to maintain anxiety, such as parenting factors (Hirshfeld-Becker et al., 2010). To conduct robust early interventions for AD, a better understanding of the development of AD in young children, including risk and maintaining factors, is needed (Bayer et al., 2010; Rapee et al., 2005).

Family environment and parenting have been of interest in developmental psychopathology research, as many aspects of psychological problems have been shown to be familial in nature (Deater-Deckard, 1998). For example, the familial nature of anxiety is established (Bögels & Brechman-Toussaint, 2006; Ginsburg & Schlossberg, 2002; Rapee, 1997; Schrock & Woodruff-Borden, 2010). Parenting style is one factor that has been investigated in research involving the impact of family on childhood AD. The association between parenting style and childhood AD has been studied using community, high risk, and clinical samples (Lindhout, Markus, Borst, Hoogendijk, Dingemans, & Boer, 2009). Most studies examining familial factors in the development of AD involve school-aged children and adolescents (see Bayer, Sanson, & Hemphill, 2006; Ginsburg & Schlossberg, 2002; Ginsburg et al., 2004). Childrearing studies have consistently highlighted parenting style as a key factor in the development of AD. However, the role of parenting in the development of AD in younger populations, for example, preschool-aged children, has been less extensively researched.

Parenting stress, a physiological and psychological reaction to a parent's perceptions of a) the demands of parenting, b) resources available to meet the demands of parenting, and c) the

parent's ability to utilize available resources to meet those demands (Abidin, 1992; Deater-Deckard, 1998, 2004), has been linked to parenting behaviour and child outcome (Crnic, Gaze, & Hoffman, 2005; Deater-Deckard, 1998). Quality of caregiving, parent-child interactions, and child behaviour have been found to be negatively impacted by parenting stress (Crawford & Manassis, 2001; Crnic et al., 2005). For example, higher parenting stress has been associated with negative and harsh (authoritarian) parenting, less responsiveness, and in extreme cases, neglect and abuse (Deater-Deckard, 1998). Parents of children with early signs of psychopathology have been found to show higher levels of parenting stress (Deater-Deckard, 1998). Parenting stress is also associated with negative outcomes for children, such as behavioural problems and insecure attachment (Crnic & Low, 2002; Deater-Deckard, 1998), and is indicated as a predictor of both externalizing and internalizing problems in children (Bayer et al., 2008).

The association between externalizing disorders and parenting stress has been extensively researched. A positive relationship between externalizing problems in children and overall parenting stress has been demonstrated (see Morgan, Robinson, & Aldridge, 2002, for review). Less attention has been paid to the association between parenting stress and internalizing difficulties in children. Although relatively less research is available, the current literature suggests that a similar positive relationship exists between increased parenting stress and internalizing symptoms.

Problem Statement

There is limited research investigating the association between parenting stress and internalizing problems, specifically anxiety disorders, in children. While familial factors in the development of AD are commonly researched in school-aged children, investigations into family

factors contributing to the development of AD in young children is in its early stages. The goal of this study is to explore the relationship between parenting stress and anxiety disorders in a community sample of kindergarten-aged children.

Anxiety disorders are highly prevalent and cause significant impairment in multiple domains of functioning, and usually persist into adolescence and adulthood. Furthermore, the stability of internalizing symptoms in childhood has been demonstrated, with children's internalizing difficulties at age 2-years continuing through to age 4- and 7-years (Bayer et al., 2010). Although they are responsive to treatment and can be preventable with early interventions, AD often remain undetected and untreated. Because of the prevalence of AD in children and the negative, long-term trajectory associated with untreated anxiety, it is important to explore critical gaps in research to be better able to contribute to the effectiveness of preventative and early interventions.

Reciprocal interactions between parents, their children, and environmental stressors have been highlighted in the conceptualization of the development of childhood AD (Ginsburg et al., 2004). Much research has been conducted to explore the association between family variables and anxiety disorders in children. Literature reviews by Ginsburg and Schlossberg (2002), and Bögels and Brechman-Toussaint (2006), identify numerous parental factors, such as parental anxiety and parenting style, which may impact the development of childhood anxiety. The intergenerational transmission of AD has been established, although more research into the mechanisms of transmission is needed (Bögels & Brechman-Toussaint, 2006; Ginsburg & Schlossberg, 2002; Wheatcroft & Creswell, 2007). Parental functioning and childrearing practices are of particular importance, as they have been shown to predict treatment outcome (Crawford & Manassis, 2001; Kendall, Hudson, Gosch, Flannery-Schroeder, & Suveg, 2008;

Silverman & Berman, 2001). Research exploring parenting and the development of childhood AD has not yet explicitly considered the role of parenting stress.

Research suggests that a relationship exists between parenting stress and child psychological well-being (Crnic & Low, 2002). Maternal stress has been identified as a predictor of both internalizing and externalizing problems in children (Bayer et al., 2008). A significant body of research linking externalizing behavioural problems in children and parenting stress supports findings that identify maternal stress as a predictor of externalizing problems (see Bayer et al., 2008). Although maternal stress has also been identified as a predictor of internalizing problems (Bayer et al., 2008), there is less research focus on the connection between parenting stress and internalizing problems, specifically anxiety disorders.

Purpose and Research Questions

This study aims to foster a more comprehensive understanding of the role of parenting in the development of AD in young children by exploring the association between parenting stress and childhood AD. By exploring correlates of early AD expression, this study strives to contribute to the prevention and early intervention of childhood AD.

The purpose of this survey methods study is to investigate, a) if a relationship exists between parenting stress and the diagnosis of a childhood anxiety disorder in a community sample of kindergarten-aged children, and b) if parental anxiety influences the relationship between parenting stress and an anxiety disorder diagnosis in children. Parenting stress and parental anxiety will serve as the independent (or predictor) variables, and presence or absence of childhood AD diagnosis will be the categorical dependent variable. This study will address the following research questions in a community sample of children enrolled in public school kindergarten classrooms:

1. Does a relationship exist between parenting stress level and anxiety disorder diagnosis in children? It is hypothesized that higher parenting stress levels will be predictive of an AD diagnosis in the child.
2. Does parental anxiety influence the relationship between parenting stress levels and anxiety disorder diagnosis in children? It is hypothesized that parental anxiety will moderate the relationship between parental stress level and child AD diagnosis. Specifically, it is hypothesized that higher levels of parental anxiety will strengthen the relationship between parental stress level and child AD diagnosis.

Chapter 2

Literature Review

Anxiety

Background.

Anxiety is a normal reaction to threat (Kyrios, Moulding, & Nedeljkovic, 2011), and an emotional state involving physiological, cognitive, and behavioural components (Hubert, 1997). Anxiety is characterized by feelings of apprehension and distress about real or anticipated threat, involves a state of elevated arousal (Rachman, 2004), and can generate a sense of helplessness due to a perceived lack of control over future events (Barlow, 2002). Anxiety can be both adaptive and maladaptive (Lowe & Raad, 2011; Whiteside & Ollendick, 2009), depending on the level of intensity (Beidel & Turner, 2005). For example, a moderate amount of anxiety can enhance performance, while low or high levels of anxiety can impair performance (Beidel & Turner, 2005). Anxiety also serves as a survival mechanism and has evolutionary value (Lowe & Raad, 2011; Whiteside & Ollendick, 2009). When an individual perceives potential threat, the sympathetic nervous system is activated and the individual prepares to respond to the threatening stimuli by fighting, fleeing, or freezing (acute stress response), which serves to protect the individual from harm. Children with high anxiety display higher sympathetic nervous system reactivity than non-anxious children (Wood & McLeod, 2008).

Transitory anxiety and fear, and general symptoms of anxiety in childhood and adolescence are considered part of normal development (Craske, 1997; Bell-Dolan, Last, & Strauss, 1990). Anxiety and fears typically follow a developmental sequence (Warren & Sroufe, 2004; Weems & Costa, 2005). Factor analysis revealed that children and adults are concerned with 2 types of feared outcomes: those of physical danger (e.g., animals, injury, death, unknown)

and social difficulties (failure and criticism; Campbell & Rapee, 1994; Lovibond & Rapee, 1993). Fears about physical threat are prominent in early and middle childhood and typically decline in adolescence (Westenberg, Drewes, Goedhart, Siebelink, & Treffers, 2004). Cognitive and physical maturation may account for the decline in physical fears (Gullone, 2000). As children move into adolescence, fears shift to those that are social and evaluative in nature (Ollendick & Hirshfeld-Becker, 2002). Increases in social evaluative fears are likely influenced by developmental changes, such as socio-cognitive maturation (Westenberg et al., 2004). As children develop, their perceptions and responses to the social world change. For example, adolescents have a heightened sense of self-consciousness and self-awareness.

Specific developmental patterns of fear content have been identified through many years of research (Gullone, 2000). Fears surrounding immediate environment, separation from caregivers, and unfamiliar objects are predominant in the first years of life. In preschool years, fears about being alone, darkness, and animals emerge. During the school years, children's fears pertain to supernatural phenomena, evaluation and performance, and health and physical well-being. Global, economic and political fears are more prevalent in older adolescents (Beidel & Turner, 2005). Generally, the content of fears shift from being concrete in nature to anticipatory and abstract fears (Gullone, 2000).

Although there are some similarities in the content of children's fears across cultures, there is evidence of cultural variation. Ollendick, Yang, King, Dong and Akande (1996) identified the ten most common fears held by children and adolescents in America, Australia, China and Nigeria: inability to breathe, being hit by a truck, bombing attacks, earthquakes, fire (getting burned), falling from a high place, failing a test, having parents argue, getting poor grades, and death/dead people. In comparing the 10 most common fears in each country to the 10

most common fears across all four countries, Ollendick et al. (1996) found differences, suggesting the presence of country-specific fears. For example, in America, three of the top ten most common fears were different than the top ten fears across cultures. Specifically, a burglar breaking into the house, looking foolish, and getting lost in a strange place replaced earthquakes, failing a test, and having my parents argue. Three of the top ten most common fears in China also differed. Getting a shock from electricity, bears, and ghosts or spooky things replaced bombing attacks, falling from high places, and death/dead people. Significant differences found in the number of children from each country endorsing each of the 10 common fears across all four countries further suggests that children and adolescents from different countries have different common fears. This research indicates both similarities and differences in fears across cultures, and highlights the importance of cultural considerations in anxiety research.

While childhood fears are common (for review, see Ollendick, Hagopian & King, 1997), they can reflect substantial anxiety problems (Muris, Merckelbach, Mayer, & Prins, 2000). To understand the difference between developmentally appropriate anxiety and maladaptive or pathological levels of anxiety, a distinction between anxiety and an anxiety disorder is necessary. Persistent and elevated anxiety symptoms can impair functioning and develop into disordered levels of anxiety (Craske, 1997). Although anxiety can reach high levels of intensity, it is not considered pathological unless it is chronic (Barlow, 2002) and causes significant distress and life interference (Schniering et al., 2000).

Clinical presentation of anxiety disorders in children.

The current diagnostic classification system, the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR)* (American Psychiatric Association; APA, 2000) describes eight AD subtypes: separation anxiety disorder (SAD), social phobia

(SoP), obsessive compulsive disorder (OCD), specific phobia (SP), generalized anxiety disorder (GAD), panic disorder with and without agoraphobia (PD), post-traumatic stress disorder (PTSD), and acute stress disorder (ASD). Although SAD is the only AD classified as a childhood disorder, children can be diagnosed with any of the other seven AD (Albano, Chorpita, & Barlow, 2003).

There is evidence of developmental trajectories of anxiety disorders and symptoms. Separation anxiety disorder and specific phobia have onset in childhood. The prevalence of SAD decreases from childhood to adolescence (Schniering et al., 2000). In contrast, the prevalence of GAD, PD, and SoP increases from early to middle adolescence (King, Ollendick, Mattis, 1994; Rapee, 2001). In the general population, PD and SAD symptoms decrease slightly from early (10- to 15-years of age) to middle adolescence (16- to 18-years of age), while symptoms of SoP remain stable during this period (Hale, Raaijmakers, Muris, van Hoof, & Meeus, 2008). Another study exploring the developmental trajectory of anxiety symptoms in the general population found that in early adolescence (10- to 12-years of age) symptoms of SAD, SoP, GAD, PD, and OCD tend to decrease. The decrease in symptoms plateaus and is followed by an increase in middle (12- to 15-years of age) or late adolescence (14- to 18-years of age; Van Oort, Greaves-Lord, Verhulst, Ormel, & Huizink, 2009). Specifically, SAD, SoP and GAD increase in middle adolescence and PD and OCD increase in late adolescence. Increases in the AD symptoms remain evident after controlling for co-occurring depressive symptoms (Van Oort et al., 2009).

The clinical presentation of anxiety disorders is typically conceptualized as consisting of somatic or physiological, cognitive, and behavioural features (Lang, 1985). This conceptualization assumes that symptoms in these three domains are consistently present across

development (Whiteside & Ollendick, 2009). The *DSM-IV-TR* (APA, 2000) applies an adult model of psychopathology to children, although some consideration of developmental aspects of AD is present (Whiteside & Ollendick, 2009). Adulthood AD are typically preceded by childhood or adolescent AD (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Gregory, Caspi, Moffitt, Koenen, Eley, & Poulton, 2007), however most childhood AD do not persist into adulthood (Pine et al., 1998). The continuity of AD as a broad category of psychopathology across development, rather than homotypic continuity (the same diagnosis at different assessment points) has been demonstrated. In other words, having an AD in childhood may increase the likelihood of having an AD in adolescents or adulthood; however, the diagnosis of a specific subtype during childhood does not increase the likelihood of being diagnosed with that same AD subtype later in development. Since specific AD subtypes do not necessarily persist, developmental variations in presentation of AD should be considered.

Children's somatic complaints, cognitions, and behavioural expressions of anxiety can differ from those of adults. Headaches, stomachaches and muscle tension are common somatic complaints of children with AD (Hughes, Lourea-Waddell, & Kendall, 2008; Last, 1991). As with adults, anxious children have cognitions that vary in severity, content, frequency, and controllability. For example, anxious children sometimes report excessive worries and catastrophic thoughts (Beidle & Turner, 2005). However, the cognitive manifestations of anxiety are influenced by age and cognitive development (Beidel & Turner, 2005). Similarly, children's behavioural expression of anxiety is often different from adults due to children's developmental level (Beidel & Turner, 2005). This section will describe and discuss developmental aspects of the clinical presentation of anxiety disorders in children and adolescents.

Somatic symptoms.

Somatic complaints are important to consider in the clinical presentation of AD. Somatic symptoms have been linked to higher overall clinician severity ratings of anxiety and impairment in life functioning in children and adolescents (Ginsburg, Riddle, & Davies, 2006). Furthermore, somatic complaints can distinguish between children with and without AD. Children with AD report more somatic complaints and a significantly higher frequency of somatic complaints than normal controls. Similar results were found when comparing anxious children to children with other psychiatric disorders (Beidel, Christ, & Long, 1991; Hughes et al., 2008).

It is important to note that not all children with anxiety will experience the same physiological reactions (Beidel & Turner, 2005). Variations in somatic symptoms between AD subtypes exist. For example, children with panic disorder or separation anxiety disorder are more likely to report somatic complaints compared to children with phobic disorders (Last, 1991). Certain symptoms are characteristic of specific AD subtypes. Restlessness, stomachaches, blushing, palpitations, muscle tension, sweating, and trembling/shaking are commonly reported by children with SoP, SAD, and GAD (Ginsburg et al., 2006). However, higher rates of restlessness, stomachaches, and palpitations are associated with SAD and higher frequency of sweating is associated with SoP (Ginsburg et al., 2006).

Somatic symptoms and complaints can also vary across developmental stages. Older children are more likely to report somatic complaints compared to younger children (Last, 1991; Ginsburg et al., 2006). Ginsburg et al. (2006) found that older children (12- to 17-year-olds) reported significantly more blushing, sweating, trembling/shaking and paresthesia (prickling or tingling sensation) compared to younger children (6- to 11-year-olds). These somatic complaints appear to correspond with the nature of typical fears in adolescence (i.e., social and performance

based). Additionally, headaches, a commonly reported somatic symptom experienced by children with AD, are not mentioned in the *DSM-IV-TR* (Whiteside & Ollendick, 2009).

Somatic symptoms are an important feature in AD. Complaints of somatic symptoms may serve a dual purpose for children with anxiety. Children may express their emotional distress through somatic complaints, and these complaints may also be used as an excuse to avoid situations or events that induce anxiety (Hughes et al., 2008). Being aware of commonly reported somatic complaints in anxious children may aid in the identification and early intervention of childhood anxiety disorders.

Cognitions.

Cognitive distortions are evident in childhood AD (Muris & Field, 2008). Cognitive distortions can include attentional bias, a proclivity to hyperattend to potentially threatening stimuli; interpretation bias, a tendency to perceive threat in ambiguous situations; memory bias, recalling memories congruent with anxiety (Muris & Field, 2008); and attributional bias, in which positive events are accredited to external, specific, unstable causes and negative events to internal, global, and stable causes (Kagan, MacLeod, & Pote, 2004). Cognitive distortions can lead to maladaptive emotional and behavioural responses (Wood & McLeod, 2008). Cognitive features of anxiety disorders in children may be developmentally related. Negative cognitions may not appear until metacognition develops, during adolescence (Beidel & Turner, 2005).

There are similarities and differences in the presentation of cognitive distortions between anxious adults and anxious children. As with anxious adults, there is growing evidence that anxious children demonstrate interpretational (e.g., Barrett, Rapee, Dadds, & Ryan, 1996), and attentional bias (Daleiden & Vasey, 1997; Bar-Haim, Lamy, Peragamin, Bakermans-Kranenburg, & van IJzendoorn, 2007). However, attentional biases are not consistently observed

in children under 8-years of age (Vasey & MacLeod, 2001). Recognizing developmental variations in cognitive features of AD may facilitate the diagnosis of AD in children.

Behaviours.

Behavioural dimensions of anxiety in children can include overt displays, such as tantrums, aggression, crying, trembling, somatic complaints, and reassurance seeking (Bagnell, 2011). More subtle displays of anxiety are also possible, such as procrastination and or persistent questioning (Albano et al., 2003). Avoidance behaviours are also common in AD. Children may engage in avoidance through “playing sick”, refusing to participate in a feared activity, and using delay tactics (Beidel & Turner, 2005). Older children also display avoidance by their hesitance to leave home or engage in peer activities without their parents (Bell-Dolan & Brazeal, 1993). Extreme avoidance behaviours include school refusal and selective mutism (Beidel & Turner, 2005). Although the use of avoidance behaviours brings relief from anxiety or fear, albeit temporarily, it serves to strengthen anxiety and reinforce avoidant behaviour. Other behavioural expressions of anxiety include compulsions, repetitive behaviours or rituals. Support for the presence of developmental differences in compulsions is available. Children and adolescents exhibit hoarding and saving compulsions more frequently than adults (Geller et al., 2001). Similar to somatic and cognitive features, behavioural displays of anxiety may vary over the course of development.

Gender differences.

Gender differences in prevalence rates are evident for internalizing problems in adolescence. Females are twice as likely as males to experience internalizing difficulties (Crick & Zahn-Waxler, 2003). However, gender differences in prevalence rates in younger children have not been supported in research (Bayer et al., 2010; Marakovitz, Wagmiller, Mian, Briggs-

Gowan, & Carter, 2011). Research supports a similar finding in gender differences when exploring anxiety disorders, and suggests that gender differences in prevalence rates are evident for each AD subtype (Merikangas et al., 2010). Higher rates of AD have been found in adolescent females compared to adolescent males (Bosquet & Egeland, 2006). Furthermore, these differences in rates remain stable throughout adolescence (Hale et al., 2008; Van Oort et al., 2009). Such gender differences can be found in children as young as 6-years of age (Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998). However, in preschool aged children, there is no significant gender difference in anxiety symptoms (Edwards, Rapee, & Kennedy, 2010) or on levels of internalizing difficulties (Bayer et al., 2010).

Family factors in the development of anxiety.

Overview.

Many complexities must be considered when conceptualizing the development of childhood AD. Recent perspectives on disorder development stem from a transactional model known as developmental contextualism, which involves reciprocal, dynamic interactions between an individual and the environment (Whiteside & Ollendick, 2009). Current models of understanding the development of anxiety disorders acknowledges multiple factors and vulnerabilities, and underscore the importance of early experiences (Chorpita & Barlow, 1998; Ginsburg et al., 2004).

Researchers have explored the association between family variables and anxiety disorders in children. Reciprocal interactions between parents and their children and environmental stressors have been highlighted as important (Ginsburg et al., 2004). Literature reviews by Ginsburg and Schlossberg (2002), and Bögels and Brechman-Toussaint (2006), identify numerous parental factors, such as parental anxiety and parenting style, which may impact the

development of childhood anxiety. Specific factors, such as child behavioural inhibition, a history of insecure attachment in the parent, and marital discord have been hypothesized to influence the development of anxiety disorders in children (Ginsburg et al., 2004).

It is clear that multiple factors, including genetics and parenting are involved in the etiology of childhood AD. Family aggregate studies, using both top-down and bottom-up methodologies, suggest that anxiety disorders run in families (Ginsburg & Schlossberg, 2002). Through the examination of the mechanisms of intergenerational transmission of anxiety, Wheatcroft and Creswell (2007) found a significant correlation between parental anxiety and parental report of child anxiety in a community sample. Parental anxiety was associated with parent locus of control and parent perceived control of child anxious behaviour. These findings suggest that parent cognitions may be a contributing factor to the intergenerational transmission of anxiety. Although the process through which anxiety is transmitted in families is not well understood, there is likely a genetic and environmental contribution (Bögels & Brechman-Toussaint, 2006; Ginsburg & Schlossberg, 2002).

Family/environment factors.

Several familial risk factors for the development of internalizing problems and, specifically childhood AD, have been identified in the literature. A recent longitudinal study explored the role of early child and family variables in the prediction of internalizing difficulties in middle childhood (Bayer et al., 2010). Early childhood risks (parenting practices, parental internalizing symptoms, family life-stress, and child internalizing symptoms) explained almost half of the variance in midchildhood. Furthermore, earlier childhood (2- and 4-years of age) internalizing symptoms mediated the effects of early family environment on child internalizing symptoms at midchildhood (7-years of age). Family effects were most predictive of internalizing

symptoms in early childhood, and internalizing symptoms at 2- and 4-years of age showed substantial stability to 7-years of age. This suggests that parent-child interactions and family factors are likely to have significant effects on young children, and provides further support of the persistence of internalizing symptoms.

In a review of 20 child-report, parent-report and observational studies, Ginsburg and Schlossberg (2002) identified nine categories of family variables associated with childhood AD: 1) overcontrol, 2) overprotection, 3) modeling or reinforcing anxious or avoidant behaviours, 4) negative beliefs and expectations about the child, 5) emotional warmth and positive affect, 6) rejection/criticism, 7) conflict, 8) family environment (including factors such as family functioning, cohesion, adaptability and problem solving), and 9) parenting style. Several of these variables (overcontrol, overprotection, emotional warmth and positive affect, and rejection criticism) are considered aspects of the larger category of parenting style.

Parenting style.

Using a typological approach, Baumrind (1978, 1991) classified parenting styles into four types: authoritative, authoritarian, permissive and neglectful. Each parenting type is a function of two orthogonal dimensions: responsiveness and demandingness. Factor analytic studies have garnered support for these two dimensions (Maccoby & Martin, 1983). Authoritative parenting involves moderate levels of both responsiveness and demandingness. Authoritative parenting is characterized by supportive behaviour in combination with firm and consistent discipline. Parents using an authoritative parenting style are warm, provide structure and foster the child's autonomy. Authoritarian parenting, by contrast, is unpredictably reactive and overly harsh. Parents who are authoritarian have high levels of demandingness, but low levels of responsiveness. Authoritarian parenting involves a high degree of structure and control and

restricts the autonomy of the child. A third style of parenting describes parents with high responsiveness and low demandingness, and is classified as permissive. Parents who are permissive provide little structure and allow a high degree of freedom. Permissive parenting involves low control and often indulges the child. The fourth style of parenting is neglectful. Neglectful parents are neither responsive nor demanding. Parents who are neglectful devote minimal time and energy in interactions with their children and lack warmth, structure and support.

In studying the transmission of anxiety in families, research using child-focused studies, parent studies, and observational studies has supported the notion that childrearing is related to the development of anxiety (see Ginsburg & Schlossberg, 2002; Rapee, 1997). A negative correlation between authoritative parenting and anxiety has been demonstrated. Although Ginsburg and Schlossberg reported mixed findings regarding the association between parental warmth and positive affect, and AD in children, a meta-analysis found that parental warmth and autonomy granting, parenting behaviours characteristic of authoritative parenting, are associated with less child anxiety (McLeod, Wood & Weisz, 2007). Authoritative parenting is linked to positive cognitive and social-emotional development outcomes in children and adolescents (Baumrind, 1991; Darling & Steinberg, 1993; Davidov & Grusec, 2006).

A connection between authoritarian parenting and AD is well supported in research. (Lindhout, Markus, Borst, et al., 2009; Lindhout, Markus, Hoogendijk, & Boer, 2009; Rapee, 1997). Negative parenting behaviours characteristic of authoritarian parenting, such as rejection, control and over-protectiveness, have been linked to parent anxiety, which can lead to the development of AD in children (Schrock & Woodruff-Borden, 2010). Low responsiveness can be demonstrated through rejection, while over-control and overprotection are parenting

behaviours that convey high demandingness. Through the use of negative, critical parenting, children may learn that they do not have adequate coping skills and that they are not capable of dealing with adversity (Schrock & Woodruff-Borden, 2010). A relationship between negative parenting behaviours and the development of child anxiety has been hypothesized (Lindhout, Markus, Hoogendijk, et al., 2009; Schrock & Woodruff-Borden, 2010).

A review by Rapee (1997) showed that participants meeting criteria for clinical levels of anxiety perceive their parents as more rejecting and controlling than non-clinically anxious subjects. Similar, but less consistent results were found in studies comparing nonclinical samples scoring high or low on various anxiety symptoms. Furthermore, studies investigating a linear relationship between degree of anxiety and degree of rejection and control suggest a positive correlation between anxiety and parental rejection and control. While the above-mentioned research is encouraging, there are methodological considerations to be taken into account. A number of studies were conducted primarily using adult participants, used retrospective questionnaires, and varied in sample size. The reliability of retrospective reports has been criticized (Holden & Edwards, 1989). Because of the methodological issues mentioned, the generalizability of the findings to children with AD may be limited.

The review by Ginsburg and Schlossberg (2002) provides evidence that parental over-control and overprotection, characteristics of authoritarian parenting, play a role in the development and/or maintenance of anxiety disorders in children. This review included self-report and observational studies involving child and adolescent subjects and their parents, and is consistent with more recent research. Overprotection is associated with the development of anxiety symptoms in preschool aged children. Both mother and father reports of overprotection

for children approximately 4-years of age positively predicts anxiety in children one year later (Edwards et al., 2010).

Differences in childrearing styles have been found between parents of children with and without AD. Lindhout, Markus, Borst and colleagues (2009) found that AD children were reared significantly differently from their siblings, as well as from non-AD controls. Specifically, they found that, compared to their non-AD siblings, AD children perceived their parents as more rejecting. Also, parents of AD children expressed more criticism toward their AD child than toward the non-AD sibling. Although there were no differences between AD children and controls on child- and parent-report of overprotection and restrictiveness, parents of AD children are less likely to encourage autonomy in their children (both AD and non-AD sibling), compared to parents of controls. Parenting styles may contribute to the development of AD in children and style may vary within families (i.e., different children and parented with different styles). Exploring factors related to particular parenting styles that promote anxiety in children may be beneficial in developing prevention and early intervention strategies.

Modeling or reinforcing anxious or avoidant behaviours.

Modeling anxiety and reinforcing avoidant behaviour also consistently shows a positive association with anxiety disorders (Ginsburg & Schlossberg, 2002; Spence, 2001). Through family interactions, children's fears and anxious and avoidant behaviours can develop through different forms of conditioning, social learning and inaccurate schemata (Barrett, Rapee, et al., 1996; Wood & McLeod, 2008). For example, Lester, Field and Muris (2011) found that children's interpretational biases of ambiguous events can be altered through reinforcement. A pattern of family interaction, known as the FEAR effect (Family Enhancement of Avoidant Responses; Barrett, Rapee, et al., 1996), helps to demonstrate that anxious individuals can also

learn interpretational biases and coping through modeling. In ambiguous situations, both anxious children and their parents perceived more threat compared to families of non-anxious children. Importantly, in families with anxious children, discussion with parents enhanced avoidant responses in children in the ambiguous situations. Research also suggests that children have more negative emotional responses when parents respond to stressful events with anxiety and over-protection (Spence, 2001). Family interactions are significant in the development of anxious responses, cognitive distortions and avoidant behaviours in children with AD.

Parent psychopathology.

Research indicates that parental psychopathology is instrumental in the development of internalizing disorders in youth, such as anxiety (Burstein, Ginsburg, Petras, & Ialongo, 2010). Using a regression approach, Merikangas, Dierker, and Szatmari (1998) found that after controlling for parental substance abuse disorders, parental anxiety disorders predicted anxiety disorders in children. In a bottom-up study, Martin, Cabrol, Bouvard, Lepine, and Mouren-Siméoni (1999) found that 78% of mothers and 54% of fathers of children with anxiety based school-refusal met criteria for a lifetime diagnosis of an anxiety disorder. These studies support the finding that children of parents with anxiety disorders are at high risk for developing anxiety or depression (Beidel & Turner, 1997; Micco et al., 2009). Parental anxiety may also impact parenting practices. Parents with AD are more withdrawn and disengaged (rejecting) from tasks with their children compared to non-anxious parents (Woodruff-Borden, Morrow, Bourland, & Cambron, 2002). Although it is likely that both genetic and environmental factors are at play, the exact mechanisms by which anxiety is transmitted remain unknown (Ginsburg & Schollossberg, 2002; Merikangas et al., 1998).

The idea of specificity in the transmission of psychopathology suggests that children are at greatest risk for the type of psychopathology displayed by their parents (Burstein et al., 2010). First- and second-degree relatives of clinically anxious children showed higher prevalence of anxiety disorders compared to relatives of children without any clinical diagnosis and relatives of children with attention deficit hyperactivity disorder (Last, Hersen, Kazdin, Orvaschel & Perrin, 1991). In studying the heritability of internalizing disorders, findings from twin studies suggest that a general vulnerability for anxiety or depression may result from genetic risk factors (Albano et al., 2003). Research supports the transmission of AD as a broad class of psychopathology, however, evidence for the transmission of specific anxiety disorders is not supported.

It appears that parental psychopathology, specifically internalizing disorders, influences the assessment of AD in children. Greater discrepancies are found between mothers and fathers, between parents and children on reports of anxiety in older children, and greater agreement between parents and sons as opposed to parents and daughters (Krain & Kendall 2000; Treutler & Epkins, 2003). An important finding to consider when assessing for child anxiety is the interaction between parental psychopathology, parent and child gender, and child age.

The type of parental psychopathology influencing discrepant reports has been explored in research. Given the specificity of transmission of AD as a broad category and the role of parent cognitions in intergenerational transmission, one might hypothesize that parental anxiety influences parent reports of child anxiety. Others suggest that parent reports of child anxiety are influenced by paternal depression. However, the literature demonstrates both maternal anxiety and maternal depression have been shown to influence maternal reports of their child's anxiety (Briggs-Gowan, Carter, & Schwab-Stone, 1996; Krain & Kendall, 2000; Wheatcroft & Creswell, 2007).

Positive correlations between both maternal depression and maternal anxiety, and discrepancies between mothers' ratings and other informants' ratings of child psychopathology have been reported. Previous research has shown maternal depression to be the best predictor of parent perceptions of their children's anxiety. That is, the higher level of depression the mothers experienced, the more they perceived their children as maladjusted (Griest, Wells & Forehand, 1979; Schaughency & Lahey, 1985). In regards to anxiety, Krain and Kendall (2000) found that maternal anxiety was non-significant once maternal depression was accounted. Yet after considering depression, Briggs-Gowan et al. (1996) have identified anxiety as a unique predictor of discrepancies between informants. Frick, Silverthorn, and Evans (1994) found that anxious mothers reported more symptoms of anxiety in their older children, but did not find the same results for younger children. Research indicates that maternal internalizing disorders can influence maternal reports of child anxiety; however, definitive conclusions cannot be drawn about the specific type of maternal psychopathology most likely to influence maternal reports of child anxiety.

Some argue that parents with psychopathology have a heightened awareness of disordered behaviour in their children, or that children may display such behaviour only in front of their parents (Grills & Ollendick, 2003). It has been suggested that a positive correlation between anxiety in the parent informant and discrepancies between reports would be consistent with an anxiety-reporting bias (Frick et al., 1994). In fact, Frick et al. found that mothers with anxiety tended to over-report anxiety symptoms in their child. Similarly, Angold, Weissman, John, and Merikangas (1987) found that parents diagnosed with depression reported significantly more depressive symptoms in their children. Although data sets were too small to draw firm conclusions, the possibility of parental depression priming parents to be more sensitive to

depressive symptoms in their child was suggested as a potential explanation.

In contrast, parents with psychopathology may have a low threshold for child behaviours and may misinterpret their children's age-appropriate behaviours as symptomatic. Another possibility is that these parents project their behaviours onto their children (Grills & Ollendick, 2003). Mothers reporting the highest level of anxiety and depression also reported 25% more child symptoms than daughters and teachers (Briggs-Gowan et al., 1996). It is unlikely that daughters did not report and/or teachers did not observe such a large number symptoms, therefore, the excess symptoms reported by mothers were thought to be "real symptoms". From these results, Briggs-Gowan et al. (1996) interpreted these mothers as having a lower threshold for problem behaviour in their children.

Parental anxiety and depression have been found to play a role in parental reports of children's anxiety (Krain & Kendall, 2000). Although research findings have not conclusively determined which type of internalizing symptoms (depressive or anxious) is influential in parental reports of child AD, these findings demonstrate that higher levels of parental internalizing symptoms are related to increased parental reports of child anxiety. Given the methodological differences in these studies, and the existing inconsistent findings regarding the type of parental psychopathology, further research would be beneficial.

Parenting Stress

Overview.

This study will use Abidin's theory of parenting stress (1992, 1995), based on the P-C-R perspective, to conceptualize parenting stress. Abidin's theory takes into consideration child and parent characteristics, as well as situational factors as contributors to parental stress. This section will introduce parenting stress by briefly describing the model of general stress (Lazarus &

Folkman, 1984) on which Abidin's parenting stress model is based. A discussion of Abidin's model will follow.

The concept of stress in humans has been studied extensively. Lazarus and Folkman (1984) theorized that stress encompasses individual characteristics, environmental events, and the nature of the relationship between the two. They define stress as a specific relationship between a person and the environment, in which the person appraises a lack of resources to cope with the environment, and personal well-being is compromised. Stress can be specific to particular domains of life, such as work, finances, or marriage/romantic relationship, and parenting/home life. Stress resulting from parenting problems is not independent from stress experienced in other domains (Creasey & Reese, 1996; Deater-Deckard, 2004). Many theories of parenting stress derive from Lazarus and Folkman's (1984) transactional model of general stress.

Parenting stress has been conceptualized in numerous ways (see Abidin, 1992; Belsky, 1984, Crnic & Low, 2002; Deater-Deckard, 1998; Mash & Johnston, 1990; Webster-Stratton, 1990). A core feature of parenting stress theories is the balance between the parent's perception of the demands of the parenting role and the resources available to meet those demands (Deater-Deckard, 2004). This balance of perceptions and resources involve the task demands of parenting, the parent's psychological well-being and behaviour, the qualities of the parent-child relationship, and the psychosocial adjustment of the child (Deater-Deckard, 1998). Demands of parenting are diverse and include meeting children's basic (e.g., food, shelter, protection) and psychological needs (e.g., attention, affection, help in regulating emotions; Deater-Deckard, 2004). Resources for parents vary and can range from basic parenting knowledge, feelings of competence as a parent, emotional and instrumental support from others, and factors which meet survival needs, such as food, housing and income (Deater-Deckard & Scarr, 1996). Parents'

perceptions and attributions of their child's behaviour, and perceptions of their competence as parents are also important in theories of parenting stress. The following definition of parenting stress has been proposed for use in this study: "aversive psychological and physiological reaction to the demands of being a parent" (Deater-Deckard, 1998, p. 315).

Abidin's theory of parenting stress.

Abidin initially posited that dysfunctional parenting was a result of higher levels of parenting stress. A more integrative model was later hypothesized, in which a multitude of factors (sociological, environmental, behavioural and developmental) were found to influence parenting behaviour and child adjustment (Abidin, 1992). Abidin hypothesized that child characteristics, parental characteristics, and situational variables directly related to the parenting role interact and contribute to the total stress a parent experiences. Child characteristics include temperament-related variables and interactive variables. Parental characteristics involve role-related variables and a pathology component. Situational variables include four aspects, which are major contributors to parental stress.

With support from the literature and from clinical experience, four child temperamental characteristics have been indicated as stressors in parenting: adaptability, demandingness, mood, and distractability/hyperactivity (Abidin, 1995). *Adaptability* refers to how well the child is able to deal with change and transition. Difficulties in adaptability are most often demonstrated as stubbornness and passive noncompliance in the child. *Demandingness* addresses behaviours that the child engages in that place direct pressure on the parent. Acts of open defiance, aggression, and demands for attention or services are seen as stressors. Particular aspects of the child's *mood* are considered stressors. Parents typically experience their child's crying, withdrawal, and depression as anxiety or anger provoking, thereby contributing to parental stress. The

distractibility/hyperactivity characteristic in children requires parental management and continual high states of vigilance, which continually deplete parents' energy.

The interactive child characteristics, *acceptability* and *reinforces parent*, contribute to parenting stress by impacting the parents' personality and sense of self. Acceptability refers to how closely the child meets the expectations the parent has for that child. This characteristic is associated with the degree to which the child embodies socially desirable characteristics. The *reinforces parent* characteristic refers to the attachment relationship between the child and parent. It refers to the degree to which parent-child interactions are able to produce positive affective responses in the parents. This child characteristic is important in maintaining the parent's motivation to provide for the child.

Parental characteristics also play a role in the development of parenting stress. In Abidin's model (1995) depression, competence and parental attachment are identified as variables relating to parenting stress. *Depression* in the parenting role refers to the parent's emotional availability to the child. It addresses the extent to which the parent's emotional and physical energy is compromised and impairment in the parent's emotional availability. The *competence* characteristic is closely associated with the parent's own internal working model. It addresses the parent's sense of competence in the parent role. The third characteristic of the parent is related to *attachment*. It refers to the intrinsic motivation a parent has to fulfill the role of parent.

Spouse, isolation, health and role restriction are situational components considered to be major contributors to parenting stress (Abidin, 1995). The *spousal* component includes emotional and physical support to assist the parent in functioning in the parenting role. Stressors in this domain can include conflict in the relationship, as it relates to parenting. *Isolation* refers

to social isolation and encompasses the availability of social support for the parent in the parenting role. The *health* aspect considers the parent's current physical health as it relates to his or her ability to parent. In the *role restriction* aspect, losses (e.g., freedom, other important life roles), the sense of resentment and negative impact associated with those losses are viewed as stressors.

Parenting stress is more strongly related to parenting behaviour and child development than stress in other domains of life (Creasey & Reese, 1996). In linking parenting stress to parenting behaviour and child outcomes, the literature demonstrates adverse effects of family stress on children's well-being (Crnic & Low, 2002; Crnic et al., 2005; Deater-Deckard, 1998; 2004). Children of distressed parents are less likely to receive stimulation that promotes optimal social-emotional and cognitive development. However, the exact mechanisms by which parenting stress and child outcomes interact are unclear.

The level of parenting stress that is experienced by any parent is determined by the parent's appraisal of stressors (Abidin, 1992). A parent's appraisal is based on his or her own cognitions, beliefs and expectations of the parenting role, that is, his or her own internal working model. Parenting stress serves as a motivator to use available resources, such as social support, parenting skills, and cognitive coping. The amount of resources accessible to a parent plays an important role in parenting behaviour (Abidin 1992). Maternal psychopathology is associated with higher levels of parenting stress (Williford, Calkins, & Keane, 2007). Cognitive and social coping skills required to decrease parenting stress may be limited by mental illness while increasing the risk for ineffective parenting (Webster-Stratton, 1990). The appraisal of stressor and use of resources interact and influence the outcome: parenting behaviour.

Parenting stress and child development.

The role of parenting behaviour.

To understand how parenting stress impacts child development, Deater-Deckard (1998) developed three hypotheses relating parenting stress, parenting behaviour and child development. The first hypothesis is that a causal relationship exists between parenting stress and parenting behaviour. Parents with higher levels of stress exhibit poorer parenting. There is evidence to support this hypothesis. Parents reporting higher levels of parenting stress also reported using more strict discipline, having lower expectations of their children and demonstrating less nurturing behaviour towards their children (Anthony et al., 2005). Family stress is associated with higher over-involved/protective and power-assertive/punitive parenting, and lower warm-engaged parenting. Furthermore, family stress has been shown to predict a higher use of over-involved/protective parenting (Bayer et al., 2006).

The second hypothesis is that poor parenting causes poor adjustment and cognitive and social-emotional outcomes for children. There is a positive association between harsh, negative and inconsistent parenting and maladjustment in children and adolescents. A study exploring parenting stress and children's behaviour in a preschool setting demonstrated a strong, direct relationship between parenting stress and social competence and internalizing behaviours (Anthony et al., 2005). In a longitudinal study examining parent influences on early childhood internalizing problems, parenting practices and parenting stress were shown to be predictive of early childhood internalizing problems (Bayer et al., 2006). Specifically, power-assertive/punitive and autonomy-encouraging parenting did not significantly predict early childhood internalizing problems, however, over-involved/protective and low warm-engaged

parenting did. Bayer et al. (2006) also found that over-involved/protective parenting predicted early childhood internalizing problems independent of all other variables.

Sensitive protective parenting can facilitate positive socialization outcomes in several ways: self-regulation of negative emotions, facilitation of empathic responding, and fostering of trust in the parent (Grusec & Davidov, 2007). Parent responsiveness to preschooler distress correlated with children's overall competence at school even after controlling for parental warmth (Davidov & Grusec, 2006). A positive significant relationship was found between responsiveness to distress and effective regulation of negative affect. Both mothers' and fathers' responsiveness to child distress significantly predicted the child's ability to more effectively regulate negative affect and respond to others' distress with empathy and prosocial behaviour. Maternal warmth was a significant predictor of children's competent regulation of positive affect and of boys' peer acceptance.

The third hypothesis is that parenting behaviour mediates the relationship between parenting stress and child outcome. Research exploring this hypothesis has been mixed. In a longitudinal study testing the mediating role of parenting behaviour on the relationship between cumulative parenting stress and child well-being, Crnic and colleagues (2005) did not find support for the mediating role of parenting behaviour. Rather, a direct and additive effect of stress on child well-being was found. Similarly, Anthony and colleagues (2005) also found that there was little evidence of parenting behaviours playing a mediating role. In contrast, Bayer et al. (2006) found some evidence of the mediating role of parenting practices. Child internalizing difficulties at age 2-years were related to family stress, but the relationship was partially mediated by parenting practices. However, by age 4-years, parenting did predicted child internalizing difficulties. This suggests that parenting mediates, or influences and supports the

direction of influence of parenting stress and child internalizing disorders cumulatively over time. Early family life stress was not independently predictive of internalizing difficulties at age 7-years (Bayer et al., 2010). However, levels of internalizing difficulties during preschool-age predicted internalizing difficulties at school-age. This indicated that parenting and family predictors of child outcome at age 7-years were mediated by internalizing symptoms in early childhood (age 2- and 4-years). Taken together, research exploring the mediating role of parenting behaviours on parenting stress and child development underscores the importance of family and parenting stress, particularly in early childhood, and its influence on later development.

Child outcomes.

Parenting stress has been associated with negative outcomes for children, such as behavioural problems and insecure attachment (Crnic & Low, 2002). Quality of caregiving, parent-child interactions, and child behaviour have been found to be negatively impacted by parenting stress (Crawford & Manassis, 2001; Crnic et al., 2005). Higher parenting stress has been associated with authoritarian parenting, less responsiveness and in extreme cases, neglect and abuse (Deater-Deckard, 1998). Parenting stress can also influence treatment outcomes for children with AD. Crawford and Manassis (2001) found that children with AD receiving cognitive behavioural therapy had less favourable outcomes if their parents reported higher levels of stress.

Research has established that a relationship exists between parenting stress and child psychological well-being (Crnic & Low, 2002). Parenting a child with mental health problems can be a source of parenting stress (Tan & Rey, 2005). Parents of children and adolescents with major depression reported higher levels of parenting stress than parents of non-depressed

children. Additionally, mothers of depressed children perceived their children as more difficult. Higher levels of parenting stress can also be found in parents of children showing symptoms of early psychopathology (Deater-Deckard, 1998). This is true of parents of children with externalizing problems (Johnston & Mash, 2001; Solem, Christophersen, & Martinussen, 2011) and internalizing problems (Bayer et al., 2006).

Externalizing problems.

The relationship between parenting stress and externalizing problems is well researched. Higher levels of parenting stress have been consistently identified as a risk factor for externalizing problems in children (Williford et al., 2007). In a study examining the effects of child characteristics and parent coping practices on parenting stress, findings show that parents of boys, ages 6- to 13-years, with clinical behavioural problems perceived significantly more stress than parents in the comparison group (Solem et al., 2011). The greatest predictor of parenting stress was having a child with behavioural problems, accounting for 57% of the variance in parenting stress. Crnic and colleagues (2005) found that parental life stress and daily parenting stressors contributed to child negative behaviour, ranging from pouting to physical expressions of anger. Stress factors also independently influenced mothers' subjective appraisals of their children's behaviour at age 5-years. This reinforces the importance of parents' appraisals in parenting stress. Marital conflict, and particularly conflict in front of the child, has been correlated with externalizing child behaviours, such as aggression, noncompliance and delinquency (Cummings, Goeke-Morey, & Papp, 2001).

Internalizing problems.

Limited research indicates that parenting stress has also been linked to internalizing problems in children. A longitudinal study demonstrated that certain factors in early childhood,

specifically over-involved/overprotective parenting and lower levels of warm-engaging parenting, family life stress, and parental symptoms of anxiety and depression, significantly predict children's internalizing difficulties in midchildhood (Bayer et al., 2010). Even when considering children's reports of their own adjustment, parenting stress is associated with both anxious and depressive symptoms in children (Rodriguez, 2011).

In an attempt to identify patterns in sources of parenting stress, Rodriguez (2011) used the *Parenting Stress Index (PSI)* (Abidin, 1995), a paper pencil measure of parenting stress, based on Abidin's Parenting Stress model. She found that the "mood" and "demandingness" subscales on the child domain of the *PSI* are most strongly related to children's reports of their own anxiety and depressive symptoms. "Depression" and "spouse" subscales on the parenting domain were significantly associated with children's reports of their internalizing difficulties. Over time, family interactions associated with higher levels of parenting stress are likely to have important effects on the development of internalizing problems in young children.

Parenting stress may influence the development of childhood AD through cognitive processes in children. Maternal stress has been negatively correlated with children's adaptive attributional styles in regards to positive events, while no relationship with negative events was evident (Rodriguez, 2011). Children attributed positive events to external, specific and unstable causes, which has been associated with the development of both depression and anxiety (Kagan et al., 2004). When investigated further, children's maladaptive attributional styles for positive outcomes was found to mediate the relationship between parenting stress and children's internalizing symptoms. Additional research is needed to substantiate further the association between parenting stress and internalizing problems in children, including the processes by which the relationship operates.

Chapter Summary

Anxiety is a normal response to threat. Although adaptive at moderate levels, chronic excessive anxiety can reach pathological levels and impair functioning. Anxiety disorders are common and cause significant distress in those suffering from it. With early detection and intervention, the negative sequela of AD may be ameliorated. Childhood AD is a relatively new area of research, with less research attention to AD in younger children. While somatic, cognitive, and behavioural aspects of AD are present in children, adolescents, and adults, there is support for developmental variation in the clinical presentation of AD. More research is needed to explore risk factors contributing to the development of AD in young children. By identifying correlates of childhood AD, more effective identification, prevention and intervention strategies may be developed.

Family factors have been emphasized in etiological models of AD, as research consistently demonstrates that AD is present along family lines. Although there is a general consensus that multiple factors, such as genetics, family influences, and child temperament contribute to the development of childhood AD, research consistently demonstrates that AD aggregate in families. Research highlights the association between family factors, parenting, and child anxiety disorders in understanding the intergenerational transmission of anxiety. Parenting style has been linked to AD in children, as has parental psychopathology. The relationship between parenting stress and childhood AD has not been researched.

Parenting stress has been defined as an aversive psychological response to a parent's perception of an imbalance between the demands of parenting and the resources to meet those demands (Deater-Deckard, 1998). Parent's perceptions and attributions of their child's behaviour, and perceptions about their own competence as a parent play a vital role in the

experience of parenting stress. Paralleling developmental models of anxiety, Abidin's model of parenting stress hypothesizes that child characteristics, parent characteristics, environmental factors, and the interaction between these factors contribute to parenting stress.

In considering practical implications, Solem et al. (2011) highlighted the importance of including a focus on family relations and general life conditions, such as parenting stressors, in addition to treatment of children's symptoms. Deater-Deckard (1998) proposed three hypotheses linking parenting stress, parenting practices and child outcome. Research has shown support of a causal relationship between parenting stress and parenting practices. Correlational studies have pointed to a relationship between parenting practices and child outcomes. There is also evidence of parenting practices being predictive of child outcomes. In exploring parenting behaviour as a mediator of the relationship between parenting stress and child outcome, inconsistent results have been found. Methodological differences may account for the inconsistencies, and indicate that further research into this relationship is necessary.

Parenting stress is associated with children's psychological health. Ample support for a positive relationship between parenting stress and externalizing problems can be found in the literature. An association between internalizing difficulties and parenting stress has also been supported, although less research on this topic is available. Cognitive processes have been suggested in research as potential pathways for the relationship to occur. Parenting stress and anxiety disorder development in young children has not been explicitly studied.

Parental anxiety influences both child anxiety and parenting stress. Anxiety may be transmitted from parent to child through genetic factors, and through modeling and reinforcing anxious behaviour and cognitions. Parental anxiety may also impact parental perceptions and attributions. It is possible that cognitive distortions associated with AD may influence a parent's

appraisal of stress. The cognitive distortions, such as interpretational bias and attributional bias, inherent in anxiety could make a parent more susceptible to perceive their own competence in a negative light and perceive their child's behaviour as problematic, thereby increasing parenting stress. Parental anxiety may also impact parenting practices, which is associated with parenting stress. Taken together, this research indicates that parental anxiety may strengthen the relationship between parenting stress and child AD diagnosis.

In order to understand the relationship between three variables, moderation or mediation models are employed in the social sciences. The use of a mediation approach in this study would indicate a causal link between parenting stress and parental anxiety, and a causal link between parental anxiety and child AD diagnosis, in the investigation of the role of parental anxiety on the relationship between parenting stress and child AD diagnosis. As there is no empirical evidence of parenting stress causing parental anxiety, a mediational approach is not warranted. Thus this study examined the relationship between these three important variables using a moderation model, more appropriately used when exploring if one variable influences the strength of a relationship between two variables (Baron & Kenny, 1986).

The goal of this study is to explore the relationship between parenting stress and AD in young children. Investigations of this relationship are lacking in the literature. Because of the importance of parental anxiety in both the development of anxiety and parenting stress, another goal of this study is to examine the effect of parental anxiety on the relationship between parenting stress and AD in children.

Chapter 3

Methods

A cross-sectional, survey design was used to investigate the relationship between parenting stress and anxiety disorders in a community sample of children enrolled in lower mainland public school kindergarten classrooms. This study used data from a larger study, whose purpose was to evaluate the clinical utility of a brief, school-based screening measure for the detection of early childhood anxiety.

The Original Study

The original study, *A validation study of a brief screening tool for the detection of anxiety in young children* (Hamill & Miller, in prep), received ethics approval from UBC (H08-02601), and relevant school boards. In the original study, I was involved all aspects of the procedure, including the recruitment of schools and participants, the collection of data, and data entry.

Participants.

Participants were recruited over a three-year period from participating kindergarten classes from the lower mainland. Parents (mothers and fathers) of children aged 4- to 6-years (both male and female) were invited to participate in the study. Exclusion criteria included children with a previously diagnosed mental health problem, children with any developmental delay, and parents not fluent in English.

Procedure.

Superintendents of school districts in a large metropolitan area in western Canada were approached to participate in the study. Two school districts (School District A and School District B) demonstrated interest in participating, and ethics approval from each district was obtained. Following receipt of school district approval, principals from each school were emailed

and/or faxed an information package, which included a description of the study and detailed the tasks involved. Kindergarten teachers were invited to participate in the study if approval from the school principal was received.

Kindergarten teachers interested in participating provided informed consent and were asked to distribute a brief description of the project, consent forms, screening questions, and return envelopes to parents of all children in the classroom. Over a two week period, interested parents returned the signed consent and questionnaire to the classroom teacher in a sealed envelope. Teachers were provided with a stamped return envelope to return all collected consents to the researcher.

Interested parents were then contacted via email or telephone to schedule a 1-hour telephone interview to conduct the *Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Version (ADIS-C/P; Silverman & Albano, 1996)*. ADIS-C/P interviews were conducted by trained, blinded graduate student research assistants who were supervised by two experienced Registered Psychologists, trained in the ADIS-C/P protocol. Integrity checks were completed on ADIS interviews to ensure inter-rater reliability. Upon completion of the interview, parents who provided additional consent were mailed a package containing several paper-pencil questionnaires: *State-Trait Anxiety Inventory (STAI; Spielberger, 1983)*, *Parenting Stress Index (PSI; Abidin, 1995)*, and *Preschool Anxiety Scale (PAS; Spence et al., 2001)* and a self-addressed, stamped return envelope.

Secondary use of the data was approved by BREB for the current study. This study is considered to have minimal risk.

The Current Study

Participants.

Participants from the larger study (Years 1, 2 and 3) who returned completed measures (*PSI* and *STAI*) and completed an *ADIS-C/P* were included in the current study's sample. Participants were excluded from the study if they were not fluent in English or their child was previously diagnosed with a mental health problem or a developmental delay.

Measures.

Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Version.

The *Anxiety Disorders Interview Schedule for DSM-IV: Child and Parent Version* (*ADIS-C/P*; Silverman & Albano, 1996) is a semi-structured clinical interview that consists of a series of modules that cover all childhood anxiety disorders in accordance with criteria set out in the *DSM-IV-TR* (American Psychological Association, 2000). Diagnosis is assigned based on parent-report of information about the symptoms and degree of impairment the child experiences. The *ADIS-C/P* provides clinician severity ratings, which estimate the level of functional impairment for each assigned diagnosis. Clinician severity ratings range from 0-8, with a score of 4 or higher being indicative of clinical levels of anxiety.

The *ADIS-C/P* has been rated as excellent in inter-rater reliability ($\kappa = .80-1.0$), test-retest reliability (intraclass correlation coefficients = 0.86 to 0.99; Silverman, Saavedra, Pina, 2001; Lyneham, Abbott, & Rapee, 2007). Content and construct validity, and clinical utility have also been demonstrated (Wood, Piacentini, Bergman, McCracken, & Barrios, 2002). This assessment has also been widely used in childhood anxiety clinical trials and specifically with children in the kindergarten age range (Dadds & Roth, 2008; Rapee et al, 2005).

State-Trait Anxiety Inventory.

The *State-Trait Anxiety Inventory* (STAI; Spielberger, 1983) is a pencil paper measure used to evaluate parental anxiety. This assessment consists of two scales of 20 items each that differentiate between the temporary condition of state anxiety and the long-standing quality of trait anxiety in adults. Items are rated on a scale of one to four, with approximately half the items on each scale reverse-scored. Scoring keys are used to hand-score the measure. Scores for both the state and trait scales range from 20-80. In this study, scores on the trait scale will be used to measure parental anxiety.

Norms for the STAI are provided for working adults, college students, high school students and military recruits (Spielberger, 1983). Data from the normative sample of working adults will be used in this study. According to the norms, the mean score on the trait anxiety scale for working adult males is 34.89 (SD = 9.19). For working adult females, the mean score on the trait anxiety scale is 34.79 (SD = 9.22)

Test-retest reliability of the STAI is .40-.54 for state anxiety and .86 for trait anxiety (Rule & Traver, 1983). Convergent validity of the *STAI* has been demonstrated through positive correlations with other anxiety measures including the *Beck Anxiety Inventory* (0.64 for the *State* scale and 0.68 for the *Trait* scale; Creamer, Foran, & Bell, 1995).

Parenting Stress Index.

The *Parenting Stress Index* (PSI; Abidin, 1995) is a self-report pencil paper measure of parenting stress, designed to assess important aspects of the parent-child system. These aspects are reflected in the three domains: child, parent, and life stress. The child domain contains 6 subscales, labeled: Distractibility/Hyperactivity (DI), Adaptability (AD), Reinforces Parent (RE), Demandingness (DE), Mood (ME), and Acceptability (AC). The seven subscales included in the

parent domain are: Competence (CO), Isolation, (IS), Attachment (AT), Health (HE), Role Restriction, (RO), Depression (DP), and Spouse (SP). Scores on the life stress domain indicate the level of stress the parent is experiencing outside of the parent-child relationship.

The measure consists of 101 items as well as 19 life stress items. Parents rate each item on a 5-point Likert scale, indicating the degree to which they agree with each statement. The subscale and domain scores help to identify sources of stress. A Total Stress Score can be calculated and is designed to guide practitioners in deciding if professional interventions are needed. In this study, Total Stress scores will be used to measure parenting stress.

Child age should be taken into consideration when interpreting the PSI Total Stress scores. (Abidin, 1995). For parents of children 6 years of age, a raw score of 248 or higher, corresponding to the 85th percentile, is indicative of clinically significant levels of stress. Normative data for 6 year olds specify that the mean score for the child domain is 99 (SD = 20), the mean score for the parent domain is 121 (SD = 21), and the mean total stress score is 222 (SD = 37).

The PSI has been shown to have very good reliability and validity. The internal reliability coefficients for the subscales were calculated based on the normative sample of 800 participants, and ranged from .80 to .91, with the Total Stress scale having the highest alpha coefficient (.91). Abidin (1995) reported test-retest reliability estimates of .78 to .85 over 6 months. Validity of the factor structure has been demonstrated (Abidin, 1995).

Data Analyses

In this section, the research purpose is reviewed, followed by a description of the analytic strategies used to examine the data. The preliminary analyses are described first, followed by the

descriptive analyses. Finally, the strategies used to analyze the data in response to each research question are outlined.

Restatement of research purpose.

This study evaluates whether a) a relationship exists between parenting stress and the diagnosis of a childhood anxiety disorder in a community sample of kindergarten children, and b) parental anxiety influences the relationship between parenting stress and an anxiety disorder diagnosis in children. It is hypothesized that higher parenting stress levels will be predictive of an AD diagnosis in the child, and that parental anxiety will moderate the relationship between parental stress level and child AD diagnosis. That is, higher levels of parental anxiety will strengthen the relationship between parental stress and child AD diagnosis.

Preliminary analyses.

An *a priori* power analysis was conducted to determine whether the sample size was sufficient to detect significant effects for the logistic regression analyses. Data entry was subject to rigorous error checking. Demographic information about the current sample is provided in the results section.

All data were analyzed using the statistical software program SPSS, version 19.0. The data were examined to determine whether logistic regression analysis was appropriate. A linear relationship between the independent variable (in this study, parenting stress) and dependent variable (in this study, anxiety disorder) is not assumed in logistic regression (Pallant, 2007). However, logistic regression is sensitive to sample size, multicollinearity, and outliers. As two predictor variables (parenting stress and parental anxiety) were included in the model, testing for multicollinearity was necessary. Multicollinearity was examined by analyzing the Tolerance and Variance Inflation Factors (VIF). Outliers were identified from the standardized residual plot.

Descriptive analyses.

Descriptive statistics were calculated for the dependent variable, presence of an AD diagnosis, and each of the predictor variables (parenting stress and parental anxiety). Information about the means, standard deviations and ranges of the PSI Total Stress scores and STAI Trait Anxiety scores are provided in the results section. This information is provided for the whole sample, AD children and non-AD children.

Main analyses.

A multiple logistic regression was used to answer the first research question: Does a relationship exist between parenting stress level and anxiety disorder diagnosis in children? The dependent variable, AD diagnosis (yes/no), is dichotomous, and therefore a multiple binary logistic regression was used. To test the overall fit of the binary logistic regression model, Hosmer and Lemeshow's goodness of fit test was conducted and confirmed.

Following the main effects model, a moderation analysis was conducted to examine the second research question: Does parental anxiety influence the relationship between parenting stress levels and anxiety disorder diagnosis in children? Findings from the moderation model determine whether there were any interactions between parenting stress (independent variable) and parental anxiety (moderator variable) in its effect on the AD diagnosis status of the child (dependent variable). If parental anxiety acts as a moderating variable in this model, it will interact with the independent variable, parenting stress, in predicting child AD diagnosis. Thus, the interaction between parental anxiety and parenting stress may serve as a better predictor of child AD diagnosis than parenting stress alone.

Chapter Summary

A secondary analysis was conducted on data from a larger study to answer the two research questions: Does a relationship exist between parenting stress level and anxiety disorder diagnosis in children? And, does parental anxiety influence the relationship between parenting stress levels and anxiety disorder diagnosis in children? Preliminary analyses were conducted to test for violations of assumptions, as well as to determine a sufficient sample size to detect power medium effect size. A multiple logistic regression was used to determine if parenting stress is predictive of AD diagnosis in children. A moderation logistic regression analysis was conducted to explore if parental anxiety moderates the relationship between parenting stress and AD diagnosis in children.

Chapter 4

Results

In this section, a brief overview of the study is provided. Next, the results are presented, beginning with the preliminary analyses, including sample characteristics. The results of the descriptive analyses follow. Finally, the results from the main analyses are presented.

Overview of the Study

Research demonstrates that a relationship exists between parenting stress and child psychological well-being (Crnic & Low, 2002). However, research investigating the relationship between parenting stress and AD in young children is lacking. The purpose of this survey methods study is to explore if a relationship between parenting stress and AD diagnosis in kindergarten-aged children exists. Additionally, this study aims to determine if parental anxiety influences the relationship between parenting stress and AD diagnosis in children.

As part of a larger study, participants completed ADIS-C/P interviews, conducted by trained, blinded research assistants. Following the completion of the clinical interview, parents were asked to complete several paper-pencil questionnaires, PSI, STAI and PAS. Participants who completed the ADIS-C/P and returned the PSI and STAI were included in the present study.

A logistic regression was conducted to answer the following research questions: Does a relationship exist between parenting stress level and anxiety disorder diagnosis in children? And, a moderation logistic regression was performed to answer the second research questions, does parental anxiety influence the relationship between parenting stress levels and anxiety disorder diagnosis in children? The dependent variable is AD diagnosis (yes/no) as assessed by the ADIS-C/P. The independent variables, parenting stress and parental anxiety, were measured by total stress scores on the PSI and trait anxiety scores on the STAI, respectively.

Preliminary Analyses

Using G*Power 3.1.3 (Faul, Erdfelder, Buchner, & Lang, 2009), an *a priori* power analysis indicated that a minimum of 107 participants are necessary to achieve power, $\beta = 0.95$ with a statistical significance criterion of 0.05, and a medium effect size ($f^2 = .15$) according to Cohen's guidelines (1988).

Sample characteristics.

School district demographics.

School District A is among the most diverse public school systems in Canada (School District A, 2010). School District A includes 90 elementary school (including 17 elementary annexes), 18 secondary schools, and 7 adult education centres, in addition to a Distributed Learning School, district programs, and community school teams. Thirty one thousand elementary students are enrolled in the district, with 2000 students attending full-day kindergarten. Over 125 languages have been identified in the schools. Sixty percent of students speak a language other than English at home, and 25% of students are designated ESL. Two thousand students self-identify as Aboriginal.

School District B has two primary schools, 12 elementary schools, and three secondary schools. Currently there are approximately 7,200 students enrolled, including 3,600 elementary students. Full-day kindergarten is offered in all primary and elementary schools. In the district, over 500 students are in special education programs and over 600 are designated ESL. In addition, there are over 470 international (fee paying) students. Thirty-six students enrolled in the district identify as Aboriginal.

Participant demographics.

A total of 119 participants from the larger study completed ADIS-C/P interviews and returned the PSI and STAI, and therefore met inclusion criteria for this study. Eleven participants were excluded because they submitted questionnaires that had an excess of missing data (as outlined in the PSI and STAI manuals). Participants ($n = 4$) were also excluded from the data set as they indicated they belonged to one of the following exclusionary criteria: they were not fluent in English or their child was previously diagnosed with a mental health problem or a developmental delay.

The final sample consisted of 104 participants and their Kindergarten-age children. Respondents included 97 mothers and 7 fathers. The age of respondents ranged from 29 to 57 ($M = 40.76$, $SD = 4.05$). Information about each child's mother and father was also collected. The age of all mothers ranged from 29 to 53 ($M = 39.57$, $SD = 8.12$) and all fathers' ages ranged from 32 to 59 ($M = 42.70$, $SD = 7.03$). The majority of participants (67.3%) identified themselves as Caucasian ($n = 70$), with 88.5% speaking English only at home ($n = 92$). Other ethnic groups were represented in the sample, with participants self-identifying as Asian (10.6%), South Asian (3.8%), Iranian (1.9%), First Nations (1%), and mixed ethnicity (12.5%). Of the 104 children, 42.3% were male ($n = 44$) and 57.7% were female ($n = 60$). Children's ages ranged from 5.12 to 6.97, with a mean age of 6.09 years ($SD = .30$). Additional demographic information is outlined in Table 1.

Descriptive Analyses

ADIS interviews were conducted with the child's parent to determine if the child met criteria for an AD diagnosis. Following the ADIS interviews, children were assigned to the AD diagnosis category ($n = 32$) or the no-AD diagnosis category ($n = 72$). Approximately 30% of

the sample received an AD diagnosis. Additional information about the each group is provided in Table 2.

Each respondent completed the PSI to assess parenting stress, and the STAI to assess parental anxiety. Total Stress scores on the PSI were used to measure parenting stress. The Trait Anxiety scores on the STAI were used to measure parental anxiety. Because parenting stress was found to be predictive of the presence of a child AD diagnosis, additional descriptive analyses were conducted on the various domains of the PSI. The means and standard deviations for each independent variable, and the additional PSI domains, were calculated and are reported in Table 4. According to the normative data for 6 year olds, the mean for the child domain score is 99 (SD = 20), the mean for the parent domain is 121 (SD = 21), and the mean total stress score is 222 (SD = 37). Total Stress scores above the 85th percentile (248 and higher) are indicative of clinical levels of stress. A higher score on Trait Anxiety scale is indicative of greater anxiety. Mean scores for working males is 34.89 (SD = 9.19) in the normative sample. Mean scores for working females is 34.79 (SD = 9.22) in the normative sample.

A two-tailed independent samples t-test was conducted to compare the total stress scores for AD diagnosis ($M = 247.56$; $SD = 31.84$) and no AD diagnosis groups ($M = 211.08$; $SD = 33.61$). The significance of Levene's test for equality of variances ($p = .90$) demonstrates that the assumption of equal variance was not violated. A significant difference in scores was found, $t(102) = -5.19$, $p < .001$ (two-tailed), corresponding to a medium effect size according to Cohen's guidelines ($d = 1.03$; 1992; Cohen, 1992). Similarly, a two-tailed independent samples t-test was conducted to determine if there was a significant difference in the mean scores of Trait Anxiety scores for the AD diagnosis ($M = 44.69$; $SD = 4.19$) and the no-AD diagnosis groups ($M = 45.03$; $SD = 3.39$). The assumption of equal variance was not violated, as indicated by the

significance of Levene's test ($p = .29$). No significant difference in scores was found, $t(102) = .44$, $p = .66$ (two-tailed). The effect size for the group differences in parental anxiety was small according to Cohen's guidelines ($d = .09$; Cohen, 1992). The t-test results for parenting stress scores indicates that parents of children with an AD diagnosis have statistically significantly higher mean scores on stress than parents of children with no AD diagnosis. Parents of children, regardless of diagnostic category, were similar in Trait Anxiety. Compared to the general population the parents in this sample have greater anxiety.

Missing data.

In the current study, when possible, scores on the PSI and STAI were calculated for participants with missing data. As recommended in the PSI Manual (Abidin, 1995), scores were not calculated for participants if they were missing data from a) four or more items from either the child or parent domain, b) two or more items from a subscale, and c) six or more items were missing from the entire PSI. Participants without PSI scores were excluded from the study. Omitting more than two items on the STAI impacts the validity of the scale (Spielberger, 1983), and as such, participants who were missing data on three or more items on the STAI were excluded from the study. In the current sample, 11 participants were excluded from the study based on missing data from the PSI and/or the STAI.

Main Analyses

Prior to running the main analyses, the predictor variables, parenting stress and parental anxiety, were tested for multicollinearity. Tolerance indicates the amount of variance in the specified predictor variable that cannot be accounted for by other independent variables in the model (Chen, Ender, Mitchell, & Wells, 2003). Tolerance values under .10 suggest that an independent variable is redundant and merit further investigation, as multicollinearity may be a

threat. The VIF is the inverse of Tolerance and demonstrates the degree to which the variance of the coefficient estimate is being inflated by multicollinearity (Chen et al., 2003). VIF values above 10 warrant further exploration. As indicated in Table 3 below, multicollinearity was not found. Tolerance values for both the PSI and STAI were above .10 and VIF values for both the PSI and STAI were below 10.

The standardized residual plot was used to identify outliers, cases in the current sample for whom the main effects model did not fit well. Further attention should be paid to cases with standardized residual values above 2.5 or less than -2.5, given that 99% of cases will fall between that range (Pallant, 2007). There was one case with a standardized residual value outside of the recommended range, and was predicted to be in the no-AD diagnosis group, but was observed to be in the AD diagnosis group. Upon further investigation, it was found that the case with the high standardized residual value (2.85) scored high on the defensive responding scale on the PSI, suggesting that the participant was responding in a defensive manner. No other outliers were indicated.

Logistic regressions were performed to answer each of the two research questions: Does a relationship exist between parenting stress level and anxiety disorder diagnosis in children? And, does parental anxiety influence the relationship between parenting stress levels and anxiety disorder diagnosis in children? The full model containing both predictor variables was statistically significant, $\chi^2(2, 104) = 23.08, p < .001$, indicating that the model was able to distinguish between children who received and did not receive an AD diagnosis. The Homer and Lemeshow Goodness of Fit Test indicated that the model was supported, $\chi^2(8) = 4.028, p = .855$.

As a whole, the model explained between 19.9% (Cox and Snell R Square) and 28.1% (Nagelkerke R square) of the variance in diagnosis status, and correctly classified 78.8% of cases. As indicated by the significance of the Wald test, shown in Table 5, only parenting stress made a unique statistically significant contribution to the model, with an odds ratio of 1.032. Parental anxiety did not contribute statistically significantly to the main effects model.

Because parenting stress was shown to be predictive of child AD diagnosis, further analysis was conducted to explore which of the three domains (parent, child and/or life stress) contributed to overall parenting stress. Scores from each of the parent, child and life stress domains were tested for multicollinearity, and the assumption was not violated. Next, the parent, child and life stress domains were entered into a logistic regression as predictor variables, and AD diagnosis was entered as the dependent variable. As demonstrated by the significance of the Wald test in Table 6, only the child domain statistically significantly contributed to the predictive ability of the model, with an odds ratio of 1.061.

Although parental anxiety did not contribute significantly to the main effects model, a moderation analysis, using multiple logistic regression, was conducted to address the second hypothesis and explore whether parental anxiety moderates the relationship between parenting stress and AD diagnosis in the child. A moderation analysis determines if a moderating variable (parental anxiety) interacts with the independent variable (parenting stress) in predicting the dependent variable (child AD diagnosis).

Both PSI Total Stress scores and STAI Trait Anxiety scores were centred to address multicollinearity in the moderation analysis. To centre the parenting stress variable, the mean Total Stress score ($M = 222.31$) was subtracted from each of the individuals' scores on the Total Stress scale. This created a new mean of zero for parenting stress. The parental anxiety variable

was centred in the same way, with the mean Trait Anxiety score ($M = 44.92$) being subtracted from each of the individuals' scores on Trait Anxiety scale. Next, the interaction term was created by multiplying the centered moderator (trait anxiety scores on the STAI) with the centred predictor (total stress scores on the PSI).

These terms were entered into a multiple logistic regression, with AD diagnosis group as the dependent variable. Centred parenting stress scores and parental anxiety scores were entered in block one, and the interaction term (centred parenting stress scores * centred parental anxiety scores) was entered in block two. As seen in Table 7, the interaction term between parental stress and parental anxiety did not significantly contribute to the predictive ability of the model. These findings suggest that the interaction between parental anxiety and parenting stress does not better predict child AD diagnosis than parenting stress alone. In other words, parental anxiety does not statistically significantly moderate the relationship between parental stress and anxiety disorder diagnosis in children.

Chapter Summary

Through the secondary analysis of an existing dataset, this study explored the relationship between the parenting stress and child AD diagnosis, and the impact of parental anxiety on this relationship. In the original study, consenting participants completed the ADIS-C/P interview via telephone and were then asked to complete three paper-pencil measures: the PSI, STAI, and PAS. In the current study, the ADIS-C/P interview determined if the parent's child met criteria for an AD diagnosis. Parenting stress was measured by the PSI Total Stress scores and the STAI Trait Anxiety score was used to measure parental stress. The PAS was not used in the current study.

In the larger study, participants were recruited from two public school districts in western Canada. A total of 104 participants and their Kindergarten-aged children were included in the present study, with 97 mothers and 7 fathers responding. Mothers had a mean age of 39.57 years, fathers had a mean age of 42.70 years, and children had a mean age of 6.09 years.

A multiple logistic regression was performed to investigate if a statistically significant relationship between parenting stress and the diagnosis of an AD in children exists. Parenting stress was found to be predictive of child AD diagnosis group; however, parental anxiety did not contribute significantly to the main effects model. A moderation analysis was conducted to determine whether the effect of parenting stress on child AD diagnosis category depended to any extent on levels of parental anxiety. The second hypothesis was not supported, as parental anxiety did not serve as a statistically significant moderator.

Chapter 5

Discussion

Brief Overview of the Study

This survey methods study had two goals. The first goal was to explore the relationship between parenting stress and an anxiety disorder diagnosis in children. The second goal was to determine if parental anxiety influences the relationship between parenting stress and AD diagnosis in children. One hundred and four children were recruited from two public school districts in western Canada. Parents completed clinical interviews (ADIS-C/P) over the telephone by trained, blinded assessors. Subsequent to the completed interview, all parents completed self-report, paper-pencil questionnaires of parenting stress, PSI, and parental anxiety, STAI. This study is part of a larger study investigating a novel screening question serving as proxy for a clinical interview of child anxiety.

Children were classified as having an AD diagnosis if they met diagnostic criteria according to the ADIS-C/P (Silverman & Albano, 1996). Parenting stress was assessed by total stress scores on the Parenting Stress Index (*PSI*; Abidin, 1995). Parental anxiety was measured by the STAI (Spielberger, 1983) Trait Anxiety scale scores. State subscale scores were not analyzed because it assesses transitory emotional state experienced by the respondents, rather than the enduring personality trait anxiety assessed by the Trait scale. A multiple logistic regression was the data analytic strategy employed to answer the first research question: Does a relationship exist between parenting stress level and anxiety disorder diagnosis in children? The second research question, does parental anxiety influence the relationship between parenting stress levels and anxiety disorder diagnosis in children? was answered by using a moderation logistic regression analysis. The results are discussed in this section.

Discussion of Findings

The results of this study provide support for the first hypothesis, that higher levels of parenting stress were predictive of an AD diagnosis in the child, while controlling for parental anxiety. Overall, an increase in parenting stress was found to predict an increase in the likelihood that a child would receive an AD diagnosis. The odds ratio indicates a 3.2% increase in the odds of receiving an AD diagnosis with every one-unit increase on the PSI total stress scale. When looking at the three domains of the PSI (child, parent and life stress), only the child domain contributed statistically significantly to parental total stress. The odds of the child receiving an AD diagnosis increase by 6.1% for every one-unit increase on the child domain score. These results suggest that parenting stress, particularly stress associated with child characteristics in the parent-child system, is predictive of the child receiving an AD diagnosis, and highlights the importance of focusing on both parts of the system (parent and child) in reducing anxiety in young children.

The finding that parental self-report anxiety, as assessed by the STAI, did not predict AD diagnosis in the child, while controlling for parenting stress, is surprising. Ample evidence in the literature suggests a strong and positive relationship between parental anxiety and anxiety in children. Further examination of the parental Trait Anxiety scores revealed that the current sample's mean score on the Trait Anxiety scale ($M = 44.92$, $SD = 3.638$) is greater than one standard deviation above the mean scores of the normative sample, based on working adults (females: $M = 34.79$, $SD = 9.22$; males: $M = 34.89$, $SD = 9.19$). In addition, results from the t-test conducted in the descriptive analyses demonstrate that there is no statistical difference in means between the AD diagnosis ($M = 44.69$, $SD = 4.19$) and no-AD diagnosis groups ($M = 45.03$, $SD = 3.39$). These findings may be interpreted as the study having a selection effect, with

parents with higher levels of anxiety being more likely to participate in the study, compared to parents with more normative levels of anxiety.

The second hypothesis, that parental anxiety would moderate the relationship between AD diagnosis category and parenting stress, was not supported. The moderator logistic regression model demonstrated that the interaction between parental anxiety and parenting stress did not serve as a better predictor than parenting stress alone. Given the sample's overall high scores on the Trait Anxiety scale of the STAI, and that there is no statistical difference in means on the Trait Anxiety Scale for AD diagnosis and no-AD diagnosis groups, results from the moderation analysis should be interpreted with caution. Further research attention on the effect of parental anxiety on the relationship between parenting stress and AD diagnosis in children is recommended.

Strengths

Many studies have explored the relationship between parenting stress and externalizing disorders in children; however, fewer studies have examined the relationship between parenting stress and internalizing disorders. This research contributes to the literature in two ways: it investigates the relationship between parenting stress and AD in children, specifically, and it is novel because it focuses on young children. No research, to date, has evaluated whether parenting stress is related to the diagnosis of a child AD in this age group. Determining risk factors for AD in this age group is important to the development of prevention and early intervention programs. While these findings provide evidence for a relationship between parenting stress and AD diagnosis in children, longitudinal research exploring the relationship between parenting stress and AD diagnosis in children is recommended.

The measures used in the study have robust psychometric properties. The ADIS-C/P is considered the gold standard for assessing anxiety disorders (Greco & Morris, 2004). Both the PSI and the STAI have demonstrated strong reliability and validity. Additionally, the psychometric of the PSI and the STAI have been supported in cross cultural research and diverse populations (Abidin, 1995; Groth-Marnat, 2009).

Another strength of the study is the use of a diverse community sample. Participants were recruited from a two public school districts, including a large, urban, multicultural school district. A range of ethnic groups were represented in the study's sample, with participants self-identifying as one of 7 different ethnic groups. In the current sample, 67.7% self-identified as Caucasian. Although this study does not focus specifically on cultural differences in the relationship between parenting stress and AD diagnosis in children, the findings suggest that the relationship exists in an ethnically heterogeneous sample. Further research explicitly exploring cultural differences is necessary; caution should be exercised when considering the generalizability of these results to specific cultural groups.

Delimitations and Limitations

A delimitation of the study is that a richer description of demographic information, such as socio-economic status, education, and marital status, was not collected in the larger study. Without this information, the ability to draw inferences about parenting stress, such as parents' ability to provide for basic needs is limited. Additionally, the lack of further demographic details limits the generalizability of the results.

The use of a convenience sample and access to English-only measures also limits the generalizability of the results. Although participants self-identified as one of several different ethnic groups, providing a diverse range of ethnicities, not all ethnic groups were well

represented in the current sample. The distribution of participants' ethnic groups in this study is not representative of this particular province in Western Canada. Ethnic minority groups were underrepresented in the study as compared to the Statistics Canada's 2006 Census (Statistic Canada, 2008). In the current sample, 10.6% identified themselves as Asian, 6.4% as South Asian, 1.9% Iranian and 1.0% as First Nations compared to 20.2%, 6.4%, 0.7%, and 4.7%, respectively, in this province's population. The current sample is also not representative of the two participating school districts. For example, 3.6% of the student population identified as Aboriginal compared to 1% of the study sample. Exploration of the relationship between parenting stress and child AD diagnosis in various cultural groups is warranted.

Future Directions

This study examined the relationship between parenting stress and AD diagnosis in children, as well as the effects of parental anxiety on this relationship in a community based sample of kindergarten children. This research suggests a number of different avenues for future research.

Findings from this study provide support for a relationship between parenting stress and anxiety disorders in young children. Specifically, stressors associated with child characteristics were predictive of an AD diagnosis in children. Additional analysis of the subscales in the Child Domain of the PSI can be examined to provide more detailed information about which aspects of the parent-child system serve as stressors to parents. Deater-Deckard (1998) proposed that parenting behaviours mediate the relationship between parenting stress and child outcomes. Research into the mechanisms of how parenting stress and child AD are related would be valuable.

In the current study, AD diagnosis was viewed dichotomously, with participants either receiving or not receiving a diagnosis. Factors such as AD subtype, the presence of multiple AD diagnoses, and comorbidities with other psychopathologies were not examined in this study. Future studies could investigate if those factors influence the relationship between parenting stress and AD diagnosis in children.

The inclusion of a dimensional classification system for Anxiety Disorders has been proposed for the DSM-V (Shear, Bjelland, Beesdo, Gloster, & Wittchen, 2007). Although individuals may not meet criteria for clinical levels of an anxiety disorder as outlined by the DSM-IV-TR (APA, 2000), they may still suffer from anxiety and its related symptoms. Future research into the relationship between parenting stress and child AD diagnosis should include individuals with varying degrees of anxiety (i.e., subclinical levels of anxiety).

Fathers have been neglected in research examining childhood anxiety (Bögels & Phares, 2008). Recently, there has been a move toward understanding not only the roles of the father, but also the functions, impact of father-child relationships, and the effects of differing levels of paternal involvement on child development (Lamb & Tamis-LeMonda, 2004). The majority of respondents in the present study were mothers. Including paternal reports of parenting stress would allow for a comparison with maternal reports of parenting stress to explore whether a fathers' parenting stress levels are related to child AD diagnosis.

Implications

This study presents support for the existence of a relationship between parenting stress and anxiety disorders in a community sample of young children. Parents with anxious children are experiencing more stress compared to non-anxious children. Furthermore, parents with higher levels of parenting stress are at increased odds of having a child with an anxiety disorder.

In particular, stress associated with child characteristics in the parent-child system contribute to increased probabilities of children meeting criteria for and AD. This finding suggests that when developing intervention programs for anxiety disorders, including the child and the parent as participants should be considered.

A key component of parenting stress is the balance between resources available to parents to meet the demands of parenting. Providing parents with resources to meet the demands of parenting their anxious child is important in reducing parenting stress and may have implications for prevention and early intervention programs. As the child domain of the PSI significantly predicted child AD diagnosis, parents of anxious children may benefit from resources targeted at reducing stress by helping the adults manage their children's anxiety. Further research can be conducted to determine what type of resources (e.g., increasing basic parenting knowledge regarding anxiety, increasing feelings of competence as a parent of an anxious child or emotional and instrumental support from others) will be most beneficial in reducing parenting stress. Once resources that are effective at decreasing parental stress of parents of children with AD are identified, they may be incorporated into prevention and early intervention programs.

Canada's first mental health strategy was recently unveiled (Mental Health Commission of Canada; MHCC, 2012). The strategy outlines several directions, including the promotion of mental health across the lifespan by enhancing protective factors and preventing mental illness by reducing risk factors, and increasing research knowledge and knowledge translation. Priorities of the strategy involve increasing the capacity of families to support the mental well-being of children through prevention and early intervention. This study aligns with the aims of the Canadian Mental Health Strategy. The findings provide evidence for an association between

parenting stress and AD in young children. In addition to teaching children skills to manage their anxiety, resources for parents to support their anxious children should also be considered in treatment. This new area of research has the potential to engage families in the prevention and early intervention of the most common mental health problem in children, anxiety disorders.

One aspect that current research into intervention programs for young children with anxiety disorders explores is parent-focused interventions (Cartwright-Hatton et al., 2011). From a parenting stress perspective, parent-based interventions teach parents the skills and knowledge to help manage their child's anxiety, as well as their own anxiety. These skills and information provide parents with resources to meet the demands they face in parenting their young, anxious child. In addition, many of these studies deliver the intervention in a group format, which may act as an additional resource to parents. Group formats may serve as instrumental support for parents, as it allows parents to connect with others who have shared experiences. Additionally, offering group-format interventions may be more cost effective than individual counselling. Further research into sources of parenting stress may benefit intervention programs by indicating which areas parents need support or resources to be able to better meet the demands of parenting an anxious child, and thereby reducing parental stress.

Conclusion

A review of the literature has shown that there is an association between parenting stress and child outcomes. There is evidence in the literature showing that parents of children with symptoms of early psychopathology report higher levels of stress (Deater-Deckard, 1998) and that parenting a child with mental health problems can be a source of stress for parents (Tan & Rey, 2005). Deater-Deckard (1998) proposed that parenting practices mediate the relationship between parenting stress and child outcomes; however, research has produced mixed findings.

Although parenting stress has not been shown to independently predict internalizing disorders in school-aged children, parenting behaviours and parenting stress have been shown to interact with internalizing difficulties in early childhood to contribute to the development of children's internalizing difficulties in school years (Bayer et al., 2010).

This study has determined that an association between parenting stress and AD diagnosis in young children exists. It contributes to the literature by demonstrating that parents with increased levels of parenting stress are at greater odds of having a young child with an AD diagnosis. Although parental anxiety was not shown to act as a moderator in the relationship between parenting stress and the diagnosis of an AD in children, there is a wealth of research suggesting that parental anxiety plays an important role in the development of AD in children.

The relationship between parenting stress and AD diagnosis in young children has implications for practice, as it suggests that reducing parenting stress reduces the odds of children receiving an AD diagnosis. According to Abidin's parenting stress model (1992), offering parents of anxious children accessible resources, such as basic knowledge about anxiety, anxiety management skills, and instrumental support, may help to reduce parenting stress because the resources may allow parents to be better able to meet the demands of parenting a child with a mental health problem. Professionals in the fields of mental health and education should be aware that parenting stress is related to the diagnosis of AD in children. Sources of parenting stress and effective ways of increasing accessibility of resources to parents should be explored in future research.

Table 1

Participant Demographics (N = 104)

Respondent age [†]	Range	Mean (SD)
Mother (<i>n</i> = 97), father (<i>n</i> = 7)	29-57	40.76 (4.05)
Child age	Range	Mean (SD)
Total sample	5.12-6.97	6.09 (.30)
Female (<i>n</i> = 60)	5.49-6.64	6.07 (.31)
Male (<i>n</i> = 44)	5.12-6.97	6.12 (.30)
Mother age [†] (<i>M</i> = 39.57, <i>SD</i> = 8.12)	Frequency	Percent
29 or younger	1	.97
30-39	44	42.72
40-49	53	51.47
50-59	5	4.85
Father age [†] (<i>M</i> = 42.70, <i>SD</i> = 7.03)	Frequency	Percent
30-39	29	28.16
40-49	60	58.25
50-59	14	13.59
Ethnicity	Frequency	Percent
Caucasian	70	67.3
Asian	11	10.6
South Asian	4	3.8
Iranian	2	1.9
First Nations	1	1.0
Mixed	13	12.5
Missing	3	2.9
Language spoken at home	Frequency	Percent
English	92	88.5
English & other language	7	6.7
Chinese/Cantonese/Mandarin	2	1.9
Farsi/ Persian	2	1.9
Korean	1	1.0
Number of siblings (<i>M</i> = 1.28, <i>SD</i> = .81)	Frequency	Percent
0	16	15.4
1	50	48.1
2	31	29.8
3	7	6.7

[†] missing data, *n* = 1

Table 2

Descriptive Statistics for Dependent Variable (Child AD Diagnosis)

Child AD Category	Total Sample		Females		Males	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
No diagnosis	72	69.2	44	73.3	28	63.6
Diagnosis	32	30.8	16	26.7	16	36.4

Table 3

Multicollinearity Statistics for Main Effects Model

Predictor Variable	Collinearity Statistics	
	Tolerance	VIF
Parenting Stress (PSI Total Stress Score)	.997	1.003
Parental Anxiety (STAI Trait Anxiety Score)	.997	1.003

Table 4

Means and Standard Deviations of Independent Variables for Participants

Variable	Total Sample (N = 104)		AD Diagnosis (N = 32)		No AD Diagnosis (N = 72)	
	Mean (SD)	Range	Mean (SD)	Range	Mean (SD)	Range
Parenting Stress (Total Stress)	222.31 (37.02)	149-319	247.56 (31.84)	188-319	211.08 (33.61)	149-311
Defensive Responding	33.32 (7.85)	19-55	37.75 (7.64)	21-55	31.35 (7.15)	19-52
Life Stress	6.53 (6.66)	0-34	8.78 (9.13)	0-34	5.53 (4.97)	0-17
Child Domain	94.40 (21.18)	61-182	110.03 (17.21)	79-159	87.46 (19.05)	61-182
Parent Domain	127.90 (20.25)	78-180	137.53 (18.18)	95-167	123.63 (19.75)	78-180
Parental Anxiety (Trait Anxiety)	44.92 (3.64)	36-56	44.69 (4.19)	36-55	45.03 (3.39)	37-56

Table 5

Logistic Regression Predicting Likelihood of the Presence of an Anxiety Disorder Diagnosis

Independent Variable	B	S.E.	Wald	Odds Ratio	95% C.I.
Parenting Stress	.03	.01	17.52***	1.03	[1.02, 1.05]
Parental Anxiety	-.01	.06	.05	.99	[.87, 1.12]

*** $p < .001$

Table 6

Logistic Regression - PSI Domains Predicting Child Anxiety Disorder Diagnosis

PSI Domain	B	S.E.	Wald	Odds Ratio	95% C.I.
Life Stress	.063	.037	2.82	1.07	[.99, 1.15]
Parent	.005	.015	.10	1.01	[.98, 1.04]
Child	.060	.018	11.22***	1.06	[1.03, 1.10]

*** $p = .001$

Table 7

Logistic Regression – The Moderation of Parental Anxiety on Parenting Stress and Child Anxiety Disorder Diagnosis

Independent Variable	B	S.E.	Wald	Odds Ratio	95% CI
Centered Parenting Stress	.031	.007	17.666***	1.03	[1.02, 1.05]
Centered Parental Anxiety	-.027	.075	.133	.97	[.84, 1.13]
Interaction Term	.001	.002	.108	1.00	[.10, 1.01]

*** $p < .001$

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