ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)  
– A DIAGNOSIS FOR CHILDREN OR A CURE FOR PARENTS?  
A CRITICAL ANALYSIS OF THE NATURE AND PREVALENCE OF ADHD, AND PARENTS’ PERCEPTIONS

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And it isn’t easy to listen to someone who would challenge those ideas of yours which have come to be so precious to you

Anthony De Mello
Statement of Authentication

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either whole or in part, for a degree at this or any other institution.

Anthony Dillon
March, 2011
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ABSTRACT

Attention deficit hyperactivity disorder (ADHD) is the most commonly diagnosed psychiatric disorder in children (Neven, Anderson, & Godber, 2002), and one of the most controversial topics in children’s mental health (Wolraich, 1999), where the controversy relates to the questionable validity of ADHD as a medical condition. This study evaluates parental attitudes that canvass a spectrum of beliefs in this respect. The predominant belief within the scientific and research community is that ADHD is a proven neurological condition. However, many researchers (e.g., H. Glasser, 2005; Spillane, 2009; D. B. Stein, 2001b) question its validity as a medical condition, largely on the basis that there is currently no objective diagnostic test to identify a pathology believed to cause ADHD-type behaviours (Diller, 2006; Furman, 2009) and that a genetic basis for ADHD has not been identified (Joseph, 2006). The concern is raised that presenting ADHD as a medical condition is potentially disempowering for parents, and may lead to misdirected treatment for children (Neven, et al. 2002). Parents with children displaying ADHD-type behaviours (i.e., hyperactivity, impulsivity, and inattentiveness), typically must decide whether they believe that their child’s behaviours are the result of a medical condition called ADHD, or are simply a cluster of behaviours that some adults find problematic. Once having decided, parents are then faced with the related decision of treatment: namely, whether the ADHD-type behaviours should be managed using medication, through a non-medicative approach such as behavioural interventions, or perhaps through a combination of both approaches. The use of medication to control behaviours adds to the controversy surrounding ADHD, especially for children. Another point of controversy in relation to the use of medication is the growing concern regarding safety and side-effects, as well as medication’s limited long-term effectiveness in helping children (e.g., Breggin, 2008).

Given these concerns, and using a mixed-methods approach, this research comprises three inter-related synergistic studies to explore parents’ perceptions and experiences of ADHD, as well as the decision-making process they go through when deciding whether or not to accept the ADHD diagnosis for their child. Study 1 aims to
develop and test the psychometric properties of a newly developed measure of a range of psycho-social constructs that may influence parents’ decision-making processes, and identifies parents’ opinions of the nature, causes, and appropriate treatment of ADHD. Study 2 builds on the first study to explicate the relations between psychosocial constructs and parents’ acceptance or rejection of a diagnosis of ADHD as a medical condition, and the perceived helpfulness of a medical diagnosis, to provide a rare empirical study elucidating the role of research-identified psycho-social drivers that inform parental decision-making. Study 3 is a qualitative analysis that complements and extends the findings of the first two studies by further elucidating parents’ experiences and perceptions of ADHD-type behaviours by conducting interviews with parents. In addition, health professionals are also interviewed, to provide further insights into parents’ experiences of ADHD. While much research has been undertaken regarding the nature of ADHD in relation to the child, comparatively little research has examined ADHD from the perspective of parents. Hence, this research potentially makes a valuable contribution to expanding the literature in this field.

Results from this research show that psychosocial factors (e.g., parents’ perceptions of the ADHD label being helpful, the degree of stress experienced from parenting a child who displays ADHD-type behaviours, and beliefs about whether ADHD-type behaviours have a biological or non-biological cause), can be used to predict parents’ acceptance or rejection of the ADHD diagnosis for their child. An important finding of this research is that parents who accept the ADHD diagnosis for their child are more likely to report experiencing stress, and that they find the diagnosis helpful. A tentative interpretation of these findings is that parents may seek a medical diagnosis to explain or describe their child’s behaviours, because it offers some form of relief. Based on these research findings, the argument is made that enabling parents to manage stress better, may lead their considering, and even accepting, alternative (i.e., psychosocial) explanations for their child’s ADHD-type behaviours and exploring a wider range of options for managing ADHD-type behaviours.
INTRODUCTION

“There are some who are so desperate that any diagnosis would be helpful and there are some who are very resistant to that sort of diagnosis.” (Personal communication with a Paediatrician talking about ADHD)

While the aims of parenting are generally the same today as they have been for past generations (i.e., raising and nurturing children, and preparing them for adulthood), the task seems more complex now than it was in previous generations (e.g., Rosemond, 2007). Modern life is characterised by more luxuries, more comforts, more freedom, and perhaps more of everything (including more problems). The acquisition of freedom has been accompanied by more choices, which in turn is accompanied by the need for more decision-making. In relation to parenting, parents are making many more decisions in regard to how to raise their children and how to respond to the many problems associated with childhood – decisions that can impact favourably or unfavourably on their children, themselves, and their families. Add to the equation of modern-day parenting the pressure placed on children to perform and succeed to such a degree that average is barely acceptable, and the fact that any signs of developmental delay are seen as prima facie evidence of a medical disorder (Neven, Anderson, & Godber, 2002), and it can be seen that today’s generation of parents faces pressure, confusion, and worry unequalled by past generations, in regard to raising children.

The concern held by parents, that developmental delay is related to a medical disorder is perhaps nowhere more evident than with Attention Deficit Hyperactivity Disorder (ADHD; Rosemond & Ravenel, 2008). ADHD is a household term, and one which carries many inaccurate conceptions and expectations (Desgranges, Desgranges, & Karsky, 1995), making it one of the most controversial topics in parenting and child health. Experts and parents are divided in their views on exactly
what ADHD is, and even if it exists. Many researchers across the fields of education, psychology, and medicine have questioned ADHD’s validity as a medical condition. For example, Rosemond and Ravenel (2008, p. xi) state, “Science depends on verifiable, objective evidence and experimental results that can be replicated by other scientists. Where ADHD is concerned, neither verifiable, objective evidence nor replicable experimental results exist to support the claims of the ADHD Establishment.” Researchers holding such views have also argued that there is currently no objective diagnostic test to identify a pathology believed to cause ADHD-type behaviours (Diller, 2006; Furman, 2009) – rather, diagnosis is based on expert opinion from health professionals, which may be aided by checklists and assessment of cognitive abilities. These claims are in stark contrast to the predominant message that ADHD is a proven neurological condition and that it is currently the most commonly diagnosed psychiatric disorder in children (Neven, et al., 2002). Given the uncertainty regarding ADHD as a medical condition, and purely for convenience, the term “ADHD” is operationalised throughout this thesis to refer to the cluster of behaviours that has been used to define the term (namely hyperactivity, inattentiveness, and impulsiveness). Hereafter they will often be referred to as ADHD-type behaviours without any necessary inference that the behaviours indicate a medical illness.

These opposing views regarding ADHD’s validity as a medical disorder have resulted in parents whose children display ADHD-type behaviours receiving conflicting information regarding ADHD’s causes and treatments. Amidst the confusion resulting from the conflicting information, there are often very real and immediate problems associated with ADHD-type behaviours for children and their families (e.g., poor school performance, family conflict) that require an immediate response. One of the most important responses to be considered is whether or not to consider medication as a treatment option – an option that is increasingly being questioned by medical specialists and other professionals. However, the selective transmission of knowledge concerning the potential risks and benefits of medication, combined with pressure from other stakeholders (e.g., schools), means that informed parental decisions are unlikely (B. Kean, 2005). Thus, parents need to carefully consider current conflicting views and decide on: (a) what they think is in their own best interests as a parent coping with difficult behaviours and also (b) what they believe is in the child’s best interests in the short-term and long-term. The concept of
parents’ best interests provides a whole new perspective from which to view the ADHD debate – a perspective which this research will explore in detail. Despite the significant influence parents have on treatment options and management of ADHD in their children, parents’ beliefs and attitudes have not been widely studied (Johnston, Seipp, Hommersen, Hoza, & Fine, 2005). Knowing why some parents are quick to embrace a diagnosis of ADHD for their child can equip those involved in finding solutions for the child, (e.g., parents, doctors, teachers) to explore other factors beyond the child’s biology (e.g., increased strain on families, more competitive schooling environments, more impersonal societies, strained health systems), that may also be likely to contribute to this modern phenomenon called ADHD. This is particularly important given the growing concern by many health professionals (e.g., Furman, 2009; D. L. Jackson & Gillaspy, 2009) about the safety and side effects of stimulant medications for young children.

Hay, Bennett, McStephen, Rooney, and Levy (2004) have aptly pointed out that although there is much debate about the diagnosis and treatment of ADHD, it is the outcomes for the child that are most important. Given the outcomes for the child are, among other factors, influenced by the parents’ beliefs about ADHD and its underlying causes, which in turn influence the choice of treatment (Hoza et al., 2000) it is important to understand more about the drivers of parents’ beliefs. Furthermore, if it is possible to understand more about those parents who view ADHD as a medical condition, perhaps it is possible to understand more about the parents who are most likely to seek a medical treatment. This research was designed to address some of these issues by identifying new research-based evidence to elucidate parents’ opinions of the nature, causes, and appropriate treatment of ADHD, and their decision-making processes in relation to their children’s ADHD-type behaviours. By knowing what factors influence parents to accept the ADHD diagnosis, it may be possible to assist them in making more informed decisions regarding their child’s ADHD behaviours that are more effective and helpful for their child and their family.

The research uses a mixed-methods design comprising two quantitative studies and a qualitative study. Mixed-methods designs are increasingly espoused as important to the development of sound research findings and interpretations of component data (Marsh, Martin, & Hau, 2006). When research is intended to serve multiple audiences (e.g., parents, health professionals, teachers), as is the case here,
Mertens (2005) suggests that a mixed-methods approach is most appropriate. More specifically, this research is comprised of three interrelated studies that aim to:

1. Develop a psychometrically sound survey instrument that measures a range of psycho-social constructs (e.g., parenting self-concepts, stress) that may influence parents in their decision-making processes and their opinions on the nature, causes, and appropriate treatment of ADHD (Study 1).

2. Explicate the relation of psycho-social constructs measured by the survey instrument developed in Study 1 to parents’ acceptance or rejection of a diagnosis of ADHD as a medical condition, and perceived helpfulness of the diagnosis, so as to provide a rare empirical study elucidating the role of research-identified psycho-social drivers that inform parental decision-making (Study 2).

3. Use qualitative methodology to explicate parents’ and health professionals’ views, practices, and personal experiences with ADHD to complement and extend the findings from the quantitative component of the investigation (Study 3).

By clarifying these issues and thereby offering novel and methodologically sound evidence-based approaches to explicating the nature of parental decision-making in regard to ADHD, this research assists in:

- improving our understanding of parental knowledge and decision-making processes in regard to the diagnosis and treatment of ADHD,
- identifying effective theoretical orientations to strengthen education in regard to ADHD, and
- contributing to elucidating the psycho-social determinants of decision-making in regard to diagnosis and treatment.

Armstrong (2006) suggests that the ADHD field needs to be re-examined so that “fresh research methodologies, novel intervention strategies, and new ways of looking at children” (p. 42), can emerge, that may result in positive outcomes for children. The aim of this thesis is to contribute to addressing this need. When parents are better
informed and empowered to make decisions on issues that matter most to them, their children automatically reap the benefits (as does society as a whole). More specifically, the research contributes to advancing knowledge about parental perceptions, decision-making processes, and responses to ADHD.

This research is not about preventing parents from seeking a medical treatment option, but rather about elucidating potential drivers from the broader psycho-social context that may enable parents to make informed decisions. For example, if stress is a factor that influences parents in their decision to accept a medical explanation for their child’s behaviour, then empowering them to better deal with stress in their lives may assist them to be more judicious in seeking an explanation for their child’s behaviour. This is important, as “Labelling ADHD as a disease shuts out the consideration of a broader context and might lead to the isolation of the child, to the disempowerment of parents and ultimately to a misdirected treatment” (Neven, et al., 2002, p. 4). While the stance taken in this thesis is not opposed to treatment, it does acknowledge concerns regarding “misdirected treatment,” which in this context refers to treatment of a chemical nature applied in order to correct behaviours believed to be due to a brain pathology, where currently a brain pathology has not been identified. On this matter, Furman (2009) claims that in our attempts to help children who display ADHD-type behaviours, children require more than a checklist and medication, and that their parents can be supported to advocate for their children’s needs.

Explaining ADHD-type behaviours as resulting from a neurological illness is related to the tendency of mental health experts to increasingly view problematic behaviours as medical illnesses (in the absence of scientific evidence to support their claims), where ADHD is but one example of this trend. Conrad (2007) notes that the increased practice of medicalising behaviour means that virtually any human differences can potentially be considered a form of pathology, a diagnosable disorder, and subject to a medical intervention. Further, Horwitz (2002) notes that “diagnostic psychiatry mistakenly equates expectable responses to stressful conditions with mental disorders” (p. 14).

In addition, with greater emphasis in child mental health now being placed on “early intervention,” it is possible that such an approach may open the way for a medical intervention for certain childhood behaviours, where one is not warranted. For example, the term “early onset bipolar disorder” was relatively unknown until
recently, though it is becoming increasingly well-known, with claims that it is affecting more and more young children. As another example, researchers have recently claimed to have provided validation for depression in preschool children (Luby, Si, Belden, Tandon, & Spitznagel, 2009). Like ADHD, there is no objective medical test for early onset bipolar childhood disorder or depression. Results from this research potentially can be used to enable parents to seek a treatment option that best meets their unique circumstances.

This thesis comprises ten chapters. Chapter 2 is the first of two literature reviews. Given that this thesis explores what factors influence parents in accepting ADHD as a medical condition or as a psychosocial explanation, it is necessary to establish that an alternative conceptualisation of ADHD and explanation for ADHD-type behaviours exists, apart from the dominant medical model. ADHD is defined in this chapter, and it is then demonstrated that sufficient doubt exists regarding the validity of ADHD as a medical condition. The common arguments used to prove ADHD to be a medical condition are responded to, and a critical examination of other factors that help bolster the public’s opinion (and that of the scientific community) that ADHD is a valid medical condition, is furnished. The aim is not to disprove the existence of ADHD, but only to demonstrate that evidence of ADHD as a medical condition is highly questionable, resulting in confusion for parents in deciding what is best for their child. Given that this research employs the use of a range of psychological constructs, an explanation of their theoretical underpinnings is warranted; this is provided in Chapter 3, the second literature review for this investigation. Chapter 4 presents the aims, hypotheses, and research questions, along with their rationales, for each of the three studies comprising this research. Chapter 5 gives a detailed account of the methodology employed for each of the three studies separately. Chapters 6 to 8 present the results of each of the three studies consecutively. Chapter 9 provides a discussion of the research results, explores the strengths and limitations of the research, and presents the implications of the findings for theory, research, and practice. Finally, Chapter 10 provides a summary of findings and highlights the conclusions drawn from the three studies in relation to the research aims.
CHAPTER 2

A CRITICAL ANALYSIS OF COMPETING VIEWS OF THE
SCIENTIFIC STATUS OF ATTENTION DEFICIT
HYPERACTIVITY DISORDER

“It is more accurate to say that people, and particularly social scientists, select theories that are consistent with their personal values, attitudes, and prejudices, and then go out into the world, or into the laboratory, to seek facts that validate their beliefs about the world and about human nature, neglecting or denying observations that contradict their personal prejudices.” (Albee, 1982, p. 5)

Introduction

The scientific status of attention deficit hyperactivity disorder (ADHD) is one of the most contentious and controversial issues in child and mental health research internationally (Wolraich, 1999). Introduction of the term “ADHD” to explain certain childhood behaviours seems to have generated more questions than it has answered, with the most enduring question surrounding it being whether or not it actually exists (Graham, 2007). This debate whether ADHD exists or not is in itself prone to ambiguity, as the controversy does not relate to whether or not the behaviours that characterise ADHD exist – because this is not disputed – rather, the controversy relates to causality (Baughman & Hovey, 2006). Specifically, the debate hinges primarily on whether ADHD-type behaviours are due to a medical condition or are simply a cluster of behaviours that some adults find problematic.

Both professional and public discussions on ADHD tend to be highly polarised. On one side of the debate are those who adopt the medical model conceptualisation of ADHD, thereby asserting that the behaviours defining ADHD are due to a medical condition that is best responded to with a medical intervention (e.g., Barkley, 2002). On the other side of the debate there are those who adopt a psychosocial model of ADHD, claiming that it is simply the pathologising of normal
behaviours, and who therefore question its existence as a medical condition (e.g., H. Glasser, 2005; Newnes, 2009). The latter stance is likely aided by the observation that ADHD is a condition for which an underlying aetiology has not been identified, which is also generally acknowledged by the proponents of the medical model of ADHD (e.g., Biederman, 2005; Sprich, Biederman, Crawford, Mundy, & Faraone, 2000). While this thesis does not set out to prove whether or not ADHD is a valid medical condition, these polarised views provide a provocative and interesting landscape in which to study and understand how parents respond when it is suggested to them that their child may have ADHD.

Given the controversy surrounding ADHD, the purpose of this chapter is to critically examine the arguments most commonly used to support or refute the medical model conceptualisation of ADHD. No attempt is made to give a full explanation for what ADHD is, or is not. Rather, the intention is to show that competing views of the scientific status of ADHD offer different explanations for the commonly observed ADHD-type behaviours, and that this has important implications for the present investigation, in that the decision-making process for parents in considering what explanation they may adopt for their child’s ADHD, is anything but straightforward for many of them. This chapter commences with a general discussion on the nature of ADHD, on how it is conceptualised, and provides an overview of the most controversial treatment option – stimulant medication. This is followed by a critique of the most common arguments used to support the medical model of ADHD. Next, a selection of other possible reasons that contribute to the ready acceptance of the medical model is provided. Finally, the implications of this controversy for the present investigation are presented.

**Differences of Opinion About the Scientific Status of ADHD**

**What is ADHD, How is it Diagnosed, and Does it Exist?**

The contention over whether or not ADHD exists is mired in ambiguity and essentially unanswerable until there is an agreed-upon definition of ADHD. The Diagnostic and Statistical Manual of Mental Disorders Fourth Edition (DSM-IV), developed by the American Psychiatric Association (1994), is generally considered by mental health professionals to be the official reference that classifies mental conditions and disorders (Neven, et al., 2002). This manual identifies the behaviours
used to identify ADHD: inattentiveness, hyperactivity, and impulsivity at levels which would be considered excessive by normative measures. The criteria for ADHD as set out in the DSM-IV are as follows:

A. Either (1) or (2)

(1) six (or more) of the following symptoms of **inattention** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

- Inattention
  - (a) often fails to give close attention to details or makes careless mistakes in school, work, or other activities
  - (b) often has difficulty sustaining attention in tasks or play activities
  - (c) often does not seem to listen when spoken to directly
  - (d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behaviour or failure to understand instructions)
  - (e) often has difficulty organizing tasks and activities
  - (f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
  - (g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
  - (h) is often easily distracted by extraneous stimuli
  - (i) is often forgetful in daily activities

(2) six (or more) of the following symptoms of **hyperactivity-impulsivity** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

- **Hyperactivity**
  - (a) often fidgets with hands or feet or squirms in seat
(b) often leaves seat in classroom or in other situations in which remaining seated is expected
(c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
(d) often has difficulty playing or engaging in leisure activities quietly
(e) is often “on the go” or often acts as if “driven by a motor”
(f) often talks excessively

Impulsivity
(g) often blurts out answers before questions have been completed
(h) often has difficulty waiting turn
(i) often interrupts or intrudes on others (e.g., butts into conversations or games)

B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.
C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).
D. There must be clear evidence of clinically significant impairments in social, academic, or occupational functioning.
E. Symptoms do not occur exclusively during the course of a Pervasive Development Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

Code based on type:

3.14.01 Attention-Deficit/Hyperactivity Disorder, Combined Type: if both Criteria A1 and A2 are met for the past 6 months
3.14.00 Attention-Deficit/Hyperactivity Disorder, Predominantly

**Inattentive Type:** if Criteria A1 is met but Criterion A2 is not met for the past 6 months

3.14.01 Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type: if Criteria A2 is met but Criterion A1 is not met for the past 6 months

**Coding note:** For individuals (especially adolescents and adults) who currently have symptoms that no longer meet full criteria, “In Partial Remission” should be specified (APA, 1994, pp. 83–85).

As with all listings of the DSM-IV, there is no specific test for ADHD (Timimi, 2007), as the criteria for the diagnosis (presence of the aforementioned ADHD-type behaviours) were arrived at by consensus (R. E. K. Stein, 2007). Hence, if these criteria are used to define a medical condition called ADHD, then the simple answer to the question posed earlier is that ADHD does indeed exist, since the behaviours meet the DSM-IV criteria. However, once a person has been assigned the label of ADHD there is still the heated debate amongst professionals about what that exactly means (specifically, whether or not ADHD is a brain condition), and consequently, what treatments or interventions should be provided to an individual with that label.

**What Causes ADHD-Type Behaviour?**

A greater understanding of the nature of ADHD, its likely causes, and its associated treatments is critically important when considering the well-being of our future generations and the need to offer accurate and informed advice to parents on intervention options. Accordingly, ADHD researchers have emphasised that:

- discussions of the etiology of ADHD have serious implications. Because conclusions from such discussions are likely to drive future research and treatment development, how we address these issues will ultimately affect the lives of the many children, adolescents, and adults who suffer from this disorder. (Faraone & Biederman, 2000, p. 569)
Those who believe that ADHD is a medical disorder generally assert that ADHD-type behaviours are the result of a neurological condition (e.g., Barkley, 2006a; Pliszka, 2007). Dryer, Kiernan, and Tyson (2006) note that this is the dominant view, as such a position is commonly found in the popular media (e.g., http://www.chadd.org/Content/CHADD/Understanding/Causes/default.htm), as well as in official government publications (e.g., Clinical Excellence Commission, 2007). While some of these sources rightly acknowledge that definitive proof for a biological cause has not been established, they do assert that available evidence is converging on an underlying biological cause (e.g., Barkley, 2000). Thus, despite there being currently no “reliable, valid set of neurobiological markers to diagnose ADHD” (Lollar, 2008, p. 16), ADHD as a neurological disease or illness is seen by many as an unquestionable and well established fact. For example, Barkley et al. (2002) in their international consensus statement, clearly express their opinion on the validity of ADHD. In a response to criticisms by those who question the medical conceptualisation of ADHD (e.g., Sami Timimi, 2004), Barkley et al. (2004) state “Any ‘debate’ over the legitimacy of ADHD as a valid disorder exists only in some segments of the popular media, not in the scientific community” (p. 65). However, as will be shown throughout the rest of this chapter, there are members of the scientific community who do question the validity of ADHD as a medical condition.

In stark contrast to those who claim that ADHD is a well recognised medical disorder, there are those researchers (Baughman & Hovey, 2006; Breggin, 2001; D. B. Stein, 2001b; Sami Timimi, 2007) who claim otherwise. They assert that in the absence of any scientific/medical test identifying an underlying brain pathology specific to ADHD, the behaviours of those children that are attributed to a neurological illness are simply normal (albeit, sometimes problematic) behaviours that manifest at the outer limits of the normal curve for childhood behaviours. While these critics acknowledge that children who are labelled as having ADHD often have problems that warrant attention, they believe that psycho-social explanations that examine the child in the broader context of families, modern society, and schools, are better able to serve the child.

Given the absence of scientific certainty in regard to the validity of ADHD as a medical condition, Graham (2010) aptly suggests that it is “the medical equivalent of where there’s smoke, there’s fire” (p. 2). With the assumption of a “fire,” the topic
of how to “extinguish” the fire arises, in particular through the use of stimulant medication, which is the focus of the next section.

**Treatments for ADHD-Type Behaviour**

A contributing factor to the controversy surrounding ADHD is the notion of children using psychotropic drugs (Mayes, Bagwell, & Erkulwater, 2009). The general acceptance of the medical model of ADHD has led to an increase in prescription of medication (Graham, 2008). Controversy centres on whether or not it is appropriate to treat a condition that is characterised by a cluster of behaviours – behaviours which many would consider to be normal for children – with medication. According to the Clinical Excellence Commission (2007), stimulant medications are generally recommended as first-line treatments. The Paediatric and Child Health Division of The Royal Australasian College of Physicians (2009) advocate a multimodal approach which may include the use of medication, but further suggest that it is not recommended for every case. However, despite the wide use of medication, the NSW Commission for Children and Young People (2007) has suggested that there “is a need for social research in Australia into the nature of side effects from ADHD medications from the perspective of children, young people and their parents” (p. 7). In recognition of these concerns, the Australian Psychological Society (2007) has noted that Australia has been one of the heaviest prescribers of drugs in the world to treat ADHD. As a result of this finding, the APS is urging doctors and parents to consider psychological interventions instead of medical interventions, because of the risk of side effects and misuse of these drugs. This view is consistent with that offered by the American Psychological Association (2006), whose report on psychotropic medication for children states that: “the preponderance of available evidence indicates that psychosocial treatments are safer than psychoactive medications. . . . [and] it is the families’ decision about which treatments to use” (p. 16). Hence, controversy also abounds about the most appropriate type of treatment for ADHD-type behaviours. Furthermore, H. Glasser (2005) cautions about the dangers of polypharmacy (as sometimes happens when the need arises to prescribe other drugs to counteract the side effects of stimulant medication). On this matter, the policy statement of the American Academy of Child and Adolescent Psychiatry (2001 ¶p. 3) notes: “Little data exist to support
advantageous efficacy for drug combinations, used primarily to treat co-morbid conditions.”

With regard to the medical model, DeGrandpre (2000) has also observed that implicating the child’s genetic material places the problem solely within the nature of the child, which often leads to a medical intervention. Given the claims regarding the problems of stimulant medication (H. Glasser, 2005; G. Jackson, 2009), there is strong opposition by both experts and parents alike to its use. For example, Breggin (2002) notes that stimulants (such as Ritalin) work by suppressing the brain’s activity to generate spontaneous mental life and behaviour, and do not help children in their scholastic abilities. Some of the physical side effects of Ritalin as described by the Paediatric and Child Health Division of The Royal Australasian College of Physicians (2009) include decreased appetite, sleep problems, and increased heart rate and blood pressure. With regard to the impact on growth, longitudinal research undertaken by Poulton and Cowell (2003) suggested that children with ADHD experienced a decrease in growth (as indicated by weight and height measurements) when on stimulant medication. However, a limitation of this research was that the growth characteristics of children on stimulant medication were compared to normative growth charts, and not unmedicated controls, due to the difficulty of obtaining children with ADHD who were not on medication. Perhaps what is most troubling for those concerned about the use of medication, is not so much the side effects, as side effects can be expected with most medications, but rather, the use of medication to treat what many would consider normal childhood behaviour, rather than a proven medical condition. On this matter, Breggin (2001) asserts that:

The drugging of children for behavior control should raise profound spiritual, philosophical, and ethical questions about ourselves as adults and about how we view the children in our care. Society ignores these critical questions at great peril to itself, to its values, and to the well-being of its children. (p. 140)

Regardless of whether medication is an appropriate form of treatment, or even if ADHD is a valid medical condition, one fact remains unchanged, that children with ADHD can be a source of frustration and challenges for their families.
It naturally follows that families with children displaying ADHD-type behaviours are in need of support, and not criticism.

**Critique of Some Arguments Used to Support ADHD as a Medical Condition**

*Overview: Arguments, Proofs, and Biases*

DeGrandpre (2000) suggests that the gap between what the public knows about ADHD (even what physicians know), and what science shows, is vast. This is particularly true with regard to the functioning of the human brain. Many arguments have been offered in support of ADHD as a medical condition affecting brain functioning. This section provides a brief critique of the most common arguments used to support the notion of ADHD being a medical condition – that is, a neurological disorder with an underlying causal physical pathology.

When discussing a topic on which there are strongly polarised views – in this case, whether or not ADHD is a medical condition – caution needs to be exercised so as to avoid being seen as biased, simply because a viewpoint different from the predominant one is offered. In controversial matters, it is easy for opposing sides to view each other as biased. However, with regard to ADHD, even the most adamant supporters of the biomedical paradigm for ADHD have acknowledged that an underlying physical aetiology has not been identified. For example, Barkley (2006a) states “Neurochemical abnormalities that may underlie ADHD have still proven extremely difficult to document with any certainty” (p. 219). Further, Nigg (2005, p. 1424) in his review of the neuropsychologic theory of ADHD states “Yet these findings point to many neural networks being involved in the syndrome and to modest effect sizes suggesting that any one neuropsychologic deficit will not be able to explain the disorder.” This does not necessarily mean that neurological mechanisms to explain ADHD will not be found, but only that such mechanisms are likely to be complex. Interestingly, once acknowledging the difficulties in being able to identify an underlying pathology, some proponents of the medical model of ADHD then proceed to talk about ADHD as if it were a proven medical condition (e.g., Giedd, Blumenthal, Molloy, & Castellanos, 2001). However, the more common practice is to refer to ADHD simply as a “disorder”, where this term typically is never defined. For example, Faraone et al. (2008) refer to ADHD as being “among the best-validated childhood disorders” (p. 1387). Such discourse on ADHD would then seem to fit the description of a bias. However, because a large
number of people hold similar views (that ADHD is a medical condition) it comes to be seen as fact.

Before responding to the major arguments used by proponents of the medical model of ADHD, it is worth mentioning that a major tenet of science is that the burden of proof falls squarely on the claimant, and not on the sceptic (Gilovich, 1991; Lilienfield, Lynn, & Lohr, 2004; Shermer, 1997). Therefore, in the paragraphs that follow, no attempt is made to prove that ADHD as a medical condition does not exist. Rather, a critique is provided of those arguments most often used to prove that ADHD is a medical condition. Interestingly, these arguments are used in place of direct medical evidence (e.g., an x-ray, blood test, or some other pathology test) that could validate ADHD as a neurological disease, as opposed to a cluster of behaviours that may or may not have biological or neurological correlates. In this context, when discussing the term “disease” D. B. Stein and Baldwin (2000) suggest that “consensus indicates it infers observable and measurable abnormalities in anatomy, chemistry, and physiology as causative for an observed cluster of symptoms” (p. 29). Of course, although a physiological abnormality has not been consistently observed in children displaying ADHD-type behaviours, this does not mean that it does not exist. Hence, the present discussion does not assert that ADHD is not a disease, but rather, that at present it has not been proven to be a disease, at least not by the definition proposed by D. B. Stein and Baldwin. The words of child and adolescent psychiatrist Sami Timimi (2007) when discussing the validity of ADHD as a medical disease are relevant here:

The true scientist has to maintain scepticism, and that means keeping an open mind to the possibility that in time we may discover a definite physical abnormality in the brains of at least some of those currently diagnosed with ADHD, and to the possibility that, as a biological condition, it simply doesn’t exist. (p. 31)

The Mental Health Profession Asserts That ADHD is a Medical Condition

Given that there is no medical test for ADHD, it is natural to ask why the medical model of ADHD is so widely adopted and promoted. Timimi (2009), in his experience as a child psychiatrist, has suggested that because of their high status, once doctors and medical scientists begin to use the term ADHD, it “begins to seep
into everyday consciousness of the population” (p. 145). Consequently, for many anxious parents who want the best for their children, it is possible that they may accept that their child’s ADHD-type behaviours are due to a brain pathology because a doctor or other health professional has said so (even in the absence of a medical test to verify diagnoses).

When discussing parents’ experiences and understanding of ADHD, Taylor, O’Donoghue, and Houghton (2006) observe that, “when leading authorities responsible for formulating the body of information upon which the individual . . . or society acquires its knowledge hold divergent views, then the decision making process is more complex” (p. 112). Aronson (2004) further suggests that when people are uncertain about relevant issues in their life, they tend to use their social reference groups as sources of validation for their decision making. Given the conflicting information regarding its validity as a medical condition, and the absence of an objective medical test for ADHD, the topic of ADHD is one about which many parents are likely to feel uncertain. Hence, they may tend to rely more heavily upon those reference groups that are viewed as providing the most credible source of validation of their own response. If ADHD is presented to the public as a medical condition which is effectively treated with a medical intervention, then health professionals potentially become a major source of validating information; after all, health professionals would seem to be the appropriate reference group for offering advice on medical conditions.

People’s willingness to follow the instructions of those in positions of authority with perceived expertise has been well demonstrated in well-known seminal social psychology experiments conducted by Milgram (1963, 1965). Briefly, these experiments demonstrated that participants would follow instructions from a person in a position of authority to inflict supposed pain through a series of electrical shocks on an accomplice of the researcher, whom the participant assumed was a fellow participant (Milgram, 1974). Actually, no shocks were administered, but the participant was led to believe he or she was administering shocks. Although the participants of Milgram’s research were not being told how to manage their children, the study does clearly indicate what influence authority figures can have on the actions of those who are not in positions of authority, and hence inferences can be made regarding what parents may do when seeking assistance from authority figures (e.g., doctors) with respect to decisions regarding issues they are unsure of.
Inclusion of ADHD in the (DSM-IV) Lends Legitimacy as a Medical Condition

Given the wide use of the DSM-IV amongst mental health professionals, it is likely that inclusion of ADHD therein would lend support to its legitimacy as a medical condition. While the DSM-IV has an aura of scientific legitimacy, many authors have written about its shortcomings in terms of reliability and validity (e.g., Kutchins & Kirk, 1997; Laungani, 2002). Although the DSM-IV is often used when discussing mental illnesses, be it in a research setting or a clinical practice setting, Laungani aptly points out that such extensive use does not in itself guarantee either its validity or reliability. The DSM-IV is purely descriptive and presents no new scientific insights about the causes of the many entries it lists (Valenstein, 1998). Under the heading of “Cautionary Statement,” the DSM-IV (American Psychiatric Association, 1994) states:

These diagnostic criteria and the DSM-IV Classification of mental disorders reflect a consensus of current formulations of evolving knowledge in our field . . . . The purpose of the DSM-IV is to provide clear descriptions of diagnostic categories in order to enable clinicians and investigators to diagnose, communicate about, study, and treat people with various mental disorders. (p. xxvii)

While the use of diagnostic terms such as those defined in the DSM-IV is useful for clinicians when describing cases and treatment options, or conducting research (Alloy, Jacobsen, & Acocella, 1999), critics of the DSM-IV have observed that it is not useful for explaining why ADHD-type behaviours exist in children. For example, D. Cohen (2006) suggests that checking a list of symptoms and labelling a child as hyperactive or inattentive explains nothing. Furthermore, Barkley (2006c) suggests that a theory of ADHD is sorely needed, because the current clinical view of ADHD is purely descriptive. While it may be convenient to use a term to describe a cluster of behaviours, the chosen term does not necessarily explain what causes those behaviours to exist. For example, using a descriptive diagnostic term like ADHD to explain the cause of ADHD-type behaviours could be likened to using a term like rust to explain what causes the red flaking substance to form on iron in the presence of moisture. In both these cases, the terms used, though having some use, are descriptive and not explanatory.
ADHD is Portrayed as a Real Disease Just Like any Other Disease

Brown (2004, 2005) observes that ADHD is a diagnostic label and hence has a certain scientific status and legitimacy. However, he further adds that unlike traditional diagnoses, ADHD does not refer to a set of biological symptoms caused by a pathological process. To establish ADHD as a medical condition, it is often compared with a medical condition like diabetes – a medical condition for which a physical pathology has been identified, and whose status as a disease is not disputed. It is claimed that just as insulin can be used to treat a known chemical deficiency or abnormality, so also can stimulant medication be used to treat a child with ADHD (Barkley, 2000). As most parents are genuinely concerned for their children’s health and safety, the consideration that ADHD is a medical condition is potentially a concern for many parents.

The analogy between insulin and psychotherapeutic drugs is somewhat limited (Block, 2001; Valenstein, 1998). Consider for example that insulin is prescribed only after a reliable test has measured the extent of a person’s glucose metabolism problem. In contrast, as previously noted, there is no laboratory or medical test available to determine if a child’s ADHD behaviour is caused by a chemical imbalance or brain malfunction of any sort (Critser, 2005; Diller, 2006; Furman, 2009; Rosemond & Ravenel, 2008; D. B. Stein, 2001b; Timimi, 2007). Furthermore, while the medical profession has a good understanding of how insulin regulates glucose metabolism and how a deficiency of that hormone can produce diabetic symptoms, the medical profession and drug manufacturers do not fully know how the medications prescribed for ADHD work. For example, the Consumer Medication Information document provided by Novartis (the makers of Ritalin) states “It is thought to work by regulating specific chemicals in the brain that affect behaviour” (Novartis Australia, 2009; italics added). In addition, while insulin is a natural hormone produced in the body and is essential for life, drugs like Ritalin are chemically-derived amphetamine-like drugs that are not necessary for life (Block, 2001). Finally, diabetes is present in a person across all settings, unlike ADHD, which seems to vanish in one setting, only to reappear in another setting (Armstrong, 1997). The DSM-IV requires that the ADHD-type behaviours be present in two or more settings. This requirement allows for the possibility that there are some settings where the behaviours do not manifest.
What Current Brain Imaging Research Can and Cannot Tell Us About ADHD

Overview. A complete review of the literature on brain imaging in relation to ADHD is beyond the scope of this chapter, due to the highly technical nature of the topic. However, it is a topic that has generated considerable interest in the nature of ADHD and whether an underlying pathology is involved. Hence, some of the scientific articles that have been used to make claims regarding the medical status of ADHD will be discussed here, in addition to writings critical of such articles.

For clinicians and parents who wonder if the ADHD diagnosis points to a disease which is best treated with drugs, neuroimaging research can be a deciding factor (Leo & Cohen, 2009). However, as will be shown shortly, the use of brain scanning technology is currently not sufficient to identify pathologies or differences associated with ADHD-type behaviours. This does not necessarily mean that a brain pathology is not associated with ADHD, but only that currently, such pathologies (if they exist) are not routinely identifiable using brain scanning technology. It is therefore well worth exploring some reviews of this research and the claims that have been made in regard to brain scans and brain imaging technology.

Research reviews and critiques. Neuroimaging research into ADHD is fraught with difficulties, the two most common being a failure to replicate findings, and the confounding effects of medication. For example, Giedd, et al. (2001), in their summary of over 30 ADHD neuroimaging studies conclude that there is evidence for a “right frontal-striatal circuitry involvement in ADHD with a modulating influence from the cerebellum” (p. 44). However, these researchers note that few findings have been replicated and that most of the studies had inadequate statistical power. With regard to medication, in an extensive review of these findings, Leo and Cohen (2009) have noted that the vast majority of the studies had either used children who were currently on medication (e.g., Berquin et al., 1998) or who had previously been medicated (e.g., Hynd et al., 1993), or for whom the medication status was not reported (e.g., Sieg, Gaffney, Preston, & Hellings, 1995). Given the known problem of growth suppression associated with stimulant medication, and the concerns regarding stimulant medication’s effects on the brain (G. Jackson, 2009), it is difficult to determine if any identified differences in brain structure and functioning are related to ADHD or rather to the effects of medication.

Interestingly, in more recent neuroimaging studies, although medication-free participants with ADHD have been used, a comparison between these participants
and controls (i.e., children who do not have ADHD) has not been made. As one example, consider the research conducted by Kim, Lee, Cho, and Lee (2001) where a group of 32 previously medication-free ADHD children were examined before and after eight weeks of medication. Their research showed that changes were detected in the prefrontal cortex and the caudate nucleus. However, no comparisons were made with a control group comprising children who did not have ADHD, as there were no controls included in the study.

It is also generally well accepted amongst the scientific community that the brain imaging technology is not as yet currently useful for the routine identification or diagnosis of ADHD. For example, Giedd et al. (2001) have stated “although imaging is currently not of diagnostic utility in ADHD it may help to uncover the core neuropathology of the disease and may be useful in certain clinical situations” (p. 45). Interestingly, while noting the limitations of brain imaging technology, these authors assume that a neuropathology is associated with ADHD-type behaviours. Baumeister and Hawkins (2001) however have also stated that “The principal conclusion is that the neuroimaging literature provides little support for the neurobiological etiology of ADHD” (p. 4). Similarly, Furman (2005) has commented that structural and functional neuroimaging studies have not identified a unique aetiology for ADHD. More recently, Timimi (2007) observes that with over thirty brain scan studies in the last three decades involving children with the ADHD label, a consistent abnormality has not been observed. Complementing these claims, G. Jackson (2006) provides a thorough and insightful overview of what brain imaging techniques can and cannot do in relation to psychiatric conditions. In particular, she makes reference to a position paper by Flaherty et al. (2005)\(^1\). The paper notes:

> Although knowledge is increasing regarding specific pathways and specific brain areas involved in mental disease states, at present the use of brain imaging to study psychiatric disorders is still considered a research tool. Continued study of child and adolescent psychiatric disorders using a variety of brain imaging methods, as well as refinements in imaging techniques, may result in evidence supporting the utility of these tools for clinical work in the future. Imaging research cannot yet be used to diagnose psychiatric illness.

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\(^1\) This paper was previously from the website of the American Psychiatry Association. It is available as a PDF from them upon request.
and may not be useful in clinical practice for a number of years. In the future, imaging techniques may be useful to examine medication effects and predict medication response . . . We conclude that, at the present time, the available evidence does not support the use brain imaging for clinical diagnosis or treatment of psychiatric disorders in children and adolescents. (p. 1).

**Limitations associated with brain scanning research.** There are several limitations that prevent brain imaging technology from being used to identify an underlying pathology associated with ADHD. Reasons suggested by Ernst (1996) include the changing definition of ADHD over time, inclusion of children in studies with co morbid conditions (e.g., mood disorders), the difficulty in obtaining large sample sizes, and ethical concerns regarding the use of children with procedures involving radiation exposure. However, perhaps the most important concern, according to Leo and Cohen (2009), is the difficulty in obtaining non-medicated participants with ADHD in order to compare with controls (i.e., children without the ADHD diagnosis). Yet as Leo and Cohen state it is an “incontrovertible point that only such a comparison would provide unambiguous findings concerning any possible pre-existing brain anomaly in children diagnosed with ADHD” (p. 111).

**Genetics and ADHD as a Heritable Disorder**

**Overview.** Many researchers confidently assert that ADHD is a heritable disorder (e.g., Levy, Hay, & Bennett, 2006). Green and Chee (2001) claim that while researchers may disagree on the exact causes of ADHD, what is certain is that it is a hereditary condition. Green and Chee, both paediatricians, support their assertion that ADHD is a genetic condition by the observation that most children with ADHD in their practice have a close family member with a similar problem. Perhaps such an observation is not too dissimilar to the observation which dieticians might make when members of the same family seek their services for weight management. While in some cases a genetic factor may contribute to being overweight, in other cases being overweight can result from lifestyle factors which families share. In any case, it is a maxim in psychology that correlation does not necessarily imply causation. Hence, the observation of ADHD clustering in families cannot be used to establish a genetic link. However, the recognised limitations of family studies (see later discussion) cannot be used to negate a genetic link for ADHD either; thus, other
arguments used in support of the genetic basis for ADHD need to be addressed, in
order to evaluate the validity of genetic theories of ADHD. While an in-depth
discussion of genetics and the techniques used to establish genetic contribution is
beyond the scope of this research, a critical look at the main assumptions and
methods associated with genetic research is presented in this section. This is done in
order to assess the status of claims made about genetic contributions to ADHD,
relative to conditions known to be genetically transmitted illnesses. This section on
genetics gives a brief critique of family studies, twin studies, and adoption studies
related to ADHD research in the area of genetics.

**Opposing perspectives.** Green and Chee (2001) advocate that they are certain
of the genetic basis of ADHD. In contrast, other researchers (e.g., Joseph, 2006;
Rosemond & Ravenel, 2008) have questioned the notion of ADHD being genetic,
principally on the grounds that an underlying causal pathology has not been
identified to establish ADHD as a valid medical disorder. Further, those questioning
the genetic contribution of ADHD, do so on the basis that they believe that the
methodologies most often used to establish the genetic contribution are of
questionable validity.

Proponents of the strongly genetic basis of ADHD have acknowledged the
difficulty in trying to locate genes associated with ADHD (which likely adds to the
doubt regarding ADHD’s validity as a medical condition). For example, Faraone et
al. (2008) have suggested, based on their research that “The absence of regions of
significant or suggestive linkage in these data suggest that there are no genes of large
effect contributing to the ADHD phenotype” (p. 1387). However, the genetic
contribution to ADHD is considered so important by many, that the *American
Journal of Medical Genetics* Part B (Neuropsychiatric Genetics) provided a
comprehensive overview of the genetics of ADHD in a special edition of the journal.
In one article of this edition, Neale et al. (2008, p. 1337), noted that “despite
numerous linkage and candidate gene studies, strongly consistent and replicable
association has eluded detection.” This current failure to identify the specific genes
for ADHD does not necessarily mean that they do not exist. It may just mean that
ADHD is multi-genetic in origin (similarly to many other human traits and
behaviours), making the identification of a single gene difficult to detect. For
example, ADHD genetic researchers Faraone et al. (2008, p. 1387) have stated “For
ADHD, the lack of replication across the available studies completed so far suggests
that genes of moderately large effect are unlikely to exist.” Given the claims of a
genetic basis for ADHD, it is important to critically examine the arguments most
often used to support the assertion that ADHD is a heritable condition, in order to
establish the validity of such arguments. For parents, once hearing from an
authoritative source (e.g., family doctor or school counsellor) that ADHD is a
heritable condition, it is possible that their own personal experiences will confirm
what they have been told (e.g., “I behaved the same way when I was a child.”). Of
course, experiences confirming a belief do not necessarily equate with proof for that
belief.

**Family studies.** That members of the same family often display ADHD-type
behaviours is seen by many as potential evidence of a genetic link (e.g., Green &
Chee, 2001). Further, Barkley (2006b) suggests that given the significant clustering
amongst biological relatives, this strongly implies a hereditary basis. Such reasoning
has its merits, and therefore, the research and arguments used to suggest that ADHD
is genetic in nature should be carefully examined. Both the supporters and the critics
of the medical paradigm of ADHD agree that ADHD-type behaviours tend to run in
families, and that is not in dispute here. What this observation of a familial trend
does do, is allow researchers to generate a set of hypotheses that explore the genetic
basis of or contribution to ADHD, and also another set of hypotheses that explore the
psychosocial nature of ADHD. There is also a third set of hypotheses that explore an
interaction effect in which each factor is necessary but neither in itself is sufficient to
produce the manifestation of ADHD-type behaviours. Hence, given the opposing
views, the influences of nature and nurture have been “especially contentious when
behavioural and mental traits (and disorders) are at issue” (Schaffner, 2006, p. 3).

Families provide common socialising and physical environments for all
siblings, and use common methods to deal with the results of their socialisation
processes. Furthermore, they often use the same doctor when seeking an explanation
for their child’s ADHD-type behaviours. As an example of the difficulty in teasing
out the effects of heredity from environmental influences, consider that at one time
pellagra, due to its having a strong familial tendency, was assumed to be simply a
genetic disease. It is now known however that pellagra is due to a niacin deficiency
linked to malnutrition, where malnutrition is often familial. Even a casual
observation of families suggests that smoking seems to be common in members of a
family. That is, if you smoke, it is likely that you have a parent or sibling who
smokes. Subsequently, there are some who believe that there is evidence for the existence of a smoking gene (e.g., Lerman et al., 1999). As Breggin (1998) observes: “Similarly, families share political outlooks, national feelings, cultural values and prejudices . . . but nowadays scientists do not consider these traits to be genetic in origin” (p. 117). This conclusion might no longer be necessarily true for political outlooks, as some researchers (e.g., Alford, Funk, & Hibbing, 2005), based on their research into twin studies have suggested that genes can also influence political opinions. However, the methodology used to make these claims (i.e., the genetic basis of political attitudes) have been criticised (e.g., Joseph, 2010).

The discussion thus far does not necessarily prove that ADHD is not a genetic condition, but only that the shared environment of families makes it difficult to isolate the direct effects of genes from the shaping and nurturing effects of the family environment shared by family members. To illustrate how family environments can confound the effects of nature and nurture, consider the possibility that lung cancer is a heritable condition. It is generally accepted that smoking increases the risk of lung cancer. If smoking behaviour is familial (as previously suggested), then members of a family are at a greater risk of contracting lung cancer (even where some family members do not smoke, assuming the risk of passive smoking) where some family members smoke. Such a situation does not allow the researcher to determine easily if a case of lung cancer is caused by the smoking, or is due to a genetic factor, or to a combination of both. Similarly, according to Schaffner (2006, p. 8), “Family studies can suggest that a trait or disorder is genetic, but since both genes and environments are shared by family members, contributions of nature and nurture cannot be disentangled in family studies. Different types of studies are needed.”

**Twin studies.** ADHD genetic researchers Faraone et al. (2005, p. 1313) have remarked that because family studies cannot “disentangle genetic from environmental sources of transmission” twin and adoption studies are used to determine the contribution of genes to family transmission. The use of twin studies contributed to the belief that ADHD is a heritable illness (e.g., Stevenson, 1992). The twin method, as it is sometimes referred to, compares the concordance rates for a specific condition or trait in same-sex fraternal twins, also known as dizygotic (DZ) twins, to that of identical twins, also known as monozygotic (MZ) twins. This method assumes that the degree of environmental similarity for both types of twins is
approximately the same (Plomin, DeFries, & McClearn, 1990). The assumption of equal environments is known as the “equal environment assumption” (EEA) and is considered crucial to the validity of the twin method (Jang, 2005; Keski-Rahkonen, Viken, Kaprio, Rissanen, & Rose, 2004). Briefly, the twin method asserts that if the EEA holds (i.e., similarity of environments for both MZ twins and DZ twins), then any significant difference in concordance rates between MZ twins and DZ twins must be due to factors other than environmental factors – i.e., genetic influences (Scarr & Carter-Saltzman, 1979). This is explicable on the grounds that MZ twins differ from DZ twins in that MZ twins share 100% of their genes while DZ twins share on average 50% of their genes (Colbert, 2001).

In an extensive review of the research literature, Joseph (2006) has shown that ADHD twin studies consistently show that MZ twins are more concordant for ADHD than DZ twins, or correlate higher for ADHD-related behaviours (e.g., Rietveld, Hudziak, Bartels, van Beijsterveldt, & Bomsma, 2004; Stevenson, 1992). Such findings are consistent with the hypothesis that ADHD has a genetic component and have underpinned conclusions such as “twin studies add substantially more evidence to that already found in family and adoption studies to support a strong genetic basis to ADHD and its behavioural symptoms” (Barkley, 2005, p. 39). However, the EEA, upon which the twin method rests, is not without its critics (e.g., Colbert, 2001; Horwitz, 2002; Joseph, 2006).

The main objection to the twin method is that the environments for MZ twins are believed to be different to that of DZ twins (Kendler, 1983). Specifically, it is believed that the different environments result from MZ twins being treated more similarly than DZ twins. For example, Scarr and Carter-Saltzman (1979) report that most investigators of twins would agree that MZ twins share more experiences throughout their development and are likely to be treated more alike by significant others due to their striking physical resemblance. It is noteworthy at this point, that similarity of environment is the same objection for which family studies have been criticised as previously discussed – a point that will be expanded upon shortly. According to critics of the twin method (e.g., Joseph, 2006), the differential treatment of MZ twins compared with DZ twins, makes interpretations of findings from the twin method problematic. Specifically, if MZ twins behave more similarly than DZ twins (e.g., if MZ twins display greater similarity in ADHD-type behaviours), it is difficult to determine if the observed greater similarity is due to
similar treatments which MZ twins receive, or due to the greater genetic similarity which they share.

Interestingly, many proponents of the twin method and the EEA acknowledge the greater similarity in MZ twins compared with DZ twins. For example, Scarr and Carter-Saltzman (1979) claim that the greater environmental similarity for MZ twins over DZ twins is overwhelming. Faraone, Tsuang, and Tsuang (1999), also proponents of the twin method, suggest that a greater environmental similarity for MZ twins cannot be ignored and that several studies have shown that the social environments are more similar for MZ twins than DZ twins. However, some proponents of the twin method, in response to criticisms of this method assert that the difference in environment between the MZ twins and DZ twins is not always relevant; that is, environmental influences are only of concern for some traits (and not others). For example, according to Carey and DiLalla (1994), the twin method assumes MZ twins are not treated more similarly than DZ twins, or if they are, then the difference in treatment is not relevant to the phenotype being studied. Furthermore, other proponents of the EEA (e.g., Bouchard, 1997) assert that any causal relation between a similar environment/treatment shared by twins (the cause) and the similar behaviours by twins that may be manifest (the effect), needs to be demonstrated, and not assumed.

This modified form of the EEA (i.e., the belief that similar treatment/environment is relevant for some traits but not others) is referred to as the “equal trait-relevant environments” assumption by behaviour geneticists (e.g., Carey & DiLalla, 1994, p. 33). For convenience, the expression “trait-relevant EEA” (Joseph, 2004, p. 79) will be used here. In response to the introduction of the trait-relevant EEA for investigating the influence of genes, critics of the twin method, such as Joseph (2006), have noted that this requirement is somewhat arbitrary, and that consistent use of this logic (i.e., the need to demonstrate that a similar environment for each member of a MZ twin pair leads to similar behaviours for each member) would dictate that it should also be applied to family studies – which it is not – rather, it is well accepted without the perceived need to demonstrate it. If the trait-relevant EEA logic is extended to family studies, then “it follows that the familiality of a condition demonstrates its genetic basis, unless it can be shown that the affected families were exposed to ‘trait relevant’ environmental influences” (Joseph, 2004, p. 80). Simply stated, this means that consistent application of the
trait-relevant EEA to family studies would imply that observed similarity in family members for a specific trait would be assumed to be due to genetics (nature) and *not* due to the similar family environment that members of a family are exposed to (nurture), *unless* it could be specifically proven that the common family environment was influential on the trait in question. However, the confounding effects of genetics and environmental factors in family studies are well accepted (as previously discussed) without the need to demonstrate trait relevance (see Schaffner, 2006). In fact, it is the acknowledgement of these confounding effects that led to the abandonment of family studies (for proving the genetic contribution of illnesses) and the need to consider twin and adoptive studies to differentiate genetic and environmental factors. Another maxim of research methods is applicable here: namely, a confounding factor is a threat to internal validity. Thus, findings from twin studies, like those of family studies, do not (at this stage) prove a genetic link – nor do the limitations of twin studies, discussed above, disprove that genetics is a contributing factor. Hence, the contributions of genetics and environmental factors each need to be considered when trying to determine what factors contribute to, or cause ADHD-type behaviours. It is noteworthy however, that researchers (e.g., Sprich, et al., 2000, p. 1432) use language such as “studies strongly suggest,” “lend support,” and “consistent with a genetic hypothesis” when discussing twin studies and the genetics of ADHD.

**Adoption studies.** To address some of the problems associated with twin studies, researchers have relied on adoption studies. The usefulness of adoption studies, in theory, lies in being able to compare the rates of ADHD amongst both adoptive and biological parents of children with ADHD. For example, Faraone (2004, pp. 305-306) notes, in relation to examining the genetic contribution to ADHD, that “by examining both the adoptive and biological relatives of ill probands, one can disentangle genetic and environmental sources of familial transmission.” This is correct. However, the statement by Faraone may inadvertently convey to the reader that the research he refers to included both the adoptive and the biological relatives of one group of children with ADHD (the ill probands), but this was *not* the case. In the following paragraph of the same article, Faraone contends that early ADHD adoption studies “showed that adoptive relatives of hyperactive children are less likely to have hyperactivity or associated disorders than are the biological relatives of hyperactive children” (p. 306). However, the research being
discussed did not comprise the adoptive and biological relatives of the one group of hyperactive children, but actually two separate groups of hyperactive children. That is, the adoptive relatives of one group of hyperactive children are being compared with the biological parents of another totally different group of hyperactive children, which is therefore a limitation of early research.

Faraone (2004) cites studies by Sprich et al. (2000), Morrison and Stewart (1973), and Cantwell (1975b) in support of his conclusions. However, as Joseph (2009) notes, upon reviewing the available relevant literature, no study into ADHD has ever been done that looks at both the adoptive parents and the biological parents of the same group of children. The title of the journal article by Sprich et al. (2000) is “Adoptive and biological families of children and adolescents with ADHD.” Readers of this title could be forgiven for assuming that it was the biological and adoptive parents of the same group of adopted children and adolescents that were studied. Actually, there were two separate groups of children and adolescents. These authors state clearly in the limitations section of their article that “data could not be obtained on both the biological and adoptive relatives of the same group of children” (Sprich et al., p. 1436). Incidentally, the difficulty in using biological parents of adopted children is due to privacy laws.

Morrison and Stewart (1973) mention two different groups of children (plus a control group comprising children without hyperactivity) in their article: one group where each child lived with at least one biologic parent, and a second group comprising children who lived with adoptive parents. These authors mention that only scant information on the biological parents of the adoptive children was obtainable, but was not reported on. The article by Cantwell (1975b) makes reference to the article by Morrison and Stewart (the limitations already discussed) and to a book chapter by Cantwell (1975a). In this chapter, he states that nothing can be said about the prevalence rate of hyperactivity for those parents since “no information was available on the biologic parents of the adopted hyperactive children” (1975a, p. 279).

Interestingly, Faraone and Biederman (2000, p. 570), themselves proponents of the twin method and the genetic hypothesis for ADHD, agree with Joseph (2000), as shown by their statement: “We agree with Joseph that no ADHD adoption study has directly compared the biological and adoptive families of the same child.” This limitation is not a relatively minor methodological problem, since it actually makes it
difficult to “disentangle genetic and environmental sources of familial transmission” (Faraone, 2004, pp. 305–306). It is therefore imperative that we recognise these methodological limitations, so that a fuller understanding of the nature of ADHD (particularly in regard to its etiology) can be reached.

What roles do genes play? D. B. Stein (2001b) observes that if a gene connection is established with ADHD, which he states will probably happen one day, this still does not mean ADHD is a medical condition, but probably means only that one component that contributes to the physiological differences of children labelled as ADHD has been identified. Indeed, it would be difficult to imagine any behaviour or trait (e.g., height) that did not have a genetic factor as one of its components, for all behaviour must somehow be linked to the body’s genotype that, through its interactions with the environment, produces its phenotype. However, for ADHD to achieve the status of a genetically identifiable medical condition it would need to be shown that the genetic component was necessary for the condition to manifest at some point. When considering the contribution of genetics to human behaviour, it is also worth noting that researchers who investigate genetic contributions to behaviour have suggested that genetics plays an important role in many human behaviours that would not ordinarily be considered to have a genetic component. For example, Alford, Funk, and Hibbing (2005) have suggested that the results of twin studies (based on samples from the United States and Australia) indicate that genes play an important part in shaping political attitudes and ideologies. Putting aside for the moment the criticisms and limitations of the twin methods as previously discussed, it is not too difficult to see that even if the conclusions drawn from these methods are scientifically sound, that one’s political alliance, far from being genetically determined, is highly influenced in its manifest phenotype by environmental factors. Furthermore, political attitudes can be easily shaped by non-medical means, even if there is a genetic contribution or predisposition. Applying this example to ADHD means that while it is possible (even likely) that a genetic component may provide the precondition for certain ADHD-related behaviours, given the variety of ways that such a precondition can be shaped by the individual’s environment, it would be incorrect therefore to label the manifest behaviour a medical condition in need of medical treatment. While identification of the contribution of genes towards certain behaviours contributes towards our understanding of human behaviour, care needs to be taken such that the
identification (or suggestion) of a specific genetic contribution to a trait or set of behaviours is not used as evidence that the trait or set of behaviours is a disease or the result of an underlying pathology.

**Maintaining objectivity and minimising bias in relation to genetics.** When a decision is made or an opinion is offered on a topic, particularly one as emotive and contentious as ADHD (specifically, whether or not the child’s behaviour is due to a brain illness, or psychosocial factors), there is always the danger of being seen as being biased, closed-minded, or as having started with the end in mind. This is particularly true when the reigning paradigm is questioned. For example, such criticism was given to those who questioned the geocentric paradigm of our solar system, and would likely have been aimed at those who suggested that the eugenics movement was built on faulty assumptions (both these beliefs were upheld because there was supporting evidence for each at the time, or at least there were widely held assumptions). As this discussion on genetics shows, several ADHD genetic researchers (e.g., Faraone et al., 2008; Neale et al., 2008) have acknowledged that a genetic contribution to the manifestation of ADHD-type behaviours has not been identified in the same way that other identified genes have been shown to contribute to other validated genetic conditions (e.g., Huntington’s disease). These researchers often use statements such as “have converged to suggest” to describe current findings (e.g., Faraone, et al., 2005, p. 1313). While such statements are warranted, they can remain continuously true in the sense that they are not easily falsifiable.

It is possible that the researchers described in the previous paragraph are experiencing what Aronson (2004, p. 124) refers to as the “confirmation bias.” The confirmation bias describes the process whereby people seek confirmatory evidence for their initial beliefs. For example, Biederman (2005) states “Because ADHD is believed to be highly genetic, studies of twins have been used to establish heritability,” [italics added], then lists several references to support the assertion. The references cited used the methodologies discussed in this chapter. Further, heritability for ADHD still has not been established. But the confirmation bias also applies to critics of the medical conceptualisation of ADHD, as they are not immune from seeking supporting evidence for their paradigms. Therefore, critics need to be careful to ensure that the limitations and shortcomings identified in genetic research are not used to demonstrate that a medical conceptualisation of ADHD is invalid.
Rather, identifying such limitations optimises objectivity in respect of whether or not such claims are valid. Clearly, with regard to ADHD, it is worth considering Timimi’s (2007) view, that as scientists we need to keep an open mind to the possibility that ADHD exists as a medical condition, and also to the possibility that as a biological condition, it simply does not exist.

**Concluding comments on genetics and ADHD.** In sum, this critique of family, twin, and genetic studies has not proved that ADHD is not an inherited brain illness. What it does do is demonstrate that, while the scientific community seems to have reached a consensus regarding the genetic contributions to ADHD, critics have shown that there is good reason to re-examine this consensus, since at this stage it seems that conclusions may be premature. For example, Joseph (2009) concludes “By 2008, however, concerted worldwide efforts have failed to discover the genes presumed to cause ADHD.” He further adds that perhaps one of the reasons why researchers have not been able to locate the genes presumed to cause ADHD, is that perhaps they do not exist. More recently, Neale et al. (2010) have stated that genetic variants influencing ADHD at a genome-wide significant have not yet been identified. In addition, with regard to the behaviour genetics and molecular genetics of ADHD, Levy, Hay, and Bennett (2006, p. 6) state that researchers “are only at the beginning of being able to postulate relationships between phenotypes and genetic mechanisms.” Similarly, Propping (2005, p. 2) notes that while “genetically complex traits are being successfully pinned down to the molecular level in other fields of medicine, psychiatric genetics still awaits a major breakthrough.” More generally though, Kendler, one of the world's leading psychiatric genetic researchers, has stated “Although we may wish it to be true, we do not have and are not likely to ever discover ‘genes for’ psychiatric illness” (Kendler, 2005, p. 1250).

**Possible Reasons Why the Medical Model of ADHD is Readily Accepted**

**Overview**

Given that an underlying causal pathology for ADHD-type behaviours has not been identified, it is natural to ask why the medical model of ADHD is so widely accepted? This section explores some additional possibilities as to why the medical model is so widely accepted.
**Physical Problems are Easier to Conceptualise Than Those of Psychological Origin**

“It has sometimes been asserted that explanation consists in reducing the mysterious or unfamiliar to that which is familiar” (Salmon, 1992, p. 14). The physical realm is generally easier to comprehend than the psychological for most people. When it comes to understanding behaviours that deviate significantly from the norm, then it is generally easier to view such behaviours as being physical in nature rather than psychological in origin (W. Glasser, 2000). For example, with regard to ADHD, behaviours such as hyperactivity, which are often disruptive not only for the child displaying those behaviours but for others near the child, then a physical explanation involving the child’s biology is more readily embraced than a psychological explanation. Further, according to Valenstein (1998), “chemical theories of mental disorders are particularly seductive because they suggest that a relatively simple explanation and solution exist for a problem that has been regarded as complex and often stubbornly resistant to treatment” (p. 234); and there is no denying that dealing with children who display ADHD behaviours is a difficult task. In support of this argument, Diller (1999) suggests that for parents wanting answers in regard to ADHD, it is much simpler to refer to a neurological problem. Hence it may be that by assigning a medical label to a child’s behaviour, parents then believe they understand why their child behaves the way he or she does.

**Ethical Dilemmas**

Previous sections of this chapter have suggested how health professionals can influence parents (and the public in general) in regard to their beliefs on what qualifies as a medical condition and what is the most appropriate treatment. But health professionals themselves can also be influenced – most notably by the pharmaceutical industry, which spends “billions of dollars on the influencing, education, and entertainment of doctors around the world” (R. Smith, 2006a, p. 292). This influence has been written about extensively (Abramson, 2005; Angell, 2005; Kassirer, 2005; Moynihan & Cassels, 2005; R. Smith, 2006b) and so is only mentioned briefly here. Timimi (2009) notes that child psychiatry is particularly vulnerable to the influence of the pharmaceutical industry. On this matter, Cosgrove, Krimsky, Vijayaraghavan, and Schneider (2006) describe how research they undertook showed that more than half (56%) of 170 expert panel members for the
DSM-IV had financial ties to drug companies through receiving research funding, having a consulting income, or serving on a speakers’ bureau. This does not mean that receiving payment from a drug company necessarily compromises a health professional’s judgement or behaviour, but as Tarvis & Aronson (2007) suggest, it does increase the likelihood that they will feel the need to reciprocate in a way that benefits the drug company (see also, Steinman, Shlipak, & McPhee, 2001; Wazana, 2000).

The Disparagement of Researchers who Criticise the Medical Model of ADHD

This chapter has included the ideas of several researchers and authors who have questioned the validity of ADHD as a medical condition with a proven physical aetiology. Some of the authors referenced have been very vocal with their concerns, and have attracted a lot of criticism as a result. Often, these criticisms have not addressed the arguments used by the critics of the medical model for ADHD, but rather, have been critical of the critics using the arguments. People not agreeing with the medical model of ADHD are often portrayed negatively. For example, Pliszka (2007) states, “there is no debate among competent and well-informed health care professionals that ADHD is a valid neurological condition” (p. 894). The implied message from this statement is that the health care professional who doubts the validity of ADHD as a neurological condition is not competent and is ill-informed. As another example, consider that Green and Chee (2001) state “The concept of ADHD is said to be controversial, but in 2001 there is controversy only in the media, not in reputable professional circles” (p. 4). They could be interpreted by some as saying that those who question ADHD as a medical condition are outside of reputable professional circles – and few parents would wish to take the advice of someone they believe was outside of the “professional circles.”

On the related topic of stimulant medication for ADHD, Green and Chee (2001) assert “We make no apology for our enthusiasm for stimulant medication. The body of evidence is now so great that no reputable research centre questions the benefit and safety of this treatment in ADHD” (p. 136). The emotive word reputable could convince some readers that stimulant medication has been proven to be safe and effective. Further, any person or research centre that questions the effectiveness of stimulant medication could be seen as not being reputable. The two chapters of Green and Chee’s book Understanding ADHD: Attention deficit hyperactivity
disorder, from whence these statements come are titled “ADHD – The facts” and “Medication – The facts.” When parents read the word facts in a book on ADHD written by two paediatricians, it rings with confidence and authority, particularly when the authors are paediatricians. However, whilst the statements employed are presented in an authoritative manner, they can only ever be opinions, and not statements emanating from scientific research. For if scientific research were available that demonstrated ADHD-type behaviours were due to a medical condition, that research would surely be used. The statements used are, according to Newness (2009) when discussing the validity of ADHD as a medical condition, “merely part of the rhetoric of professions which allows statements to appear true, when they can only ever be opinion” (p. 161).

Repetitious Exposure

Finally, with ADHD being discussed so widely to the point that it is a household term (Desgranges, Desgranges, & Karsky, 1995) it is likely that a “mere-exposure-effect” (Timothy Scott, 2006, p. 98) is occurring. Scott, discussing why people so readily accept and favour the biological view of mental illness, suggests that through repetitious exposure to anything new, people will grow to like it – and the public are well and truly exposed to the concept of ADHD as a brain illness that affects millions of children worldwide. Similarly, H. Glasser (2005) uses the term “theory begging” to explain why the notion that mental illness is caused by a biochemical imbalance, has gained wide acceptance. “Theory begging is, simply, the repetition of a theory so often that it becomes accepted as fact within the profession, without actually having been proven” (p. 77). With regard to ADHD specifically, Newnes (2009) suggests that “the more the ADHD construct is used, the more GPs are likely to accept it as an entity; the value of simple repetition has not been lost on those with a vested interest in promoting ADHD” (p. 162).

The preceding discussion does not necessarily mean that the search for a biological cause for ADHD should be abandoned or that the medical model of ADHD will never be justified. However, at the very least, more research needs to focus on other potential influences such as psychosocial determinants that are likely to contribute to the manifestation of ADHD-type behaviours. Total agreement amongst experts (i.e., those with suitable training in medicine, pathology, and research methodology) with regard to ADHD’s validity as a medical condition may
never be reached. However, if claims are to be made regarding the validity of ADHD as a medical condition, then the same methods and principles of health and medical research that are used in studying recognised medical illnesses (i.e., illnesses for which an objective medical test exists for diagnostic purposes) should be applied when studying children who display the defining behaviours of ADHD (i.e., hyperactivity, inattentiveness, impulsiveness). Furthermore, if the methods of science are going to be adhered to, then the null hypothesis for the ADHD debate should be reframed, as “there is currently no evidence that proves ADHD-type behaviours are the result of an underlying physical pathology of the brain,” instead of the current popular null hypothesis: “ADHD-type behaviours must be due to an underlying physical pathology of the brain because it has not been proven otherwise.” Unfortunately, this latter null hypothesis, widely accepted and promoted, is not readily amenable to falsification and as such is not testable. Scientific method however, does not rely on procedures to show that hypotheses are correct, but rather to show that they might be incorrect (Tarvis & Aronson, 2007). The current logic of assuming that ADHD is a medical condition resulting from an underlying identifiable causal pathology has resulted in researchers focusing on trying to find possible genetic or biological aetiologies, and not on exploring the role of psychosocial determinants, which many theorise may better explain the observed behaviours of those children who have come to be assigned the label of ADHD.

ADHD – A Diagnosis for Children or a Solution for Parents?

In the absence of an identified aetiology for ADHD, many critics of the medical model of ADHD have speculated why a medical explanation for the ADHD-type behaviours is so popular. Some researchers (e.g., Smelter, Rasch, Fleming, Nazos, & Baranowski, 1996) have suggested that acceptance of the ADHD diagnosis can sometimes meet the needs of the parents. For example, Weathers (1998) observes that when discussing the label ADHD, there is something curative about finding exactly the right name for these troubled children. Further, Rosemond and Ravenel (2008) suggest that acceptance of the ADHD diagnosis absolves parents and the child of any and all responsibility:

The genetic explanation effects almost instantaneous changes in how the parents view the child and respond, therefore, to his misbehaviour.
Frustration is replaced with compassion. Exasperation is replaced with patience. In short, the disease model serves the interests of the parents, the therapist, the prescribing physician, and the manufacturer(s) of the drug(s) prescribed. The only person the disease model does not benefit is the child. (pp. 74–75)

On the matter of responsibility, it is important to note that being responsible is not synonymous with being culpable. While parents may be responsible for addressing their child’s ADHD-type behaviours, they are not to be blamed for such behaviours (Timimi, 2007). This fast-paced society with its emphasis on quick results, increased expectations of school performance, over-exposure to electronic media, decaying moral standards, and a breakdown of the nuclear family is also a likely contributor to the rise in ADHD-type behaviours witnessed today (DeGrandpre, 2000; Diller, 2006; Rosemond & Ravenel; D. B. Stein, 2001b).

**Implications for the Present Investigation**

The earlier sections of this chapter have shown that there exist opposing opinions to the dominant view that ADHD-behaviours are the result of a neurological illness. These diametrically opposed views come from a diverse range of sources, such as the popular media, family doctors, psychologists, schools, the Internet, and friends, all of which could be considered expert sources, to varying degrees. With so much information, parents are usually compelled to make a choice (either by their own volition, or because they feel the expectation by others to do so) as to whether or not they will accept a medical diagnosis of ADHD for their child. Furthermore, once this decision is made, there is usually the closely related decision of treatment. Much has been written about ADHD and its treatments. However, comparatively little has been written about how parents make decisions regarding acceptance or rejection of the ADHD diagnosis — the focus of this investigation. Having established that parents are exposed to differing views, it is of interest to explore what personal psychosocial factors (other than the information they are exposed to) may influence them in their decision making. While this chapter has explored the information available to parents, information is only one variable that influences parents’ acceptance or rejection of ADHD as a medical condition that applies to their child. Parents after all, are social and emotional beings with a range
of individual needs and differences that also influence their decision-making processes. It is possible for example, that two sets of parents could be exposed to the same identical information regarding ADHD, yet come away with two different conclusions: one set may accept the diagnosis, the other might reject it. It will be shown in the next chapter, that there are certain psychological characteristics of parents that may be potentially influential in their decision-making process with regard to their acceptance of the ADHD diagnosis. Once these characteristics are identified, it is of interest to know whether or not it is possible to predict which parents are more likely to accept a diagnosis of ADHD and which ones are more likely to reject it. Doing so, potentially could lead to interventions that assist parents in making more fully-informed decisions that are of greater benefit to them and their children.

Chapter Summary

This chapter has presented the competing views on the scientific status of ADHD. Discussion commenced by establishing that there are different opinions regarding the nature of ADHD, and in particular, that a medical basis for it has yet to be firmly established. This was followed by a critique of the most common arguments used to support the medical conceptualisation of ADHD. No attempt has been made to give a full account of what ADHD is or is not. Rather, the purpose was to show that there are competing views on ADHD’s aetiology, and consequently, diametrically opposed views exist regarding appropriate treatments or responses. The defining behaviours of inattentiveness, hyperactivity, and impulsiveness which together attract the label ADHD are not questioned. Rather, it is the widely accepted belief that such behaviours are evidence of a medical condition (which is best responded to with a treatment that includes medication) that is questionable. These differing viewpoints have resulted in a strong polarisation of views regarding the validity of ADHD as a medical condition within the scientific community, as well as for the general public, and particularly parents. While some see ADHD as a medical condition, others see it as being psychosocial in nature. It is these two contrasting views that parents are often required to choose between.

The implications for this investigation are that ultimately, parents need to make choices: choices with regard to acceptance or rejection of a diagnosis, and choices with regard to accepting medication as an appropriate treatment. The choices
they make, have important implications for them and their children. The knowledge parents are exposed to, particularly knowledge from expert sources, is an obvious significant driver in influencing what choices parents make in regard to ADHD. However, parents are not neutral in their assessment of the information they receive. Personal factors such as their parenting self-concepts, and stress, are also potentially influential. The theoretical underpinnings of these psychological constructs are explored in the next chapter.
CHAPTER 3

THEORETICAL OVERVIEW OF UNDERPINNING PSYCHOLOGICAL CONSTRUCTS FOR THE PRESENT INVESTIGATION AND THEIR INFLUENCE ON BELIEF FORMATION

“Psychologists generally agree that many, if not most of the scales commonly used for the observation of psychological events and states provide at best a rough reflection of the constructs they are intended to represent.” (R. E. McGrath, 2005, p. 112)

Introduction

In this chapter, a set of psychological variables (e.g., parenting self-concept, stress) and relevant parental beliefs pertaining to ADHD (e.g., appropriateness of medication, beliefs regarding the causes of ADHD) are hypothesised as potential factors that may influence how parents view the nature of ADHD and how they respond when considering that their child may be a candidate for the ADHD diagnosis. The psychological variables to be discussed are constructs. Given that Netemeyer, Beardon, and Sharma (2003) emphasise that the importance of theory in measuring constructs cannot be overstated, this chapter commences with a discussion of the theoretical nature and uses of constructs. This is followed by a discussion of the theoretical underpinnings of specific constructs used in this research, with justification for their inclusion.

Theoretical Concepts and Constructs

Overview

The constructs discussed in this chapter are well known (though perhaps not as well understood) and are even considered standard in the behavioural and social
sciences. However, according to Machado and Silva (2007), while the process of clarifying and conceptualising constructs used in a research study is very important, it is often a neglected component of the scientific method. Failure to understand the theoretical nature of constructs and the limitations of their relationship to the empirical world they are meant to relate to, can seriously compromise the ultimate validity of any scientific research. However, despite the importance of this, the practice of conceptualising constructs is often not given the consideration it deserves. This may be partly due to the belief that sophisticated software packages and advanced statistical techniques are able to deal adequately with the subjectivity and uncertainty associated with constructs. On this matter, in discussing multivariate research, Marsh and Yeung (1997) suggest that reliance on mathematically sophisticated statistical models (which typically incorporate the use of data intended to measure the constructs) is no guarantee that the conclusions yielded are valid. Knowledge of such limitations can prevent researchers and users of research findings from being seduced into thinking that the use of sophisticated statistical techniques can compensate for a rudimentary understanding of the nature of psychological constructs.

The Nature of Constructs

Cote, Buckley, and Best (1987) define a construct as an “intangible or nonconcrete characteristic or quality on which individuals differ” (p. 302), while R. J. Cohen and Swerdlik (2010) describe a construct as “an informed, scientific idea developed or hypothesized to describe or explain behaviour” (p. 175). Constructs, also referred to as concepts, (Bergman, 2010; Pedhazur & Pedhazur Schmelkin, 1991) are described by Morse, Hupcey, Mitcham, and Lenz (1996) as tools used for the purpose of organising reality. That is, a construct is hypothetical, and not reality (e.g., just as a map may represent a territory, it is not the territory itself, i.e., it is not reality), but merely the representation of a reality (Hayakawa, 1974); albeit a representation that is clearly very useful².

² Incidentally, in the absence of an objective medical test to confirm ADHD as a medical condition, ADHD itself could be considered a construct with the observable (and measurable) features of inattentiveness and/or hyperactivity and impulsivity. This is also true for any mental disorder (Kutchins & Kirk, 1997). According to Horwitz (2002), “Mental disorders are not found in nature; like all concepts, they are human constructions” (p. 11). While use of the term ADHD is considered useful for health professionals to communicate with one another regarding clients and their treatments, Kendell and Jablensky (2003) note that just by listing a diagnostic concept in an official
Conceptualising a Construct

Constructs are not developed for their own sake, nor are they best understood by commencing with the offering of operational definitions (though the process of operationally defining a construct is important, and is discussed shortly). Rather, researchers introduce constructs, or invoke their existence, for the purpose of better understanding people in a range of contexts (e.g., work performance, education, personal relationships). Understanding the purpose for which a construct is developed, relates to the notion of conceptualisation of a construct, which according to Clark and Watson (1995) is the essential first step when dealing with constructs, scales, and their measurement.

According to Anastasi (1986), constructs are “ultimately derived from empirically observed behavioural consistencies” (p. 5), and are assumed to have a causal relation with the observed behaviours from which their existence is inferred (DeVellis, 2003). The term “behaviour” is used in a general sense to include such observable actions as responses to test or survey items, or any physical action, whether it be voluntary or involuntary. For example, in this research, parenting self-concept (the construct) is hypothesised to influence parents’ decision-making processes and practices, as indicated by their responses to the survey items, which are considered to be indicators of specific behaviours.

Constructs, in order to be scientifically meaningful, are typically embedded in a theoretical network that ideally initially addresses within-construct issues that theorise and test the nature and structure of the construct, and proceed to between-construct studies that examine the relations of the construct considered with other constructs and observed behaviours (Netemeyer, et al., 2003; Pedhazur & Pedhazur Schmelkin, 1991). As such, this network, referred to as the “nomological network” by Cronbach and Meehl (1955, p. 290), examines the relations between the internal facets of the construct, as well as the construct’s relations with other constructs. Using the terminology of Cronbach and Meehl, relations between the internal facets of the construct form the within network of the nomological network, while relations with other constructs form the between network (Netemeyer, et al., 2003). Failure to nomenclature (e.g., DSM-IV) and including a precise definition, this practice tends to encourage reification. Reification can lead to problems such as the failure to understand the underlying causes of the observed ADHD-type behaviours. On this matter, Brown (2005) points out that reification of the ADHD label gives the false impression that a causal explanation is provided for the problematic behaviour from which it is inferred. He further states “to turn a descriptive label derived from the presence of a particular set of behaviours into an explanation … is tautological nonsense” (p. 45).
adequately define a construct at the conceptual level by grounding it to a particular theoretical base, ultimately obscures the entire conceptual framework of the study, thereby making investigation of research hypotheses difficult (B. M. Byrne, 1996).

Rather than trying to develop an ideal all-encompassing conceptualisation of a construct, Hattie (1992) recommends the use of “open concepts” (p. 5). An open concept comprises several sentences that offer no complete definition for the construct it introduces, but rather seeks only to partially determine the meaning of the construct. This approach leaves the construct open to application in new contexts. This is an important point for this research, and is revisited later in this chapter in discussion on construct validity. As Hattie points out, the method of open concepts parallels a metaphor offered by Wittgenstein (1958), who argued that a construct involves a network of similarities that overlap each other like a thread of fibres, where the strength of the thread does not reside in any one particular thread, but in the overlapping of many fibres. Therefore, for the constructs used in this research, no attempt is made to provide a single definitive statement that describes them completely. Nor is it possible to do so, given the abstract and subjective nature of constructs. Instead, a construct is best conceptualised by using many similar and converging descriptions. Thus, researchers should provide a conceptual definition before providing an operational definition (Bryant, 2000).

From Conceptualisation to Operationalisation

The constructs to be used in this research are well known. While the use of well-known constructs can be an advantage (because they have been well studied), somewhat paradoxically, problems can occur because it is often assumed that because the constructs are so well known, once conceptualised there is no need to define them. For example, in relation to the self-concept, Marsh (1997) notes that like many other constructs, it suffers because people assume they know what it is, and therefore feel no need to provide a definition. Further, Stanovich (2007) observes that while the need to explicitly describe the characteristics of a variable in the physical sciences is well accepted, the same priority is often not applied when dealing with psychological constructs in the social sciences. One of the reasons he offers is the “preexisting-bias problem” (p. 42). That is, it is a common tendency for humans to have their own implicit psychological theories about themselves and others, where these theories typically contain constructs for which an assumed
personal meaning is held. To mitigate against the problem of a pre-existing bias, once a construct is conceptualised, it needs to be operationally defined for it to be useful in research and practice (Maddux & Gosselin, 2005).

As a single construct can potentially have many different operational definitions (Leary, 2004), the researcher needs to select or develop an operational definition that suits his or her purposes. So for example, while the construct of “intelligence” may be defined differently by a psychologist, a sociologist, and an educator, the respective operational definitions are such that they meet the needs of the researchers. It is expected that the different definitions, though distinct, overlap significantly, given that they describe a common construct. The use of different definitions recognises that the construct possesses different facets (or aspects), where each facet provides a different window of opportunity for understanding the construct and its relation with other constructs and behaviours in a given research context. No one particular definition is necessarily more correct than any other; however, some may be more useful than others in helping the researcher achieve his or her intended research aims. A construct is useful to the degree that it measures what it is supposed to measure. Determination of a construct’s usefulness relates to the topic of construct validity, and is discussed next.

**Construct Validity**

Given the hypothetical nature of constructs, an important feature is that they can never be absolutely confirmed (L. Crocker & Algina, 2006). This is an important consideration for research, as some constructs have come to be seen by other researchers as objective reality (reification), fuelling disagreements on what exactly a particular construct is, or is not, thus resulting in contradictory research findings. If a construct cannot be completely confirmed, then it is natural to ask “how can it be known if a test instrument is actually measuring the construct it purports to measure?” Questions of this nature, and their answers, relate to the topic of construct validity. In a review of the available literature, Clark and Watson (1995) note that there is widespread misunderstanding of what construct validity is; hence, it is worthwhile to discuss it briefly here. Construct validity is defined as the degree of agreement between a score derived from the instrument and the construct it is supposed to be measuring (Kaplan & Saccuzzo, 2005). While this definition is concise, determination of how well a construct has been measured is not a
straightforward process, given that constructs are hypothetical and not directly observable.

Determining construct validity usually involves analysing scores obtained from a survey instrument. Survey instruments designed to measure a construct are, strictly speaking, neither valid nor invalid in and of themselves (T. J. B. Kline, 2005; Nunnally, 1978). Further, the scores obtained from a survey instrument are neither valid nor invalid in and of themselves. While judgements may be made about the reliability of the scores (using statistical measures such as Cronbach’s alpha), judgements about validity cannot be made unless reference is made to a well-specified theory (Netemeyer, et al., 2003). Determining construct validity for an instrument is a judgement of the appropriateness of the inferences derived from instrument test scores regarding individual standings on the construct (R. J. Cohen & Swerdlik, 2010; Furr & Bacharach, 2008; Thompson & Daniel, 1996), where these inferences are guided implicitly or explicitly by theory. In other words, an instrument’s construct validity is assessed when theories or hypotheses involving other constructs and behaviours are used to determine how people who measure high on the construct of interest differ from those who measure low on the construct. On this matter, B. M. Byrne (1984) states “construct validation studies seek empirical evidence to support hypothesized relationships associated with the nomological network of a construct” (p. 431). To try to validate a construct without reference to at least one other construct, to establish a nomological network, is like trying to describe the locus of a straight line in Euclidian geometry with only one point; this is impossible, as at least two points are needed to identify a unique straight line.

The theory that describes the constructs and their relations also typically describes the conditions under which the hypothesised relations hold. This is important, because while a survey instrument may be shown to be valid for one purpose, it may not necessarily be valid for another purpose (Carmines & Zeller, 1979; Hunsley, Lee, & Wood, 2004). On this matter, Urbina (2004) makes the point that “validity is a matter of judgments that pertain to test scores as they are employed for a given purpose and in a given context [italics added]” (p. 152). This view is also supported by B. Whitely (2002), who suggests that the validity of a measure for a construct is relative to a purpose, and that while the measure may be valid for one purpose, it is not necessarily valid for another purpose. For the present investigation,
the constructs chosen, are ones on which parents who accept the ADHD diagnosis may differ from parents who reject the diagnosis.

**Important Considerations Regarding Construct Validity**

*Establishing the validity of a measure in a different context.* It is often desirable to use the same definition for a construct and the same scale in different studies for the purpose of making meaningful comparisons between studies or across different time periods. This is usually done because existing scales are often seen to have an established validity. While the use of existing definitions and scales is highly desirable in a new study, it is not always possible. Nor is it always appropriate, due to the purpose of the studies and the construct being investigated. For example, if the aim of a study is to replicate another study, then it is appropriate to use the same definition for a construct and the same scale. However, if the aim of a new study varies from the aim of the original study for which the scale was developed, then it is possible that the scale will need to be modified to meet the aims of the new study. This is where the notion of an open concept (Hattie, 1992) as discussed earlier, is relevant. That is, once a construct is conceptualised, it can be defined differently for different purposes, where a different definition enables a different aspect of the construct to be examined, as discussed earlier. It is not enough to claim that validity for a scale or instrument has been established in one study, and therefore conclude that it is valid for other studies. Hair, Black, Babib, Anderson, and Tatham (2006), have suggested that even with well-established scales, there is a need to confirm validity in new contexts. Recall that the notion of validity is context dependent (Urbina, 2004) and purpose specific (B. E. Whitely, 2002), and so a test’s validity cannot be assumed to transfer from one context to another.

Careful selection and development of scale items is particularly relevant for this research, as the constructs used are well known and many published scales that measure them were available for use. Take as an example, the family/parenting stress scale developed for this research (see Chapter 4). While other scales that measure family/parenting stress were available, the one used in this research was developed with the specific aim of distinguishing those parents who experience stress due to having a child who displays ADHD symptoms, from those who manage quite comfortably. For example, one existing scale that could have been used in this research was developed and validated for the purpose of measuring the stress in
families where a child has a chronic condition (which however ADHD is generally not – it may be problematic and challenging, but is generally not considered chronic). This scale was not deemed to be the best for this research, since measuring instruments as previously discussed, are validated in relation to the purpose for which they are used.

**Naming fallacy.** Because of the known limitations in using a single-item measure to identify a construct, several items typically are used in an attempt to better capture the essence of the construct of interest. The use of several items helps to provide a more reliable estimate of the construct by minimising associated error, a topic that is discussed in Chapter 5. However, although an estimate of the construct based on multiple measures may be more reliable (i.e., repeated measures yield more consistent results), it may not be a valid measure. According to Spector (1992),

> Unfortunately, the use of multiple items does not guarantee that the true score measured was the true score intended. It is quite possible, and in many domains even likely, that the true score measured is not the trait that the scale was designed to assess. (p. 11).

Although scale items are carefully chosen and subjected to psychometric testing (to be discussed in Chapter 5), it can be difficult, due to the intangible and dynamic nature of constructs, to choose items that are representative of the construct of interest. On this matter, R. B. Kline (2011) states that just because a name is assigned to the latent construct, it “does not mean that the hypothetical construct is understood or even correctly labeled” (p. 230).

**A Final Word on Constructs and Their Validation**

As the constructs used in this research are being used for a novel purpose (i.e., differentiating those parents who accept the ADHD diagnosis and those who reject it), the construct validity needs to be investigated. As all evidence bearing on a measure contributes towards establishing a construct’s validity (Netemeyer et al., 2003), construct validity should be established through multiple methods. Methods used in this research (discussed in detail in Chapter 5) include investigating reliability and structural validity.
While the strategies just mentioned can be used to gather support for a construct’s validity, determining construct validity is an ongoing process and cannot be finalised by any one study (Allen & Yen, 2002; Marsh, Ellis, Parada, Richards, & Heubeck, 2005; Messick, 1995; Netemeyer, et al., 2003). Furthermore, Anastasi (1986) suggests that construct validation extends across the entire instrument development process, while Rust and Golombok (2009) suggest that the process is “never complete, but is cumulative over the number of studies available” (p. 81). In other words, construct validity is not established by one final test or operation, but rather, ongoing evidence is gathered to support it. In this research, any claims relating to the validity of survey instruments or the constructs they purport to measure are assumed to be open to modification, ongoing verification, and reproof.

Having given an overview of the nature of constructs and their uses, the main constructs used in this research are discussed next. These constructs are: self-concept, self-esteem, and stress. In addition to introducing these constructs, the discussion intends to demonstrate the difficulties in conceptualising and defining a construct to be used for research purposes.

**Theoretical Perspectives of the Self-Concept Construct**

*Overview*

This section provides an overview of theoretical conceptualisations of the self-concept construct. A discussion of the self-concept is important not only in its own right, but also because the other constructs discussed later in this chapter are closely related to the self-concept. B. M. Byrne (1984), when discussing educational research, has suggested that an important prerequisite to the valid use of the self-concept construct is a thorough understanding of the construct itself. The same prerequisite applies to psychological research and any other research where the self-concept is a central construct. More generally, Deci and Ryan (1991) have emphasised the importance of providing a comprehensive understanding when dealing with theories that relate to the self (e.g., the self-concept), given its centrality to understanding human behaviour:

There is perhaps no type of theory for which the underlying meta-theory — the philosophical starting point — is more critical than for theories of the self. Because the self is the core of what we are, the characterization of self
(whether explicit or implicit) reflects what the theorists assume the nature of the human being to be. (p. 238)

Given the centrality of the self for this research, the following section provides an overview of theoretical perspectives for understanding the self-concept as it relates to the present investigation. This is achieved first by briefly introducing the notion of the self, before progressing to a discussion of self-concept, self-esteem, and self-enhancement. Finally, this chapter concludes by introducing the other constructs used in this investigation.

**The Self**

The topic of the self is foundational to psychology and relevant to this chapter as a means of introducing and understanding the self-concept. However, it is a topic that is philosophical in nature and is very complex, so is only discussed briefly here as a means of providing a context for discussing self-concept as it relates to the present research. Hence, a comprehensive account of this most important topic of psychology is beyond the scope of the present investigation.

According to Bracken (1996), “Because the self is not an observable phenomenon, one can only make inferences about self-related constructs by observing and making inferences about an individual’s behaviour” (p. 465). As the self itself is a construct, the characteristics of constructs described earlier in this chapter are readily applicable here: in particular, the self is not easily described by a universal definition, nor is it easily measured or quantified. The self, according to Bracken, has come to be conceptualised as the “essence of the individual” (p. 465).

Using the terminology of James (1890), the self is both composed of our thoughts and beliefs about ourselves (often referred to as the *known*); and also the processor of information (often referred to as the *knower*). The self is therefore characterised by a subject-object duality, where subject and object are one and the same. Aronson, Wilson, and Akert (2006) provide a useful analogy for understanding the self: it is both a book (content) and a reader (processor) of the book. The *knower* dimension of the self relates to self-awareness, while the *known* dimension relates to the self-concept. While Burns (1979) notes that each dimension can only exist through the other, and so each is equally important in gaining a thorough knowledge of a human psychology, the theory and methodology used in
this research (see Chapters 4 and 5) relates mostly to the self-concept (i.e., the known component of the self) and is discussed next.

**Conceptualising and Defining the Self-Concept**

Leary and Tangney (2005) state, “It seems impossible to understand the complexities of human behavior without reference to the human capacity to think about oneself” (p. 4). In this research, what parents think about themselves (particularly in their role as parents) is hypothesised to influence their decision to accept or reject ADHD as a medical condition, and further influence how they manage children’s ADHD-type behaviours. The idea that people’s behaviours are somehow related to the views and opinions of themselves dates back to Biblical times and before. The observation that human beings think about themselves relates to the topic of the self-concept. As the self-concept itself is not directly observable, it is a construct (Burns, 1979).

Widespread use of the term *self-concept* (and the closely related term *self-esteem*, to be discussed shortly) introduces potential problems in that many researchers have not provided a theoretical definition for these terms (Marsh & Craven, 1997). Given that they are both hypothetical constructs, Butler and Gasson (2005) suggest that it is not surprising that a universal definition is lacking. Following from the advice of Hattie (1992) mentioned earlier in this chapter, no attempt is made in this thesis to provide a universal definition for self-concept, as the notion of an “open concept” (p. 5) when dealing with constructs is more useful than a universal definition. However, an examination of some of the available definitions can help provide an insight into this central construct of psychology. Stets and Burke (2005) define self-concept as the set of meanings we have of ourselves which is based on our own observations, as well as inferences about who we are based on others’ behavior toward us. Hamachek (1987) explains the self-concept as the cluster of ideas and attitudes we have about our awareness at any given moment. More simply though, Shavelson and Bolus (1982) define the self-concept broadly as “a person’s perceptions of him- or herself” (p. 3). What these definitions have in common, is that they generally converge on the notion of the opinions and views a person holds of themself. Hence, for the purposes of the current investigation, the parenting self-concept is broadly operationalised as the self-perceptions parents have of themselves in regard to their role as parents.
The Elusive Nature of the Self-Concept

The definitions in the preceding paragraph recognise the human capacity for self-reflection. Stated another way, “Humans have the ability to reflect back on themselves as objects” (Stets & Burke, 2005, p. 130). However, while people have this capacity to reflect back on themselves, self-reports, which are frequently used to measure the self-concept, can be inaccurate, due to the respondent’s tendency to sometimes systematically distort (whether consciously or unconsciously) his or her responses (Piedmont, McCrae, Riemann, & Angleitner, 2000). These distortions are often performed for the purpose of self-enhancement. Self-enhancement processes are designed to distort the picture of the self and related behaviours towards a desired – often socially approved – self-concept. Given that much of what we know about ourselves is derived from others (Stets & Burke, 2005), the conditional approval we receive from others almost guarantees that most individuals will feel psychological pressure to distort their self-concept to some degree in order to attain and retain feelings of acceptability.

The tendency to self-enhance may create problems when collecting survey responses on topics related to the self, due to social desirability considerations (Shavelson, Hubner, & Stanton, 1976). This is likely to be particularly true for the parenting self-concept, which involves addressing such emotive issues as children’s behaviour and parents’ responses to those behaviours. The relevance for this research is that some parents with a negative parenting self-concept may respond to survey items in a way that presents a more favourable view of themselves as parents, given that parenting is such an emotive topic. The tendency for people to give socially desirable responses deserves consideration when conducting research, as such responses potentially can affect the measurement of the construct as well as relations with other constructs (Netemeyer et al., 2003). With regard to the self-concept and the potential for giving socially desirable responses, Combs (1981) argues that measures of the self-concept are actually better considered as measures of self-report, and that the two cannot be accepted as identical. Further, according to Combs and Gonzalez (1994), “The self-concept is a system of beliefs; the self-report is behaviour. These categories are not the same” (p. 46). These authors note that the self-concept is what people perceive themselves to be, while the self-report is what people are willing or able to say about themselves. This difference does not mean
that measures purporting to measure the self-concept should not be used, but rather, only that their limitations should be considered.

**Structural Aspects of the Self-Concept**

The self-concept is not just a collection of ideas and opinions we have about who we are. There are metacognitive aspects of the self-concept such as self-concept clarity and self-concept stability (Kernis & Goldman, 2005). Further, the self-concept can be studied in terms of the ideal self and the perceived self (Burns, 1982). Thus, the self-concept is not a simple human entity but is dynamic and multifaceted. However, amidst the complexity, there is structure and organisation to the self-concept (Scheier & Carver, 1980; Shavelson, et al., 1976). With regard to the organisational nature of the self-concept, Marsh and Shavelson (1985) note that it is multifaceted: people categorise the vast amount of information about themselves into categories, and relate these categories to one another.

Following from the seminal work by Shavelson et al. (1976) which proposed that self-concept was multidimensional and hierarchical, much research (e.g., Marsh & Yeung, 1998) on the self-concept has shown that a multidimensional conceptualisation of the construct yields greater insight into this somewhat esoteric, elusive, and central psychological construct, and facilitates greater application for improving human potential, when its structural aspect is delineated. Specifically, the self-concept is more clearly elucidated when its multidimensional nature is examined, as opposed to viewing it only as a unidimensional construct. In keeping with this finding, B. M. Byrne (1996) notes that most instruments measuring the self-concept developed since 1980 are multidimensionally structured and that the measure of the general self-concept is of limited value. Recognition of a multidimensional structure (that has been repeatedly verified using sound psychometric methodology in a multitude of contexts) provides valuable insights not available when the self-concept is viewed only as a general unitary entity. Specifically, Marsh and Craven (2006) suggest:

We propose that if specific components of self-concept are logically related to the aims of a particular study, then these specific components will typically be more useful – more strongly related to important criteria, more influenced by interventions, and more predictive of future behaviour – than a
For example, Craven, Marsh, and Burnett (2003) have shown that when attempting to improve educational outcomes for students, focusing on a specific domain of the self-concept (e.g., math self-concept) most logically related to the goals of the study is more appropriate than focusing on the general self-concept. Given that the self-concept has been demonstrated to be a multidimensional construct, and given the importance of employing a construct validity approach such that the self-concept domains that are logically and closely related to a behaviour of interest are examined, the implication for this research is that the decision-making process parents undertake is perhaps best understood when multiple domains of the parenting self-concept are conceptualised and examined. Hence, in the present investigation parenting self-concept is conceptualised as multidimensional in nature, and a construct validity approach is employed.

**Parenting Self-Concept and its Potential Relation with the ADHD Diagnosis**

An overview of the theoretical conceptualisation of the self-concept as a multidimensional and dynamic construct has been presented in this chapter. Pertinent to this research is the relation between a parent’s parenting self-concept, and their response to having a child who displays ADHD-type behaviours. Leary and Tangney (2005) note that the ability to think about oneself allows for the possibility for people to regulate themselves. Applied to this research, it is assumed that how parents perceive themselves as parents (i.e., their parenting self-concept) may have some bearing on their beliefs and behaviour in regard to the ADHD diagnosis. Therefore, it is hypothesised that domains of the parenting self-concept may relate to specific parenting behaviours, attitudes, and concerns.

Whether ADHD-type behaviours are due to a medical condition or are simply the extreme behaviours of otherwise healthy children, such behaviour is likely to be challenging for many families. Research undertaken by Epstein et al. (2000) has suggested that parents of children displaying ADHD behaviours have lower self-concepts according to self-reports than parents of non-ADHD children. Another aspect of the parenting self-concept considered important for this research is parents’ views of their competency. In regard to parenting competency, DeWolfe, Byrne, and
Bawden (2000) have noted that parents of preschool children with ADHD rated themselves as less competent parents who experienced a restricted parenting role. Hence, the present investigation extends self-concept theory and research by examining parents’ parenting self-concepts in the context of ADHD.

**The Relation of Self-Concept to Self-Esteem**

Given that the self-concept comprises both a descriptive and an evaluative component (Shavelson & Bolus, 1982; Shavelson et al., 1976), it may seem convenient to sort our self-opinions into either descriptive or evaluative categories. However, when we describe something or somebody (including ourselves), Levy (1997) suggests that the words used are almost invariably value laden. Further, Greenwald, Bellezza, and Banaji (1988) suggest that much of our self-knowledge has evaluative connotations, even if they are not explicit. For example, while stating that “I am an Australian Aborigine,” is offered as a description of one’s cultural heritage, there are also evaluative connotations attached. For example, identifying as an Australian Aborigine could be either a source of pride or shame. This would tend to suggest that the tendency to evaluate ourselves is a pervasive feature of our self-concept, and is not just restricted to those overt judgements about ourselves. In other words, when we describe ourselves, we also typically attach a judgement or assessment to the description. Even if we are not consciously aware of this evaluation, it is present, even if perhaps at the barely conscious level (Burns, 1982). This evaluative part of the self-concept is often referred to as self-esteem (Stets & Burke, 2005) and is also commonly referred to as the general self-concept in the self-concept literature (see Marsh & Craven, 2006 for an overview).

Thus, researchers have often used the terms general self-concept and general self-esteem interchangeably (Bracken & Lamprechtt, 2003; Burns, 1982; Shavelson, et al., 1976). Indeed, in higher order factor analysis studies undertaken by Marsh and Hattie (1996), measures of self-esteem and the general self-concept consistently correlate at about .95, suggesting that both measures are measuring the same construct. Given their relatedness and apparent equivalence, the general self-concept and self-esteem of parents in this research is measured using a single scale. For the purposes of the present investigation, the general self-concept refers both to evaluative and descriptive components of self-concept and to the apex of the
multidimensional and hierarchical model of the self-concept hypothesised in the seminal work of Shavelson et al. (1976).

**Conceptualising and Defining Self-Esteem**

Self-esteem is a topic for which the experts are in much disagreement regarding many fundamental issues (Leary, 2006). For example, some scholars suggest that it is a highly desirable attribute to have (e.g., Branden, 2001), while others believe it is of little benefit and is associated with negative outcomes (R. F. Baumeister, Campbell, Kruger, & Vohs, 2005). To unravel these polarised views, some researchers have suggested that a first step in seeking to understand self-esteem is to define it (Branden, 2006; Mruk, 2006). Actually, this belief is a major source of the problems associated with self-esteem research. While defining self-esteem is an important and necessary step, it should not be the first step. The first step that should be asked when commencing research on self-esteem, or any other psychological construct for that matter, is to address the question of “why should the construct be defined?” rather than “how should the construct be defined?”

The question of “why should the construct be defined?” relates to the process of conceptualising a construct, a topic that has been discussed earlier in this chapter. Leary (2006) has observed that conflicting research findings on self-esteem can result when attempts are made to operationalise it before conceptualising it. He further states, “researchers must provide an explicit description of the conceptualization they are using and demonstrate that their operationalizations are consistent with it, being careful to distinguish self-esteem from [other] empirically related constructs” (p. 427). This view is also shared by Psyzczynski (2006), who states “we must first have a clear conception of what self-esteem is, what function it serves, and what role it plays in day-to-day human functioning” (p. 407). Therefore, a construct needs to be conceptualised before attempts are made to define it, and if it has already been conceptualised, then the conceptualisation needs to be made explicit. Unless a construct is first conceptualised through the offering of a conceptual definition, its construct validity cannot be established (Bryant, 2000). However, researchers who have suggested that defining the construct of self-esteem is the first step, may also conceive the process of defining as incorporating the preliminary step of conceptualising, even if they do not explicitly state it. This is
particularly true for constructs such as the self-concept and self-esteem, which are amongst the most well-known and most studied constructs in the social sciences.

Constructs are not developed for their own sake, but rather are grounded in a theoretical framework (Netemeyer et al., 2003) that typically is developed to understand some aspect of human behaviour (usually with the aim of solving a problem or enhancing quality of life). In seeking to understand why some people are genuinely happy, successful, and possess optimal mental health (by almost any definition of the terms “happy” and “optimal mental health” that can be demonstrated by observable behaviours), many researchers of the social sciences (as well as those who are naturally curious about human nature) have observed that given people’s “seemingly irresistible urge to make evaluations” (Scheier & Carver, 1980, p. 237), those people observed as being happy or successful generally possess a favourable evaluation of themselves. Therefore, self-esteem can be conceptualised as a person’s self-evaluation, which correlates with their ability to succeed and enjoy life. Using this conceptualisation, a person with a favourable evaluation of themselves is said to have high self-esteem (or sometimes, just self-esteem, without the qualifier “high”), while a person with an unfavourable evaluation of themselves is said to have low self-esteem.

The conceptualisation for self-esteem just given lacks precision (as many conceptualisations do) and needs refining in order to be useful, but it is a start. The next step is to provide an operational definition. Once it is operationally defined, individual test items can be developed for measuring self-esteem. The individual items are scored and combined in such a way so as to quantify the construct of self-esteem. While a definition is necessary to being able to measure self-esteem, definitions can be fraught with difficulties, as is shown next.

**Disagreements and Controversies With Self-Esteem**

While many researchers would agree with the conceptualisation of the self-esteem construct described in this chapter (or variants thereof), disagreements begin when researchers try to identify the conditions under which people are likely to possess positive evaluations about themselves (i.e., possess high self-esteem) and what are the conditions under which they possess negative evaluations about themselves (i.e., possess low self-esteem). Disagreement amongst researchers is fine, as this promotes further inquiry and greater understanding. However, problems can
arise when a definition of a construct is formulated to include an explanation (implicitly or explicitly) of what contributes to high measures of the construct and what contributes to low measures of it. A definition of self-esteem (or any construct for that matter) should not incorporate how it is achieved. As an example to facilitate understanding, if asked for a definition of a well-behaved child, a helpful definition would not be “A well-behaved child is one who reads the Bible and whose parents have enforced strong discipline.” While it may be hypothesised that Bible reading and discipline leads to a child being well-behaved, these behaviours are not relevant in a definition of a well-behaved child, and are actually counterproductive for the research process.

It is clear that implicit in some definitions of self-esteem are what some researchers believe to be the causes of high and low self-esteem. For example, while many definitions of self-esteem refer to the attribute of worthiness (where someone with high self-esteem feels worthy and someone with low self-esteem feels unworthy), Mruk (2006) suggests that worthiness must be earned. Further, other researchers have incorporated the notion of competence (usually defined in behavioural terms) into a definition of self-esteem. For example, a scale item in the “Self-liking/self-competence scale-revised version” (Tafarodi & Swann, 2001), is “I am very talented” (p. 670). Tafarodi and Swann have described self-esteem as having two distinct dimensions, where the dimensions are competence, and intrinsic value, such as character. There can be no denying that competence is often associated with feeling worthy, but achievement and competence should not be used to define self-esteem, just because they are believed to be necessary prerequisites for self-esteem. Interestingly, other writers (Deci & Ryan, 1995) believe that possessing positive evaluations of oneself (i.e., having high self-esteem) is an entitlement and should not be contingent on achievement, and therefore do not seek to define self-esteem in terms of meeting conditions. Competence, ability, talents, and other related attributes are certainly important psychological variables in their own right, and the possibility that they are necessary for positive evaluations of oneself (i.e., high self-esteem) should be investigated, but they should not form part of a definition of self-esteem. In summary, the problem associated with research involving self-esteem is not one of competing theories, but rather that there is a lack of agreement to the more fundamental question among researchers, of what self-esteem is (Leary, 2006).
One Self-Esteem or Many?

As previously mentioned, once conceptualised, a construct can be defined in a way that suits the needs of the researcher, so long as the definition is consistent with the conceptualisation of the construct (Leary, 2006). Three different definitions of self-esteem have been described by Brown and Marshall (2006). These definitions are not mutually exclusive, and are only intended as an aid for understanding self-esteem. The three different definitions are: a) state self-esteem, b) trait self-esteem, and c) domain specific self-esteem. Each of these definitions provides a “different window of opportunity” for the researcher in seeking to understand well-being, and is discussed in the next paragraph.

The first type of self-esteem refers to a personality trait that represents the way people generally feel about themselves. Also called global or trait self-esteem, it is an indicator of a person’s general evaluation of themselves (Dutton & Brown, 1997). In addition to having a general or average evaluation of oneself, people often describe their self-esteem as “plummeting” or “skyrocketing” in relation to a particular stimulus (e.g., feedback from a significant other). In such cases a person’s evaluation of their worth is referred to as trait self-esteem, or alternatively, acute self-esteem (Heatherton & Polivy, 1991). This is often the type of self-esteem studied when researchers set out to manipulate a participant’s self-esteem for the purpose say of examining its effect on a dependent variable. Finally, recognising that the self-concept is best conceptualised as a multidimensional construct, as previously described, people can evaluate the different components of their self-concept. For example, a person who may feel discontented with their academic abilities can be said to have low academic self-esteem, while they may feel pleased with their social skills and therefore be said to have high social self-esteem. This type of self-esteem is referred to as domain-specific self-esteem or sometimes attribute-specific self-esteem (Dutton & Brown, 1997). In application to this research, it is possible that a parent may view themselves favourably as a home carer, but not favourably in their role as a parent; hence, the focus will be on self-views relating to parenting ability.

For this research, domain-specific self-esteem is examined and is termed the self-concept. This is not to suggest that the other two types of self-esteem are not useful, but in keeping with the findings of Marsh and Craven (2006), focusing on domains of the self-concept most closely related to an area of interest is more likely to give greater insights into that area of interest. Hence the parenting self-concept...
scale used in this research includes items intended to capture a parent’s self-esteem in multiple domains of the self-concept specifically in relation to parenting.

**Self-Enhancement**

*The Universal Tendency to Self-Enhance*

The effects of social desirability were mentioned earlier. Given the significance of this problem in survey research, it is important to explore this issue further. The topic of social desirability is closely related to the process of self-enhancement. Despite the many disagreements regarding the nature of self-esteem, there is much agreement amongst researchers that those who evaluate themselves favourably try to maintain that evaluation, and those who do not evaluate themselves favourably, try to enhance their opinion of themselves or protect it from further assaults (Aronson, 2004; Combs & Gonzalez, 1994; J. Crocker & Park, 2005). In other words, people generally try to maintain or enhance their self-esteem. So widely accepted is this tendency, that Leary and Downs (1995) state: “In a discipline with few universally accepted principles, the proposition that people are motivated to maintain and enhance their self-esteem has achieved the rare status of an axiom” (p. 123). Echoing the words of Leary and Downs are those of Psyczczynski, Greenberg, Solomon, and Schimel (2004), who state, “the notion that people are motivated to sustain high levels of self-esteem is so pervasive . . . that most theorists use it as a postulate or paradigmatic assumption without providing justification or explanation” (p. 435).

But is the tendency to self-enhance really a universal phenomenon? Some people think not. For example, Heine, Lehman, Markus, and Kitayama (1999) have observed that the tendency for self-enhancement is largely based on research conducted in North America within a context of the Westernised culture. Further, some researchers (e.g., Kitayama, 2006, p. 377) claim that self-enhancement is “quite elusive if not totally absent” in Asian cultures. Actually, it would seem that cultures do not vary in whether or not they self-enhance, but rather in the way they self-enhance. In his summary of the available literature, Leary (2007) has observed that all people like to feel good about themselves and that because different characteristics are valued in different cultures, people self-enhance in culturally defined ways. For example, countries like America, which are generally high in individualism on the “individualism-collectivism continuum” (Solomon, 2006, p.
tend to define the self in terms of competences and achievement, and therefore self-esteem is contingent on being the best, or one of the best in a chosen domain (Pyszczynski, 2006). By contrast, in Asian countries characterised by collectivism, self-esteem is underpinned by maintenance of social harmony and relationships (Koch, 2006). In Japan for example, the practice of self-criticism is valued and encouraged early in life as it encourages one to seek improvement (Heine, Lehman, Markus, & Kitayama). Leary’s observation in this regard is most telling: “Ironically, either self-criticism or self-enhancement can make people feel good about themselves, depending on what their culture values” (pp. 322–323).

What the previous paragraph shows, is that although manifested differently between different cultures, there is a strong tendency for all people to self-enhance. Applied to this research, while it might seem that labelling a child with a paediatric mental condition (e.g., the ADHD diagnosis) is not self-enhancement, it can potentially be a form of self-enhancement for some parents. Noting that it is actually the parents who request the diagnosis in many cases, Neven, et al. (2002) suggest that the stigma of a psychiatric diagnosis such as ADHD is less aversive in relative terms than the stigma of perceived parenting or personal failure. Acceptance of the ADHD label may therefore be an attempt to protect or enhance the parenting self-concept. How acceptance of the ADHD label may come to be an act of self-enhancement for parents, is next discussed in detail.

Acceptance of the ADHD Label and Self-Enhancement

Smelter, et al. (1996) suggest that when a parent takes their child to the doctor, they may wish to come away with a diagnosis for ADHD because it meets their needs more than it does those of the child. So what are the needs of parents and how does acceptance of the ADHD diagnosis meet those needs? Many researchers have suggested that humans strive for consistency within their self-concepts and that inconsistency among their self-related thoughts, feelings, and perceptions produces an unpleasant psychological state (Burns, 1982). This unpleasant psychological state, referred to as cognitive dissonance (Festinger, 1957), has proven to be a useful construct for understanding the motivation behind an individual’s use of self-enhancement strategies. Applied to this research, dissonance theory can be used to contribute to an explanation of why parents would choose to believe that their child’s problematic behaviour is attributable to a medical condition, even where no medical
proof or clinical support is offered to them that would substantiate such a diagnosis, as opposed to accepting a psychosocial explanation that may consider factors such as the relevance of schools, parenting practices, families, and the changing nature of society.

The cognitive dissonance theory postulated by Festinger (1957) proposes that whenever we hold two opposing cognitions (e.g., thoughts, ideas, opinions or attitudes), a state of dissonance is produced that motivates us to try to eliminate the dissonance by modifying a behaviour or cognition. While Festinger’s original conceptualisation of the cognitive dissonance theory posited that any two conflicting cognitions produces dissonance, Aronson (2004) reformulated the theory and posited that one of the cognitions always relates to how a person sees themselves (i.e., self-concept). This parsimonious reformulation assumes that most people like to think of themselves as decent people, as discussed previously, and that dissonance is strongest when their “self-concept is threatened” (p. 169).

Applied to this research, it is assumed that parents typically experience social conformity pressures motivating them to see themselves as good and decent parents. Further, believing oneself to be a good parent is an intrinsic goal of most parents. For some parents, observing problematic behaviour in their child could lead them to question their parenting ability (i.e., it is a threat to their parenting self-concept), thus creating a state of dissonance. If the child’s behaviour can be explained in a way that does not indicate a possible failure to fulfil their role as parents (e.g., the behaviour is due to a brain illness), then, according to cognitive dissonance theory, dissonance is reduced and a state of cognitive consonance is re-established.

Cooper (2001) has observed that, consistent with the cognitive dissonance theory, people with undiagnosed ADHD are often dismissed as incompetent, disorganised, aggressive, lazy, and a host of other undesirable descriptors which do not speak highly of parents’ ability to raise their children. The implication, in considering a diagnosis of ADHD, is that these negative attributes are due to a brain malfunction when the ADHD diagnosis is given, and not due to ineffective parenting. By focusing on an underlying biological cause within the child, parents perhaps no longer need to face the potential of blame (Diller, 1999; Neven, et al., 2002; Pozzi, 2000; Weathers, 1998) and the solution to the problem can largely be taken out of their direct control as behaviour managers. Furthermore, given that “people’s tendency to self-enhance also leads them to think they are not self-
enhancing” (Leary, 2007, p. 322) parents may be largely unaware of the underlying psychodynamics influencing their role in the whole diagnostic and management process. As such, the process of self-evaluation potentially creates a blind spot in a person’s observations about themselves.

Having used the cognitive dissonance theory as a possible explanation for how the parenting self-concept may be potentially involved in a parent’s decision-making process, an important comment on the use of theory for explaining human behaviour is warranted at this point. If a theory’s usefulness is to be evaluated in terms of its power to predict human behaviour consistently under specified conditions, then many years of research lend considerable support to the cognitive dissonance theory as a useful theory when seeking to explain phenomena of the type under study in this present research (Aronson, 1992; Mills, 1999). However, having a theory that successfully makes predictions regarding human behaviour does not necessarily mean that the theory is factual in what it is describing; after all, theories can still be wrong and yet make accurate predictions (e.g., Newton’s theory of classical mechanics). Good theories are falsifiable, and attempts should be made to falsify them in the hope of further establishing the validity and usefulness of the theory or finding a better theory (Stanovich, 2007). Such reasoning is in contrast to that typically used by many of the proponents of the medical model of ADHD (see Chapter 2), who have accepted their model as an established fact, and present it as such in peer-reviewed journals, even though unsupported by valid scientific research evidence. The cognitive dissonance theory and its application to this research is presented only as a theory, and is therefore always open to falsification and revision, as all theories should be (Maraun & Peters, 2005).

Other Constructs of Interest

Stress and Relief in Relation to an ADHD Diagnosis

Burns (1992) explains that people’s self-concept, performance, and feedback received from others all interact, and are all related to stress. As the two constructs of stress and the self-concept are closely related, much of what has been said in discussing the self-concept also relates to stress, and so only a very brief overview of stress is given here.

It was mentioned previously when discussing self-esteem, that there is a universal tendency for people to be their best, and also a desire to be seen by others
as being their best. In this research, how parents believe others see them in regard to their role as parents is seen as an important factor that influences how they may evaluate their child’s behaviour, and subsequently respond to that behaviour. Often, when people feel that they are not meeting the standards they have set for themselves or the standards which others have set for them, there can be a degree of emotional discomfort (and sometimes physical discomfort). This feeling, commonly referred to as stress, can serve to motivate people to perform, or it can have a negative impact. According to Burns (1992), stress is a term used to describe any demand that requires a physical or emotional readjustment. More formally, Barkway (2009, p. 177) states:

Stress is a physical, cognitive, emotional and behavioural reaction of an individual . . . to a stressful event – stressor – that threatens, challenges or exceeds the individual’s internal and external coping resources. The threat may be actual . . . or perceived. The threat or stressor can be physically or emotionally challenging, or both.

Given the defining behaviours of ADHD, it is to be expected that parents would be likely to experience more stress when parenting a child who displays ADHD-type behaviours than the parents of children who do not have the ADHD label. Indeed, a summary of the literature by Anastopolous, Guevremont, Shelton, and DuPaul (1992), offers findings in support of this suggestion. In research undertaken by these researchers, the severity of the ADHD, among other factors (e.g., child’s health status), was a significant predictor of parenting stress. However, it should be noted that due to the correlational nature of their research, conclusions regarding causality could not be drawn. Similarly, Byrne, DeWolfe, and Bawden (1998), found that preschoolers with ADHD were judged by their parents as being significantly more stressful to manage than parents of children who did not have the ADHD label.

Closely related to stress is the construct of relief. When stressed, individuals typically seek relief. In the present investigation a subscale was developed to elucidate if participants experience a sense of relief when considering acceptance of the ADHD diagnosis. This subscale serves as a measure of the affective component of a parent’s decision to accept or reject the ADHD diagnosis, while the question
which explicitly asks whether or not they have accepted the diagnosis may be considered as the cognitive component of their decision.

**Other Constructs of Interest**

Other constructs considered relevant for this research are parents’ opinions about medication as a treatment for ADHD, their opinions about their child’s peer relations, and their beliefs about the causes of ADHD. Each of these variables is a construct, in the sense that none are directly observable, and parents can be expected to provide various responses in ways that can be reliably measured. These constructs, along with those previously discussed in this chapter, will be investigated to determine if predictions can be made regarding parents’ acceptance or rejection of the ADHD diagnosis.

**Measuring the Constructs in This Research**

The constructs mentioned in this chapter are central to the overarching aims of this investigation. While they have been described at a conceptual level in this chapter, no discussion has been furnished on how they may be quantified. To provide valid measures for these constructs for the purposes of conducting quantitative analyses, a survey instrument has been designed which, when administered to parents, can be used to estimate parents’ relative standing on each construct. The survey instrument is the Parents’/Guardians’ Perceptions of ADHD Questionnaire (PPAQ; Dillon, 2009) and is provided in Appendix A. The next chapter describes the PPAQ in detail and proposes a set of research hypotheses and questions which can be used to assess its psychometric properties.

**Chapter Summary**

Constructs are not only the building blocks of theory, but they also link theory with empirical research (Bergman, 2010). Hence, an understanding of their nature and use is essential when conducting research, particularly in the behavioural sciences where constructs are routinely conceptualised, defined, measured, and analysed as a means for better understanding human behaviour. This chapter has discussed the appropriate use of constructs, both generally and in the context of this present investigation, and the importance of understanding why and how measures of constructs are validated. The self-concept and self-esteem, two important constructs
for this present investigation and for the behavioural sciences generally, were introduced and their relevance highlighted. Both these constructs provide an ideal context for further explicating the nature of constructs, as well as providing the theoretical foundation for the methodology used in this research for addressing the overarching research aims and questions. The methodology employed in the present investigation is discussed in the next chapter.
CHAPTER 4

AIMS AND HYPOTHESES

“There are no statistical adjustments to correct for having asked the wrong research question.” (Hetherington, 2000, p. 42)

Introduction

The overarching aims of this research are to undertake three interrelated studies in order to:

1. Develop a psychometrically sound survey instrument that measures a range of psycho-social constructs (e.g., parenting self-concepts, stress) that may influence parents in their decision-making processes and their opinions on the nature, causes, and appropriate treatment of ADHD (Study 1).

2. Explicate the relation of psycho-social constructs (parenting self-concepts, stress, beliefs regarding causes) to parents’ acceptance or rejection of a diagnosis of ADHD as a medical condition, and perceived helpfulness of the diagnosis, so as to provide a rare empirical study elucidating the role of research-identified psycho-social drivers that inform parental decision-making (Study 2).

3. Use qualitative methodology to explicate parents’ and health professionals’ views, practices, and personal experiences with ADHD to complement and extend the findings from the quantitative component of the investigation (Study 3).

In this chapter, the aims, hypotheses, research questions, and their rationale are presented separately for each of the 3 studies that comprise the present investigation.
**Brief Description of the Three Studies Comprising the Present Investigation**

Study 1 has two major aims. The first aim is to investigate the psychometric properties of a newly developed survey instrument – the Parents’/Guardians’ Perceptions of ADHD Questionnaire (PPAQ). Hence, Study 1 seeks to establish the psychometric properties of the PPAQ, in order to develop a new suite of psychometrically sound instruments to measure parents’ perceptions of ADHD. The second aim is to examine group differences for the constructs measured in the PPAQ. The participants of this study are grouped according to the following three criteria: (a) whether parents accept or reject the ADHD diagnosis for their child, (b) whether the child on which the parent is reporting is male or female, and (c) whether or not an official diagnosis is given to the child. By using advanced statistical techniques (see Chapter 5), intergroup differences across all factors of the PPAQ are examined.

Study 2 continues from Study 1 and employs structural equation modelling (SEM; see Chapter 5) to investigate whether a set of predictor variables (comprising varying psychological constructs of the parents) can be used to predict a set of outcome variables, centring around a parent’s acceptance or rejection of ADHD as a medical diagnosis.

Study 3 is qualitative in nature and uses parents’ responses to open-ended questions included in a parental survey, and interviews with selected parents and health professionals, to provide “the opportunity to step into the mind of another person, to see and experience the world as they do themselves” (McCracken, 1988, p. 9). It is intended that analysis of responses to open-ended data and interviews will allow for an in-depth examination of the issues raised in the quantitative data, as well as extending the findings about parents’ views on the nature, causes, and treatments of ADHD, and providing a rich source of narrative data.

**Research Questions and Hypotheses**

Each study had a guiding set of numbered research aims. A series of hypotheses and/or research questions was also posed for each aim. Each hypothesis and research question is labelled with a three-digit identifier. The first digit represents the study (e.g., 1, 2, or 3), while the second digit refers to the number of the aim, and the third digit identifies the particular hypothesis or research question. For example, Hypothesis 1.1.1 refers Study 1, Aim 1, Hypothesis 1; Research Question 2.2.1 refers to Study 2, Aim 2, Research Question 1, and so on. In a similar
manner, the rationales for the hypotheses are presented with a clear title to match the corresponding aim and hypothesis or research question.

Hypotheses are either based on previous theory and research, or are extrapolated from knowledge corresponding to relevant psychological literature that focuses on ADHD, as well as psychometric theory. Where a hypothesis could not be formulated, due to inconsistencies in the extant research, research questions have been offered. Whether a hypothesis or a research question is offered, the purpose of each is to guide the research process toward addressing the overarching aims of the thesis.

Study 1: Psychometrics of the PPAQ and Between Group Differences

Introduction
This section is necessarily long, as it seeks to assess the psychometric properties of the PPAQ as a new suite of psychometrically sound instrumentation to measure parents’ perceptions of ADHD. This lays the foundation for being able to confidently measure relations amongst a set of variables that relate to parents’ beliefs and experiences relating to ADHD. To achieve this, a set of research aims is provided, followed by a set of research hypotheses and questions to address these aims. This section concludes by providing rationales for the research hypotheses and questions posed for Study 1.

The Problem
To what extent does the PPAQ possess acceptable psychometric properties for each of its four measurement scales as demonstrated by: (a) internal consistency of the scales, (b) a valid factor structure which conforms to the constructs the instrument is hypothesised to measure, and (c) equivalence (invariance) of the factor structure of each scale across different subgroups of the population? Further, once establishing invariance, what significant group differences exist amongst the factors measured by the PPAQ? For example, are the parents of boys more likely to accept the ADHD diagnosis to explain their child’s behaviour, than the parents of girls? Or are parents who accept the ADHD diagnosis more likely to report experiencing more stress than parents who do not accept the ADHD diagnosis?
**Measurement Scales and Subscales of the PPAQ**

The PPAQ comprises the following four measurement scales: Parents’ Perceptions and Experiences of ADHD Scale (PPEAS); Parents’ Beliefs of Causes Scale (PBCS); Parenting Stress Scale (PSS); and Parenting Self-Concept Scale (PSCS). Table 4.1 provides a summary of these measurement scales, with sample items for each of the 12 subscales that comprise the PPAQ (all 4 measurement scales combined in one instrument). Each of the 12 subscales is measured on an eight-point Likert scale (1 = strongly disagree to 8 = strongly agree). The terms subscale, construct, and factor, are used interchangeably throughout this thesis.

Table 4.1

*Summary of the PPAQ Measurement Scales and their Respective Subscales*

<table>
<thead>
<tr>
<th>Measurement Scale</th>
<th>Subscales</th>
<th>Sample items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents’ Perceptions and Experiences of ADHD Scale (PPEAS)</td>
<td>Peer Relations (4)</td>
<td>“Most other kids like my child”</td>
</tr>
<tr>
<td></td>
<td>Medication Attitudes (3)</td>
<td>“I think that medication (such as Ritalin) is often an effective treatment for some children with ADHD in the short term”</td>
</tr>
<tr>
<td></td>
<td>Helpfulness (4)</td>
<td>“I experienced a sense of relief”</td>
</tr>
<tr>
<td>Parents’ Beliefs of Causes (PBCS).</td>
<td>Home Environment (3)</td>
<td>“Lack of parental discipline”</td>
</tr>
<tr>
<td></td>
<td>Brain Disorder (3)</td>
<td>“A problem in the way the brain functions”</td>
</tr>
<tr>
<td></td>
<td>Child’s Behaviour (4)</td>
<td>“Lack of child’s self-discipline/control”</td>
</tr>
<tr>
<td>Parenting Stress Scale (PSS)</td>
<td>Family Stress (3)</td>
<td>“My child’s ADHD/ADHD-type behaviour has created some tension between some family members”</td>
</tr>
<tr>
<td></td>
<td>Individual Stress (3)</td>
<td>“I have often felt stressed due to my child’s ADHD/ADHD-type behaviour”</td>
</tr>
<tr>
<td></td>
<td>Criticisms (3)</td>
<td>“Friends have often been critical of my child regarding his or her ADHD/ADHD-type behaviour”</td>
</tr>
<tr>
<td>Parenting Self-Concept Scale (PSCS)</td>
<td>Affect (4)</td>
<td>“I find parenting rewarding”</td>
</tr>
<tr>
<td></td>
<td>Competency (3)</td>
<td>“In general, I am a good parent”</td>
</tr>
<tr>
<td></td>
<td>Relationship (3)</td>
<td>“My child and I share a good relationship”</td>
</tr>
</tbody>
</table>

*aThe number of items for each subscale is given in parentheses after the subscale name.*
**Aims**

It is axiomatic that assessment instruments should be reliable and valid (Clark & Watson, 1995) where both these attributes (i.e., reliability and validity) centre around the measurement of constructs (see Chapter 3). On the importance of measurement, Pedhazur and Pedhazur Schmelkin (1991) suggest that “no matter how profound the theoretical formulations, how sophisticated the design, and how elegant the analytic techniques, they cannot compensate for poor measures” (p. 3). Hence, the importance of this study cannot be overstated, as the PPAQ is used to address the central research questions for this thesis.

The psychometric properties of the PPAQ were evaluated by: (a) testing the reliability for each of the instrument’s subscales, (b) testing the a-priori hypothesised factor structures for each of the instrument’s measurement scales, and (c) demonstrating the equivalency of each measurement scale’s factor structure across the different subgroups of parents, thus providing further evidence of the instrument’s validity and generalisability. Assessing the psychometric properties of the PPAQ was achieved using confirmatory factor analysis (CFA) techniques. CFA serves another important purpose in Study 1, and is discussed next.

In assessing the psychometric properties of the PPAQ, it is important to identify how different groupings of parents may vary on the different factors of the PPAQ. CFA techniques can be used to determine differences in scores on latent variables for different groups, in the same way that $t$ tests can be used to assess group differences in basic inferential statistics. More specifically, Study 1 aims to:

1. Test the psychometric properties of the PPEAS as a measure of three distinct factors (Peer Relations, Medication Attitudes, Helpfulness);
2. Test the psychometric properties of the PBCS as a measure of three distinct factors (Home Environment, Brain Disorder, Child’s Behaviour);
3. Test the psychometric properties of the PSS as a measure of three distinct factors (Family Stress, Individual Stress, Criticisms);
4. Test the psychometric properties of the PSCS as a measure of three distinct multi-dimensional domains of parenting self-concept (Affect, Competency, and Relationship);
5. Test that the factorial integrity of each of the four measurement scales of the PPAQ is maintained when combined;
6. Extend the procedure of the mass CFA introduced in the previous aim to explore if parents’ scores on each subscale of the PPAQ vary according to whether they accept or reject the ADHD diagnosis for their child;

7. Explore if parents’ scores on each subscale of the PPAQ vary, according to whether the child on which the parent is reporting is male or female; and

8. Explore if parents’ scores on each subscale of the PPAQ vary, according to whether or not an official diagnosis of ADHD was given to the child.

Schematic Representation of Factors (Latent Variables) and Their Indicator Variables

In the discussion that follows, several references to factor structures are given when discussing the research aims and hypotheses. Figure 4.1 shows an example of a pictorial representation of a factor structure with the factors and their respective items. In each diagram, an ellipse represents the factor or latent variable, while the rectangles represent the observed variables (i.e., survey items). An arrow radiating out from the factor towards the item indicates that the response given to the item is caused by the factor. Arrows originating from the right hand side represent error measurements. Errors are also assumed to cause or contribute to the observed item score, and are latent variables because they cannot be directly observed. While errors could be represented by ellipses in structural model diagrams, because they are latent variables, it is customary to represent them only by arrows. Curved arrows between factors represent covariation between factors.

A desirable attribute of the subscales of the PPAQ, is that each one is a measure of one, and only one factor (see Chapter 5). To achieve this condition, for each factor structure of the PPAQ, there should be no correlations between the error terms, and no cross loadings (i.e., no item is permitted to load on to more than one factor).
**Statement of the Hypotheses and Research Questions**

*Hypothesis 1.1.1: Reliability of the PPEAS.* Tests of reliability will demonstrate acceptable reliability scores for each of the three subscales of the PPEAS (Helpfulness, Medication Attitudes, and Peer Relations).

*Hypothesis 1.1.2: Factorial structure of the PPEAS.* CFA will demonstrate the three a-priori factor structure of the PPEAS (see Figure 4.2).

*Figure 4.1.* An example of a schematic representation of a factor structure.
Hypothesis 1.1.3: Factorial invariance across parents’ decision to accept/reject the ADHD diagnosis for PPEAS. The factor structure of the PPEAS will be similar for parents/guardians who accept the ADHD diagnosis and those who reject it, as demonstrated by CFA tests of invariance.

Hypothesis 1.1.4: Factorial invariance across child’s gender for PPEAS. The factor structure of the PPEAS will be similar for the parents of both male and female children, as demonstrated by CFA tests of invariance.

Hypothesis 1.1.5: Factorial invariance for whether or not an official diagnosis for ADHD was given for the PPEAS. The factor structure of the PPEAS will be similar for when an official diagnosis of ADHD has been given and when an official diagnosis has not been given (i.e., the parent believes the child qualifies for a diagnosis, but where one has not been sought), as demonstrated by CFA tests of invariance.

Hypothesis 1.2.1: Reliability of the PBCS. Tests of reliability will demonstrate acceptable reliability scores for each of the three factors of the PBCS (Home Environment, Brain Disorder, Child’s Behaviour).
**Hypothesis 1.2.2: Factorial structure of the PBCS.** CFA will demonstrate the three a-priori factor (Home Environment, Brain Disorder, Child’s Behaviour) structure of the PBCS (see Figure 4.3).

![Figure 4.3. Factorial Structure of the PBCS.](image)

**Hypothesis 1.2.3: Factorial invariance across parents’ decision to accept/reject the ADHD diagnosis for PBCS.** The factor structure of the PBCS will be similar for parents/guardians who accept the ADHD diagnosis and those who reject it, as demonstrated by CFA tests of invariance.

**Hypothesis 1.2.4: Factorial invariance across child’s gender for PBCS.** The factor structure of the PBCS will be similar for the parents of both male and female children, as demonstrated by CFA tests of invariance.

**Hypothesis 1.2.5: Factorial invariance for whether or not an official diagnosis for ADHD was given for the PBCS.** The factor structure of the PBCS will be similar for when an official diagnosis of ADHD has been given and when an official diagnosis has not been given (i.e., the parent believes the child qualifies for a diagnosis, but where one has not been sort), as demonstrated by CFA tests of invariance.
**Hypothesis 1.3.1: Reliability of the PSS.** Tests of reliability will demonstrate acceptable reliability scores for each of the three factors of the PSS (Family Stress, Individual Stress, and Criticisms).

**Hypothesis 1.3.2: Factorial structure of the PSS.** CFA will demonstrate the a-priori three factor structure of the PSS (see Figure 4.4).

**Hypothesis 1.3.3: Factorial invariance across parents’ decision to accept/reject the ADHD diagnosis for PSS.** The factor structure of the PSS will be similar for parents/guardians who accept the ADHD diagnosis and those who reject it, as demonstrated by CFA tests of invariance.

**Hypothesis 1.3.4: Factorial invariance across child’s gender for the PSS.** The factor structure of the PSS will be similar for the parents of both male and female children, as demonstrated by CFA tests of invariance.

**Hypothesis 1.3.5: Factorial invariance for whether or not an official diagnosis for ADHD was given for the PSS.** The factor structure of the PSS will be similar for when an official diagnosis of ADHD has been given and when an official diagnosis has not been given (i.e., the parent believes the child qualifies for a diagnosis, but where one has not been sought), as demonstrated by factorial tests of invariance.

*Figure 4.4. Factorial Structure of the PSS.*
**Hypothesis 1.4.1: Reliability of the PSCS.** Tests of reliability will demonstrate acceptable reliability scores for each of the three factors of the PSCS (Affect, Competency, and Relationship).

**Hypothesis 1.4.2: Factorial structure of the PSCS.** CFA will demonstrate the a-priori three factor structure of the PSCS (see Figure 4.5).

![Factorial Structure of the PSCS](image)

*Figure 4.5. Factorial Structure of the PSCS.*

**Hypothesis 1.4.3: Factorial invariance across parents’ decision to accept/reject the ADHD diagnosis for PSCS.** The factor structure of the PSCS will be similar for parents/guardians who accept the ADHD diagnosis and those who reject it, as demonstrated by CFA tests of invariance.

**Hypothesis 1.4.4: Factorial invariance across child’s gender for PSCS.** The factor structure of the PSCS will be similar for the parents of male as for female children, as demonstrated by CFA tests of invariance.

**Hypothesis 1.4.5: Factorial invariance for whether or not an official diagnosis for ADHD was given for the PSCS.** The factor structure of the PSCS will be similar for when an official diagnosis of ADHD has been given and when an official diagnosis has not been given (i.e., the parent believes the child qualifies for a diagnosis, but where one has not been sought after), as demonstrated by CFA tests of invariance.
Research Question 1.5.1: Factorial integrity of the instrument as a whole when all measurement scales are simultaneously administered. To what extent does the factorial integrity of the PPAQ as a whole hold when all four measurement scales are administered in a single sitting?

Research Question 1.6.1: Relation between parents’ acceptance or rejection of the ADHD diagnosis and the factors of the PPEAS. To what extent does parents’ acceptance or rejection of an ADHD diagnosis relate to factors measured by the PPEAS (Helpfulness, Peer Relations, Medication Attitudes)?

Research Question 1.6.2: Relation between parents’ acceptance or rejection of the ADHD diagnosis and the factors of the PBCS. To what extent does parents’ acceptance or rejection of an ADHD diagnosis relate to factors measured by the PBCS (Home Environment, Brain Disorder, Child’s Behaviour)?

Research Question 1.6.3: Relation between parents’ acceptance or rejection of the ADHD diagnosis and the factors of the PSS. To what extent does parents’ acceptance or rejection of an ADHD diagnosis relate to factors measured by the PSS (Family Stress, Individual Stress, Criticisms)?

Research Question 1.6.4: Relation between parents’ acceptance or rejection of the ADHD diagnosis and the factors of the PSCS. To what extent does parents’ acceptance or rejection of an ADHD diagnosis relate to factors measured by the PSCS (Affect, Competency, Relationship)?

Research Question 1.7.1: Relation between child’s gender and the factors of the PPEAS. To what extent will parents’ scores on the PPEAS factors (Helpfulness, Peer Relations, Medication Attitudes) vary according to the child’s gender?

Research Question 1.7.2: Relation between child’s gender and the factors of the PBCS. To what extent will parents’ scores on the PBCS factors (Home Environment, Brain Disorder, Child’s behaviour) vary according to the child’s gender?

Research Question 1.7.3: Relation between child’s gender and the factors of the PSS. To what extent will parents’ scores on the PSS factors (Family Stress, Individual Stress, Criticisms) vary according to the child’s gender?

Research Question 1.7.4: Relation between child’s gender and the factors of the PSCS. To what extent will parents’ scores on the PSCS factors (Affect, Competency, Relationship) vary according to the child’s gender?
Research Question 1.8.1: Relation between whether or not an official diagnosis of ADHD was given to the child and the factors of the PPEAS. To what extent will parents’ scores on the PPEAS factors (Peer Relations, Medication Attitudes, Helpfulness) vary according to whether or not the child has an official diagnosis of ADHD?

Research Question 1.8.2: Relation between whether or not an official diagnosis of ADHD was given to the child and the factors of the PBCS. To what extent will parents’ scores on the PBCS factors (Home Environment, Brain Disorder, Child’s Behaviour) vary according to whether or not the child has an official diagnosis of ADHD?

Research Question 1.8.3: Relation between whether or not an official diagnosis of ADHD was given to the child and the factors of the PSS. To what extent will parents’ scores on the PSS factors (Family Stress, Individual Stress, Criticisms) vary according to whether or not the child has an official diagnosis of ADHD?

Research Question 1.8.4: Relation between whether or not an official diagnosis of ADHD was given to the child and the factors of the PSCS. To what extent will parents’ scores on the PSCS factors (Affect, Competency, Relationship) vary according to whether or not the child has an official diagnosis of ADHD?

Rationale for the Hypotheses and Research Questions

Rationale for Hypotheses 1.1.1–1.1.5 (Reliability, factor structure, and invariance testing of the PPEAS). A review of the literature shows that children with the ADHD label have greater social problems that adversely affect their peer relations, compared with children who do not have the ADHD label (Frederick & Olmi, 1994). This is a valid concern for parents, hence the inclusion of a subscale to measure parental concerns with regard to their child’s peer relations. The items relating to peer relations have been adapted from the Self Description Questionnaire I (SDQ I), developed by Marsh (1990), which has excellent psychometric properties when administered to children. The items in this research were administered to the parents of children who display ADHD-type behaviours, and hence, were modified accordingly. It is anticipated that the modified items are likely to display similar...
psychometric properties to that of the SDQ I. Indeed, sound psychometric properties
for this subscale of the PPEAS have been demonstrated previously (Dillon, 2009).

The other two subscales of the PPEAS relate to medication and parents’
reported helpfulness of the ADHD diagnosis. Given the importance (and
controversy) regarding stimulant medication when discussing ADHD (H. Glasser,
2005; Kean, 2006), three survey items were introduced to assess parents’ opinions of
this treatment modality. Finally, given that critics of the medical model of ADHD
have suggested that the ADHD diagnosis enables parents to accept their child’s
problematic behaviour more easily (i.e., behaviours are seen as being caused by a
medical condition, rather than a lack of effective parenting; see Chapter 2), four
items pertaining to parents’ perceived helpfulness of the ADHD diagnoses have been
included as part of the PPEAS. The measures of parents’ opinions of medication, and
perceived helpfulness of the ADHD diagnosis, have previously been shown to
possess psychometrically sound properties (Dillon, 2009). On this basis, it is
hypothesised that the PPEAS will possess sound psychometric properties when used
for the sample in this investigation.

Rationale for Hypotheses 1.2.1–1.2.5 (Reliability, factor structure, and
invariance testing of the PBCS). Elucidating what parents believe causes ADHD
behaviours is one of the core aims of this research. Faraone and Biederman (2000)
have suggested that beliefs about the causes of ADHD significantly influence how
ADHD behaviours are dealt with (see Chapter 2). Further, parents are exposed to the
view that ADHD has a biological cause (e.g., Barkley, 2006a), as well as a view that
it is a condition that arises from essentially non-biological factors (e.g., Breggin,
2002). While parents are asked if they accept or reject the medical conceptualisation
of ADHD, determining more specifically what parents believe to be the causes of
ADHD-type behaviours, is likely to provide more insight into what parents believe
in this regard. The PBCS uses items based on those developed by Dryer, et al. (2006)
when using a principal components analysis to summarise parents’ beliefs of the
causes of ADHD. Although CFA (the factor analysis technique used in this research)
is statistically different from that used by Dryer et al., it is still expected that a valid
factor structure (similar to that achieved by Dryer et al.) will be achieved for the
sample used in this research. It is therefore hypothesised that the PBCS will possess
sound psychometric properties when used for the sample in this investigation.
Rationale for Hypotheses 1.3.1–1.3.5 (Reliability, factor structure, and invariance testing of the PSS). Johnston and Mash (2001) have suggested that while there is an association between parenting and family stress with having a child with ADHD, an understanding of how the association functions is not well understood. While there are scales available that attempt to measure stress or impact on families with a child with chronic illness, there are none that I am aware of that seek to measure these concepts in relation to having a child with ADHD. Further, while past studies on families with children with ADHD have mostly focused on families where the diagnosis was accepted, this study includes families who have not accepted the ADHD diagnosis, thereby providing an important comparison group.

To measure those aspects of a parent’s stress response that relate to having a child with ADHD, a CFA previously conducted on the PSS has shown the proposed three factor model to be psychometrically sound in terms of reliability, factorial validity, and invariance (Dillon, 2009). It is therefore hypothesised that the PSS will possess sound psychometric properties when used for the sample in this investigation.

Rationale for Hypotheses 1.4.1–1.4.5 (Reliability, factor structure and invariance testing of the PSCS). To study the relation between parents’ self-concept family functioning where one or more child family members have ADHD, Johnston and Mash (1989) have used a two-factor measure of parenting self-concept. The two factors of this scale are efficacy and satisfaction. The present research capitalises on recent developments in self-concept theory which suggest that a multidimensional conceptualisation of the self-concept has greater predictive strength over varying outcomes (Marsh, Hau, & Kong, 2002). Subsequently, the PPAQ presents the parenting self-concept as a multi-dimensional (as opposed to a unidimensional or bi-dimensional) construct comprised of three factors, thereby providing a more comprehensive measure of the parental self-concept than has been used previously. The factor of satisfaction used by Johnston and Mash (1989) has been expanded in the PSCS to measure the factors of Affect and Relationship, while their efficacy factor relates to the Competency factor of the PSCS.

A CFA of a pilot sample of parents who completed the PSCS (Dillon, 2009) has shown the proposed three factor model for parenting self-concept to be psychometrically sound in terms of reliability, factorial validity, and invariance. It is
therefore hypothesised that the PSCS will possess sound psychometric properties when used for the sample in this investigation.

Rationale for Research Question 1.5.1 (Factorial integrity of the survey instrument when all measurement scales are administered in one sitting). It is anticipated that for each measurement scale of the PPAQ, a CFA analysis will demonstrate the hypothesised factor structure for that scale, where individual items load only on to the factors they are intended to measure. While each of the four measurement scales may prove to have good psychometric properties when administered individually (as hypothesised in Hypotheses 1.1.1 to 1.4.5), it is possible that psychometric soundness may be compromised when all four measurement scales are administered in one sitting. For example, survey items may load on to more than one factor, error terms may correlate, or excessively high correlations between factors of different measurement scales may emerge. All of these problems are a threat to a measurement scale’s construct validity (Hair et al., 2006). Hence it is necessary to see how the individual measurement scales and their subscales behave when combined. As such, a research question was posed to explore this issue.

Rationale for Research Question 1.6.1: Relation between parents’ acceptance or rejection of the ADHD diagnosis and the factors of the PPEAS. Researchers have commented that parents who accept the ADHD diagnosis for their child are more likely to report that: (a) their child experiences negative peer relations (Frederick & Olmi, 1994; Stormont, 2001), (b) medication is an appropriate treatment for ADHD (Graham, 2008), and (c) acceptance of the ADHD diagnosis was helpful for them (Smelter, et al., 1996). Each of these three areas of interest relates to a factor of the PPEAS and is explored in the following three paragraphs.

The PPAQ directly asks parents if they accept or reject the ADHD diagnosis for their child. This could be considered the behavioural response arising from the cognitive component of their decision to accept or reject. To further explore parents’ acceptance or rejection of the ADHD diagnosis for their child, the PPEAS includes a subscale that may be considered to relate to the affect component associated with both the behavioural and cognitive components of parents’ decision. This subscale focuses on whether or not parents find the diagnosis helpful for them and whether they experienced a sense of relief when they considered the diagnosis for their child. Given that humans strive for consistency amongst their cognitions and behaviours
(Aronson, 2004; Burns, 1992), perhaps a parent’s acceptance of the ADHD diagnosis will correlate with their experiences in finding the diagnosis helpful for them. However, this relation between the cognitive and affective components of parents’ acceptance or rejection of the ADHD diagnosis has not been previously researched; hence, a research question was posed to explore this issue.

ADHD researchers have suggested that children with ADHD experience more problems with their peer relations than children who do not have ADHD (e.g., Barkley, 2006a; Hoza, 2007; Tur-Kaspa, 2005). However, there is no research available which explores the degree to which parents’ acceptance or rejection of the diagnosis varies with their perceptions of peer relational difficulties for their children – hence the necessity of posing a research question to examine this issue.

D. Cohen (2006) observes that ADHD as a medical diagnosis, and the prescription of stimulant medication, are inseparable phenomena. This is not surprising, considering that if parents believe ADHD to be a medical condition, then a medical treatment would be the most likely sought after treatment. Further, the research findings of Sobol, Ashbourne, Earn, and Cunningham (1989) suggest that medication may be the preferred option for parents who hold attributions that emphasise uncontrollable factors to explain their child’s ADHD-type behaviour (e.g., behaviour is caused by a medical illness). Perhaps then, parents who accept the ADHD diagnosis for their child will be more likely to accept medication as an appropriate treatment for their child’s ADHD behaviours. While the relation between acceptance of a medical diagnosis to explain children’s behaviour and acceptance of a medical intervention (i.e., medication) has intuitive appeal, no research has been conducted to explore this relation: hence, a research question was posed to elucidate this issue.

In sum, given the paucity of research exploring parents’ perceptions of ADHD in regard to the three subscales of the PPEAS, it was not possible to state directional hypotheses. Hence, a series of research questions were posed to explore the relations among the constructs of interest (Helpfulness, Peer Relations, Medication Attitudes) with parents’ acceptance or rejection of the medical diagnosis of ADHD.

**Rationale for Research Question 1.6.2: Relation between parents’ acceptance or rejection of the ADHD diagnosis and the factors of the PBCS.** This hypothesis is almost tautological in the sense that ADHD is the term typically used
to describe a set of behaviours believed to be caused by a medical condition (see Chapter 2). As discussed in Chapter 2, what a parent believes causes ADHD-type behaviours, may influence their response in terms of acceptance or rejection of the ADHD diagnosis and the subsequent treatment options (Faraone & Biederman, 2000; Johnston & Freeman, 1997). For example, parents who believe that their child’s behaviours are due to a medical condition (i.e., is biological in nature) may more readily accept the medical label most commonly used to describe those behaviours – namely, ADHD. Conversely, those parents who acknowledge the behaviours, yet believe that those behaviours are not due to a medical condition and believe it to be more psychosocial in nature, may be less likely to accept the medical explanation of ADHD. Given the limited research examining parents’ beliefs about the causes of ADHD and their acceptance or rejection of the diagnosis, a research question was posed to test the extent of the relations between the subscales of the PBCS (Home Environment, Brain Disorder, Child’s Behaviour) with parental acceptance or rejection of the diagnosis.

Rationale for Research Question 1.6.3: Relation between parents’ acceptance or rejection of the ADHD diagnosis with the factors of the PSS. Given the hypothesised relation between self-concept and stress (see Chapter 3), it can be expected that just as a parent’s decision to accept or reject a diagnosis of ADHD may be related to their self-concept, the decision may also be related to their experiences of stress. Some studies have demonstrated increased levels of stress for parents of hyperactive children (e.g., Biederman, 2005; Fischer, 1990). Other research, such as that undertaken by Johnston and Mash (2001) has suggested that having a child with ADHD is associated with increased levels of parenting stress, though they have also noted that there are inconsistencies and uncertainty in this area. Therefore, given that the previous research findings are inconclusive, a research question was posed to explicate whether relations between parents’ acceptance or rejection of the ADHD diagnosis with the factors of the PSS, are apparent.

Rationale for Research Question 1.6.4: Relation between parents’ acceptance or rejection of the ADHD diagnosis with the factors of the PSCS. The notion that acceptance of the ADHD diagnosis may be linked to maintaining a positive self-concept was discussed in Chapter 3. More specifically, Mash and Johnston (2001) have noted that, given the difficulties in families of children with ADHD, “it is reasonable to ask how these parents view themselves as parents”
(2001, p. 194). How parents view themselves as parents relates to their parenting self-concept. Further, Mash and Johnston (1983) have suggested that the presence of ADHD in children is associated to varying degrees with reduced parenting self-esteem. As mentioned in Chapter 3, Smelter, et al. (1996) have suggested that when a parent takes their child to the doctor, they may wish to come away with a diagnosis of ADHD because it meets their needs more than it does those of the child. The needs of the parents referred to may also relate to the parents’ self-concept needs. Specifically, critics of the medical model of ADHD have suggested that acceptance of the ADHD diagnosis may help protect a parent’s self-concept by enabling them to believe that their child’s ADHD-type behaviours are due to a medical condition (which is beyond the child’s control) as opposed to their parenting practices (see Chapter 3). Given that previous research has not elucidated this issue, a research question was posed to test the extent of the relations between the subscales of the PSCS (Affect, Competency, and Relationship) and parental acceptance or rejection of the diagnosis.

**Rationale for Research Questions 1.7.1–1.7.4: Relation between child’s gender with the factors of the PPAQ.** ADHD is more common amongst boys, the reasons of which are not fully known (Barkley, 2000). Further, Biederman et al. (2002) report that girls with ADHD are less likely to manifest problems both in and out of school. Given these gender differences, it is worth exploring if parents vary on the constructs measured by the PPAQ (e.g., stress, beliefs) depending on whether their child is a boy or girl. Given research into parents’ perceptions and experiences of ADHD has not explored whether differential effects for gender of child are present, a research question was posed in order to explore the extent to which parents’ experiences based on the gender of their child varies across the different factors measured by the PPAQ (refer to Table 4.1 for a list of all 12 subscales of the PPAQ).

**Rationale for Research Questions 1.8.1–1.8.4: Relation between official diagnosis of ADHD and the factors of the PPAQ.** A concern for this research was that families for which an official diagnosis was given to their child, may have different experiences to those families where an official diagnosis was not given to their child. After an exhaustive search of the literature, I have not been able to find any literature that compares characteristics of parents whose child has an official diagnosis of ADHD with parents whose child does not have an official diagnosis.
Hence, a research question was posed to explore the extent to which parents of children with an official diagnosis differ from those parents whose children do not have an official diagnosis, across the different factors measured by the PPAQ (refer to Table 4.1 for a list of all 12 subscales of the PPAQ).

Summary

The importance of using a psychometrically sound survey instrument in social research is well recognised. Few researchers would entertain the idea of using survey instruments they did not believe were capable of accurately measuring the variables of interest needed to address a study’s research questions. For this study, research questions and hypotheses were developed to investigate the psychometric properties of the PPAQ. The PPAQ consists of four measurement scales that comprise 12 subscales, with each measurement scale being separately assessed for reliability, structural validity, and invariance. In addition, a hypothesis was proposed to ensure that the psychometric integrity of the four measurement scales is maintained, when administered as a single test battery. Finally, sets of hypotheses and research questions were proposed, to explore group differences across all factors of the PPAQ.

Study 2: Predicting a Parent’s Decision to Accept or Reject a Diagnosis of ADHD for Their Child

Having assessed the psychometric properties of the PPAQ and explored group differences across its factors, Study 2 seeks to explore whether it is possible to make predictions regarding parents’ acceptance of the ADHD diagnosis for their child as well as their perceived helpfulness of the diagnosis. This section proposes a set of research questions to determine what factors measured by the PPAQ can be used to predict parents’ acceptance or rejection of the ADHD diagnosis as well as their perceived helpfulness of the diagnosis. A set of research aims is provided, followed by a set of research questions to address these aims. The section finishes with a set of rationales for the research questions.
Aims

Study 2 aims to elucidate the extent to which:

1. Peer and Medication factors of the PPEAS can be used to predict whether parents will accept or reject the ADHD diagnosis as an explanation for their child’s behaviour and whether they find acceptance of the diagnosis helpful;
2. Factors of the PBCS can be used to predict whether parents will accept or reject the ADHD diagnosis as an explanation for their child’s behaviour and whether they find acceptance of the diagnosis helpful.
3. Factors of the PSS can be used to predict whether parents will accept or reject the ADHD diagnosis as an explanation for their child’s behaviour and whether they find acceptance of the diagnosis helpful; and
4. Factors of the PSCS can be used to predict whether parents will accept or reject the ADHD diagnosis as an explanation for their child’s behaviour and whether they find acceptance of the diagnosis helpful.

Statement of the Research Questions

Research Question 2.1.1: Can the PPEAS be used to predict parents’ acceptance of the ADHD diagnosis? To what extent can the factors relating to parental beliefs about peer relationships and the appropriateness of medication as a treatment for ADHD be used in an SEM path analysis to predict parents’ acceptance or rejection of the ADHD diagnosis?

Research Question 2.1.2: Can the PPEAS be used to predict whether parents find the ADHD diagnosis helpful? To what extent can the factors relating to parental beliefs about peer relationships and the appropriateness of medication as a treatment for ADHD be used in an SEM path analysis to predict whether parents find the ADHD diagnosis helpful for them?

Research Question 2.2.1: Can the PBCS be used to predict parents’ acceptance of the ADHD diagnosis? To what extent can factors of the PBCS be used in an SEM path analysis to predict parents’ acceptance of the ADHD diagnosis?

Research Question 2.2.2: Can the PBCS be used to predict whether parents find the ADHD diagnosis helpful? To what extent can factors of the PBCS be used in an SEM path analysis to predict if parents find the ADHD diagnosis helpful for them?
**Research Question 2.3.1:** Can the PSS be used to predict parents’ acceptance of the ADHD diagnosis? To what extent can factors of the PSS be used in an SEM path analysis to predict parents’ acceptance or rejection of the ADHD diagnosis?

**Research Question 2.3.2:** Can the PSS be used to predict whether parents find the ADHD diagnosis helpful? To what extent can factors of the PSS be used in an SEM path analysis to predict if parents find the ADHD diagnosis helpful for them?

**Research Question 2.4.1:** Can the PSCS be used to predict parents’ acceptance of the ADHD diagnosis? To what extent can factors of the PSCS be used in an SEM path analysis to predict parents’ acceptance or rejection of the ADHD diagnosis?

**Research Question 2.4.2:** Can the PSCS be used to predict whether parents find the ADHD diagnosis helpful? To what extent can factors of the PSCS be used in an SEM path analysis to predict if parents find the ADHD diagnosis helpful for them?

**Rationale for Research Questions for 2.1.1–2.4.2**

Despite ADHD being considered one of the most well-researched psychiatric disorders in children, and despite recognition that the diagnosis is controversial (Mayes, et al., 2009), considerably less research has been conducted on what factors influence parents to accept or reject the diagnosis when recognising that their child displays ADHD-type behaviours. While some researchers (e.g., Johnston & Freeman, 1997) have explored parents’ experiences with children for whom a diagnosis is accepted, there is little or no literature that compares parents who accept the diagnosis with those who reject the diagnosis when they have a child who displays ADHD-type behaviours.

The research hypotheses and questions of Study 1 were posed to explore the relations amongst a range of variables relating to the psycho-social characteristics and beliefs of parents (e.g., stress and parenting self-concept). In that study, correlations between pairs of variables are examined. While correlations between pairs of variables provide useful information, additional valuable information can be gained when sets of variables (i.e., two or more variables) are incorporated in a structural equation model and used to predict an outcome variable. The predictive
relations amongst variables of the PPAQ have not been explored in previous research, hence research questions were posed to explicate this issue in Study 2.

Study 3: Qualitative Evaluation of Parents’ Experience With a Child With ADHD

The Problem

What are parents’ beliefs in relation to the nature of and causes of ADHD? What are the issues parents are concerned about when told that their child has ADHD? What factors influence their response? What influences parents’ decisions to either accept or reject a diagnosis of ADHD and medical treatment? What do parents perceive as the role of health professionals in helping parents with a child who displays ADHD-type behaviours? What do health professionals perceive as factors that influence parents’ responses to an ADHD diagnosis? What do health professionals perceive as key factors influencing parents’ decision to accept or reject the ADHD diagnosis?

Aims

Study 3 aims to elucidate:

1. Parental perceptions of the nature and causes of ADHD-type behaviours;
2. Parental perceptions of factors that influence their decision to accept or reject a diagnosis of ADHD;
3. Parental perceptions of the process engaged in when their child displays ADHD-type behaviours;
4. Parental perceptions of the role of health professionals in helping parents of children who displays ADHD-type behaviours;
5. Parental perceptions of when and if medication should be offered as a treatment for children;
6. Health professionals’ perceptions of their actions and responses when a parent or teacher expresses concern about a child who display ADHD-type behaviours; and
7. Health professionals’ perceptions of relevant factors that influence parents to accept or reject a diagnosis of ADHD and parents’ responses to medicate.
8. Health professionals’ opinions on the use of medication to manage children with ADHD.
Statement of the Research Questions

Research Question 3.1.1: What do parents perceive ADHD to be?

Research Question 3.1.2: What do parents perceive as the factors that contribute to or cause ADHD-type behaviours in children?

Research Question 3.2.1: What factors influence a parent’s decision to accept or reject a diagnosis?

Research Question 3.3.1: What is the typical process for parents and their children when their child displays ADHD-type behaviours?

Research Question 3.4.1: What do parents perceive as the role of doctors/psychologists/school counsellors/teachers in helping parents and their families when there is a child who displays ADHD-type behaviours?

Research Question 3.5.1: What are parents’ perceptions of when and if medication should be offered as a treatment for children?

Research Question 3.6.1: What do health professionals do initially when a parent or teacher expresses concern about a child who displays ADHD-type behaviours?

Research Question 3.7.1: What do health professionals think are the relevant factors that influence parents to accept or reject a diagnosis?

Research Question 3.7.2: What do health professionals think are the relevant factors that influence parents to accept or reject medication as a treatment?

Research Question 3.7.3: What do professionals believe causes ADHD or contributes to the rise in ADHD diagnoses?

Research Question 3.8.1: What are the professionals’ views/practices with regard to medication?

Chapter Summary

This chapter has presented statements of the problem, aims, hypotheses, research questions, and their rationales, for each of the three studies that comprise the present investigation. Given the diversity of issues in this investigation, as well as the limitations of relying on a single method design (i.e., either a quantitative approach or a qualitative approach), a mixed methods design was adopted to address the investigation’s overarching aims. The next chapter presents the methodology employed in each of the three studies comprising the present investigation.
CHAPTER 5

METHODOLOGY

“The exploratory nature of research, the complexities of the phenomena studied in social science, and the limitations within methods means that there are occasions when a phenomenon cannot be described in its entirety using a single method.” (Morse & Niehaus, 2009, p. 15)

Introduction

This research used three related studies to address the research hypotheses and research questions outlined in Chapter 4. The three studies together form a mixed-methods research design, with the first two studies being quantitative in nature, and the third being a qualitative study. The aims of the three studies have been described in detail in Chapter 4, but are recapped briefly here as follows:

Study 1: This study has two aims. The first aim is to investigate the psychometric properties of a newly developed survey instrument – the Parents'/Guardians’ Perceptions of ADHD Questionnaire (PPAQ). The second aim follows from the first aim and examines group differences. The participants of this study were grouped according to the following three criteria: (a) whether parents accept or reject the ADHD diagnosis for their child, (b) whether the child on which the parent is reporting is male or female, and (c) whether or not an official diagnosis was given to the child.

Study 2: This study follows closely from Study 1 and uses advanced statistical techniques to address the hypotheses and research questions posed for Study 2. Specifically, the PPAQ is used to investigate whether a set of predictor variables (comprising varying psychological constructs of the parents) can be used to predict a set of outcome variables (e.g.; parents’ acceptance or
rejection of ADHD as a medical diagnosis, and whether they find the diagnosis helpful).

Study 3: While the strengths of the survey methods and statistical techniques applied to the data collected via surveys are well recognised, there are some limitations to these quantitative techniques (discussed later in this chapter) that can be addressed using qualitative methods. For Study 3, structured interviews with relevant stakeholders (parents and professionals) were undertaken to provide rich insights into parents’ perceptions of the nature and causes of ADHD and issues facing parents of children displaying ADHD-type behaviours. Hence, Study 3 was designed to enrich the findings from Study 2 and to expand upon the results.

The purpose of this chapter is to describe the methodology used for each study. Firstly, a justification for the methodological approach taken, (i.e., why a mixed-methods design was used) is presented. Secondly, the methodological issues common to all three studies are presented. Finally, methodological issues relating to each of the three studies are examined for each study separately.

Mixed-Methods Design

What is a Mixed-Methods Design?

Denzin (1978) describes the combination of methodologies (e.g., a quantitative and a qualitative methodology) to study the same phenomenon as a mixed-methods design. Mixed-methods designs are increasingly espoused as important to the development of sound research findings and interpretations of component data (Marsh, Martin, et al., 2006). When research is intended to serve multiple audiences (e.g., parents, health professionals, teachers), as is the case here, Mertens (2005) suggests that a mixed-methods approach is most appropriate. Further, for topics of a complex and sensitive nature (such as ADHD and parenting), a combination of qualitative and quantitative techniques is useful for investigating the beliefs, opinions, and practices of participants. The rationale for using a mixed-methods approach is conveniently summarised by Greene (2007):

A mixed methods way of thinking is a stance or orientation . . . that is rooted in a multiplistic mental model and that actively invites to participate
in dialogue . . . multiple ways of seeing and hearing, multiple ways of making sense of the social world, and multiple standpoints . . . A mixed methods way of thinking rests on the assumptions that there are multiple legitimate approaches to social inquiry and that any given approach to social inquiry is inevitably partial. Moreover, social phenomena are extraordinarily complex. (p. 20)

Choosing a Mixed-Methods Design

Several typologies (i.e., types) of mixed-methods research designs are available to choose from (see Tashakkori & Teddlie, 2003). The typology used in this research is the sequential explanatory design which, as described by Hanson, Creswell, Clark, Petska, and Creswell (2005) is where quantitative data are collected then analysed, followed by the collection of qualitative data, and where the qualitative data are usually used to augment the quantitative data. This typology is similar to the convergence model described by Creswell and Clark (2007), where the results from each data collection are compared and contrasted during interpretation, with the aim of arriving at valid and well-substantiated conclusions about a single phenomenon.

The Advantages of Combining Quantitative and Qualitative Methods

Within the quantitative paradigm, advanced modern statistical techniques have a tremendous advantage over other inferential statistical techniques. However, despite these advantages, even carefully designed quantitative research methodologies can be plagued by deficiencies. For example, contextual factors such as the sensitivity of the subject matter of the survey instrument, the literacy skills of the participant, the inherent limitations of survey items in eliciting participants’ true opinions, insufficient sample size, or unfamiliarity of participants with survey instruments, all impact on the integrity of the data that are collected and analysed, and the subsequent validity of the interpretation given to the data. “Qualitative data, it is argued, can redress that imbalance by providing contextual information” (Guba & Lincoln, 1994, p. 106).

The use of mixed methods in conducting research is also referred to as triangulation by some researchers (e.g., Mathison, 1988; Webb, Campbell, Schwartz, & Sechrest, 1966). According to Mathison (p. 15), “The value of triangulation lies in
providing evidence such that the researcher can construct explanations of the social phenomena from which they arise.” Further, Sechrest and Sidani (1995) argue that quantitative and qualitative approaches are complementary, and that good science is “characterised by methodological pluralism” (p. 77). While predominantly quantitative or qualitative research paradigms have traditionally dominated the research landscape, the mixed methods paradigm has become so well accepted that it is now recognised as the “third wave” in research designs (Johnson & Onwuegbuzie, 2004, p. 17). In this research, statistical analyses of survey responses were conducted in conjunction with an analysis of qualitative data derived from interviews with parents and health professionals to gain a richer and pluralistic insight into parents’ perceptions of the nature and causes of ADHD and the decision-making process of parents with children who display ADHD-type behaviours.

The discussion thus far in this section has noted that utilising a qualitative approach within a research design can help address some of the limitations associated with quantitative methods. However, it is well recognised that qualitative methods also have limitations. For example, they have been criticised on the grounds that they are less objective than quantitative methods and are subject to more bias or misuse. Each methodological approach has its own strengths and weaknesses (see Johnson & Onwuegbuzie, 2004). As such, the purpose of this discussion is not to elevate one research method above the other, but to demonstrate the advantages of a mixed-methods approach in addressing a set of research questions. It is expected that findings from all three studies will complement each other, even perhaps providing findings that are mutually exclusive or apparently contradictory. Where the latter occurs, tentative explanations for the findings will be offered. On the matter of contradictory findings, Mathison (1988) asserts that the method of triangulation rarely provides a clear path to a singular view, with contrary and contradictory findings being common. She further adds that by expecting that triangulation will result in a singular valid proposition, researchers look for the convergence of evidence and miss the greater value of triangulation (i.e., identifying diverse findings). The appropriate use of qualitative techniques for this research is discussed later in this chapter when discussing Study 3.

In sum, the use of multiple methods in research can contribute to methodological rigour (Patton, 2002), by creating synergistic research where one method (i.e., quantitative or qualitative) enables the other to be more effective
Mixed-methods designs aim to draw strengths from quantitative and qualitative designs, thereby minimising the limitations associated with single-design methodologies (Johnson & Onwuegbuzie, 2004). More specifically, while this research capitalises on state-of-the-art statistical techniques, it also recognises that interviewing a sample of parents and health professionals will provide rich insights into the experiences of parents that are not easily captured using quantitative methods.

**Research Participants and Recruiting Procedures**

**Ethical Considerations**

Before approaching potential participants for this research, ethics approval was required from the University of Western Sydney (UWS) Human Research Ethics Committee. Approval was obtained by completing a National Ethics Application Form and submitting it to the committee. Once ethics approval was obtained from UWS, the New South Wales Department of Education and Training (DET) was also approached to seek permission to distribute letters of invitation to schools, to give to the students to take home to their parents.

**Participants**

A focus of this research is to examine the personal views and experiences of parents who have children who display ADHD-type behaviours sufficiently that they would qualify for a diagnosis of ADHD. To ascertain this information, parents were invited to complete either an online version of the survey instrument, or a paper version. The majority of parent participants completed surveys (98%) online, with the remainder choosing to complete the paper version of the survey.

Typically, parents come into contact with professionals when considering the possibility that their child qualifies for the diagnosis of ADHD. Sometimes parents will seek the advice of a health professional themselves (e.g., general practitioner, psychologist); alternatively, other professionals (e.g., teacher, school counsellor) may approach the parent. As professionals are often instrumental in helping parents reach their decision (in either accepting or rejecting the diagnosis), their insights can be helpful when seeking to understand what factors influence parents in their beliefs and decision-making process. Hence, professionals (paediatricians and school
counsellors) were also invited to participate in this research by participating in a structured interview.

Recruiting Procedures for Parents

While the prevalence estimates for ADHD vary widely, estimates typically are less than ten percent. Such a low prevalence rate immediately highlights the difficulty of obtaining a sufficient number of participants for the purposes of this research. To address this, several methods of recruitment were utilised in this investigation; these are discussed in the following section.

Distributing letters to students of DET schools to take home. Once DET ethics approval was received, public schools (both primary and secondary) were selected on the basis of geographic location (attempts were made to draw a representative sample of schools from all 10 DET regions within NSW) and student population of the school (schools with 500 or more students were preferred in the distribution of letters; smaller schools were included in a second distribution of letters). Of the 83 school principals approached by a letter of invitation (see Appendix B), 71 agreed to participate. Principals distributed an invitation to participate in the study, based on informed consent, to school counsellors (see Appendix C) and teachers, who distributed parental permission letters to students (see Appendix D). Although it was expected that ADHD would be a relevant issue for less than 10% of the children in a given school, DET suggested that a letter be provided for every family. To give a letter only to those families for which ADHD was known to be a relevant issue was problematic, for two reasons. Firstly, we did not wish any family to feel they were being singled out or targeted because their child was known to display ADHD-type behaviours, and secondly, it could not be assumed that the schools knew all families for whom ADHD was a relevant issue.

A total of 44,000 letters to parents were sent out to 83 NSW public schools. To monitor participation, principals were contacted, to answer any questions and to ascertain whether or not their school was agreeable to participating by distributing letters to school counsellors and parents. Parents completed either an online version of the survey or contacted the researcher to obtain a paper copy of the survey. Parents were also asked to indicate whether or not they would be willing to engage in a telephone interview about their perceptions and experiences of ADHD.
Throughout the data collection phase, the number of online completed surveys, as well as requests for paper copies and subsequent return of completed paper copies, was monitored very closely. It was confidently determined that the response rate was very low. Working on the assumption that 10% of families were eligible for participation (and this figure is at the upper limit of most estimates), than it can be expected that a maximum of 4,400 families would have been eligible to participate. By monitoring the completions of the web-based version of the survey, best estimates suggested that a maximum of 70 surveys were completed by parents who received a letter from school. That is, less than 2% of eligible families completed the survey.

Advertising on Internet sites and family magazines. A small advertisement (Appendix E) was placed in two parenting magazines (*Sydney’s Child* and *Perth’s child*), each of one month’s duration. This latter magazine was chosen because Perth is known to have a very high rate of children diagnosed with ADHD (Baughman & Hovey, 2006; M. Whitely, 2010). Similarly to problems with accessing schools, it was not possible to determine how many people completed the survey because they saw the advertisement. However, again, based on the number of completions (both electronically and in paper format) during the time that the advertisements were running, it can be assumed that the response rate was very low.

There are many Internet sites within Australia that have been developed to provide advice and resources to families on parenting. In addition, some of these websites are devoted specifically to providing advice and information about ADHD. Approximately 20 of these sites were approached, with several agreeing to place information about the research on their websites. In addition, a request was placed in an ADHD group on Facebook, thereby potentially attracting participants from overseas. Finally, an honours student assisting with this research also placed an advertisement on several websites for fathers. Again, using the Internet yielded a low response rate.

Placing flyers in the offices of health professionals. An A4 sized flyer was developed and sent to chiropractors and general practitioners. Chiropractors were selected because some chiropractors claim that they are able to assist in dealing with ADHD-type behaviours. Many Divisions of General Practice in NSW were approached with the request that they send general practitioners the flyer. Three divisions were able to assist, thus enabling flyers to be sent to 450 general practices
throughout NSW. Once these practices received the flyer, it was not possible to determine how many chose to display the flyer in their office. Further, for those practices where a flyer may have been displayed, it was not possible to determine how many people completed the survey because they saw the flyer in waiting room of the general practice.

The Paediatrics and Child Health Division of The Royal Australasian College of Physicians was also approached. Although it is not their policy to distribute literature to paediatricians for research purposes, they do distribute a weekly electronic newsletter to paediatricians throughout Australia. This newsletter is circulated to 2,836 people, including Paediatric Fellows and trainees, and some College staff members. A request for assistance was placed in the newsletter and sent out for five consecutive weeks. During this time, six paediatricians volunteered to help, with the result that multiple copies of the flyer were sent to these paediatricians. Similarly to the experience with general practitioners, it was not possible to determine how many parents completed the survey because they saw the flyer in the waiting room of a paediatrician’s practice.

Organisations dealing specifically with children with learning difficulties.

Learning Links is an organisation that assists children who have learning disabilities, difficulties, and developmental delays. This organisation was supportive of this research and agreed to promote it at their learning centres by distributing flyers to parents.

Media exposure. By monitoring the number of completions on the web-based version of the survey, as well as the returned completed paper versions, it was possible to determine how many surveys were being completed. On average, between two and three surveys per day were being completed. After approximately six weeks of promoting the survey, a media campaign was launched. This initially included several newspaper stories and two radio interviews. The response rate increased dramatically, with approximately 10 to 20 surveys being completed daily. This rate would typically last for three or four days after the media exposure, with most responses occurring within the first 24 hours.

In addition to the radio and newspaper exposure, I was interviewed on the television Channel Ten morning show 9am With David and Kim. While the show is produced in Melbourne, the interview was conducted in the Sydney studio. Within the next 48 hours, close to 200 surveys were completed online, thus demonstrating
that the television interview was by far the most effective means of attracting eligible participants.

**Recruiting Procedures for Professionals for the Qualitative Component (Study 3)**

*School counsellors.* A letter explaining the research was sent to the counsellor of each school, along with a consent form seeking their consent for participation in a 15 minute phone interview. Of the 83 letters for counsellors that were distributed, three returned the consent form. These counsellors were phoned and an interview arranged.

*Paediatricians.* Of those paediatricians who volunteered their assistance by displaying a flyer in their practice, an email was sent asking if they would like to participate in a 15 minute phone survey. Of the six paediatricians approached, five agreed to an interview.

**Study 1: Psychometrics, Equivalence, and Between Group Differences**

*Overview*

This section commences with a discussion of the design and development of the PPAQ, followed by a description of the essential first stage of data analyses (i.e., data screening, tests for reliability and unidimensionality). These techniques were utilised for conducting preliminary data analyses deemed necessary for assessing the psychometric properties of the PPAQ. The advanced statistical technique of confirmatory factor analysis (CFA) is introduced next, to describe the specific analytical methods for assessing the psychometric properties of the PPAQ. Two important applications of CFA are the identification of group differences (e.g., Do the parents of boys with ADHD possess more positive self-concepts than the parents of girls with ADHD?), and the identification of relations amongst latent variables (e.g., is level of stress significantly correlated with parenting self-concept?). Both these applications are described in the final part of this section.

*Initial Considerations*

The survey instrument was designed to collect data that could be analysed using a set of advanced statistical procedures to address the overarching research aims and questions of this thesis. Analyses should be dictated “first and foremost by a strong theoretical base” (Hair et al., 2006, p. 714), and thus, survey items were
developed based on relevant theory and research. Consistent with the overarching aim of this research, survey items were carefully chosen that addressed domains of parenting self-concept, affects of stress, and parental beliefs regarding the nature and causes of ADHD-type behaviours in children.

In the initial stages of selecting survey items, a group of eight interested school counsellors and one paediatrician were consulted. While the pool of survey items arrived at by the school counsellors and the paediatrician was considered appropriate, initial pilot testing and feedback from a small sample of parents suggested that the survey was too long – with some participants taking 35 minutes to complete the survey. Given this finding, selected items (mostly from the demographics section) were deleted from the pilot survey. A revised version of the survey contained considerably fewer items, with the average completion time being approximately 15 minutes.

Very early on in the survey period, one participant (the father of a child who displays ADHD-type behaviours) expressed his concerns that the language used through the questionnaire reflected a bias towards the medical conceptualisation of ADHD. The research team knew from the beginning that it would be difficult to describe ADHD in terms that neither suggested that it was a medical condition, nor suggested that it was not a medical condition. Based on this gentleman’s concerns, the wording used throughout the questionnaire was modified to reflect a more impartial view. For example, the expression “ADHD-type behaviours” was used to refer to the observable behaviours that characterise ADHD (described in Chapter 2), without the necessary inference that the behaviours are due to a medical condition. In addition, an instruction was inserted at the beginning of the survey explicitly stating that the language chosen for the questionnaire was done so for convenience, without any inference that ADHD is a medical condition. The gentleman raising the concern was satisfied with the modifications.

**Components of the PPAQ**

The PPAQ survey instrument (see Appendix A, also see Table 4.1 for a list of scales and sample items) is divided into five sections: demographics, parenting self-concept scale (PSCS), stress scale (PSS), parents’ perceptions and experiences (PPEAS), and parents’ beliefs on the causes of ADHD-type behaviours (PBCS). Each of these scales was scored on an eight-point Likert scale (1 = strongly disagree
to 8 = strongly agree). In addition to these six sections (discussed in greater detail below) there was a title page that explained the purpose of the survey, with instructions, as well as making provision to ask participants to indicate whether they were willing to participate in a phone interview.

**Demographics.** This section (see Appendix A) was very brief and aimed to collect only basic information (e.g., age, gender) about the child and parent completing the survey. In addition, some basic information regarding the ADHD status of the child (e.g., whether or not an official diagnosis for ADHD had been received) was collected.

**Parenting self-concept scale (PSCS).** The self-concept is a psychological construct of a complex nature (see Chapter 3). To address this complexity, advice based on the findings of Marsh and Craven (2006), was adopted. That is, it was determined that focusing on that aspect of the self-concept most closely related to the behaviour of interest (parenting) is more likely to give greater insight into what role the self-concept plays in the decision-making process of parents, as opposed to focusing on a general self-concept. While the parenting self-concept is one aspect, or one dimension of the general self-concept, it too may be argued to be multidimensional. That is, the parenting self-concept can be conceptualised as having multiple aspects. Given the aims of the research, three dimensions or aspects (factors) of the parenting self-concept (Affective, Competency, Relationship), were postulated, as shown in Table 4.1 (see also Appendix A).

**Parenting stress scale (PSS).** Like all constructs, the construct of stress can be defined in a way that is intended to meet the aims of the research. For this research, with its emphasis on the decision-making processes of parents, stress was postulated to have three aspects or factors: Family Stress, Individual Stress, and Criticism, as shown in Table 4.1 (see also Appendix A).

**Parents’ perceptions and experiences scale (PPEAS).** Having a child who displays ADHD-type behaviours affects (and not always negatively) many aspects of life. There was no attempt in this research to cover all those aspects. Instead, three diverse though related aspects that were considered to be important issues for families where a child displays ADHD-type behaviours, were chosen for this research. The factors are Peer Relations, Medication Attitudes, and Helpfulness, as shown in Table 4.1 (see also Appendix A). These three aspects were considered broad enough to gain some insight into those issues most relevant to parents with
children displaying ADHD-type behaviours, while at the same time being conceptually related, thus allowing the formation of a worthwhile measurement scale for the purpose of addressing the research aims.

**Parents’ beliefs on the causes of ADHD-type behaviours scale (PBCS).** What parents believe about what causes ADHD-type behaviours, lies at the core of this research. While some parents see the ADHD-type behaviours arising from a biological cause (e.g., brain condition), others see the behaviours as arising from essentially non-biological factors (e.g., a child’s inappropriate behaviour, or home environment). While parents were directly asked if they accepted or rejected the medical conceptualisation of ADHD, determining from parents what they believe to be the causes of ADHD-type behaviours is likely to provide more insight into why parents accept or reject the ADHD diagnosis for their child. The three factors of the PBCS are Home Environment, Brain Disorder and Child’s Behaviour (see Table 4.1 and also Appendix A)

**Survey Administration**

**Paper version.** A paper version of the survey was developed, along with a consent form attached to the front of the survey (see Appendix A). Copies of the survey, along with an addressed reply-paid envelope were sent out upon request.

**Web-based version.** An electronic version of the survey that paralleled the paper version, was developed on SurveyMonkey (2010). SurveyMonkey is a web-based survey development tool that can be used to create sophisticated and user-friendly online surveys. Once developed, a variety of options are available for making the survey available for potential participants. The option utilised for this research was to purchase a website name in which to locate the survey, and then to mention that website name on the brochures, advertisements, websites and in media interviews. Hence, participants could complete the survey on-line at a time suitable for them.

**Data Analysis**

**Statistical Software.** Data screening and general analyses (reliabilities, frequencies, etc.) were performed using SPSS 17.0. Advanced statistical techniques were performed using EQS 6.1 (Bentler, 2005).
Treatment of missing data. The problem of missing data is well recognised and has been written about extensively in journals and textbooks. Fortunately for this research, there were no missing data. This was due to the fact that the overwhelming majority of surveys were completed on SurveyMonkey. Surveys created using SurveyMonkey allow for the option either of making individual survey items compulsory, or allowing participants to skip them. While there are advantages and disadvantages to both approaches, the research team decided that in the interests of convenience for the participants (i.e., making the survey short), only those survey items that were deemed absolutely necessary to the research questions would be retained. Hence, survey items that were not considered central to the research questions were eliminated at the developmental and pilot stages of survey construction, and all remaining items were programmed so as to be compulsory. That is, if a participant did not respond to a certain item, a message was displayed, prompting the participant to respond to the item.

Other data screening tests. Data screening analyses included screening for univariate and multivariate outliers, checking for the assumptions of normality, linearity, and homoscedasticity (Hills, 2008; Tabachnick & Fidell, 2007). While the conditions of linearity and homoscedasticity were met, there were univariate and multivariate outliers present in the raw data. Initially, a procedure suggested by Tabachnik and Fidell was considered. This procedure entailed converting raw scores into standardised scores (z-scores) to identify extreme scores. Raw scores with an absolute z-score value greater than 3.29 are considered univariate outliers and need to be modified. Modification involved transforming the raw score to one unit more extreme than the next most extreme score. It is often necessary to repeat this procedure, as with each modification, the distribution of scores changes, thereby potentially producing new outliers. A problem with this approach (both conceptually and statistically), is that scores meeting the criteria of an outlier as suggested by Tabachnik and Fidell could potentially be adjusted to take on only values of 4 and 5, thereby reducing the variance of the data considerably. As variance of data is crucial for establishing reliability, this approach of modifying outliers was re-examined. Adopting the advice of H. W. Marsh (personal communication, December 9, 2010) outliers should not be discarded unless it is clear that the responses are incorrect. With regard to multivariate outliers, EQS 6.1 is able to identify those cases having the greatest contribution to multivariate kurtosis, using Mardia’s coefficient (B. M.
Byrne, 2006). Using this statistic, two cases were deleted from the data. Hence the final dataset comprised 430 cases.

Tests of Reliability. The concept of validity and its importance in measuring psychological constructs was discussed in Chapter 3. One factor that significantly impacts on validity is measurement error. In the social and behavioural sciences, measurements are much more prone to error, “due to the elusive nature of the constructs that are assessed and to the fact that behavioural data through which they are assessed can be affected by many more intractable factors than other types of data” (Urbina, 2004, p. 117). Though measurement error can never be totally eliminated, it can be estimated by measuring the reliability of scores. In this context, reliability relates to consistency of measurements. That is, a score is reliable if the same score (or very close to it) is obtained on successive occasions of measurement. More simply, reliability relates to the degree to which observed scores are unaffected by random measurement error (T. J. B. Kline, 2005).

All psychometric theory of reliability centres on the tripartite notion of the true score, observed score, and error component (Cronbach & Shavelson, 2004), which is described by classical test theory, and has been the dominant theory used to understand how reliability is best estimated (Pedhazur & Pedhazur Schmelkin, 1991). Under classical test theory, researchers work with observed scores, which are equal to the true score plus its associated error component. One of the fundamental tenets of classical test theory is that observed variation in test scores arises from two sources: variation in the true score component (e.g., the participants’ actual ability or opinion) and the error score component. The true score is conceptualised as the mean score that would be achieved if an infinitely large number of observed scores were averaged (Cronbach & Shavelson, 2004). True scores and error scores are not observable, and so are themselves hypothetical constructs (Allen & Yen, 2002). A formal definition of reliability can then be considered as the ratio of true score variance to the total score variance (DeVellis, 2003; Urbina, 2004). As the variance due to variation in the true score can never be greater than the total variation due to both the true score and error component combined, reliability is expressed as an index (commonly referred to as reliability coefficient) that takes on values between zero and a maximum value of one. From this definition it follows that if the variance in the observed score were due solely to variation in the true score, reliability would be perfect – that is, error free and equal to one (Urbina, 2004).
The most commonly used measure of reliability is Cronbach’s alpha (B. M. Byrne, 2006; Streiner, 2003). Cronbach’s alpha is a measure of internal consistency and is best applied to unidimensional items (i.e., items that are explained by only one latent factor). Each subscale of the PPAQ was assessed for reliability using Cronbach’s alpha (sometimes referred to as alpha coefficients). Alpha coefficients were obtained for the total sample, as well as for the individual subgroups of interest (i.e., parents who accept the ADHD diagnosis, and those who reject it; parents of boys and parents of girls; and parents of children with an official diagnosis of ADHD, and parents of children without an official diagnosis). Although there is no universally agreed minimum threshold for a reliability coefficient (R. B. Kline, 2009; Urbina, 2004), values of .7 or greater are preferred (Netemeyer et al., 2003), with values of at least .6 being acceptable (Aron & Aron, 2003).

While Cronbach’s alpha is a widely used statistic, it has limitations. Most notable perhaps, is that it is based on a restrictive one-factor model that requires all factor loadings and error variances to be equal (Bentler, 2005) – conditions that are not easily met in dealing with most datasets. In addition, Cronbach’s alpha is easily inflated by scale length. That is, even with modest correlations and internal consistency, the inclusion of many scale items (e.g., ten or more) is likely to yield an inflated measure of internal consistency. Furthermore, what is paramount in scale development is not internal consistency, but rather unidimensionality (Clark & Watson, 1995). A scale is unidimensional if the variance of the items that make up that scale can be accounted for by only one latent factor (Gerbing & Anderson, 1988). A more technical definition offered by Netemeyer et al. (2003) is that a set of scale items is unidimensional if, upon removal of the underlying factor for the set (by using a statistical formula for partial correlation), the relations among items disappear. Despite the limitations of Cronbach’s alpha, it is customary to report its value, and so alpha values will be reported in this research. The reason perhaps why it is so commonly used is that internal consistency is a necessary, though insufficient condition for unidimensionality; however, unidimensionality implies the existence of internal consistency (G. T. Smith & McCarthy, 1995).

Unidimensionality. Interpretations of a measure are clearest when one dimension underlies the measure (Neuberg, West, Judice, & Thompson, 1997); that is, the measure is unidimensional. Selection of indicators of a construct in the scale development process is facilitated by the use of empirically based methods of item
inclusion and exclusion (e.g., item-total correlations and inter-item correlations). For such methods, Hair et al. (2006) suggest that items with item-to-total and inter-item correlations of less than .5 and .3 respectively are candidates for exclusion.

While the traditional statistical techniques of inter-item correlation and item-total correlations mentioned in the previous paragraph are empirical in essence, and easily performed using SPSS 17.0, they have a limitation in that they are not always sensitive to detecting unidimensionality. That is, while a set of scale items may correlate well, they can in fact be indicators of more than one factor. Establishing unidimensionality requires the use of a more sophisticated statistical technique.

Hair et al. (2006) describe confirmatory factor analysis (CFA) as a way of testing (confirming) how well a set of measured variables represents a single underlying construct. Further, Gerbing and Anderson (1988) suggest that “confirmatory factor analysis affords a stricter interpretation of unidimensionality than can be provided by more traditional methods such as coefficient alpha, inter-item correlations, and exploratory factor analysis” (p. 186). For this reason, the analyses conducted in this research rely primarily on CFA.

**Establishing Psychometric Properties of the Survey Instrument**

**Confirmatory Factor Analysis (CFA).** CFA is used to provide support for the validity of constructs being investigated. Specifically, CFA was used in this research to investigate the structural validity of the constructs of interest. Briefly, CFA assumes that variation amongst observed scores for a set of survey items is due to the influence of a hypothesised underlying construct plus unique measurement error. Use of a CFA requires the researcher to postulate an a priori model structure that depicts a set of relations between a set of observed indicator variables (such as survey item responses) and an underlying construct (T. A. Brown, 2006), where the underlying construct is assumed to cause the responses given by participants to the survey items. The hypothesised factor structures used in this research have been discussed in Chapter 4. To assess the structural validity of the four measurement scales (i.e., PPEAS, PBCS, PSS, PSCS) and their 12 associated measurement scales, the following criteria are hypothesised: (a) each measured (or indicator) variable would have a non-zero loading on the factor it was assumed to measure, with zero loadings on all other factors, (b) for each subscale, the factors comprising it would be correlated, and (c) the error terms (also referred to as uniquenesses) for each
measured variable would be uncorrelated. The structural validity is assessed using
goodness of fit statistics.

An important note is warranted at this point with regard to using CFA to
assess construct validity. As discussed in Chapter 3, establishing construct validity is
an ongoing process and is never accomplished in a single testing or by using a single
technique. While the use of CFA is particularly useful for establishing the
unidimensionality and internal structure of a set of items, these are necessary, though
insufficient conditions for establishing construct validity (Gerbing & Anderson,
validity is gathered by examining a range of measures. Therefore, establishing the
structural validity of the subscales of the survey instrument alone (by confirming the
hypothesised a priori factor structure and establishing unidimensionality) does not
establish construct validity (Clark & Watson, 1995), but rather provides support for
construct validity. On this matter, Netemeyer, et al. (2003, p. 12) note:

Given that all evidence bearing on a measure contributes to establishing
construct validity, a measure must also a priori exhibit its theoretical
dimensionality and show evidence of reliability to be considered valid. As
such, dimensionality and reliability are necessary but insufficient conditions
for construct validity [italics added].

Assessing CFA analyses. Several estimates exist for assessing model fit (see
Hair et al., 2006 for an overview), many of which are generated using the EQS 6.1
statistical application. The chi-square statistic ($\chi^2$), its associated degrees of freedom,
and its associated probability ($p$-value), are typically reported in CFA analyses in
this research. The null hypothesis in CFA is that the sample and estimated
covariance matrices are equal. The sample covariance matrix is the matrix
comprising variances and covariances based on the collected data, while the
estimated covariance matrix is the matrix comprising variances and covariances
implied by the hypothesised relations amongst constructs. As the discrepancy
between the two matrices increases, so too does the magnitude of the $\chi^2$. The $p$-value
represents the probability of obtaining a $\chi^2$ that exceeds the $\chi^2$ value under the null
hypothesis. Thus a high $p$-value (e.g., $> .05$) is indicative of a good fit, while a low
$p$-value is indicative of a poor fit between the estimated and sample covariance
matrices. Therefore, in CFA, a small $p$-value (attainment of statistical significance) is not desired, but rather, a large $p$-value is desired, thereby indicating that the differences between the model-implied covariance matrix and the observed covariance matrix are small enough to be due to sampling error. So, whereas with conventional statistical applications, researchers assume a null hypothesis and hope to reject the hypotheses, thereby demonstrating a difference in treatments, groups, samples, etc., researchers using CFA seek to accept the null hypothesis that the model-implied covariance matrix and the observed covariance matrix are from the same population.

The $\chi^2$ statistic is directly proportional to sample size, and so large sample sizes generate large $\chi^2$ statistics, suggesting (sometimes incorrectly) that the covariance matrices are not equal (B. M. Byrne, 2006). A further problem is that the $\chi^2$ statistic is very sensitive to the assumption of multivariate normality, with departures from normality tending to increase the $\chi^2$ statistic (Klem, 2000). Given these problems, other fit statistics are required. For evaluating the models in this research, the recommendations of several researchers are used (e.g., Holmes-Smith, 2008; Hu, Bentler, & Kano, 1992). In addition to the $\chi^2$ statistic, the non-normed fit index (NNFI), also known as the Tucker-Lewis Index (TLI), was used, along with the comparative fit index (CFI), and the root mean square of error approximation (RMSEA) and its 90% confidence interval. For both the NNFI and the CFI, values greater than .90 are considered acceptable, while values greater than .95 are considered excellent (Hu & Bentler, 1999). For the RMSEA, values less than .08 are considered reasonable, with values less than .05 indicating a good fit (Browne & Cudeck, 1993).

**Practical considerations.** CFA is a statistical procedure that takes a confirmatory approach (i.e., a model stipulating statistical relations is offered and then confirmed as being plausible on the basis of the available empirical data). If confirmation is not achieved according to predefined criteria (e.g., specified goodness-of-fit statistics), then the proposed model is rejected, or at least said not to be supported. However, as B. M. Byrne (2006) notes, given the costs associated with the collection and analysis of data, it is not practical to terminate research based on a rejected hypothesised model. Hence she notes that a model-generating approach is commonly adopted. With this approach, once an initial model is rejected on the basis of a poor fit with the sample data, the researcher proceeds to identify the source of
misfit and determine a model that better fits the sample data. However, while identification of the source of misfit and the identification of a better fitting model can be guided by statistical analysis, it should be theory driven (Hair et al. 2006). That is, any modifications to the model should not be undertaken, solely to obtain a better fit unless substantial justification can be given on theoretical grounds.

**Invariance testing.** When investigating the relations between latent factors, and their respective indicator variables for a set of data, it is important to determine to what degree the relations hold (or are equivalent) across different groups of interest within a sample (e.g., males and females). That is, survey items should measure the same construct comparably across different subgroups of the sample (T. A. Brown, 2006). Such demonstrated equivalence, also referred to as invariance (B. M. Byrne, 2006), is a necessary prerequisite for establishing validity of the survey scales as well as generalisability. For this research, three different groupings were of interest: (a) parents’ decision to accept or reject the medical model conceptualisation of ADHD for their child, (b) gender of the child, and (c) whether or not an official diagnosis (i.e., diagnosis by a suitable medical professional) had been given for the child. While establishing invariance for parents’ gender would also have been desirable, this could not be tested, due to the small number of fathers ($n = 31$) completing the survey.

Invariance testing is conducted in a sequential manner, where the equivalence of model parameters (e.g., factor loadings and factor covariances) is tested in a logically ordered and increasingly restrictive fashion by constraining the model parameters to be equal (invariant) across designated group levels (B. M. Byrne, 2006). While some researchers (e.g., Bodkin-Andrews, Dillon, & Craven, 2010) use five models for measuring invariance, a more streamlined approach using four models was used in this research. Model 1 (M1), being the least restrictive, contains no invariance constraints between groups and serves as a baseline model (sometimes referred to as configural invariance). In Model 2 (M2), the factor loadings are constrained to be invariant, and is considered the base level of invariance (Marsh, Tracey, & Craven, 2006). However, B. M. Byrne (2006) and Marsh (1994) have recommended the addition of constraining the factor covariances to be invariant in assessing invariance, thereby giving a third model (M3) to be tested. While these first three models are often recommended by researchers for establishing a desirable minimal level of invariance (e.g., Netemeyer, et al., 2003), Marsh (1994) notes that
there is no clear consensus on the ordering of subsequent invariance constraints. Although invariance testing can involve the testing of uniqueness (error variance), B. M. Byrne (2006), emphasises the first three models only, as models testing the invariance of the error variance are often deemed too restrictive. However, results for total invariance (i.e., constraining factor loadings, factor variances and covariances, and errors) are reported for completeness and are done so under Model 4 (M4).

With regard to determining invariance, although chi-square difference testing traditionally has been used, Cheung and Rensvold (2002) note that it is too sensitive a measure for determining overall model fits, especially when dealing with larger sample sizes. Instead, they recommend that attention be placed on the CFI fit index, whereby a change of no more than .01 in the CFI fit index between M1 and successive models is representative of invariance across groups. In addition, Bodkin-Andrews, Denson, and Craven (2010) suggest that an overlap in the 90% confidence interval of the RMSEA between M1 and subsequent models is supportive of further invariance.

**Investigating Relations Between Constructs**

Once establishing the structural validity for the four measurement scales of the PPAQ, it is necessary to check that the structural validity of the instrument as a whole is maintained when all 12 subscales are combined. The reason for this is that it is possible that a subscale from one measure could correlate highly with a subscale from another measure, to such a degree that the high correlation indicates redundancy of one subscale. That is, a substantially high correlation is suggestive that both scales are measuring the same construct. Further, it is possible that one or more items from one subscale will correlate highly with an item from another subscale. Such cross correlations are a threat to the structural validity of the instrument. Assessing the structural integrity of the instrument by administering all the scales simultaneously is known as a mass CFA. The mass CFA further allows the opportunity to detect meaningful relations between subscales. Hence, Study 1 postulates a research question to explore the covariance between different subscales of the PPAQ (see Chapter 4).

Once establishing invariance for the groups, it is of interest to investigate potential group differences for different factors (see Chapter 4). For example, do the parents of boys with ADHD differ in the amount of stress they experience compared
to the parents of girls with ADHD? Establishing the invariance across different group levels of selected characteristics (i.e., child gender, official or unofficial diagnosis, parents’ acceptance/rejection of diagnosis; hereafter referred to as grouping variables) allows such questions to be investigated. Based on the principle of Multiple-Indicator-Multiple-Indicator-Cause (MIMIC), the mass CFA was also used to explore group differences on the latent constructs of the PPAQ.

A MIMIC is a structural equation modelling (SEM) application that is able to easily incorporate both discrete and continuous variables, where the grouping variables are allowed to covary with latent factors. For this research, the discrete variables are the grouping variables previously mentioned, while the continuous variables are the latent factors of the PPAQ. The paths (i.e., correlations) leading from the group variables to the latent factors can be interpreted as the potential influence that the grouping variable has on the latent variable (Bodkin-Andrews, O'Rourke, & Craven, 2010). The MIMIC model is assessed using the same goodness-of-fit criteria used for CFA and SEM analyses. The covariances and correlations between the latent factors and grouping variables are examined for statistical significance and effect size ($r^2$). An additional benefit of the MIMIC model technique is that it is able to deal with smaller sample sizes than those required for typical invariance testing and even more traditional MANOVA techniques (Bodkin-Andrews, O'Rourke, et al., 2010). MIMIC applications are traditionally run in an SEM path analysis format where two or more categorical variables are used to predict latent variables. However, given that most categorical predictors in SEM techniques are rarely significantly correlated (e.g., Bodkin-Andrews, O'Rourke, et al., 2010) a CFA-MIMIC (as explained here) was conducted where the categorical variables were included in a mass CFA.

**Summary**

This section has described the components of the PPAQ and the statistical procedures necessary to achieve the aims of Study 1 – namely, evaluation of the psychometric properties of the PPAQ and assessing group differences across the scales of the PPAQ. An important advanced statistical technique, CFA, was introduced. CFA is a structural equation modelling (SEM) technique and is discussed next in the Study 2 outline.
Study 2: Predicting a Parent’s Decision to Accept or Reject a Diagnosis of ADHD for Their Child

Introduction

Study 1 uses CFA to evaluate the psychometric properties of the PPAQ and conduct analyses that examine the correlation between variables, where either or both variables may be latent variables or single-item variables. Study 2 looks at more advanced relations between variables, where two or more variables can be used to predict a desired outcome (e.g., parents’ acceptance or rejection of the ADHD diagnosis). To achieve this, Study 2 uses an advanced statistical procedure known as structural equation modelling (SEM). This technique is closely related to CFA and is discussed next.

Structural Equation Modelling

The structural model. Assessing a survey instrument’s psychometric properties using CFA (i.e., ensuring the survey items measure the latent variables they are intended to measure), is a necessary condition before using it for specific research purposes. One purpose often is, as is the case for this investigation, to examine hypothesised relations between variables, where two or more of the variables are used to predict a variable designated as an outcome variable, which may either be a latent variable or a categorical variable. The relation between a set of indicator variables and their associated respective latent variables is termed the measurement model, while the relations between latent variables are termed the structural model (B. M. Byrne, 2006). Diagram 5.1 gives a schematic representation of a simple structural equation model (also referred to as a path analysis). The measurement model is what is tested when doing a CFA. The relations described by the structural model are called structural equations. The structural equations in this investigation are applied to test the hypotheses and research questions for Study 2 in Chapter 4.
Both the measurement model and the structural model are easily developed and tested using an SEM package, where SEM itself is an advanced statistical technique that takes “a confirmatory (i.e., hypothesis-testing) approach” (B. M. Byrne, 2006, p. 3). Although it is not practical to provide a comprehensive description of SEM in this chapter, an attempt is made to provide a brief introduction to facilitate an understanding of the statistical methods used in this research.

Advantages of SEM. SEM is one of the most popular and powerful statistical techniques in the social sciences (DeShon, 1998). It was derived from the statistical techniques of factor analysis, regression structure, and path analysis and holds several advantages over standard statistical procedures (B. M. Byrne, 1998). One of the most important perhaps, as described by Byrne is “by demanding that the pattern of intervariable relations be specified a priori, SEM lends itself well to the analysis of data for inferential purposes” (p. 3). An important advantage that SEM has over the more traditional data analysis techniques is that measurement errors, which are an inevitable part of any quantitative research methodology, are taken into account and not just ignored (see DeShon, 1998). Other advantages are that multiple relations between variables can be examined simultaneously, and hypothetical constructs can be more thoroughly investigated. As discussed in Chapter 3, this research incorporates the use of some hypothetical constructs, and so SEM was deemed the appropriate statistical procedure to employ.

*Figure 5.1. Schematic Representation of a Structural Equation Model.*
**Evaluating models.** Using an SEM program (e.g., EQS 6.1), the structural equations are used to test the fit between a theoretical model proposed by the researcher and the empirical data. Specifically, a theoretical covariance matrix (or sometimes a correlation matrix) is generated, based on the hypothesised theoretical relations amongst a set of variables and then compared with a covariance matrix generated from the empirical data. In determining if the proposed theoretical model is an appropriate fit with the observed data, Marsh (1994) recommends a three-step general approach. Firstly, it is necessary to determine that the iterative procedures used in the SEM algorithm converge and that all parameter estimates are mathematically sensible (e.g., no negative variances, no correlations greater than 1). Secondly, the researcher establishes if the parameter estimates (e.g., correlations) are reasonable in relation to the a priori model. Finally, the chi-square test statistic and other selected fit indices should be evaluated. These fit indices are the exact same ones that were described when discussing how to assess CFA analyses (see previous discussion), as CFA is just a special case of SEM.

**SEM Path Analyses for Study 2**

Diagram 5.1 shows a simple structural equation model, where one latent variable is predicting another single latent variable. Similarly to linear regression models and path models, several variables (latent and categorical variables) can be used to predict a single outcome variable itself, which may be either a latent or categorical variable. The hypotheses and research questions posed for Study 2 (see Chapter 4) are answered by testing a set of structural equations. Similarly to linear regression models and path models, the beta coefficients will be of interest, and an interpretation will be given for each set of coefficients.

**Important Considerations of SEM and CFA**

This chapter has discussed the advantages of using advanced statistical techniques such as SEM and CFA when doing research that involves latent variables. However, despite the numerous advantages, Tomarken and Waller (2005), when discussing SEM, suggest “it is important for clinical scientists to have a balanced perception of its strengths and limitations” (p. 31). One important limitation to consider is that analyses with latent variables can still be adversely affected by the same sorts of problems that affect multivariate analyses involving single-item
indicators (e.g., multiple regression). Specifically, analyses, whether they be with single-term variables or latent variables can be compromised to varying degrees by the presence of multicollinearity or suppression effects. What makes these conditions particularly problematic is that if either of them are present (or both at the same time), statistical procedures can produce results that appear sensible, thereby leading the researcher to draw conclusions that may not be correct. Finally, another problem with SEM procedures is that evidence of a good model fit does not prove the proposed model is the best model, or the correct model. These problems are discussed separately in the following paragraphs.

**Multicollinearity.** Grewal, Cote, and Baumgartner (2004) suggest that researchers sometimes readily dismiss multicollinearity because they assume that SEM procedures are robust. This is perhaps why these authors, when examining 42 articles which used either SEM or CFA, observed that potential multicollinearity problems could be assessed for 31 of these studies, but had not been assessed. The problems arising from multicollinearity are not minor and should always be considered in any research using multivariate data analysis. Marsh, Dowson, Pietsch, and Walker (2004) provide a good example where failure to consider the effects of multicollinearity resulted in incorrect findings. Briefly, Marsh et al. (2004) noted, when examining the work of Pietsch, Walker, and Chapman (2003), that these authors concluded that their measure of self-efficacy significantly predicted achievement while their measure of self-concept failed to do so; this is despite the measures of self-concept and self-efficacy being highly correlated ($r = .93$). It is not the high correlation between self-efficacy and the self-concept that is problematic, as the theoretical conceptualisation of both these constructs predicts that they should correlate highly. What is problematic is that the inclusion of two highly correlated constructs produced invalid results due to the effects of multicollinearity. In this example, the predictive strength of self-efficacy was unrealistically inflated, due to the problems associated with multicollinearity.

Grewal et al. (2004) note that multicollinearity is difficult to mitigate once it is present in the dataset, and hence suggest that the best strategy is to avoid it in the first place. This research adopted the advice of Billings and Wroten (1978) for cases where multicollinearity is suspected. Specifically, if an instance arises where multicollinearity might exist, a higher-order factor model should be proposed and tested. Such models are common in SEM and CFA, and are easily dealt with using
an appropriate SEM application, which for this research is EQS 6.1. This discussion on multicollinearity concludes with the sound advice of Marsh, et al. (2004) who suggest that when using CFA and SEM, “many problems such as multicollinearity, that are well known in traditional analyses of manifest (non-latent) variables do not disappear when using more advanced latent-variant modelling techniques” (p. 520).

Suppressor variables. The counter intuitive finding in linear regression that a predictor variable (the independent variable) may correlate poorly with the criterion variable (the dependent variable) yet still serve as a useful predictor in a regression equation is well known, and discussed (albeit often only briefly) in undergraduate and graduate behavioural sciences texts. Such variables, first introduced by Horst (1941), are called suppressor variables because they suppress variance in other predictor variables that is irrelevant to the criterion variable. Maassen and Bakker (2001) note that suppressor variables commonly occur with latent variables, are often not foreseen, and present problems of interpretation to researchers. Given the importance that latent variables have in this research, suppressor variables are discussed here. Unlike multicollinearity, where the problem for the researcher is usually either prevention or correction, or both, when dealing with suppressor variables, the problem is typically one of interpretation. While detection is relatively easy if the researcher is looking for them, interpretation is more difficult. To better illustrate the nature of suppressor variables and their effects, a brief example of a suppressor variable is given, followed by discussion of how these variables relate to this research. It should be noted that while in the example that follows, the interpretation of the suppressor variable is straightforward, interpretation is not always straightforward in practice, and can often be difficult.

The following example from Darlington (1990) serves to illustrate how suppressor variables work. Suppose a history exam is given in which students only have a short time in which to complete it (i.e., a speeded exam). The exam scores are to be matched to a known objective measure of students’ knowledge of history. Further suppose that a reading speed test is also administered. While it can be assumed that reading speed is not correlated with one’s true knowledge of history, it is very likely to correlate positively with the speeded exam result. So, although the reading speed scores do not correlate with knowledge of history, it is useful for predicting a student’s true knowledge of history. This is because variance in students’ speeded exam scores is influenced by both the knowledge of history, and
their reading speed. In this example, the students’ reading speed test score is the suppressor variable because it suppresses unwanted variance in the speeded exam scores. When the unwanted variance in the speeded exam scores (i.e., variance due to reading speed) is suppressed (partialled out) by the suppressor variable, the remaining variance of the speeded exam becomes more pure and is more strongly matched with a student’s true knowledge of history.

This type of suppression, where the suppressor variable correlates poorly with the criterion variable but correlates with other predictor variables, is known as classical suppression (Tabachnick & Fidell, 2007). Tabachnick and Fidell describe other types of suppressor variables which are not discussed here. A definition then, of a suppressor variable given by R. Kline (2011) is when the absolute value of the variable’s beta weight (i.e., the standardised regression coefficient in a linear regression equation) is greater than the bivariate correlation between the variable and the criterion variable.

A difficulty with suppressor variables is that there is no statistical test to determine when a suppression effect is taking place (R. L. Smith, Ager, & Williams, 1992); rather, detection of a suppression effect is a matter of judgement. Further, once detected, the interpretation of the suppression effect is also a matter of judgement, though it is one that should make theoretical sense, and ideally should be subject to replication across differing samples (B. M. Byrne, 1998). Once an interpretation is given, it can be difficult to determine if the interpretation is correct. Thus, any interpretation of a suppression effect should be done tentatively (unless it has been previously identified within the literature).

The confirmatory nature of SEM. Another very important aspect of SEM is worthy of mention at this point. McCoach, Black, and O’Connell (2007) assert that with SEM it is impossible to confirm that a proposed model is correct. SEM adopts a confirmatory approach to investigation where a model is proposed and the procedures of SEM are used to demonstrate how well the model fits the available data. However, it may also be the case that other models fit the data (Tomarken & Waller, 2005). On this matter, Hair et al. (2006) state “If the proposed model has acceptable fit . . . the researcher has not proved the proposed model but only confirmed that it is one of several possible acceptable models” (p. 732). Supporting this view, Tomarken and Waller (2003) add that there is no statistical test or fit index that can prove that a model is correct – rather, one can only conclude that a well-
fitting model is one plausible solution. Therefore, a model that yields good fit indices cannot be taken to mean that the model is the correct one, or the best one. Again, this is why adherence to theoretical considerations is so important, as a well fitting model, if it is to be meaningful, should make theoretical sense.

Summary

Study 2 utilised an advanced statistical technique (SEM) to explore relations amongst three or more variables (one dependent variable, and two or more independent variables), where the variables may be either single-item variables or latent variables, or both. This study is central to this thesis, as it seeks to answer whether or not it is possible to predict which parents accept the ADHD diagnosis for their child, and which parents reject it. The SEM procedure has been discussed in detail, with attention given to the strengths and limitations of SEM procedures.

Study 3: Qualitative Analyses

Introduction

Eby, Hurst, and Butts (2009) observe that qualitative methodology is not as well regarded in the social sciences as quantitative methodology. However, qualitative methodology is increasingly becoming recognised as a viable method for research in the social sciences. While valuable insights are to be gained from the first two quantitative studies that comprise the present investigation, it is recognised that “qualitative data are useful when one needs to supplement, validate, explain, illuminate, or reinterpret quantitative data gathered from the same setting” (Miles & Huberman, 1994, p. 10). This section discusses important features of qualitative methodology as a means for establishing its appropriateness for use in this investigation. To begin with, a brief discussion on the philosophical underpinnings of both qualitative and quantitative methods is provided, before discussing the concepts of validity and reliability in the context of qualitative research – both of which are very well recognised and accepted in the conduct of quantitative research. Finally, the specific qualitative techniques and procedures used in this research are presented.
A Place for Qualitative Research

Qualitative versus quantitative methods. One of the fiercest debates in the social sciences involves the relative merits of qualitative versus quantitative research (Eby, Hurts, & Butts, 2009). While quantitative methodology has its recognised strengths (e.g., objectivity, precision, generalisability, and reproducibility), in contrast, “Qualitative researchers are called journalists, or soft scientists. Their work is termed unscientific, or only exploratory, or subjective” (Denzin & Lincoln, 2003, p. 12). However, quantitative methodology, with its roots in the positivistic orientation (Miles & Huberman, 1994; Sale, Lohfeld, & Brazil, 2002), is also characterised by similar limitations to those for which qualitative methodology is criticised. For example, Hawkins (1995) has suggested:

The philosophic position of positivism, based on the premise that nothing is real except as it is quantifiable, is native to the sciences . . . . The fallacy of logical empiricism is clear from its essential premise. To say that nothing is real unless it’s measurable is already an abstract position, is it not? This proposition itself isn’t tangible, visible, or measurable; the argument of tangibility is itself created from the intangible. (p. 135)

This quote highlights that while the quantitative and qualitative methodologies have their differences, they also have commonalities (i.e., a degree of abstract nature), which researchers should be aware of. Once aware of the differences and commonalities, both methodologies can be used together to achieve a common research goal. Hence, it is not always appropriate to view them as incompatible or antagonistic methodologies, or perhaps, more importantly, to view qualitative methodology as second rate.

Validity and Reliability. The topics of validity and reliability are very important considerations when conducting quantitative or qualitative research. In general, both quantitative and qualitative researchers see validity as relating to the credibility or accuracy of the data they collect and to the generalizability of findings, while reliability is seen as relating to the reproducibility of findings; however, beyond this, each group has a different conceptualisation of validity (Eby, Hurst, & Butts, 2009). Both validity and reliability relate to the inferences drawn from the data. With respect to qualitative data, Lewis and Ritchie (2003) remark that
Inferences drawn from qualitative data relate to the nature of what is being studied, and not its prevalence or statistical distribution. Hence, applying validity and reliability to qualitative studies the same way they are used in quantitative studies, is not straightforward. Briefly though, validity relates to trustworthiness of findings, while reliability relates to the dependability of the data (Guba & Lincoln, 1989).

In quantitative studies, establishing validity and reliability relates to having a psychometrically sound survey instrument. In qualitative studies, the researcher is the instrument (Mertens, 2005), hence the “credibility of the qualitative methods, therefore, hinges . . . on the skill, competence, and rigour of the person doing the fieldwork” (Patton, 2002, p. 14). This means that validity and reliability are maximised when the qualitative researcher has good intentions, clear research aims, and acknowledges his or her potential for bias. In the context of understanding the meaning of validity in qualitative research, Lewis and Richie (2003) suggest that validity relates to the question of “Are we accurately reflecting the phenomena under study as perceived by the study population?” (p. 274). Study 3 was designed to accurately capture the experiences of parents and professionals in relation to their views of ADHD.

An approach adopted in this research, to maximise validity and reliability, is triangulation (Greene, 2007; Willig, 2008). The concept of triangulation was introduced at the beginning of this chapter, where it was used to describe the use of different research methodologies to conduct research (e.g., Mathison, 1988; Webb et al., 1966). The term can also be used to refer to the use of different methods or techniques within a particular methodology, to gain a more accurate insight into a situation (Patton, 2002; Silverman & Marvasti, 2008). More specifically in relation to this investigation, triangulation assumes that the use of different sources for gathering data will assist in improving the clarity of research findings (Lewis & Richie, 2003). So for example, when using an interview technique, different groups of stakeholders can be used to gain a more representative or balanced view into the phenomenon of interest. For Study 3, the use of two different interviewee groups (parents, health professionals) is an example of triangulation.

**Interviewing Data Analysis**

Interviews, particularly those in the semi-structured format, are the most popular method of qualitative data collection in psychology (Madill & Gough,
2008). For this research, the interview technique was chosen for two main reasons. Firstly, telephone interviews were deemed the most appropriate method for gathering qualitative data, given the time constraints in this study. Secondly, as suggested by Patton (2002), interviews allow us to discover things about people that we cannot directly observe. On this matter, Patton further adds:

> The fact is that we cannot observe everything. We cannot observe feelings, thoughts, and intentions. We cannot observe behaviors that took place at some previous point in time. . . . We cannot observe how people have organized the world and the meanings they attach to what goes on in the world. We have to ask people questions about those things. (p. 341)

Interviews therefore, are an ideal way to gain additional insights into parents’ perceptions and experiences regarding ADHD. Interview data assist in articulating the richness of the data and encapsulating its complexity, allowing the story to be told from a holistic point of view. They enable the participants’ perceptions to be examined from an historical and event-driven basis.

A series of research questions (mentioned in Chapter 4) was developed in Study 3 to gain a richer insight into parents’ perceptions and personal experiences relating to ADHD. All interviews were recorded with the permission of the interviewee and later transcribed to a Microsoft Word document. For each research question, contrasting views, and where appropriate, consistent patterns and emerging themes were identified by two coders carefully reading through each transcript and coding responses for each theme identified for each research question, for each case.

The transcribed data were manually coded by two coders using content categories developed utilising an emic approach (i.e., a contextualised approach to reveal the theories and perspectives of the participants) and the key dimensions identified in this component of the study’s conceptual framework. This preliminary analysis formed the basis for collaborative discussion and refinement of initial coding categories. The data were also further scrutinised to identify rich narratives that further extend the findings of the qualitative component in relation to the issues of concern in this component of the study.
Summary

This section has outlined the qualitative methodology technique (interviews) used in this research. Before describing the procedures for interviews, some justification for the appropriateness of qualitative methodology was given. In particular, the topics of validity and reliability were addressed. For this research, interviewing a range of stakeholders (parents, health professionals) is deemed an ideal approach to supplement the findings of the results from the quantitative studies.

Chapter Summary

This investigation incorporates three interrelated studies to provide a mixed-methods research design. A brief, though comprehensive account of the broad methodology utilised (i.e., a mixed methods design) has been provided, along with an justification for why such an approach was chosen. It was suggested that a mixed-methods design helps capitalise on the strengths of both the quantitative and qualitative approaches, while helping to minimise limitations that occur when only one approach is adopted. The results for each of three studies are presented in the next three chapters.
CHAPTER 6

RESULTS FOR STUDY 1: PSYCHOMETRIC PROPERTIES OF THE PARENTS'/GUARDIANS’ PERCEPTIONS OF ADHD QUESTIONNAIRE

*Measurement is the Achilles’ heel of sociobehavioral research.* (Pedhazur & Pedhazur Schmelkin, 1991, p. 2)

Introduction

Study 1 (introduced in Chapter 4) investigates the psychometric properties of the Parents'/Guardians’ Perceptions of ADHD Questionnaire (PPAQ). This chapter presents the findings of Study 1 for each of the hypotheses and research questions corresponding to the aims of Study 1 (see Chapter 4). Firstly, the factor structure for each measurement scale of the PPAQ (i.e., PPEAS, PBCS, PSS, and PSCS; see Table 4.1 for subscales and example items) is tested separately by increasingly stringent and advanced psychometrical testing techniques. Secondly, the psychometric properties of all 12 scales when combined are examined. Thirdly, group differences across all factors measured by the PPAQ are examined.

Given that Study 1 is a quantitative study and uses advanced statistical methodologies, a significant amount of statistical data is generated to evaluate the hypotheses. These data are presented in a series of tables, to assist in the interpretation of results. The tables contain results for reliability, CFA, factor structure (i.e., factor loadings and correlations), and invariance. Before addressing the hypotheses that relate to specific measurement scales of the PPAQ, descriptive statistics for each measurement scale are also given, to allow for a more complete assessment of the PPAQ.
The same series of psychometric tests is conducted for each of the four measures of the PPAQ and hence the results are presented concisely, with important findings briefly commented on.

**Results for Hypotheses 1.1.1–1.1.5: Psychometric Assessment of the PPEAS**

*Descriptive Statistics*

Descriptive statistics for the PPEAS are given in Table 6.1. The majority of values for the skewness and kurtosis are close to zero, hence any violations in multivariate normality are minimal and are not likely to impact on the CFA procedures. EQS uses the maximum likelihood method of estimation, which according to West, Finch, and Curran (1995), is adequate when the absolute values of kurtosis and skewness are less than 7 and 2 respectively. The results in Table 6.1 suggest that parents who accept the ADHD diagnosis are more likely to report that medication is an appropriate treatment, that the diagnosis was helpful for them, and that their child experiences less positive peer relations. In a similar manner, parents of children having an official diagnosis are more likely to report that medication is an appropriate treatment, that the diagnosis was helpful for them, and that their child experiences less positive peer relations. Differences between the various grouping variables are examined for significance when discussing later Research Questions (1.6.1, 1.7.1, and 1.8.1).
Table 6.1

Descriptive Statistics for the Parents’ Perceptions, Experiences of ADHD Scale (PPEAS)

<table>
<thead>
<tr>
<th>Grouping variable</th>
<th>Peer</th>
<th>Helpfulness</th>
<th>Medication Attitudes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Total</td>
<td>4.57</td>
<td>6.21</td>
<td>5.67</td>
</tr>
<tr>
<td>Accept</td>
<td>4.43</td>
<td>6.61</td>
<td>6.10</td>
</tr>
<tr>
<td>Reject</td>
<td>5.21</td>
<td>4.48</td>
<td>3.78</td>
</tr>
<tr>
<td>Official</td>
<td>4.40</td>
<td>6.43</td>
<td>6.00</td>
</tr>
<tr>
<td>Not official</td>
<td>4.97</td>
<td>5.72</td>
<td>4.94</td>
</tr>
<tr>
<td>Male</td>
<td>4.69</td>
<td>6.26</td>
<td>5.77</td>
</tr>
<tr>
<td>Female</td>
<td>4.16</td>
<td>6.04</td>
<td>5.33</td>
</tr>
<tr>
<td>SD Total</td>
<td>1.90</td>
<td>1.51</td>
<td>1.95</td>
</tr>
<tr>
<td>Accept</td>
<td>1.89</td>
<td>1.16</td>
<td>1.73</td>
</tr>
<tr>
<td>Reject</td>
<td>1.84</td>
<td>1.64</td>
<td>1.75</td>
</tr>
<tr>
<td>Official</td>
<td>1.93</td>
<td>1.44</td>
<td>1.87</td>
</tr>
<tr>
<td>Not official</td>
<td>1.78</td>
<td>1.54</td>
<td>1.95</td>
</tr>
<tr>
<td>Male</td>
<td>1.88</td>
<td>1.48</td>
<td>1.90</td>
</tr>
<tr>
<td>Female</td>
<td>1.94</td>
<td>1.58</td>
<td>2.12</td>
</tr>
<tr>
<td>Skewness Total</td>
<td>0.05</td>
<td>-1.10</td>
<td>0.84</td>
</tr>
<tr>
<td>Accept</td>
<td>0.02</td>
<td>-1.21</td>
<td>-1.19</td>
</tr>
<tr>
<td>Reject</td>
<td>-0.42</td>
<td>-0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Official</td>
<td>0.04</td>
<td>-1.46</td>
<td>-1.06</td>
</tr>
<tr>
<td>Not official</td>
<td>-0.22</td>
<td>-0.51</td>
<td>-0.52</td>
</tr>
<tr>
<td>Male</td>
<td>-0.13</td>
<td>-1.11</td>
<td>-0.89</td>
</tr>
<tr>
<td>Female</td>
<td>0.23</td>
<td>-1.06</td>
<td>-0.66</td>
</tr>
<tr>
<td>Kurtosis Total</td>
<td>-1.03</td>
<td>1.11</td>
<td>-0.16</td>
</tr>
<tr>
<td>Accept</td>
<td>-1.00</td>
<td>2.64</td>
<td>1.00</td>
</tr>
<tr>
<td>Reject</td>
<td>-0.84</td>
<td>-0.19</td>
<td>-0.86</td>
</tr>
<tr>
<td>Official</td>
<td>-1.07</td>
<td>2.53</td>
<td>0.34</td>
</tr>
<tr>
<td>Not official</td>
<td>-0.84</td>
<td>-0.11</td>
<td>-0.55</td>
</tr>
<tr>
<td>Male</td>
<td>-1.04</td>
<td>1.16</td>
<td>-0.03</td>
</tr>
<tr>
<td>Female</td>
<td>-0.90</td>
<td>1.03</td>
<td>-0.57</td>
</tr>
</tbody>
</table>

Hypothesis 1.1.1: Cronbach’s Alpha Reliability Estimates

Overview. Hypothesis 1.1.1 proposes that the three-factor model of the PPEAS is a reliable measurement scale for the total sample, as well as for specific subgroups of the total sample.

Results: Hypothesis 1.1.1. Reliability estimates for the PPEAS factors are shown in Table 6.2. The results show that the three subscales of the PPEAS are reliable measures for the total sample (Netemeyer et al., 2003), with alpha coefficients in the range of .74 to .93. Acceptable measures of reliability were also
obtained across the different subgroups of the PPEAS (Aron & Aron, 2003), with alpha coefficients ranging from .62 to .93.

Table 6.2

Reliability Estimates (Cronbach’s Alpha) for the Total Sample and Subgroups for the Parents’ Perceptions, Experiences of ADHD Scale (PPEAS)

<table>
<thead>
<tr>
<th>Grouping categories</th>
<th>Peer</th>
<th>Medication Attitudes</th>
<th>Helpfulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>.93</td>
<td>.74</td>
<td>.76</td>
</tr>
<tr>
<td>Accept/Reject</td>
<td>.92/.93</td>
<td>.74/.80</td>
<td>.62/.73</td>
</tr>
<tr>
<td>Official/Not official</td>
<td>.92/.93</td>
<td>.75/.74</td>
<td>.73/.77</td>
</tr>
<tr>
<td>Male/Female</td>
<td>.92/.93</td>
<td>.74/.75</td>
<td>.75/.78</td>
</tr>
</tbody>
</table>

**Conclusion.** Hypothesis 1.1.1 was supported and accepted, thus demonstrating the PPEAS subscales to be reliable measures for the total sample, as well as for the specific subgroups of interest (i.e., accept/reject, official/not official, male/female).

**Hypothesis 1.1.2: Factorial Structure of the PPEAS.**

**Overview.** Hypothesis 1.1.2 proposes that the PPEAS is adequately represented by the three a-priori factor structure (see Figure 4.2).

**Results Hypothesis 1.1.2.** The statistics used to evaluate the model fit (as described in Chapter 5) include a set of chi square statistics and an additional set of overall fit statistics (RMSEA, CFI, & NNFI). The chi square results for the PPEAS factor structure were $\chi^2 = 76.85$, $df = 41$, $p < .001$. While these results would suggest that the fit is unsatisfactory (see Chapter 5) the chi square is overly sensitive to sample size, hence the need for professional interpretation and consideration of other, more stable fit statistics (B. M. Byrne, 2006). The overall fit indices are excellent (Browne & Cudeck, 1993; Marsh, Balla, & Hau, 1996) with NNFI = .982, CFI = .987, and RMSEA = .045 with a 90% confidence interval of .029 to .060.

Although the CFA yielded excellent fit statistics, a complete assessment of the factorial structure for the PPEAS requires an examination of the factor loadings between the factors and their respective items, and the factor correlations, to ensure that not only are the factors well represented by their items, but also that they are distinct constructs. Tables 6.3 and 6.4 give the factor loadings and factor correlations...
respectively. Table 6.3 shows every item loading to be statistically significant and substantial in size (ranging between .55 and .95).

Table 6.3

*Standardised Factor Loadings for the Parents’ Perceptions, Experiences of ADHD Scale (PPEAS)*

<table>
<thead>
<tr>
<th>Item number</th>
<th>Peer</th>
<th>Medication Attitudes</th>
<th>Helpfulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.79</td>
<td>.80</td>
<td>.89</td>
</tr>
<tr>
<td>2</td>
<td>.87</td>
<td>.92</td>
<td>.55</td>
</tr>
<tr>
<td>3</td>
<td>.95</td>
<td>.79</td>
<td>.69</td>
</tr>
<tr>
<td>4</td>
<td>.86</td>
<td>.61</td>
<td></td>
</tr>
</tbody>
</table>

* All factor loadings are significant at \( p < .05 \)

Jackson and Gillaspy (2009) recommend when reporting on CFA results, providing some indication of the variance explained in the model’s endogenous variables (e.g., scale items). This is easily achieved, as the variance in an item score attributable to its latent factor, is simply the square of the factor loadings from the completely standardised solution. Given that this value is easily calculated from the factor loadings, it is not included in Table 6.3 or any of the other tables in this chapter that provide factor loadings.

Table 6.4 shows that only the Medication and Helpfulness factors correlate significantly. The absence of statistically significant correlations does not imply any weakness of the scale, as it is not necessary for the individual factors to correlate, but rather demonstrates that the factors are highly distinct in nature. These three subscales were included in the PPEAS because they are conceptually related in terms of parents’ beliefs or opinions.

Table 6.4

*Factor Correlations of the Perceptions, Experiences of ADHD Scale (PPEAS)*

<table>
<thead>
<tr>
<th></th>
<th>Peer</th>
<th>Medication Attitudes</th>
<th>Helpfulness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication Attitudes</td>
<td>-.09</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Helpfulness</td>
<td>-.06</td>
<td>.60*</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* Significant at \( p < .05 \)
Summary. The factor loadings suggest that a substantial degree of variance in the items is accounted for by their respective factors. Further, the CFA fit statistics were excellent and the factors are distinct factors. Therefore, Hypothesis 1.1.2 is supported and accepted, thus demonstrating that the PPEAS is well described by the proposed three-factor model.

Hypotheses 1.1.3–1.1.5: Factorial Invariance of the PPEAS.

Overview. Hypotheses 1.1.3–1.1.5 proposed that the PPEAS is invariant across the grouping variables of (a) child’s gender, (b) whether or not an official diagnosis was given, and (c) parent’s acceptance or rejection of the ADHD diagnosis.

Results: Hypotheses 1.1.3–1.1.5. Results for invariance for each of the three grouping variables are given in Tables 6.5, 6.6, and 6.7. Invariance is evaluated by the application of four multi-group CFA models (M1–M4) as described in Chapter 5. To evaluate whether invariance is supported, the change in CFI values is used where the CFI for M1 is compared with the CFI values of M2, M3, and M4. A change in CFI of less than +/- .01 is supportive of invariance (Cheung & Rensvold, 2002). As discussed in Chapter 5, invariance for M2 is considered the base level of invariance, invariance for M3 is considered the desirable minimal level of invariance, and invariance for M4 is considered to be evidence of complete invariance.

For invariance across gender, examination of the CFI values (refer to Table 6.5) shows that the change in CFI between M1 and M3 is less than .01, thereby achieving the desirable minimal level of invariance (Cheung & Rensvold, 2002). The difference in CFI values for M1 and M4 was greater than .01, thereby suggesting that total invariance was not attained. However, there is still some overlap in the 90% confidence intervals for the RMSEA between M1 and M4, and the NNFI and CFI values are greater than .9, thereby suggesting that the level of invariance attained is somewhat higher than the desirable minimal level (Bodkin-Andrews, Denson, et al., 2010; B. M. Byrne, 1998).
Table 6.5

Summary of Goodness of Fit Statistics for Invariance Testing for the Parents’ Perceptions, Experiences of ADHD Scale (PPEAS) Across Gender

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>Completely free</td>
<td>121.95</td>
<td>82</td>
<td>.985</td>
<td>.980</td>
<td>.048</td>
<td>.028 - .065</td>
</tr>
<tr>
<td>M 2</td>
<td>FL = Invariant</td>
<td>146.55</td>
<td>90</td>
<td>.979</td>
<td>.975</td>
<td>.054</td>
<td>.038 - .070</td>
</tr>
<tr>
<td>M 3</td>
<td>FL, COV = Invariant</td>
<td>147.16</td>
<td>93</td>
<td>.980</td>
<td>.976</td>
<td>.052</td>
<td>.035 - .067</td>
</tr>
<tr>
<td>M 4</td>
<td>Completely Invariant</td>
<td>299.03</td>
<td>107</td>
<td>.966</td>
<td>.962</td>
<td>.063</td>
<td>.049 - .077</td>
</tr>
</tbody>
</table>

Note. $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

For invariance across official diagnosis status, the CFI values given in Table 6.6 show that the change in CFI between M1 and M3 is less than .01, thereby achieving the desirable minimal level of invariance (Cheung & Rensvold, 2002). As the difference in CFI values between M1 and M4 is greater than .01, total invariance is not supported. Again, as was the case for invariance across gender, there is some overlap in the 90% confidence intervals for the RMSEA between M1 and M4, and the NNFI and CFI values are greater than .9, thereby suggesting that a level of invariance higher than the desirable minimal level was achieved (Bodkin-Andrews, Denson, et al., 2010; B. M. Byrne, 1998).

Table 6.6

Summary of Goodness of Fit Statistics for Invariance Testing for the Parents’ Perceptions, Experiences of ADHD Scale (PPEAS) Across Official Diagnosis Status

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>Completely free</td>
<td>129.35</td>
<td>82</td>
<td>.982</td>
<td>.976</td>
<td>.052</td>
<td>.034 - .068</td>
</tr>
<tr>
<td>M 2</td>
<td>FL = Invariant</td>
<td>133.81</td>
<td>90</td>
<td>.983</td>
<td>.980</td>
<td>.048</td>
<td>.029 - .064</td>
</tr>
<tr>
<td>M 3</td>
<td>FL, COV = Invariant</td>
<td>136.84</td>
<td>93</td>
<td>.983</td>
<td>.980</td>
<td>.047</td>
<td>.029 - .063</td>
</tr>
<tr>
<td>M 4</td>
<td>Completely Invariant</td>
<td>195.79</td>
<td>107</td>
<td>.966</td>
<td>.962</td>
<td>.062</td>
<td>.048 - .076</td>
</tr>
</tbody>
</table>

Note. $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

For invariance across parents’ acceptance or rejection of the ADHD diagnosis, the CFI values given in Table 6.7 show that the change in CFI between
M1 and M3 is less than .01, thereby achieving the desirable minimal level of invariance (Cheung & Rensvold, 2002). The difference in CFI values for M1 and M4 was greater than .01, with no overlap of in the 90% confidence intervals for the RMSEA, thereby suggesting that total invariance was not attained.

Table 6.7

Summary of Goodness of Fit Statistics for Invariance Testing for the Parents’ Perceptions, Experiences of ADHD Scale (PPEAS) Across Parent’s Acceptance/Rejection

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>χ²</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Completely free</td>
<td>110.63</td>
<td>82</td>
<td>.987</td>
<td>.983</td>
<td>.040</td>
<td>.017 - .058</td>
</tr>
<tr>
<td>M2</td>
<td>FL = Invariant</td>
<td>115.91</td>
<td>90</td>
<td>.989</td>
<td>.986</td>
<td>.037</td>
<td>.011 - .055</td>
</tr>
<tr>
<td>M3</td>
<td>FL, COV = Invariant</td>
<td>121.59</td>
<td>93</td>
<td>.988</td>
<td>.985</td>
<td>.038</td>
<td>.014 - .055</td>
</tr>
<tr>
<td>M4</td>
<td>Completely Invariant</td>
<td>269.13</td>
<td>107</td>
<td>.932</td>
<td>.923</td>
<td>.084</td>
<td>.071 - .096</td>
</tr>
</tbody>
</table>

Note. χ² = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

Summary. Invariance for the PPEAS was explored across three subgroups: child’s gender, official/unofficial diagnosis received, and acceptance/rejection of diagnosis. The minimal desirable level of invariance was evident for all subgroups: hence, Hypotheses 1.3.3 to 1.3.5 were accepted.

Summary of Hypotheses 1.1.1–1.1.5

Evaluation of these hypotheses demonstrates that the PPEAS has strong psychometric properties. All item-to-factor loadings were significant and substantial, being above the minimum acceptable level for factor loadings. Reliability estimates for each of the scale’s three factors were high. Finally, the minimal desirable level of invariance was demonstrated across all subgroups of interest.

Results for Hypotheses 1.2.1–1.2.5: Psychometric Assessment of the PBCS

Descriptive Statistics

Descriptive statistics for the PBCS are given in Table 6.8. Similar to the descriptive data for the PPEAS, the majority of values for the skewness and kurtosis
are close to zero. These values mean that any violations in multivariate normality are minimal and are not likely to impact on the CFA procedures.

Examination of the means for each subscale (i.e., Family environment, Brain Disorder, and Child’s Behaviour), suggests that Brain Disorder is more highly endorsed than the other two factors. Examining the different subgroups of parents, of most interest are those parents who reject ADHD as a medical diagnosis. Of all the subgroups, these parents are more likely to endorse Family Environment and Child’s Behaviour (i.e., endorse the notion that ADHD is not a brain-based medical condition). Accordingly, they are also less likely to endorse the Brain Disorder factor, with a mean score of 4.96 compared with a mean score of 6.49 for those parents who accept the diagnosis. In a similar manner, parents of children with an official diagnosis are more likely to give a response suggesting that they believe the cause of ADHD is biological in nature compared with parents of children who do not have an official diagnosis. Differences between the various grouping variables are examined for significance in Research Questions 1.6.2, 1.7.2 and 1.8.2.
<table>
<thead>
<tr>
<th>Grouping variable</th>
<th>Home Environment</th>
<th>Brain Disorder</th>
<th>Child’s Behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3.37</td>
<td>6.21</td>
<td>4.59</td>
</tr>
<tr>
<td>Accept</td>
<td>3.19</td>
<td>6.49</td>
<td>4.46</td>
</tr>
<tr>
<td>Reject</td>
<td>4.15</td>
<td>4.96</td>
<td>5.16</td>
</tr>
<tr>
<td>Official</td>
<td>3.16</td>
<td>6.45</td>
<td>4.42</td>
</tr>
<tr>
<td>Not official</td>
<td>3.83</td>
<td>5.66</td>
<td>4.96</td>
</tr>
<tr>
<td>Male</td>
<td>3.31</td>
<td>6.18</td>
<td>4.56</td>
</tr>
<tr>
<td>Female</td>
<td>3.57</td>
<td>6.30</td>
<td>4.69</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.83</td>
<td>1.64</td>
<td>1.72</td>
</tr>
<tr>
<td>Accept</td>
<td>1.75</td>
<td>1.43</td>
<td>1.68</td>
</tr>
<tr>
<td>Reject</td>
<td>1.98</td>
<td>1.89</td>
<td>1.80</td>
</tr>
<tr>
<td>Official</td>
<td>1.75</td>
<td>1.54</td>
<td>1.72</td>
</tr>
<tr>
<td>Not official</td>
<td>1.94</td>
<td>1.72</td>
<td>1.68</td>
</tr>
<tr>
<td>Male</td>
<td>1.80</td>
<td>1.62</td>
<td>1.70</td>
</tr>
<tr>
<td>Female</td>
<td>1.93</td>
<td>1.70</td>
<td>1.82</td>
</tr>
<tr>
<td>Skewness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>0.52</td>
<td>-1.14</td>
<td>-0.26</td>
</tr>
<tr>
<td>Accept</td>
<td>0.62</td>
<td>-1.30</td>
<td>-0.26</td>
</tr>
<tr>
<td>Reject</td>
<td>0.04</td>
<td>-0.42</td>
<td>-0.46</td>
</tr>
<tr>
<td>Official</td>
<td>0.68</td>
<td>-1.28</td>
<td>-0.14</td>
</tr>
<tr>
<td>Not official</td>
<td>0.17</td>
<td>-0.94</td>
<td>-0.54</td>
</tr>
<tr>
<td>Male</td>
<td>0.57</td>
<td>-1.08</td>
<td>-0.23</td>
</tr>
<tr>
<td>Female</td>
<td>0.35</td>
<td>-1.37</td>
<td>-0.36</td>
</tr>
<tr>
<td>Kurtosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>-0.75</td>
<td>0.99</td>
<td>-0.64</td>
</tr>
<tr>
<td>Accept</td>
<td>-0.57</td>
<td>1.90</td>
<td>-0.63</td>
</tr>
<tr>
<td>Reject</td>
<td>-1.10</td>
<td>-0.64</td>
<td>-0.56</td>
</tr>
<tr>
<td>Official</td>
<td>-0.42</td>
<td>1.43</td>
<td>-0.71</td>
</tr>
<tr>
<td>Not official</td>
<td>-1.12</td>
<td>0.48</td>
<td>-0.17</td>
</tr>
<tr>
<td>Male</td>
<td>-0.60</td>
<td>0.86</td>
<td>-0.56</td>
</tr>
<tr>
<td>Female</td>
<td>-1.18</td>
<td>1.60</td>
<td>-0.82</td>
</tr>
</tbody>
</table>

**Hypothesis 1.2.1: Cronbach’s Alpha Reliability Estimates**

**Overview.** Hypothesis 1.2.1 proposed that the three-factor model of the PBCS would be a reliable measurement scale for the total sample, as well as for specific subgroups of the total sample.

**Results Hypothesis 1.2.1.** Reliability estimates for the PBCS factors are shown in Table 6.9. The results show that the three subscales of the PBCS are reliable measures for the total sample (Netemeyer et al., 2003), with alpha coefficients ranging from .74 to .78. Acceptable measures of reliability were also obtained across the different subgroups of the PBCS (Aron & Aron, 2003), with alpha coefficients ranging from .66 to .85.
Table 6.9

Reliability Estimates (Cronbach’s Alpha) for the Total Sample and Subgroups for the Parents’ Beliefs of Causes (PBCS)

<table>
<thead>
<tr>
<th>Grouping categories</th>
<th>Family Environment</th>
<th>Brain Disorder</th>
<th>Child’s Behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>.78</td>
<td>.74</td>
<td>.75</td>
</tr>
<tr>
<td>Accept/Reject</td>
<td>.78/.77</td>
<td>.66/.82</td>
<td>.72/.80</td>
</tr>
<tr>
<td>Official/Not official</td>
<td>.76/.81</td>
<td>.71/.76</td>
<td>.72/.76</td>
</tr>
<tr>
<td>Male/Female</td>
<td>.76/.85</td>
<td>.72/.80</td>
<td>.73/.81</td>
</tr>
</tbody>
</table>

Conclusion. The PBCS is a reliable set of measures for the total sample, as well as for the specific subgroups of interest (i.e., accept/reject, official/not official, male/female), thus supporting Hypothesis 1.2.1, which is accepted.

Hypothesis 1.2.2: Factorial Structure of the PBCS.

Overview. Hypothesis 1.2.2 proposes that a CFA will demonstrate the three a-priori factor structure of the PBCS (see Figure 4.3).

Results Hypothesis 1.2.2. The chi square results for the PBCS factor structure were $\chi^2 = 69.25$, $df = 32$, $p < .001$. Similarly to the previous chi square results, the chi-square results here suggest that the fit is unsatisfactory (B. M. Byrne, 2006), however, the overall fit indices are very good (Browne & Cudeck, 1993; Marsh, et al., 1996), with NNFI = .959, CFI = .971, and RMSEA = .052 with a 90% confidence interval of .035 to .069.

Tables 6.10 and 6.11 give the factor loadings and factor correlations respectively. Table 6.10 shows every item loading to be statistically significant and substantial in size (ranging between .53 and .86).

Table 6.10

Standardised Factor Loadings for the Parents’ Beliefs of Causes (PBCS)

<table>
<thead>
<tr>
<th>Item number</th>
<th>Family Environment</th>
<th>Brain Disorder</th>
<th>Child’s Behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.70</td>
<td>.55</td>
<td>.72</td>
</tr>
<tr>
<td>2</td>
<td>.79</td>
<td>.74</td>
<td>.66</td>
</tr>
<tr>
<td>3</td>
<td>.74</td>
<td>.86</td>
<td>.53</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td>.69</td>
</tr>
</tbody>
</table>

* All factor loadings are significant at $p < .05$
Table 6.11 shows that only the Family Environment and Brain Disorder factors correlate significantly. The absence of statistical correlations does not imply any weakness of the scale, as it is not necessary for the individual factors to correlate. These three subscales were included in the PBCS because they are conceptually related to varying facets of distinct parental beliefs.

Table 6.11

*Table Correlations of the Parents' Beliefs of Causes (PBCS)*

<table>
<thead>
<tr>
<th></th>
<th>Family Environment</th>
<th>Brain Disorder</th>
<th>Child’s Behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Environment</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain Disorder</td>
<td>.01</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Child’s Behaviour</td>
<td>.76*</td>
<td>-.11</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* Significant at \( p < .05 \)

**Summary.** The correlations between the factors show them to be distinct factors, and the factor loadings suggest that a substantial degree of variance in the items is accounted for by their respective factors. In addition, the CFA fit statistics were excellent. Therefore, Hypothesis 1.2.2 is supported and accepted, thus demonstrating that the PBCS is well described by the proposed three-factor model.

**Hypotheses 1.2.3–1.2.5: Factorial Invariance of the PBCS.**

**Overview.** Hypotheses 1.2.3–1.2.5 proposed that the PBCS is invariant across the grouping variables of (a) child’s gender, (b) whether or not an official diagnosis was given, and (c) parent’s acceptance or rejection of the ADHD diagnosis.

**Results: Hypotheses 1.2.3–1.2.5.** Results for invariance for each of the three grouping variables are given in Tables 6.12, 6.13, and 6.14, where invariance is evaluated via the change in CFI values. For invariance across gender, examination of the CFI values (refer to Table 6.12) shows that the change in CFI between M1 and M3 is less than .01, thereby attaining the desirable minimal level of invariance (Cheung & Rensvold, 2002). The difference between M1 and M4 for CFI was greater than .01, indicating that full invariance was not obtained. However, there is some overlap in the 90% confidence intervals for the RMSEA between M1 and M4, and the NNFI and CFI values are greater than .9, thereby suggesting that a level of
invariance higher than the desirable minimal level was achieved (Bodkin-Andrews, Denson, et al., 2010; B. M. Byrne, 1998).

Table 6.12

*Summary of Goodness of Fit Statistics for Invariance Testing for the Parents’ Beliefs of Causes (PBCS) Across Gender*

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>Completely free</td>
<td>121.43</td>
<td>64</td>
<td>.956</td>
<td>.939</td>
<td>.065</td>
<td>.047 - .082</td>
</tr>
<tr>
<td>M 2</td>
<td>FL = Invariant</td>
<td>128.19</td>
<td>71</td>
<td>.957</td>
<td>.945</td>
<td>.061</td>
<td>.044 - .078</td>
</tr>
<tr>
<td>M 3</td>
<td>FL, COV = Invariant</td>
<td>130.66</td>
<td>74</td>
<td>.957</td>
<td>.948</td>
<td>.060</td>
<td>.042 - .076</td>
</tr>
<tr>
<td>M 4</td>
<td>Completely Invariant</td>
<td>160.54</td>
<td>87</td>
<td>.944</td>
<td>.935</td>
<td>.063</td>
<td>.047 - .078</td>
</tr>
</tbody>
</table>

*Note.* $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = confidence interval.

For invariance across official diagnosis status, the CFI values given in Table 6.13 show that the change in CFI between M1 and M4 is less than .01, thereby demonstrating full invariance for the PBCS (Cheung & Rensvold, 2002).

Table 6.13

*Summary of Goodness of Fit Statistics for Invariance Testing for the Parents’ Beliefs of Causes (PBCS) Across Official Diagnosis Status*

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>Completely free</td>
<td>107.65</td>
<td>64</td>
<td>.965</td>
<td>.950</td>
<td>.056</td>
<td>.037 - .074</td>
</tr>
<tr>
<td>M 2</td>
<td>FL = Invariant</td>
<td>113.62</td>
<td>71</td>
<td>.965</td>
<td>.956</td>
<td>.053</td>
<td>.034 - .070</td>
</tr>
<tr>
<td>M 3</td>
<td>FL, COV = Invariant</td>
<td>113.88</td>
<td>74</td>
<td>.968</td>
<td>.961</td>
<td>.050</td>
<td>.031 - .068</td>
</tr>
<tr>
<td>M 4</td>
<td>Completely Invariant</td>
<td>137.88</td>
<td>87</td>
<td>.959</td>
<td>.953</td>
<td>.052</td>
<td>.035 - .068</td>
</tr>
</tbody>
</table>

*Note.* $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

For invariance across parents’ acceptance or rejection of the ADHD diagnosis, the CFI values given in Table 6.14 show that the change in CFI between M1 and M3 is less than .01, thereby achieving the desirable minimal level of invariance (Cheung & Rensvold, 2002). The difference between M1 and M4 for CFI was greater than .01, indicating that full invariance was not obtained. However, there
is some overlap in the 90% confidence intervals for the RMSEA between M1 and M4, and the NNFI and CFI values are greater than .9, thereby suggesting that the level of invariance attained was higher than the desirable minimal level (Bodkin-Andrews, Denson, et al., 2010; B. M. Byrne, 1998).

Table 6.14

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Completely free</td>
<td>118.64</td>
<td>64</td>
<td>.954</td>
<td>.936</td>
<td>.063</td>
<td>.045 - .080</td>
</tr>
<tr>
<td>M2</td>
<td>FL = Invariant</td>
<td>124.86</td>
<td>71</td>
<td>.955</td>
<td>.943</td>
<td>.060</td>
<td>.042 - .076</td>
</tr>
<tr>
<td>M3</td>
<td>FL, COV = Invariant</td>
<td>130.81</td>
<td>74</td>
<td>.953</td>
<td>.942</td>
<td>.060</td>
<td>.043 - .076</td>
</tr>
<tr>
<td>M4</td>
<td>Completely Invariant</td>
<td>159.79</td>
<td>87</td>
<td>.940</td>
<td>.931</td>
<td>.063</td>
<td>.047 - .077</td>
</tr>
</tbody>
</table>

Note. $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

**Summary.** Invariance for the PBCS was explored across three subgroups: child’s gender, official/unofficial diagnosis received, and acceptance/rejection of diagnosis. Full invariance was achieved for the official/unofficial status of the diagnosis, while the minimal desirable level of invariance was achieved for the other two subgroups. These results demonstrate the PBCS to be sufficiently invariant across the subgroups of interest in this research.

**Summary of Hypotheses 1.2.1–1.2.5**

These results demonstrate that the PBCS has strong psychometric properties. All item-to-factor loadings were significant and substantial and the factors are shown to be relatively distinct factors. Reliability estimates for each of the scale’s three factors were in an acceptable range. Finally, the subscale demonstrated sufficient levels of invariance across the subgroups of interest (i.e., child’s gender, acceptance/rejection of the ADHD diagnosis, and whether or not an official diagnosis was received).
Results for Hypotheses 1.3.1–1.3.5: Psychometric Assessment of the PSS

Descriptive Statistics

Descriptive statistics for the PSS are given in Table 6.15. Examinations of the means suggest that for the total sample and sub-samples, participants felt that there was greater stress for their family than for themselves as individuals. The values for both kurtosis and skewness are close to zero, hence any violations in multivariate normality are minimal and are not likely to impact on the CFA procedures.

The results in Table 6.15 show that for all subscales of the PSS (Individual Stress, Family Stress, and Criticism), parents who accepted the diagnosis scored higher than those who rejected it, and parents of children with an official diagnosis scored higher than parents of children who did not have an official diagnosis. Differences between the various grouping variables are examined for significance in Research Questions 1.6.3, 1.7.3 and 1.8.3.
Table 6.15

Descriptive Statistics for the Parenting Stress Scale (PSS)

<table>
<thead>
<tr>
<th>Grouping variable</th>
<th>Criticism</th>
<th>Individual</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Total</td>
<td>4.30</td>
<td>5.51</td>
<td>6.03</td>
</tr>
<tr>
<td>Accept</td>
<td>4.34</td>
<td>5.64</td>
<td>6.14</td>
</tr>
<tr>
<td>Reject</td>
<td>4.14</td>
<td>4.95</td>
<td>5.54</td>
</tr>
<tr>
<td>Official</td>
<td>4.42</td>
<td>5.60</td>
<td>6.16</td>
</tr>
<tr>
<td>Not official</td>
<td>4.05</td>
<td>5.31</td>
<td>5.72</td>
</tr>
<tr>
<td>Male</td>
<td>4.30</td>
<td>5.51</td>
<td>6.09</td>
</tr>
<tr>
<td>Female</td>
<td>4.31</td>
<td>5.49</td>
<td>5.80</td>
</tr>
<tr>
<td>SD Total</td>
<td>1.74</td>
<td>1.74</td>
<td>1.64</td>
</tr>
<tr>
<td>Accept</td>
<td>1.76</td>
<td>1.70</td>
<td>1.63</td>
</tr>
<tr>
<td>Reject</td>
<td>1.65</td>
<td>1.84</td>
<td>1.64</td>
</tr>
<tr>
<td>Official</td>
<td>1.77</td>
<td>1.75</td>
<td>1.65</td>
</tr>
<tr>
<td>Not official</td>
<td>1.63</td>
<td>1.72</td>
<td>1.60</td>
</tr>
<tr>
<td>Male</td>
<td>1.75</td>
<td>1.73</td>
<td>1.62</td>
</tr>
<tr>
<td>Female</td>
<td>1.70</td>
<td>1.80</td>
<td>1.72</td>
</tr>
<tr>
<td>Skewness Total</td>
<td>0.11</td>
<td>-0.55</td>
<td>-0.87</td>
</tr>
<tr>
<td>Accept</td>
<td>0.14</td>
<td>-0.58</td>
<td>-0.99</td>
</tr>
<tr>
<td>Reject</td>
<td>-0.10</td>
<td>-0.37</td>
<td>-0.45</td>
</tr>
<tr>
<td>Official</td>
<td>0.10</td>
<td>-0.57</td>
<td>-0.99</td>
</tr>
<tr>
<td>Not official</td>
<td>0.07</td>
<td>-0.53</td>
<td>-0.67</td>
</tr>
<tr>
<td>Male</td>
<td>0.08</td>
<td>-0.52</td>
<td>-0.91</td>
</tr>
<tr>
<td>Female</td>
<td>-0.24</td>
<td>-0.66</td>
<td>-0.71</td>
</tr>
<tr>
<td>Kurtosis Total</td>
<td>-0.82</td>
<td>-0.43</td>
<td>0.15</td>
</tr>
<tr>
<td>Accept</td>
<td>-0.88</td>
<td>-0.32</td>
<td>0.39</td>
</tr>
<tr>
<td>Reject</td>
<td>-0.61</td>
<td>-0.83</td>
<td>-0.14</td>
</tr>
<tr>
<td>Official</td>
<td>-0.89</td>
<td>-0.40</td>
<td>0.40</td>
</tr>
<tr>
<td>Not official</td>
<td>0.71</td>
<td>-0.45</td>
<td>-0.09</td>
</tr>
<tr>
<td>Male</td>
<td>-0.83</td>
<td>-0.41</td>
<td>0.22</td>
</tr>
<tr>
<td>Female</td>
<td>-0.75</td>
<td>-0.45</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Hypothesis 1.3.1: Cronbach’s Alpha Reliability Estimates**

**Overview.** Hypothesis 1.3.1 proposed that the three-factor model of the PSS would be a reliable measurement scale for the total sample, as well as for specific subgroups of the total sample.

**Results Hypothesis 1.3.1.** Reliability estimates for the PSS factors are shown in Table 6.16. The results show the PSS to be a reliable measure (Netemeyer et al., 2003) for the total sample across its three subscales (alpha coefficients ranging from .72 to .74). Acceptable measures of reliability (i.e., greater than .6) as suggested by Aron and Aron (2003) were also obtained across the different subgroups of the PSS (alpha coefficients ranging from .64 to .80).
Table 6.16

*Reliability Estimates (Cronbach’s Alpha) for the Total Sample and Subgroups for the Parenting Stress Scale (PSS)*

<table>
<thead>
<tr>
<th>Grouping categories</th>
<th>Criticism</th>
<th>Individual</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>.72</td>
<td>.74</td>
<td>.74</td>
</tr>
<tr>
<td>Accept/Reject</td>
<td>.73/.69</td>
<td>.73/.80</td>
<td>.76/.64</td>
</tr>
<tr>
<td>Official/Not official</td>
<td>.72/.73</td>
<td>.75/.74</td>
<td>.75/.69</td>
</tr>
<tr>
<td>Male/Female</td>
<td>.73/.70</td>
<td>.74/.75</td>
<td>.75/.69</td>
</tr>
</tbody>
</table>

**Conclusion.** Hypothesis 1.3.1 was supported, thus demonstrating the factors within the PSS to provide reliable measures for the total sample, as well as the specific subgroups of interest (i.e., accept/reject, official/not official, male/female).

**Hypothesis 1.3.2: Factorial structure of the PSS.**

**Overview.** Hypothesis 1.3.2 proposes that a CFA will demonstrate the three a-priori factor structure of the PSS (see Figure 4.4).

**Results for Hypothesis 1.3.2.** The chi square results for the PSS factor structure were $\chi^2 = 51.99$, $df = 24$, $p < .001$. Although the chi-square results were unsatisfactory, the overall fit indices were very good (Browne & Cudeck, 1993; Marsh et al., 1996); NNFI = .968, CFI = .979, and RMSEA = .052 with a 90% confidence interval of .033 to .072.

Table 6.17 shows every item loading to be statistically significant and substantial in size (ranging between .40 and .91). Although one factor loading was below the base level of acceptability of .5 suggested by Hair et al. (2006), Hills (2008) has suggested that a factor loading as low as .3 may be acceptable, so this item was retained.

Table 6.17

*Standardised Factor Loadings for the Parenting Stress Scale (PSS)*

<table>
<thead>
<tr>
<th>Item number</th>
<th>Criticism</th>
<th>Individual Stress</th>
<th>Family Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.91</td>
<td>.70</td>
<td>.75</td>
</tr>
<tr>
<td>2</td>
<td>.75</td>
<td>.57</td>
<td>.60</td>
</tr>
<tr>
<td>3</td>
<td>.40</td>
<td>.86</td>
<td>.76</td>
</tr>
</tbody>
</table>

* All factor loadings are significant at $p < .05
Table 6.18 shows that the factors of the PSS correlate moderately with each other, with the correlations ranging between .58 and .74. This range of correlations suggests that the factors are related, yet relatively distinct enough to suggest they are measuring different constructs.

Table 6.18
Factor Correlations of the Parenting Stress Scale (PSS)

<table>
<thead>
<tr>
<th></th>
<th>Criticism</th>
<th>Individual Stress</th>
<th>Family Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criticism</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td>.64</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>.58</td>
<td>.74</td>
<td>1.00</td>
</tr>
</tbody>
</table>

* All correlations are significant at $p < .05$

Summary. The factor loadings suggest that a substantial and acceptable degree of variance in the items is accounted for by their respective factors. Further, the moderate correlations between factors suggest that the factors are distinct factors. Finally, the CFA fit statistics are excellent. Therefore, Hypothesis 1.3.2 is supported, thus demonstrating that the PSS is well described by the proposed three-factor model.

Hypotheses 1.3.3–1.3.5: Factorial invariance of the PSS.

Overview. Research hypotheses 1.3.1–1.3.5 proposed invariance for the PSS across the grouping variables of (a) child’s gender, (b) whether or not an official diagnosis was given, and (c) parent’s acceptance or rejection of the ADHD diagnosis.

Results: Hypotheses 1.3.3–1.3.5. Tables 6.19, 6.20, and 6.21 provide results for invariance for each of the three grouping variables. For invariance across gender, examination of the CFI values (refer to Table 6.19) shows that the change in CFI between M1 and M4 is less than .01, thereby achieving the full invariance (Cheung & Rensvold, 2002).
Table 6.19

Summary of Goodness of Fit Statistics for Invariance Testing for the Parenting Stress Scale (PSS) Across Gender

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>Completely free</td>
<td>72.29</td>
<td>48</td>
<td>.981</td>
<td>.972</td>
<td>.049</td>
<td>.023 -.070</td>
</tr>
<tr>
<td>M 2</td>
<td>FL = Invariant</td>
<td>74.86</td>
<td>54</td>
<td>.984</td>
<td>.979</td>
<td>.042</td>
<td>.013 -.064</td>
</tr>
<tr>
<td>M 3</td>
<td>FL, COV = Invariant</td>
<td>78.50</td>
<td>57</td>
<td>.984</td>
<td>.979</td>
<td>.042</td>
<td>.013 -.063</td>
</tr>
<tr>
<td>M 4</td>
<td>Completely Invariant</td>
<td>92.18</td>
<td>69</td>
<td>.982</td>
<td>.979</td>
<td>.040</td>
<td>.012 -.059</td>
</tr>
</tbody>
</table>

Note. $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

For invariance across official diagnosis status, the CFI values given in Table 6.20 show that a change in CFI between M1 and M4 is less than .01, thereby achieving full invariance (Cheung & Rensvold, 2002).

Table 6.20

Summary of Goodness of Fit Statistics for Invariance Testing for the Parenting Stress Scale (PSS) Across Official Diagnosis Status

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>Completely free</td>
<td>74.84</td>
<td>48</td>
<td>.979</td>
<td>.969</td>
<td>.051</td>
<td>.027 -.073</td>
</tr>
<tr>
<td>M 2</td>
<td>FL = Invariant</td>
<td>83.43</td>
<td>54</td>
<td>.977</td>
<td>.970</td>
<td>.050</td>
<td>.027 -.071</td>
</tr>
<tr>
<td>M 3</td>
<td>FL, COV = Invariant</td>
<td>85.13</td>
<td>57</td>
<td>.978</td>
<td>.973</td>
<td>.048</td>
<td>.024 -.068</td>
</tr>
<tr>
<td>M 4</td>
<td>Completely Invariant</td>
<td>104.66</td>
<td>69</td>
<td>.973</td>
<td>.968</td>
<td>.049</td>
<td>.028 -.067</td>
</tr>
</tbody>
</table>

Note. $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

The CFI values for invariance across parents’ acceptance or rejection of the ADHD diagnosis are given in Table 6.21. These results show that the change in CFI between M1 and M4 is less than .01, thereby achieving full invariance (Cheung & Rensvold, 2002).
Table 6.21
Summary of Goodness of Fit Statistics for Invariance Testing for the Parenting Stress Scale (PSS) Across Parent’s Acceptance/Rejection

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Completely free</td>
<td>82.91</td>
<td>48</td>
<td>.973</td>
<td>.960</td>
<td>.058</td>
<td>.036 - .079</td>
</tr>
<tr>
<td>M2</td>
<td>FL = Invariant</td>
<td>93.25</td>
<td>54</td>
<td>.970</td>
<td>.960</td>
<td>.058</td>
<td>.037 - .077</td>
</tr>
<tr>
<td>M3</td>
<td>FL, COV = Invariant</td>
<td>97.18</td>
<td>57</td>
<td>.969</td>
<td>.961</td>
<td>.057</td>
<td>.037 - .076</td>
</tr>
<tr>
<td>M4</td>
<td>Completely Invariant</td>
<td>113.74</td>
<td>69</td>
<td>.966</td>
<td>.960</td>
<td>.055</td>
<td>.036 - .072</td>
</tr>
</tbody>
</table>

Note. $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

Summary. Invariance for the PSS was explored across three subgroups: child’s gender, official/unofficial diagnosis received, and acceptance/rejection of diagnosis. Full invariance was achieved for all groupings, hence, Hypotheses 1.3.1–1.3.5 were accepted.

Summary of Hypotheses 1.3.1–1.3.5
These results demonstrate that the PSS has strong psychometric properties. All item-to-factor loadings were significant and substantial. All but one loading was above the minimum acceptable level of .5 recommended by Hair et al. (2006). However, this loading was well above the minimum level of .3 suggested by Hills (2008). Reliability estimates for each of the scale’s three factors were high. Finally, total invariance was demonstrated across all subgroups.

Results for Hypotheses 1.4.1–1.45: Psychometric Assessment of the PSCS
Descriptive Statistics
Table 6.22 provides the descriptive statistics for the PSCS. Examination of the means shows that each factor of the PSCS was strongly endorsed ($1 = strongly disagree, 8 = strongly agree$). The high endorsements, likely impact on the normality of the data, as indicated by the nonzero values yielded for kurtosis and skewness. While there is evidence of both kurtosis and skewness, as previously stated, West, et al. (1995) recommend that the maximum likelihood method of estimation is adequate when the absolute values of kurtosis and skewness are less than 7 and 2 respectively. For these data, all values, except for four, are within these limits. The exceptions are three skewness values of -2.00, -2.05, and -2.07; and one kurtosis value of 7.97.
However, the presence of these values is not so great a problem when employing SEM and CFA techniques, as the maximum likelihood method of estimation procedure is robust with respect to violations of normality that can potentially affect parameter estimates and goodness-of-fit indices (Hu, et al., 1992; Jöreskog & Sorbom, 1993; Muthen & Kaplan, 1985). All CFAs were conducted using EQS 6.1 (Bentler & Wu, 2005) based on covariance matrices and the method of maximum likelihood estimation.

Table 6.22 shows that the parents of male children had slightly higher scores on average for each of the three factors of the PSCS. The table also shows that those parents who accept the ADHD diagnosis had slightly higher scores on average for each of the three factors of the PSCS than parents who reject the ADHD diagnosis. Differences between the various grouping variables are examined for significance in discussing of Research Questions 1.6.4, 1.7.4 and 1.8.4.
Table 6.22
Descriptive Statistics for the Parenting Self-Concept Scale (PSCS)

<table>
<thead>
<tr>
<th>Grouping variable</th>
<th>Affect</th>
<th>Competency</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6.96</td>
<td>6.91</td>
<td>6.79</td>
</tr>
<tr>
<td>Accept</td>
<td>6.98</td>
<td>6.93</td>
<td>6.79</td>
</tr>
<tr>
<td>Reject</td>
<td>6.90</td>
<td>6.82</td>
<td>6.76</td>
</tr>
<tr>
<td>Official</td>
<td>6.98</td>
<td>6.90</td>
<td>6.80</td>
</tr>
<tr>
<td>Not official</td>
<td>6.96</td>
<td>6.95</td>
<td>6.77</td>
</tr>
<tr>
<td>Male</td>
<td>7.03</td>
<td>6.97</td>
<td>6.88</td>
</tr>
<tr>
<td>Female</td>
<td>6.73</td>
<td>6.68</td>
<td>6.47</td>
</tr>
<tr>
<td>SD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.09</td>
<td>0.92</td>
<td>1.22</td>
</tr>
<tr>
<td>Accept</td>
<td>1.05</td>
<td>0.86</td>
<td>1.20</td>
</tr>
<tr>
<td>Reject</td>
<td>1.27</td>
<td>1.12</td>
<td>1.12</td>
</tr>
<tr>
<td>Official</td>
<td>1.13</td>
<td>0.94</td>
<td>1.29</td>
</tr>
<tr>
<td>Not official</td>
<td>1.01</td>
<td>0.86</td>
<td>1.03</td>
</tr>
<tr>
<td>Male</td>
<td>0.98</td>
<td>0.79</td>
<td>1.13</td>
</tr>
<tr>
<td>Female</td>
<td>1.34</td>
<td>1.25</td>
<td>1.44</td>
</tr>
<tr>
<td>Skewness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>-1.89</td>
<td>-1.81</td>
<td>-1.73</td>
</tr>
<tr>
<td>Accept</td>
<td>-1.88</td>
<td>-1.78</td>
<td>-1.71</td>
</tr>
<tr>
<td>Reject</td>
<td>-1.85</td>
<td>-1.77</td>
<td>-1.91</td>
</tr>
<tr>
<td>Official</td>
<td>-2.00</td>
<td>-2.05</td>
<td>-1.73</td>
</tr>
<tr>
<td>Not official</td>
<td>-1.53</td>
<td>-1.07</td>
<td>-1.63</td>
</tr>
<tr>
<td>Male</td>
<td>-1.77</td>
<td>-1.06</td>
<td>-1.70</td>
</tr>
<tr>
<td>Female</td>
<td>-1.83</td>
<td>-2.07</td>
<td>-1.64</td>
</tr>
<tr>
<td>Kurtosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4.83</td>
<td>6.45</td>
<td>3.73</td>
</tr>
<tr>
<td>Accept</td>
<td>5.25</td>
<td>6.97</td>
<td>3.75</td>
</tr>
<tr>
<td>Reject</td>
<td>3.41</td>
<td>4.44</td>
<td>3.96</td>
</tr>
<tr>
<td>Official</td>
<td>5.55</td>
<td>7.97</td>
<td>3.42</td>
</tr>
<tr>
<td>Not official</td>
<td>2.53</td>
<td>1.19</td>
<td>4.36</td>
</tr>
<tr>
<td>Male</td>
<td>3.87</td>
<td>1.42</td>
<td>3.50</td>
</tr>
<tr>
<td>Female</td>
<td>4.17</td>
<td>5.89</td>
<td>3.07</td>
</tr>
</tbody>
</table>

**Hypothesis 1.4.1: Cronbach’s Alpha Reliability Estimates**

**Overview.** Hypothesis 1.4.1 proposed that the three-factor model of the PSCS would attain acceptable reliability estimates on each factor for the total sample, as well as for specific subgroups of the total sample.

**Results Hypothesis 1.4.1.** Reliability estimates (Cronbach’s alpha) for the PSCS factors are shown in Table 6.23. The results show that the PSCS is a reliable measure for the total sample across its three subscales (Netemeyer et al., 2003), with alpha coefficients ranging from .86 to .92. Further, results across the different subgroups of the sample show the PSCS to be a reliable measure for these subgroups (alpha coefficients ranging from .82 to .94).
### Table 6.23
Reliability Estimates (Cronbach’s Alpha) for the Total Sample and Subgroups for the Parenting Self-Concept Scale (PSCS)

<table>
<thead>
<tr>
<th>Grouping categories</th>
<th>Affect</th>
<th>Competency</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>.90</td>
<td>.86</td>
<td>.92</td>
</tr>
<tr>
<td>Accept/Reject</td>
<td>.89/.94</td>
<td>.83/.94</td>
<td>.92/.93</td>
</tr>
<tr>
<td>Official/Not official</td>
<td>.90/.90</td>
<td>.84/.92</td>
<td>.92/.92</td>
</tr>
<tr>
<td>Male/Female</td>
<td>.89/.92</td>
<td>.82/.92</td>
<td>.90/.94</td>
</tr>
</tbody>
</table>

**Conclusion.** Hypothesis 1.4.1 is supported, thus demonstrating the factors of the PSCS to be reliable measures for the total sample, as well as the specific subgroups of interest (i.e., accept/reject, official/not official, male/female).

**Hypothesis 1.4.2: Factorial Structure of the PSCS**

**Overview.** Hypothesis 1.4.2 proposed that a CFA will demonstrate the three a-priori factor structure of the PSCS (see Figure 4.5).

**Results Hypothesis 1.4.2.** A CFA was conducted to evaluate the proposed factor structure of the PSCS. The chi square results for the PSCS factor structure were $\chi^2 = 75.09$, $df = 32$, $p < .001$. This small probability value suggests that the factor structure proposed in this research hypothesis should be rejected. However, the CFA fit statistics are NNFI = .978, CFI = .987, and RMSEA = .056, with a 90% confidence interval of .040 to .072. These are excellent fit statistics (Browne & Cudeck, 1993; Marsh et al., 1996) that support Hypothesis 1.4.2. Tables 6.24 and 6.25 provide the results for factor loadings and factor correlations respectively. Table 6.24 shows every item loading to be statistically significant and substantial in size (ranging between .76 and .92) and above the minimum level of acceptability of .5 suggested by Hair et al. (2006).
Table 6.24
*Standardised Factor Loadings for the Parenting Self-Concept Scale (PSCS)*

<table>
<thead>
<tr>
<th>Item number</th>
<th>Affect</th>
<th>Competency</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.84</td>
<td>.76</td>
<td>.84</td>
</tr>
<tr>
<td>2</td>
<td>.82</td>
<td>.87</td>
<td>.92</td>
</tr>
<tr>
<td>3</td>
<td>.82</td>
<td>.89</td>
<td>.92</td>
</tr>
<tr>
<td>4</td>
<td>.86</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*All factor loadings are significant at $p < .05$*

Table 6.25 shows that the factors of the PSCS correlate positively to each other, with the correlations ranging between .63 and .81. A high correlation between Affect and Competency factors is present. Marsh et al. (2004) have noted high correlations between factors as a potential problem for multicollinearity issues that may distort future SEM/predictive models.

Table 6.25
*Factor Correlations of the Parenting Self-Concept Scale (PSCS)*

<table>
<thead>
<tr>
<th></th>
<th>Affect</th>
<th>Competency</th>
<th>Relationship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affect</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competency</td>
<td>.81</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Relationship</td>
<td>.63</td>
<td>.69</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*All correlations are significant at $p < .05$*

Using an absolute cut off value of $r \geq .80$ to identify potential multicollinearity problems (Hills, 2008), the results of Table 6.25 suggest that a second-order construct for the parenting self-concept be proposed, as per the recommendations of Billings and Wroten (1978). Use of a second-order construct can help eliminate the problems referred to by Marsh et al. (2004), when highly correlated first-order factors are used for predictive purposes. Given the high correlations between factors of the PSCS, an additional CFA was conducted to examine a second-order factor model. A conceptual representation of this model is shown in Figure 6.1.
A CFA for the factor model shown in Figure 6.1 produced the following chi square results, $\chi^2 = 75.09$, $df = 31$, $p < .001$. Although the chi square results again suggest that the model be rejected, the fit statistics of NNFI = .981, CFI = .987, and RMSEA = .058 with a 90% confidence interval of .041 to .074 provide excellent support for the higher-order factor model (Browne & Cudeck, 1993; Marsh, et al., 1996). In addition, it should also be noted that the second order factor loadings were all strong (ranging from .73 to .95).

**Summary.** The high factor loadings suggest that a substantial degree of variance in the items is accounted for by their respective factors. Further, given the high correlations between factors, support was also gained for a second order factor model. In addition, excellent CFA fit statistics were obtained for each model. Hence, based on these findings, Hypothesis 1.4.2 is supported, thus demonstrating that the PSCS is well described by the proposed three-factor model, and also a second-order factor model.

**Hypotheses 1.4.3–1.4.5: Factorial invariance of the PSCS**

**Overview.** Hypotheses 1.4.3–1.4.5 propose that the PSCS will be invariant across the grouping variables of (a) child’s gender, (b) whether or not an official...
diagnosis was given, and (c) parent’s acceptance or rejection of the ADHD diagnosis.

**Results: Hypotheses 1.4.3–1.4.5.** Results for the invariance testing for each of the three grouping models are given in Tables 6.26, 6.27, and 6.28. For invariance across gender, examination of the CFI values (refer to Table 6.26) shows that the change in CFI between M1 and M2 is less than .01, thereby achieving the base level of invariance. The change in CFI between M1 and subsequent models (M3 and M4) is greater than .01, thereby indicating that neither the minimal desirable level of invariance, nor total invariance was attained. However, while the base level of invariance has been achieved, some alternative evidence suggests support for invariance beyond the minimum level. Specifically, the results in Table 6.26 show an overlap in the 90% confidence interval of the RMSEA between M1 and M3, and between M1 and M4, and the CFI and NNFI values are still reasonably good values (i.e., greater than .9), which is supportive of further invariance beyond the base level (Bodkin-Andrews, Denson, et al., 2010; B. M. Byrne, 1998). Hence, the invariance of the PSCS across gender can be considered satisfactory for this research.

Table 6.26

*Summary of Goodness of Fit Statistics for Invariance Testing for the Parenting Self-Concept Scale (PSCS) Across Gender*

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>$df$</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>Completely free</td>
<td>126.45</td>
<td>64</td>
<td>.981</td>
<td>.973</td>
<td>.068</td>
<td>.053 - .086</td>
</tr>
<tr>
<td>M 2</td>
<td>FL = Invariant</td>
<td>145.23</td>
<td>71</td>
<td>.977</td>
<td>.971</td>
<td>.070</td>
<td>.067 - .089</td>
</tr>
<tr>
<td>M 3</td>
<td>FL, COV = Invariant</td>
<td>177.71</td>
<td>74</td>
<td>.968</td>
<td>.961</td>
<td>.081</td>
<td>.066 - .096</td>
</tr>
<tr>
<td>M 4</td>
<td>Completely Invariant</td>
<td>257.16</td>
<td>87</td>
<td>.950</td>
<td>.942</td>
<td>.096</td>
<td>.082 - .109</td>
</tr>
</tbody>
</table>

*Note.* $\chi^2$ = Chi Square, $df$ = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = confidence interval.

For invariance across official diagnosis status, the CFI values given in Table 6.27 show that the change in CFI between M1 and M3 is less than .01, thereby achieving the desirable minimal level of invariance (Cheung & Rensvold, 2002). Total invariance was not attained, as the difference in CFI values for M1 and M4 was greater than .01, with no overlap in the 90% confidence intervals for the RMSEA.
Table 6.27
Summary of Goodness of Fit Statistics for Invariance Testing for the Parenting Self-Concept Scale (PSCS) Across Official Diagnosis Status

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1</td>
<td>Completely free</td>
<td>125.84</td>
<td>64</td>
<td>.982</td>
<td>.974</td>
<td>.067</td>
<td>.050 - .084</td>
</tr>
<tr>
<td>M 2</td>
<td>FL = Invariant</td>
<td>132.43</td>
<td>71</td>
<td>.982</td>
<td>.977</td>
<td>.064</td>
<td>.046 - .080</td>
</tr>
<tr>
<td>M 3</td>
<td>FL, COV = Invariant</td>
<td>140.25</td>
<td>74</td>
<td>.981</td>
<td>.976</td>
<td>.065</td>
<td>.048 - .081</td>
</tr>
<tr>
<td>M 4</td>
<td>Completely Invariant</td>
<td>270.60</td>
<td>87</td>
<td>.947</td>
<td>.939</td>
<td>.099</td>
<td>.086 - .112</td>
</tr>
</tbody>
</table>

Note. $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

For invariance across parents’ acceptance or rejection of the ADHD diagnosis, the CFI values given in Table 6.28 show that the change in CFI between M1 and M3 is less than .01, thereby achieving the desirable minimal level of invariance (Cheung & Rensvold, 2002). The difference in CFI values for M1 and M4 was greater than .01 and hence total invariance is not supported. However, there is still some overlap in the 90% confidence intervals for the RMSEA between M1 and M4; also the NNFI and CFI values are greater than .9, thereby suggesting that a level of invariance higher than the desirable minimal level was achieved (Bodkin-Andrews, Denson, et al., 2010; B. M. Byrne, 1998).

Table 6.28
Summary of Goodness of Fit Statistics for Invariance Testing for the Parenting Self-Concept Scale (PSCS) Across Parent’s Acceptance/Rejection

<table>
<thead>
<tr>
<th>Model</th>
<th>Model Description</th>
<th>$\chi^2$</th>
<th>df</th>
<th>CFI</th>
<th>NNFI</th>
<th>RMSEA</th>
<th>90% CI for RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Completely free</td>
<td>116.27</td>
<td>64</td>
<td>.984</td>
<td>.966</td>
<td>.062</td>
<td>.043 - .079</td>
</tr>
<tr>
<td>M2</td>
<td>FL = Invariant</td>
<td>126.70</td>
<td>71</td>
<td>.983</td>
<td>.963</td>
<td>.061</td>
<td>.043 - .077</td>
</tr>
<tr>
<td>M3</td>
<td>FL, COV = Invariant</td>
<td>140.11</td>
<td>74</td>
<td>.980</td>
<td>.959</td>
<td>.065</td>
<td>.048 - .081</td>
</tr>
<tr>
<td>M4</td>
<td>Completely Invariant</td>
<td>367.63</td>
<td>176</td>
<td>.963</td>
<td>.939</td>
<td>.082</td>
<td>.068 - .096</td>
</tr>
</tbody>
</table>

Note. $\chi^2$ = Chi Square, df = degrees of freedom, NNFI = Non-Normed Fit Index, CFI = Comparative Fit Index, RMSEA = Root Mean Square Error of Approximation, FL = Factor Loadings, COV = Factor Covariance, CI = Confidence Interval.

Summary. The PSCS was evaluated for invariance across three subgroups: child’s gender, official/unofficial diagnosis received, and acceptance/rejection of diagnosis. For child’s gender, the base level of invariance was achieved, though a closer examination of the results suggest that the level of invariance attained is
greater than the base level of invariance. For the other two subgroups, the minimal desirable level of invariance was achieved. These results suggest that the PSCS is sufficiently invariant across the subgroups of interest in this research.

Summary of Hypothesis 1.4.1–1.4.5

These results demonstrate that the PSCS has strong psychometric properties as both a first-order model having three factors, and as a second-order model where the three factors are explained by a higher-order factor. All item-to-factor loadings were significant and substantial, being above the minimum acceptable level for factor loadings (Hair et al., 2005). Further, reliability estimates for each factor of the PSCS were high, and acceptable levels of invariance were demonstrated across the subgroups of child’s gender, parents’ decision to accept or reject the diagnosis, and whether or not an official diagnosis for ADHD was given.

Results for Research Question 1.5.1: Factorial Integrity of the Survey Instrument is Maintained When all Scales are Administered in One Sitting

Overview

Research question 1.5.1 asks if the factorial integrity of the PPAQ as a whole will be maintained when all four scales are administered in a mass CFA.

Results for Research Question 1.5.1

A mass CFA was conducted where all four measurement scales were analysed simultaneously. Essentially, with a mass CFA, all factors of the PPAQ as well as the three categorical grouping variables are allowed to covary with one another. This procedure can be used to detect whether or not the items still load only on to their proposed factors, and that individual factors remain relatively distinct. Determination of the factorial integrity is achieved by examining the CFA fit statistics of the mass CFA. While the chi square results typically suggest rejection of the model ($\chi^2 = 1195.52$, $df = 758$, $p < .001$), the overall fit indices are very good with NNFI = .945, CFI = .954, and RMSEA = .037 with a 90% confidence interval of .033 to .041. These fit statistics demonstrate that factorial integrity of the four measurement scales of the PPAQ is maintained when combined as one survey instrument. However, these fit statistics are only one criterion for assessing whether the psychometric soundness of all scales is maintained. For psychometric soundness to be maintained, the factor loadings and factor correlations previously given for
each scale of the PPAQ should be very similar when all scales are combined into one instrument. Comparisons between the results of the mass CFA and results for each of the four measurement scales of the PPAQ show this to be the case, with any differences being less than 0.1 (See Appendix F).

**Results for Research Questions 1.6.1–1.6.4**

**Research Question 1.6.1: Relation Between Parents’ Acceptance or Rejection of the ADHD Diagnosis with the Factors of the PPEAS.**

*Overview.* Research question 1.6.1 asks to what extent will parents’ scores on the PPEAS vary according to whether they accept or reject the ADHD diagnosis.

*Results for Research Question 1.6.1.* The results for the differences between the mean scores of the PPEAS are shown in Table 6.29. Parents’ decision to accept or reject the ADHD diagnosis was scored as 1 = *accept*, and 2 = *reject*. Results from the mass CFA show significant differences between parents who accepted the ADHD diagnosis and those who rejected it for all three subscales of the PPEAS. The effect size (indicated by the variance shown in Table 6.29) is an indication of how the categorical variable of parents’ decision (accept or reject) varies with parents’ scores on each factor of the PPEAS.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean (SD)</th>
<th>Variance explained ($r^2$) as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Relations</td>
<td>4.43 (1.89)</td>
<td>5.21 (1.84)</td>
</tr>
<tr>
<td>Medication Attitudes</td>
<td>6.10 (1.73)</td>
<td>3.78 (1.75)</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>6.61 (1.16)</td>
<td>4.48 (1.64)</td>
</tr>
</tbody>
</table>

* $p < .05$.

For the Peer subscale, the mean scores for those parents who accepted the ADHD diagnosis and those parents who rejected it were 4.43 and 5.21 respectively ($p < .05$). This scale is positively scored, meaning that higher scores reflect more positive peer experiences. This suggests that parents who accept the ADHD
diagnosis are less likely to report that their child experiences positive peer relationships. The proportion of shared variance between child’s peer relations and parents’ acceptance or rejection of the ADHD diagnosis was 2.34%.

For the Medication Attitudes subscale, the mean scores for parents who accepted the ADHD diagnosis and those who rejected it were 6.10 and 3.78 respectively ($p < .05$). Higher scores on this scale indicate that parents believe medication is an appropriate treatment for ADHD. This result suggests that parents who accept the ADHD diagnosis are more likely to report that medication is an appropriate treatment for ADHD. The proportion of shared variance between acceptance of medication and parents’ acceptance or rejection of the ADHD diagnosis was 23.71%.

With regard to the Helpfulness subscale, the difference between mean scores for parents who accepted the ADHD diagnosis and those who reject the diagnosis were 6.61 and 4.48 respectively ($p < .05$), where higher scores indicate that parents believe acceptance of the ADHD diagnosis was helpful for them. This suggests that parents who accept the ADHD diagnosis are more likely to report that they find the ADHD diagnosis helpful. The proportion of shared variance between perceived helpfulness of the diagnosis and parents’ acceptance or rejection of the ADHD diagnosis was 37.94%.

**Conclusion.** Significant differences in scores between parents who accepted and parents who rejected the ADHD diagnosis were found for all three subscales of the PPEAS. Specifically, parents who accepted the ADHD diagnosis compared to parents who rejected the ADHD diagnosis were more likely to endorse both Medication Attitudes and Helpfulness subscales, and less likely to endorse the Peer Relations subscale.

**Research Question 1.6.2: Relation Between Parents’ Acceptance or Rejection of the ADHD Diagnosis and the Factors of the PBCS.**

**Overview.** Research question 1.6.2 asks to what extent will parents’ scores on the PBCS vary according to whether they accept or reject the ADHD diagnosis.

**Results for Research Question 1.6.2.** The results for the differences between the mean scores for the three factors of the PBCS are shown in Table 6.30. This scale is positively scored, meaning higher scores suggest higher levels of stress were experienced. Results from the mass CFA show significant differences between
parents who accepted the ADHD diagnosis and those who rejected it, for all three subscales of the PBCS.

Table 6.30

*Group Difference for Parents Accepting the ADHD Diagnosis (n = 350) and for Parents Rejecting the ADHD Diagnosis (n = 80) and MIMIC Results for the Parents’ Beliefs of Causes Scale (PBCS)*

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean (SD)</th>
<th>Variance explained $(r^2)$ as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accept</td>
<td>Reject</td>
</tr>
<tr>
<td>Home Environment</td>
<td>3.19 (1.75)</td>
<td>4.15 (1.98)</td>
</tr>
<tr>
<td>Child’s Behaviour</td>
<td>4.46 (1.68)</td>
<td>5.16 (1.80)</td>
</tr>
<tr>
<td>Brain Disorder</td>
<td>6.49 (1.43)</td>
<td>4.96 (1.89)</td>
</tr>
</tbody>
</table>

* $p < .05.$

For the two non-biological factors (i.e., Home environment and Child’s Behaviour) parents who rejected the ADHD diagnosis scored significantly higher on the subscales. For the Home Environment factor, the mean scores for parents who accepted the diagnosis and those who rejected the diagnosis were 3.19 and 4.15 respectively ($p < .05$). The proportion of shared variance between Home Environment as a cause of ADHD and parents’ acceptance or rejection of the ADHD diagnosis was 5.90%. For the Child’s Behaviour factor, the mean scores for parents who accepted the diagnosis and those who rejected the diagnosis were 4.46 and 5.16 respectively ($p < .05$). The proportion of shared variance between child’s behaviour as a cause of ADHD and parents’ acceptance or rejection of the ADHD diagnosis was 3.84%.

For the biological factor (i.e., Brain Disorder), parents who accepted the ADHD diagnosis scored significantly higher on that subscale, with mean scores of 6.49 and 4.96 respectively ($p < .05$). The proportion of shared variance between parents’ belief that ADHD is a brain condition and their acceptance or rejection of the ADHD diagnosis was 16.08%.

**Conclusion.** Across the three subscales of the PBCS, significant differences were evident for mean scores between parents who accepted and parents who rejected the ADHD diagnosis. Parents who accept the ADHD diagnosis for their child are more likely to believe the causes of ADHD are biological in nature.
Research Question 1.6.3: Relation Between Parents’ Acceptance or Rejection of the ADHD Diagnosis and the Factors of the PSS.

**Overview.** Research question 1.6.3 asks to what extent will parents’ scores on the PSS vary according to whether they accept or reject the ADHD diagnosis.

**Results for Research Question 1.6.3.** The results for the differences between the mean scores for the three factors of the PSS are shown in Table 6.31. This scale is positively scored, meaning higher scores suggest higher levels of stress were experienced. Results from the mass CFA show a significant difference between parents who accepted the ADHD diagnosis for their child and those who rejected it, in relation to the stress experienced both for them as individuals and for their families. In relation to the Criticisms subscale, there was no significant difference between parents who accepted the ADHD diagnosis and those rejecting it.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean (SD)</th>
<th>Variance explained ($r^2$) as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Accept</td>
<td>Reject</td>
</tr>
<tr>
<td>Individual Stress</td>
<td>5.64 (1.70)</td>
<td>4.95 (1.84)</td>
</tr>
<tr>
<td>Family Stress</td>
<td>6.14 (1.63)</td>
<td>5.54 (1.64)</td>
</tr>
<tr>
<td>Criticisms</td>
<td>4.34 (1.76)</td>
<td>4.14 (1.65)</td>
</tr>
</tbody>
</table>

*p < .05.

The mean scores for levels of Individual stress for parents who accepted the ADHD diagnosis and those who rejected it were 5.64 and 4.95 respectively ($p < .05$). The proportion of shared variance between Individual stress and parents’ acceptance or rejection of the ADHD diagnosis was 4.16%. The mean scores for levels of Family stress for parents who accepted the ADHD diagnosis and those who rejected it, were 6.14 and 5.54 respectively ($p < .05$). The proportion of shared variance between Family stress and parents’ acceptance or rejection of the ADHD diagnosis was 2.85%.

**Conclusion.** For Research Question 1.6.3 it was shown that parents who accept the ADHD diagnosis are more likely to report that they and their families...
experience high levels of stress, but there is no significant difference in the level of criticism they have received in relation to their child’s ADHD-type behaviours.

**Research Question 1.6.4: Relation Between Parents’ Acceptance or Rejection of the ADHD Diagnosis and the Factors of the PSCS**

*Overview.* Research question 1.6.4 asks to what extent will parents scores on the PSCS vary according to whether they accept or reject the ADHD diagnosis.

*Results for Research Question 1.6.4.* The mean scores for the total sample and the individual subgroups for the three subscales of the PSCS are given in Table 6.22. This scale is positively scored, meaning higher scores suggest higher levels of stress were experienced. Results from the mass CFA show no significant difference in mean scores of the three subscales of the PSCS between parents who accepted the ADHD diagnosis and those rejecting it.

*Conclusion.* Parents’ scores on the PSCS factors do not vary significantly according to whether or not they have accepted the ADHD diagnosis.

**Results for Research Questions 1.7.1–1.7.4**

**Research Question 1.7.1: Relation Between Child’s Gender and the Factors of the PPEAS.**

*Overview.* Research question 1.7.1 asks to what extent will parents’ scores on the PPEAS factors vary according to the child’s gender?

*Results for Research Question 1.7.1.* The results for the differences between the mean scores for the three factors of the PPEAS are shown in Table 6.32. The grouping variable of child’s gender was scored as 1 = parents of boys, and 2 = parents of girls. Results from the mass CFA show significant differences between the parents of boys and the parents of girls for the Peer Relations and Medication Attitudes factors of the PPEAS.
Table 6.32

*Group Difference for Parents of Boys (n = 337) and for Parents of Girls (n = 93) and MIMIC Results for the Parents’ Perceptions and Experiences of ADHD Scale (PPEAS)*

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean (SD) Parents of boys</th>
<th>Mean (SD) Parents of girls</th>
<th>Variance explained $\left(r^2\right)$ as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Relations</td>
<td>4.69 (1.88)</td>
<td>4.16 (1.94)</td>
<td>1.42*</td>
</tr>
<tr>
<td>Medication Attitudes</td>
<td>4.92 (2.11)</td>
<td>5.73 (1.93)</td>
<td>1.04*</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>6.26 (1.48)</td>
<td>6.04 (1.58)</td>
<td>-</td>
</tr>
</tbody>
</table>

* $p < .05.$

With regard to the Peer Relations subscale, the parents of boys scored significantly higher than the parents of girls (4.69 and 4.16 respectively; $p < .05$). This means that the parents of boys are more likely to report that their son experiences positive peer relations. While the difference is very small, it may be a significant result due to the high reliability of the subscale (i.e., alpha > .9). The proportion of shared variance between child’s peer relations and child’s gender diagnosis was 1.42% ($p < .05$). For the Medication Attitudes subscale, the parents of girls scored significantly higher than the parents of boys (5.73 and 4.92 respectively, $p < .05$). The proportion of shared variance between child’s peer relations and child’s gender diagnosis was 1.04% ($p < .05$). With regard to the Helpfulness subscale, no significant differences were observed between the parents of boys and the parents of girls.

**Conclusion.** Significant differences between the parents of boys and the parents of girls were shown for two of the subscales of the PPEAS (Medication Attitudes and Peer relations). Specifically, the parents of girls scored significantly higher than the parents of boys for the Medication Attitudes subscale, while the parents of boys scored significantly higher than the parents of girls for the Peer Relations subscale.

**Research Question 1.7.2: Relation Between Child’s Gender and the Factors of the PBCS.**

**Overview.** Research question 1.7.2 asks to what extent will parents’ scores on the PBCS factors vary according to the child’s gender?
**Results for Research Question 1.7.2.** While each of the three subscales of the PBCS was endorsed more strongly for the parents of girls than the parents of boys (see Table 6.8), results from the mass CFA show the differences were not significant.

**Conclusion.** Parents’ scores on the PBCS factors do not vary according to the child’s gender.

**Research Question 1.7.3: Relation Between Child’s Gender and the Factors of the PSS.**

**Overview.** Research question 1.7.3 asks to what extent will parents’ scores on the PSS factors vary according to the child’s gender?

**Results for Research Question 1.7.3.** While Table 6.15 shows the parents of boys to have different mean scores than the parents of girls across the three subscales of the PSS, results from the mass CFA show none of these differences to be significant.

**Conclusion.** There were no significant differences between parents of boys and parents of girls, with regard to their scores on the subscales of PSS.

**Research Question 1.7.4: Relation Between Child’s Gender and the Factors of the PSCS.**

**Overview.** Research question 1.7.4 asks to what extent will parents’ scores on the PSCS factors vary according to their child’s gender.

**Results for Research Question 1.7.4.** The results for the mean scores are shown in Table 6.33. Results from the mass CFA show that the parents of boys had significantly higher mean scores than the parents of girls for all three subscales of the PSCS. For the subscales of Affect, Competency, and Relationship, the average differences in scores between the parents of boys and the parents of girls were 0.30, 0.29, and 0.65. The proportions of shared variance between each factor of the PSCS and child’s gender were 1.69% (p < .05), 2.10% (p < .05), and 2.13% (p < .05), respectively.
Table 6.33

*Group Difference for Parents of Boys (n = 337) and for Parents of Girls (n = 93)*

and MIMIC Results for the Parents’ Perceptions and Experiences of ADHD Scale (PSCS)

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean (SD)</th>
<th>Variance explained $(r^2)$ as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Parents of boys</td>
<td>Parents of girls</td>
</tr>
<tr>
<td>Affect</td>
<td>7.03 (1.00)</td>
<td>6.73 (1.34)</td>
</tr>
<tr>
<td>Competency</td>
<td>6.97 (0.79)</td>
<td>6.68 (1.25)</td>
</tr>
<tr>
<td>Relationship</td>
<td>6.88 (1.13)</td>
<td>6.23 (1.44)</td>
</tr>
</tbody>
</table>

* $p < .05$.

**Conclusion.** Parents’ scores on the PSCS factors do vary according to their child’s gender. Specifically, the parents of boys scored significantly higher on the three factors of the PSCS than the parents of girls for all factors.

**Results for Research Questions 1.8.1–1.8.4**

**Research Question 1.8.1: Relation Between Whether or Not an Official Diagnosis of ADHD was Given to the Child and the Factors of the PPEAS.**

**Overview.** To what extent will parents’ scores on the PPEAS factors vary according to whether or not the child has an official diagnosis of ADHD?

**Results for Research Question 1.8.1.** The results for the differences between the mean scores for the three factors of the PPEAS are shown in Table 6.34. Status of the ADHD diagnosis was scored as 1 = official, and 2 = not official. Results from the mass CFA show significant differences between parents whose child does have an official diagnosis of ADHD and those parents whose child does not have an official diagnosis, for the three subscales of the PPEAS.
Table 6.34

*Group Difference for Parents of Children With an Official Diagnosis (n = 337) and for Parents of Children Without an Official Diagnosis (n = 133) and MIMIC Results for the Parents’ Perceptions and Experiences of ADHD Scale (PPEAS)*

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean (SD)</th>
<th>Official diagnosis</th>
<th>Without official diagnosis</th>
<th>Variance explained ($r^2$) as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Relations</td>
<td>4.40 (1.93)</td>
<td>4.97 (1.78)</td>
<td></td>
<td>1.88*</td>
</tr>
<tr>
<td>Medication Attitudes</td>
<td>6.00 (1.87)</td>
<td>4.94 (1.95)</td>
<td></td>
<td>6.81*</td>
</tr>
<tr>
<td>Helpfulness</td>
<td>6.43 (1.44)</td>
<td>5.72 (1.54)</td>
<td></td>
<td>6.05*</td>
</tr>
</tbody>
</table>

* $p < .05.$

For the Peer Relations subscale, parents whose children had an official diagnosis scored significantly lower than parents whose children did not have an official diagnosis (mean scores of 4.40 and 4.97 respectively). This finding suggests that parents whose child does not have an official diagnosis are more likely to report that their child experiences positive peer relations. The proportion of shared variance between child’s peer relations and official status of the diagnosis is minimal at 1.88%.

For the Medication Attitudes subscale, parents whose children had an official diagnosis scored significantly higher than parents whose children did not have an official diagnosis (mean scores of 6.00 and 4.94 respectively). This finding suggests that parents whose child has an official diagnosis of ADHD are more likely to report that they believe medication is an appropriate treatment for ADHD. The proportion of shared variance between child’s peer relations and official status of the diagnosis was 6.81% ($p < .05$).

Lastly, for the Helpfulness subscale, parents whose children had an official diagnosis scored significantly higher than parents whose children did not have an official diagnosis (mean scores of 6.43 and 5.72 respectively). This finding suggests that parents whose child has received an official diagnosis are more likely to report finding the ADHD diagnosis helpful for them. The proportion of shared variance between perceived helpfulness of the diagnosis and official status of the diagnosis was 6.05% ($p < .05$).

**Conclusion.** Significant differences between the parent of children who have an official diagnosis of ADHD and the parents of children who do not have an
official diagnosis of ADHD, were shown across the three subscales of the PPEAS. Compared to parents whose children did not have an official diagnosis of ADHD, the parents whose children did have an official diagnosis were less likely to report that their child experienced positive peer relations, more likely to report that the diagnosis was helpful for them, and more likely to report that medication was an appropriate treatment for ADHD.

**Research Question 1.8.2: Relation Between Whether or Not an Official Diagnosis of ADHD was Given to the Child and the Factors of the PBCS.**

**Overview.** To what extent will parents’ scores on the PBCS factors vary according to whether or not the child has an official diagnosis of ADHD?

**Results for Research Question 1.8.2.** The results for the differences between the mean scores for the three factors of the PBCS are shown in Table 6.35. Results from the mass CFA show significant differences between parents whose child does have an official diagnosis of ADHD and those parents whose child does not have an official diagnosis, for the three factors of the PBCS.

Table 6.35

*Group Difference for Parents of Children With an Official Diagnosis (n = 337) and for Parents of Children Without an Official Diagnosis (n = 133) and MIMIC Results for the Parents’ Beliefs of Causes Scale (PBCS)*

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean (SD)</th>
<th>Variance explained ($r^2$) as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Official diagnosis</td>
<td>Without official diagnosis</td>
</tr>
<tr>
<td>Home Environment</td>
<td>3.16 (1.75)</td>
<td>3.83 (1.94)</td>
</tr>
<tr>
<td>Child’s Behaviour</td>
<td>4.42 (1.72)</td>
<td>4.96 (1.68)</td>
</tr>
<tr>
<td>Brain Disorder</td>
<td>6.45 (1.54)</td>
<td>5.66 (1.72)</td>
</tr>
</tbody>
</table>

* $p < .05$.

For the Home Environment factor, the mean scores for parents whose child has an official diagnosis and those whose child does not have an official diagnosis were 3.16 and 3.83 respectively. The proportion of shared variance between Home Environment as a cause of ADHD and official status of the diagnosis was 4.20% ($p < .05$).
For the Child’s Behaviour factor, the mean scores where an official diagnosis was given and where one was not given were 4.42 and 4.96 respectively. The proportion of shared variance between child’s behaviour as a cause of ADHD and official status of the diagnosis was 3.13% ($p < .05$).

For the biological factors (i.e., Brain Disorder) the mean scores where an official diagnosis was given and where one was not given were 6.45 and 5.66 respectively. The proportion of shared variance between parents’ belief that ADHD is a brain condition and official status of the diagnosis was 5.86% ($p < .05$).

**Conclusion.** For all subscales of the PBCS, significant differences were evident for mean scores between parents whose child has an official diagnosis, and parents whose child does not have an official diagnosis. Parents whose child has an official diagnosis are more likely to believe the causes of ADHD are biological in nature.

**Research Question 1.8.3: Relation Between Whether or Not an Official Diagnosis of ADHD was Given to the Child with the Factors of the PSS.**

**Overview.** To what extent will parents’ scores on the PSS factors vary according to whether or not the child has an official diagnosis of ADHD?

**Results for Research Question 1.8.3.** Results for the differences between the mean scores for the three factors of the PSS are shown in Table 6.36. Results from the mass CFA show significant differences between parents whose children had an official diagnosis, compared with parents whose children did not have an official diagnosis, for two stress factors of the PSS (Family Stress, and Individual Stress). For each of these subscales, higher scores meant parents reported higher levels of stress. There were no significant differences for the Criticisms subscale of the PSS.
Table 6.36

*Group Difference for Parents of Children With an Official Diagnosis (n = 337) and for Parents of Children Without an Official Diagnosis (n = 133) and MIMIC Results for the Parenting Stress Scale (PSS)*

<table>
<thead>
<tr>
<th>Factors</th>
<th>Mean (SD)</th>
<th>Variance explained ($r^2$) as a percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Official diagnosis</td>
<td>Without official diagnosis</td>
</tr>
<tr>
<td>Individual Stress</td>
<td>5.60 (1.75)</td>
<td>5.31 (1.72)</td>
</tr>
<tr>
<td>Family Stress</td>
<td>6.16 (1.65)</td>
<td>5.72 (1.60)</td>
</tr>
<tr>
<td>Criticisms</td>
<td>4.42 (1.77)</td>
<td>4.05 (1.63)</td>
</tr>
</tbody>
</table>

* $p < .05.$

With respect to the Individual Stress subscale, parents whose children had an official diagnosis had a mean score of 5.60, while parents whose children did not have an official diagnosis had a mean score of 5.31. The proportion of shared variance between stress experienced by the parent and the official status of the diagnosis was 1.54% ($p < .05$).

With respect to the Family Stress subscale, parents whose children had an official diagnosis had a mean score of 6.16, while parents whose children did not have an official diagnosis had a mean score of 5.72. The proportion of shared variance between stress experienced by the parent and the official status of the diagnosis was 1.90% ($p < .05$).

**Conclusion.** For two of the subscales of the PSS (Family Stress and Individual Stress), parents whose child had an official diagnosis of ADHD reported higher levels of stress than the parents of children who did not have an official diagnosis of ADHD. For the remaining subscale (Criticisms) no significant differences were evident.

**Research Question 1.8.4: Relation Between Whether or Not an Official Diagnosis of ADHD was Given to the Child with the Factors of the PSCS.**

**Overview.** To what extent will parents’ scores on the PSCS factors vary according to whether or not the child has an official diagnosis of ADHD?

**Results for Research Question 1.8.4.** As the data in Table 6.22 would suggest, the differences between subscale scores of parents whose child has an official diagnosis and those whose child does not have an official diagnosis are too
small to be significant. Indeed, the results of the mass CFA show that no significant differences exist.

**Conclusion.** Across all subscales of the PSCS, there are no significant differences between the parents of children having an official diagnosis for ADHD, and those parents whose children do not have an official diagnosis for ADHD.

**Chapter Summary**

Study 1 aimed to assess the psychometric properties of the PPAQ: these were demonstrated to be robust. All hypotheses were accepted, thus demonstrating the strength of the PPAQ, as all scales had strong and robust structural validity, strong internal consistency reliability, and were invariant across the grouping variables of interest (i.e.; parents’ acceptance or rejection of ADHD, gender of the child the parent is reporting on, and official diagnosis status). In addition, by conducting a mass CFA, group differences between the subgroups of interest were explored across all factors of the four scales of the PPAQ. Thus, these psychometric results are supportive of a sound within network component of Cronbach and Meehl’s (1955) nomological network (see Chapter 3), laying a good foundation for the between network component of the nomological network (i.e., predictive relations between constructs) research.
CHAPTER 7

RESULTS FOR STUDY 2: PREDICTING A PARENT’S DECISION TO ACCEPT OR REJECT A DIAGNOSIS OF ADHD FOR THEIR CHILD

“We can think of each equation as summarizing the impact of all relevant variables in the model (observed and unobserved) on one specific variable (observed or unobserved)”
Barbara Byrne (2006, p. 11)

Introduction

Having established the psychometric properties of the PPAQ and having explored group differences (Chapter 6), Study 2 uses the PPAQ instrument to investigate whether sets of predictor variables (i.e., selected factors from measurement scales of the PPAQ) can be used to predict a set of outcome variables, centring around a parent’s acceptance or rejection of ADHD as a medical diagnosis. To achieve this aim, a set of predictive path models was proposed and tested using SEM (see Chapter 4). Interpretation of these models is analogous to the interpretation of multiple regression models, except that where only scalar variables are used with multiple regression models, path models can incorporate latent variables in addition to scalar variables.

The results for each research question for this study include a table that provides the beta coefficients (i.e., the standardised regression coefficients of the path model), and the correlations between the predictor variables and the outcome variable. Although the beta weights are used for interpreting the relative strengths of each predictor, the correlation is included, as it is helpful for detecting the possibility of suppression effects (see Chapter 5). Where it is deemed that a suppression effect is not occurring, the proportion of variance explained by each beta coefficient is given (i.e., $r^2$). However, where a suppression effect may be operating (and this is a subjective judgement, as there is no statistical test for suppression; see Chapter 5),
the proportion of variance explained by each predictor variable is not provided. This is due to the limitation of SEM programs in addressing suppression effects appropriately, when calculating the proportion of explained variance (Bodkin-Andrews, O'Rourke, et al., 2010). Where suppression effects are believed not to be present, then the proportion of explained variance in the path model is conveniently generated by the SEM program.

Results for Research Questions 2.1.1–2.4.2: Predicting Parents’ Acceptance of the ADHD diagnosis

Research Question 2.1.1: Can the PPEAS be used to predict parents’ acceptance of the ADHD diagnosis?

Overview. Research Question 2.1.1 asks if selected factors of the PPEAS (Peer Relations, Medication Attitudes) can be used in an SEM path analysis to predict parents’ acceptance of the ADHD diagnosis?

Results for Research Question 2.1.1. The overall fit indices for this predictive path model were excellent (Browne & Cudeck, 1993; Marsh et al., 1996), with RMSEA = .039, NNFI = .985, and CFI = .989. Each predictor variable (Peer Relations and Medication Attitudes) was a significant predictor of the outcome variable (parents’ acceptance of the ADHD diagnosis). The total proportion of variance in the outcome variable explained by the predictive path model is 24.70%.

As shown in Table 7.1, for each predictor variable, the associated beta coefficient and Pearson correlation are approximately equal; hence, no suppression effects are indicated and therefore, interpretation is relatively straightforward. For the factors of the PPEAS, a parent’s attitude towards medication is a strong predictor of their acceptance of the ADHD diagnosis, while their opinion about their child’s peer relations is a moderate predictor.
Table 7.1
*Standardised Predictive Paths and Correlations, and Total Variance Explained for the Structural Equation Model of the PPEAS (Peer Relations and Medication Attitudes) for Predicting Parents’ Acceptance of the ADHD Diagnosis*

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficients and correlations</th>
<th>Variance explained by SEM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Relations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beta coefficient</td>
<td>.11* (1.1)</td>
<td></td>
</tr>
<tr>
<td>Pearson correlation</td>
<td>r .15*</td>
<td></td>
</tr>
<tr>
<td>Medication Attitudes</td>
<td>-.48* (22.3)</td>
<td>24.70</td>
</tr>
<tr>
<td>Beta coefficient</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson correlation</td>
<td>r -.49*</td>
<td></td>
</tr>
</tbody>
</table>

*Variance explained as a percentage for each predictor variable is provided in parentheses.

*p < .05

**Conclusion.** Two factors of the PPEAS, Peer Relations and Medication Attitudes, are significant predictors of parents’ decision to accept or reject the ADHD diagnosis, with Medication Attitudes being the strongest predictor, accounting for nearly all (22.30%) of the variance explained by the predictive path model.

**Research Question 2.1.2: Can the PPEAS be used to predict whether parents find the ADHD diagnosis helpful?**

**Overview.** Research Question 2.1.2 asks if selected factors of the PPEAS (Peer Relations, Medication Attitudes) can be used in an SEM path analysis to predict whether parents find the ADHD diagnosis helpful? Parents’ perceived helpfulness of the ADHD diagnosis for their child is determined using the Helpfulness subscale of the PPEAS.

**Results for Research Question 2.1.2.** The model used for this research question was the same one used for Research Question 2.1.1. That is, the predictor variables are used to simultaneously predict two different outcome variables (accept/reject, and perceived helpfulness of the diagnosis). Hence, the model fit statistics are identical (RMSEA= .039; NNFI = .985; CFI = .989). The total proportion of variance in the outcome variable explained by the predictive path model is 36.70%.
Medication Attitudes was the only significant predictor of the PPEAS for the outcome variable (perceived helpfulness of the ADHD diagnosis for parents). Further, Table 7.2 shows that for the Medication Attitudes factor, the associated beta coefficient and Pearson correlation are approximately equal; hence, no suppression effects are indicated, and therefore interpretation is relatively straightforward. Parents’ attitude towards medication is a strong predictor of their acceptance of the ADHD diagnosis (36.30% of variance explained in the outcome variable).

Table 7.2

<table>
<thead>
<tr>
<th>Beta coefficients and correlations</th>
<th>Variance explained by the SEM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer Relations</td>
<td>Medication Attitudes</td>
</tr>
<tr>
<td>Beta coefficient&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.01</td>
</tr>
<tr>
<td>Pearson correlation&lt;sup&gt;(r)&lt;/sup&gt;</td>
<td>-.06</td>
</tr>
</tbody>
</table>

<sup>a</sup>Variance explained as a percentage for each predictor variable is provided in parentheses.

<sup>*p < .05</sup>

**Conclusion.** Medication Attitudes was the only significant predictor of parents’ perceived helpfulness of the ADHD diagnosis.

**Research Question 2.2.1: Can the PBCS be used to predict parents’ acceptance of the ADHD diagnosis?**

**Overview.** Research Question 2.2.1 asks if factors of the PBCS can predict parents’ acceptance of the ADHD diagnosis?

**Results for Research Question 2.2.1.** The overall fit indices for this predictive path model were excellent (Browne & Cudeck, 1993; Marsh et al., 1996) with RMSEA = .045, NNFI = .956, and CFI = .966. Two of the three predictor variables (Home Environment, Brain Disorder) were significant predictors of the outcome variable (parents’ acceptance of the ADHD diagnosis). The total proportion
of variance in the outcome variable explained by the predictive path model is 22.30%.

For two of the factors (Home Environment, Child’s Behaviour), the associated beta coefficients differ markedly from the respective correlations, suggesting that suppression effects may be present (see Table 7.3). Subsequently, the amount of explained variance accounted for by each predictor is not given. A tentative interpretation of these possible suppression effects is given in Chapter 9.

Where suppression effects are evident, a second-order model can be used if there is a moderate to high degree correlation amongst all the first-order factors (see Chapter 5, pp. 114, 115). For these factors, constructing a second-order factor model is not an option, as only two of the three factors correlate highly (Child’s Behaviour and Home Environment; see Table 6.11).

Table 7.3
Standardised Predictive Paths and Correlations, and Total Variance Explained for the Structural Equation Model of the PBCS (Home Environment, Brain Disorder, and Child’s Behaviour) for Predicting Parents’ Acceptance of the ADHD Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficients and correlations</th>
<th>Variance explained by the SEM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Home Environment</td>
<td>Brain Disorder</td>
</tr>
<tr>
<td>Beta coefficient</td>
<td>.31*</td>
<td>-.41*</td>
</tr>
<tr>
<td>Pearson correlation (r)</td>
<td>.24*</td>
<td>-.40 *</td>
</tr>
</tbody>
</table>

*p < .05

Conclusion. Two of the three factors of the PBCS are significant predictors of parents’ decision to accept the ADHD diagnosis. However, given that the beta values contrast markedly with the corresponding correlations, it is probable that suppression effects are present. A tentative interpretation of how the predictor variables predict the outcome variable (parents’ acceptance) is offered in Chapter 9.
Research Question 2.2.2: Can the PBCS be used to predict whether parents find the ADHD diagnosis helpful?

Overview. Research Question 2.2.2 asks which factors of the PBCS can be used in an SEM path analysis to predict whether parents will find the ADHD diagnosis helpful?

Results for Research Question 2.2.2. The model used for this research question was the same one used for Research Question 2.2.1, and hence has the same fit statistics (RMSEA = .045; NNFI = .956; CFI = .966). As with Research Question 2.2.1, two of the three predictor variables (Home Environment, Brain Disorder) were significant predictors of the outcome variable (parents’ perception of helpfulness of the ADHD diagnosis). The total proportion of variance in the outcome variable explained by the predictive path model is 29.10%.

As shown in Table 7.4, for two of the factors (Home Environment and Child’s Behaviour), the associated beta coefficients differ markedly from the correlations, suggesting suppression effects are occurring. A tentative interpretation of these possible suppression effects is given in Chapter 9. All three factors of the PBCS appear to be moderate to strong predictors of parents’ acceptance of the ADHD diagnosis. For the same reasoning given in Research Question 2.2.1, a higher order factor was not developed, to deal with the suppression effects.

Table 7.4
Standardised Predictive Paths and Correlations, and Total Variance Explained for the Structural Equation Model of the PBCS (Home Environment, Brain Disorder, and Child’s Behaviour) for Predicting Parents’ Perceived Helpfulness of the ADHD Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficients and correlations</th>
<th>Variance explained by the SEM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Home Environment</td>
<td>Brain Disorder</td>
</tr>
<tr>
<td>Beta coefficient</td>
<td>-.27*</td>
<td>.51*</td>
</tr>
<tr>
<td>Pearson correlation</td>
<td>-.19*</td>
<td>.51*</td>
</tr>
</tbody>
</table>

*p < .05
**Conclusion.** The results for this research question parallel those of Research Question 2.2.1. Two of the three factors of the PBCS (Home Environment and Brain Disorder) are significant predictors of parents’ perceived helpfulness of the ADHD diagnosis. However, given that the beta values contrast with the corresponding Pearson correlations, it is likely that suppression effects are present. A tentative interpretation of how the predictor variables predict the outcome variable (perceived helpfulness of the ADHD diagnosis) is offered in Chapter 9.

**Research Question 2.3.1: Can the PSS predict parents’ acceptance of the ADHD diagnosis?**

**Overview.** Research Question 2.3.1 asks which factors of the PSS can be used in an SEM path analysis to predict parents’ acceptance of the ADHD diagnosis?

**Results for Research Question 2.3.1.** The overall fit indices for this predictive path model were excellent (Browne & Cudeck, 1993; Marsh et al., 1996) with RMSEA = .046, NNFI = .959, and CFI = .970. Two of the predictor variables (Individual Stress and Criticism) were significant predictors of the outcome variable (parents’ acceptance of the ADHD diagnosis). Table 7.5 shows that the associated beta coefficients differ markedly from the correlations, suggesting that suppression effects are occurring. The total proportion of variance in the outcome variable explained by the predictive path model is 5.60%.

<table>
<thead>
<tr>
<th>Table 7.5</th>
<th>Standardised Predictive Paths and Correlations, and Total Variance Explained for the Structural Equation Model of the PSS (Family Stress, Individual Stress, and Criticisms) for Predicting Parents’ Acceptance of the ADHD Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta coefficients and correlations</td>
<td>Variance explained by the SEM (%)</td>
</tr>
<tr>
<td>Family Stress</td>
<td>Individual Stress</td>
</tr>
<tr>
<td>Beta coefficient</td>
<td>-.08</td>
</tr>
<tr>
<td>Pearson correlation (r)</td>
<td>-.170*</td>
</tr>
</tbody>
</table>
Given the suppression effects, and that the factors of the PSS are moderately to highly correlated (see Table 6.18), one option available for exploring these results is to develop a higher-order factor model for the PSS factors and calculate its correlation with the outcome variable (see Chapter 5, pp. 114, 115). Such a model was run, and produced an excellent model fit (RMSEA = .051; NNFI = .949; CFI = .960). This higher-order factor could be considered a general parenting-stress factor. The correlation between the higher-order stress model and parents’ acceptance was significant and moderate, at -.19. (proportion of shared variance = 3.57%). The measure of parents’ acceptance is scored such that a lower score indicates acceptance of the ADHD diagnosis, while a higher score indicates rejection of the ADHD diagnosis. Higher scores for the PSS factors indicate that higher levels of stress were reported. The negative correlation suggests that parents who accepted the ADHD diagnosis were more likely to report experiencing higher levels of stress. Conversely, those parents rejecting the diagnosis were less likely to report higher levels of stress.

**Conclusion.** While the PSS factors of Criticisms and Individual Stress account for 5.60% of the variance in the outcome variable of parents’ acceptance of the ADHD diagnosis, suppression effects make interpretation of the contribution of individual factors difficult. A higher-order factor model was produced and demonstrated that 3.57% of the variance in parents’ acceptance of the ADHD diagnosis was shared with reported levels of stress (as measured by a higher-order factor model of the PSS).

**Research Question 2.3.2: Can the PSS be used to predict whether parents find the ADHD diagnosis helpful?**

**Overview.** Research Question 2.3.2 asks which factors of the PSS can be used in an SEM path analysis to predict whether parents find the ADHD diagnosis helpful?

**Results for Research Question 2.3.2.** The model used for this research question was the same one used for Research Question 2.3.1, and hence has the same fit statistics (RMSEA = .046; NNFI = .959; CFI = .970). Two of the predictor variables (Family Stress and Criticisms) were significant predictors of the outcome variable (parents’ perceived helpfulness of the ADHD diagnosis). The total proportion of variance in the outcome variable explained by the predictive path model is 13.30%. Table 7.5 shows that for the two significant predictor variables,
their associated beta coefficient and correlation are markedly different. Hence, similarly to Research Question 2.3.1, suppression effects are likely occurring.

Table 7.6
Standardised Predictive Paths and Correlations, and Total Variance Explained for the Structural Equation Model of the PSS (Family Stress, Individual Stress, and Criticisms) for Predicting Parents’ Perceived Helpfulness of the ADHD Diagnosis

<table>
<thead>
<tr>
<th></th>
<th>Beta coefficients and correlations</th>
<th>Variance explained by the SEM (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Family Stress</td>
<td>Individual Stress</td>
</tr>
<tr>
<td>Beta coefficient</td>
<td>.42*</td>
<td>.04</td>
</tr>
<tr>
<td>Pearson correlation (r)</td>
<td>.32*</td>
<td>.21*</td>
</tr>
</tbody>
</table>

*p < .05

Given the suppression effects, it was appropriate to use the higher order factor model referred to in Research Question 2.3.1. The correlation between the higher-order stress model and parents’ perceived helpfulness of the ADHD diagnosis was significant, at .24. (proportion of shared variance = 5.52%). The measure of parents’ perceived helpfulness is scored such that higher scores indicate that the ADHD diagnosis was helpful, while a lower score indicates that it was not helpful. Higher scores for the PSS factors indicate that higher levels of stress were reported. The positive correlation suggests that parents who report finding the ADHD helpful for them, are more likely to report experiencing higher levels of stress. Conversely, those parents who do not find the diagnosis helpful are likely to report lower levels of stress.

Conclusion. While the PSS factors of Criticisms and Individual Stress account for 13.30% of the variance in the outcome variable of parents’ perceived helpfulness of the ADHD diagnosis, suppression effects make interpretation of the contribution of individual factors difficult. A higher-order factor model was produced and demonstrated that 5.52% of the variance in parents’ perceived helpfulness of the ADHD diagnosis is shared with their reported levels of stress (as measured by a higher-order factor model of the PSS).
Research Question 2.4.1: Can the PSCS be used to predict parents’ acceptance of the ADHD diagnosis?

Overview. Research Question 2.4.1 asks to what extent selected factors of the PSCS can be used in an SEM path analysis to predict parents’ acceptance of the ADHD diagnosis?

Results for Research Question 2.4.1. As previously discussed (see Chapter 6), due to the degree of multicollinearity amongst the PSCS factors, a higher order factor model for the PSCS was developed, to determine its predictive value in regard to parents’ acceptance of the ADHD diagnosis. The overall fit indices for this higher-order model were excellent (Browne & Cudeck, 1993; Marsh et al., 1996) with RMSEA = .050, NNFI = .972, and CFI = .977. The correlation between the higher-order model of the parenting self-concept and parents’ acceptance of the ADHD diagnosis is .048. This correlation is not significant, suggesting that a parent’s decision to accept or reject the ADHD diagnosis does not vary with their parenting self-concept.

Conclusion. There is no significant correlation between the higher order factor model for parenting self-concept and parents’ acceptance of the ADHD diagnosis.

Research Question 2.4.2: Can the PSCS be used to predict whether parents find the ADHD diagnosis helpful?

Overview. Research Question 2.4.2 asks which factors of the PSCS can be used in an SEM path analysis to predict whether parents find the ADHD diagnosis helpful?

Results for Research Question 2.4.2. Similarly to Research Question 2.4.2, this question essentially examines the correlation between the higher-order model for the PSCS with the Helpfulness subscale of the PPEAS. The correlation between these two factors is significant, at .14. Squaring this value gives the proportion of shared variance between the two constructs, which is 1.85%. Higher scores on the Helpfulness subscale mean that parents reported that the ADHD diagnosis was helpful. Hence, this result of a positive correlation suggests that parents with a positive parenting self-concept (as indicated by higher scores on the PSCS) are more likely to find the ADHD diagnosis helpful.
Conclusion. Due to the high correlations amongst the factors of the PSCS, a higher-order factor model was developed and tested. The shared variance between the parenting self-concept (as measured by the higher order parenting self-concept scale) and parents’ perceived helpfulness of the ADHD diagnosis is minimal, at 1.85%.

Summary

A set of predictive path models involved a set of predictor variables (e.g., self-concept, stress) and a set of outcome variables (parents’ acceptance of the ADHD diagnosis, parents’ perceived helpfulness of the ADHD diagnosis). Of the predictor variables, Medication Attitudes, Home Environment, Brain Disorder, Family Stress, and Individual Stress proved to have substantial predictive power in predicting the outcome variables. Subscales of the PSCS had little or no explanatory power. Interpretations of the SEMs are given in Chapter 9.
CHAPTER 8

RESULTS FOR STUDY 3: QUALITATIVE ANALYSIS OF INTERVIEWS WITH PARENTS, SCHOOL COUNSELLORS, AND PAEDIATRICIANS

“Not everything that can be counted counts, and not everything that counts can be counted.”  
(Albert Einstein)

Introduction

This chapter gives the results for the qualitative component of this research (Study 3). The aim of Study 3 was to elucidate parents’ perceptions of the nature and causes of ADHD (as well as treatment options), and the factors influencing their decision to either accept or reject a medical diagnosis. This study further aimed to explore health professionals’ views on ADHD, as well as what they believed to be the relevant factors that influence parents to accept or reject a diagnosis of ADHD, and parents’ opinions regarding medication as a treatment for ADHD. This was achieved by interviewing parents and professionals (paediatricians and school counsellors). Interviews were conducted with 13 parents, 5 paediatricians, and 3 school counsellors (hereafter referred to simply as “counsellors”).

The results are presented in three different sections relating to the three interviewee groups. For each section, each research question is presented, followed by a brief commentary on the main findings for that question. Once each research question has been addressed, a short summary of concluding comments is given.

Interviews With Parents

Overview

For this research, 13 interviews were conducted with parents who had completed the PPAQ. Direct quotes from a parent are identified with a code from Pt1
to Pt13, to represent the parent being quoted. Of the 13 parents, 5 of them could be classed as rejecting the ADHD diagnosis, while the remaining 8 could be classed as accepting the ADHD diagnosis.

**Research Question 3.1.1: What do parents perceive ADHD to be?**

**Results.** The most common response from all parents, both those who accepted and those who rejected a diagnosis, was that they defined ADHD in terms of its observable behaviours: that is, they saw it as hyperactive behaviour. Four out of the five parents rejecting the diagnosis viewed ADHD as hyperactive behaviour, while three of the eight parents accepting the diagnosis viewed it as hyperactive behaviour. Responses from parents rejecting the diagnosis are as follows:

*Supposably hyperactivity, anger, just out of control pretty much [Pt1].*

*Hyperactivity, I think sometimes they can be over focused, can’t sit still, fidgety, etcetera [Pt3].*

Two of the parents accepting the diagnosis also mentioned impulsivity. For example:

*ADHD, in my opinion, is a condition where a person has little control over impulsivity, where socially they may be challenged with their comments and behaviours with their friends or acquaintances [Pt9].*

*Well, they don’t seem to have the attention span that most other children have. They’re impulsive, they’re very aggressive at times [Pt11].*

Two parents (both of whom accept the diagnosis) made reference to ADHD being something that was neurobiological, for example:

*It is, it’s a neurobiological condition which results in the child or adult being, the overriding problem – it is an inability to focus and pay attention to those things which the person finds uninteresting. It is not a total inability to focus and pay attention. If something is very interesting to that person they’re*
totally able to pay attention. They’re certainly able to pay attention if there’s a gun to their head [Pt7].

One parent who rejected the diagnosis, also emphasised ADHD-type behaviours as normal behaviour that resulted from children not having their needs met. She commented as follows:

Because if you sit down and talk to these kids, they’ll tell you what they need. It’s just that it doesn’t fit into most of the people’s little boxes, so they can’t be shoved in a box with a lid on top. And in actual fact, I see them as little budgerigars and they have their wings clipped . . . So I don’t know what ADHD is. All I see is a bunch of really smart kids that aren’t having their needs met properly [Pt2].

Similarly, two other parents who reject the diagnosis remarked as follows:

So I just knew that my child was really smart and I just saw it as the teacher’s – not being lazy, but not seeing the individual needs of kids [Pt1].

My own opinion, I would guess it’s – for me it’s normal behaviour, particularly with children [Pt13].

Conclusion. Most parents are in agreement as to what are the defining features of ADHD, but less so on what they believe to be the causes of ADHD. Most parents felt that ADHD could be described as hyperactive behaviour. However, parents who accept the diagnosis tend to deem ADHD to be biological in nature, whereas parents who reject a diagnosis, deem ADHD to be a psychosocial phenomenon.

Research Question 3.1.2: What do parents perceive as the factors that contribute to or cause ADHD-type behaviours in children?

Results. For parents rejecting the diagnosis, the most common response for what they believe causes ADHD was that it was diet related. For example, two parents responded as follows:
They might be more predisposed to having it biologically but I think environmental factors should be taken into consideration as well, like the type of food they eat, allergies, etcetera [Pt3].

Food has a lot to do with it. . . . Colourings, MSG [Pt1].

The most common response amongst parents who accept the ADHD diagnosis was that it is biological or genetic in nature. For example:

I think it’s genetic and I’m not at all convinced that environmental factors make much difference unless they’re quite extreme [Pt6].

Well it’s largely genetic [Pt7].

Well just from my research I believe it’s the neurological wiring and those chemical bridges at the end of nerve endings that don’t exist. That’s obvious from what I’ve read [Pt9].

Similarly to parents who reject the diagnosis, some parents accepting the diagnosis also believe that diet plays a significant role and that the ADHD behaviours are the result of a mismatch between the child and his or her environment. Half the parents who accepted the diagnosis mentioned that they do not know what causes ADHD. While parent responses covered a span extending from opposite ends of the biological-psychosocial continuum, several responses given suggest that these parents saw it neither as exclusively biological nor as exclusively psychosocial in nature. For example, one parent commented:

So I’m not sure that I’m convinced that ADHD is caused by anything. I think it is a genetic disposition and a personality trait from the parents [Pt12].

Conclusion. A variety of responses were given for this research question. As might be expected, parents who accept the ADHD diagnosis see it more in terms of a biological condition, whereas parents who reject the diagnosis see it as something
other than biological. However, there were enough responses to suggest that parents see ADHD as resulting from both biological and psychosocial causes.

**Research Question 3.2.1: What factors influence a parent’s decision to accept or reject a diagnosis?**

*Results.* Parents rejecting a diagnosis, reached their decision largely through their own observations or research. One parent rejecting it was opposed to medication, while another parent had seen the effects of medication on her nephew, and so was opposed to medication. However, one parent, though opposing medication, still accepted the ADHD diagnosis for her child, as evidenced by the following response:

> Well, it wasn’t that I didn’t want to accept the diagnosis but I didn’t want to go the route of the medication. I didn’t accept the medication aspect of it, and I still don’t. We don’t treat our son with medication. We felt great opposition from the school for him in that aspect of the medication [Pt4].

Further, parents who see ADHD more as a psychosocial phenomenon (as opposed to a biological or a medical condition) are more likely to reject any suggestion that their child has ADHD. Some responses from parents when told that their children had ADHD are as follows:

> I didn’t even take it onboard in the first place. . . . his kindergarten teacher came to me and she said I think he’s got ADHD. And I said I beg your pardon? I said no, he’s not, I said, he’s just a really smart kid and he’s bored shitless in your class basically [Pt2].

> I didn’t like the idea of it in the first place. I don’t like medicating. I prefer to find out why [Pt1].

One father (the only father interviewed) believed his decision was guided by science – he believed science had not demonstrated the biological underpinnings of ADHD. He therefore sees ADHD as normal behaviour. With regard to the scientific status of ADHD his response was:
If you want to call it a medical condition it must comply to medical science, and it doesn’t [Pt13].

Two significant factors influencing parents in their decision-making process were their own research and the opinions of health professionals. Typical of the findings are the following comments made by two different parents who accepted the diagnosis:

When he was first diagnosed I was very reluctant to accept it and so I called for all the research literature I could put together from the anti-Ritalin brigade, which turned out to be largely journalists and the Church of Scientology on the one hand, and from the medical pro-medication brigade on the other hand. I just read it all for months and months and at the end of it I formed the view that the people who were taking a medical take on it and who were supporting a medication remedy for it, or management program for it, were far better qualified and far more highly educated and there was more science behind what they were saying as opposed to the other crowd [Pt7].

I think that because we had no joy with paediatricians I got online and I found a neuropsychologist with an interest in the area and had a lot of testing done and I didn’t expect the diagnosis. . . . but having talked to another paediatrician . . . I did accept it then and we also had some brain mapping done and the results of that really were the clincher for us and made us think that is what he has. . . . and the school was sure that it wasn’t a parenting issue. They thought he was very different from other children and was being disciplined well at school and disciplined well at home and they encouraged us to seek more advice and that’s what we did [Pt8].

Closely related to expert opinion (e.g., paediatricians) in helping parents reach a decision to accept the ADHD diagnosis is the use of brain imaging technology, as evidenced by the response from above, as well as the following comments:
With my second son, even though he’s got a diagnosis that’s similar he’s actually got learning difficulties which are more significant. So I was less convinced that he had the ADD. However they also tested him with the EEG and showed the same pattern [Pt6].

It’s a neurobiological condition. It’s a brain condition. My children’s paediatrician who manages their ADHD gives me brain scans. There’s an abnormality of brain waves [Pt7].

Finally, it is possible that some parents accept the diagnosis because they find it helpful in terms of providing relief. When one parent was asked the question “From a medical perspective or when the doctors say look this is what the problem is, does that provide any good feeling at all?” the parent replied with:

Yes it’s a relief because you can tell people that it’s not your child’s fault and that people will stop blaming your child; your child when they have a diagnosis, there’s a sympathy [Pt6].

Conclusion. When faced with the prospect that their child’s behaviour is due to a medical condition (i.e., ADHD), parents have available to them a range of sources of information. One important source of information is that of the expert. For example, doctors play an important role in helping parents reach their decision regarding a topic which many are confused about. Depending on the information they are exposed to, along with other personal factors and experiences, each parent reaches his or her own conclusion.

Research Question 3.3.1: What is the typical process for parents and their children when their child displays ADHD-type behaviours?

Results. A common response amongst both those who rejected the ADHD diagnosis and those who accepted it, was that of initial concern. With that initial concern there can be periods of self-doubt and soul searching. For example, one parent who had accepted the diagnosis remarked:
But it’s still, it’s just really, really distressing like emotionally distressing to the parent. You feel – like I’ve come to terms with it now a lot more and I realise it’s not my fault but you do think what did I do? Did I drink a glass of wine when I was pregnant, did I spend enough time when they were little playing with them? Did I not talk to them enough or you know expect things from them. You kind of look for what you’ve done that might have caused it. You sort of start to realise that it isn’t that and also when you look at your other children and you see they’re all different. Well I’ve treated them all the same way so why would one, it can’t be all my fault sort of thing. So you kind of look for what you’ve done. It’s just really, really sad and distressing and awful when someone tells you there’s something wrong with your son. It’s very isolating. I tended to not talk to people about it and shut down and I did that for a long time and now I just tell everybody. It’s a much healthier way to deal with it I find [Pt6].

Concerns often relate to the child’s school experiences. One parent accepting the diagnosis remarked:

Well, there’s an accepted norm in a classroom and there’s an accepted behaviour level or, I can’t think of the word, criteria of behaviour that if you need a little extra attention or you need – or you’re out of that norm you are ostracised a bit. That’s just the social side of it but as far as academic, they may struggle a bit because they can’t quite keep up in certain areas as opposed to others. Or if they’re not quite as interested in what’s going on it’s very difficult to get them to finish their work or complete assignments [Pt4].

Another parent accepting the diagnosis, when asked if she thought school is a problem for her son remarked:

Unmedicated, undiagnosed, absolutely 100 per cent yes [Pt7].

When asked if medication was helpful, she replied with:
Yes, if the parents have a management program and especially if the parents become good advocates for the child and teach the child self advocacy [Pt7].

Some parents mentioned that part of the process they went through included dealing with the pressure imposed by others. For example, one parent who rejected the diagnosis, when asked if she felt pressured to behave in a certain way or choose a certain response, remarked:

Well there’s always that pressure out there but I don’t bend to outside pressure very often [Pt 5].

For one parent who accepted the diagnosis, her response was:

Oh, sure. We felt very pressured by the school and medical people to accept it [the diagnosis] and to push on towards medication. Highly pressured, yes. [Pt4].

After their initial responses and concerns, parents typically need to respond to their child’s behaviours. Parents rejecting the diagnosis typically mentioned the need to modify their parenting practices and the need to persevere, as well as educating their child.

Every single day there was challenges, challenges, challenges, in all sorts of ways, shapes and forms. And you would get over what I would consider one hurdle and you’d just pick up yourself, and you’d go, God, no more, no more. But he just did. So I learned. I put myself in the position of rather than just sitting there and abusing him and telling him, no, no, no, no, which is what I see most parents doing, or putting him into child care or whatever. I’m a stay at home mother, and I decided if I was going to have children I was going to stay at home. And rather than just abusing him and telling him no, no, no, no, I learned that when he wanted to do something, I had to do it properly. Which takes a very lot of time [Pt2].
I was reading a book whose author recommended home schooling for boys – especially boy’s boys – for at least a couple of years, just until they were ready to sit down and focus a little bit longer. So that was the start of getting me thinking about home schooling, and then we decided to home school all of the kids [Pt5].

Therefore what we try and do is – it’s not to be throwing them into the deep end, but we don’t wrap them in cotton wool, to not expose them to things like heartache and disappointment and so on. The point is to get them to deal with it, and deal with it responsibly, and to learn how to deal with it and how to experience it. And I think that is, in terms of how we treat our child, that is what we like to do [Pt13].

Most parents accepting the diagnosis sought confirmation for the diagnosis from a suitable health professional. For example, two parents accepting the diagnosis remarked as follows:

First thing we did was have an IQ assessment done. Second thing was we consulted the developmental paediatrician and got the analysis there [Pt7].

Before we thought that it was ADHD I was just really concerned and didn’t know what was wrong. . . . I went to the GP for more advice and he sent us straight off to a paediatrician [Pt8].

An important part of the process for parents of children displaying ADHD behaviours is thinking about their child’s future. Generally, parents who accept the diagnosis are more likely to express concern about their child’s future, more so than parents who reject the diagnosis. Some responses for parents (who accepted the diagnosis) when asked how they felt about their child’s future, are as follows:

Well I’m very – there are times I have been very concerned about that. . . . If I was an employer I don’t think I would employ him. . . . I just support him now and if something bad happens to him in the future I’ll deal with it then [Pt6].
I worry about it. His schooling’s very poor and I repeated him in Year Five so he’d catch up but that didn’t help. I was told by the child development unit that he’ll always be behind and he’ll always be a plodder, so I’ve just come to terms with this, he’s not going to do that well at school and hopefully he’ll be able to get a job and that [Pt10].

Some responses from parents who reject the diagnosis when asked how they felt about their child’s future are as follows:

I don’t see an issue at all with it. . . . I think that he’ll do exactly what he wants to do when he’s ready to do it [Pt5].

God, he’s already got his university degree picked out, and decided he’s going to do the naval architecture university degree and he’s going to design his own boats and have his own boat company. I have no doubt in my mind he’ll do it [Pt2].

Although this parent was positive about her son’s future, she also expressed concern for his current school experiences:

Because they’re not accepted for who they are. They’re just not accepted – they’re seen as losers quite often, loudmouths, they’re seen as hopeless because they can’t have, they don’t have friends around them a lot, because they tend to push people away. So the whole friendship thing is a really hard gig for them. So I think they feel very alone, I think and it comes back to the not being listened to [Pt2].

Conclusion. The experiences of parents are many and varied when they respond to their child’s ADHD behaviours. Typically, parents are initially concerned when confronted with the prospect that their child has ADHD. Further, parents, whether they accept or reject the diagnosis, can experience pressure from others to behave in a certain way. After the initial concern, parents then proceed to respond to their child’s behaviour in a way that suits themselves. What a parent believes ADHD to be (i.e., a medical condition, or something else) influences the process they go
through when dealing with their child’s ADHD behaviours. For example, parents rejecting the diagnosis may choose to modify their parenting practices, while parents who believe ADHD to be a medical condition will seek a diagnosis for confirmation.

Research Question 3.4.1: What do parents perceive as the role of professionals in helping parents and their families when there is a child who displays ADHD-type behaviours?

Results. It was on this question that the opinions of the two groups of parents (i.e., parents who accepted the diagnosis and those rejecting it) diverged most. The only common response between groups (endorsed by one parent who rejected the diagnosis and several who accepted it) was that they believed professionals should be there to provide support for parents.

Some of the responses from parents who reject the diagnosis were as follows:

Finding answers instead of just medicating [Pt1].

I don’t think they should just churn out the drugs. I’m thinking they’re handing these out willy-nilly. I think counselling is probably – all sorts of counselling, not just – I’m not a religious person, but I think spiritual counselling – these kids are pretty deep and meaningful, I think [Pt2].

But definitely to be able to get support and tools from other people that have those is really important [Pt5].

Similarly, parents accepting the diagnosis also spoke of the need for (non-medical) assistance and support. A sample of responses from parents who accept the diagnosis in regard to what they believe health professionals should be doing is as follows:

If they [psychologists and school counsellors] can offer help in the classroom or help to teachers in helping them deal with children that have this problem that would be great [Pt4].
They have to be supportive, they really need to understand that, you know, by the time I got down to the kids’ hospital, I was ready to tear my hair out [Pt11].

Well I think that your local doctor should be able to prescribe the Ritalin on the recommendation of a paediatrician. It’s really annoying to have to keep going back to the paediatrician for years and they just take your money. My sons, both have to go [Pt6].

**Conclusion.** Generally, parents wish for professionals to be helpful. Naturally each parent has his or her own idea (based on their personal experiences) of what is helpful. Not surprisingly, whether parents accept or reject the ADHD diagnosis, they desire to feel supported by health professionals. Parents also expressed a need for further support and assistance, in forms other than medication. This finding suggests that whether a parent accepts or rejects the ADHD diagnosis for their child, these parents face challenges and need assistance that medication alone cannot provide.

**Research Question 3.5.1: What are parents’ perceptions of when and if medication should be offered as a treatment for children?**

**Results.** Participating parents generally had definite views on medication for ADHD. At one extreme they gladly embraced it, while at the other extreme, they strongly opposed it. Those parents accepting the ADHD diagnosis are generally more accepting of medication as a treatment than those parents rejecting it.

Of those parents who accept the diagnosis and speak favourably of medication, they often understand that it is not the total solution and may not be appropriate for all children displaying ADHD behaviours, as evidenced by these following comments:

*It’s been extremely helpful for my children and my son . . . has got a really, really good job in something he loves and I don’t think that he would have got to that without having medication but not on its own, but medication and dedicated teachers who helped him.* [Pt6]
Wonderful, but we only use it on school days. . . . or when she has major things happening. [Pt11]

Except for the children who can’t tolerate it, and I acknowledge that there are some, I am very in favour of medication as long as it’s closely supervised by a psychiatrist or paediatrician who will tweak the doses to get the optimum benefit and support for the child. There are some paediatricians who are excellent at keeping on and on and on tweaking the doses ‘til they get it absolutely right. [Pt7]

One parent was cynical of the process required to obtain medication (and not the medication itself), as evidenced by the following comment:

The paediatrician doesn’t bulk bill, she charges me a full fee for both of them and all she does is ask how they are, takes their weight and blood pressure and writes a script and I have to pay her 300 bucks. You know, we all know that we’re only there to get a script. So that is annoying. . . . but there’s a very strong motive for paediatricians to diagnose people with ADD if they get a very nice little income stream out of people going in there just to get a script. It’s not very hard for them to write it out or ring up and get the approval or whatever it is they have to do. Then just take your money [Pt6].

Not all parents who accepted the diagnosis readily accept the use of medication, as evidenced by the following response:

I don’t agree with it. The medication they use for ADHD is a narcotic in the same category as cocaine and things like that and I think that’s just a very poor thing to do to a small child’s body, to put something like that into their body every day [Pt4].

This parent further commented that doctors did not provide any alternative solutions other than medication and that both doctors and schools had put pressure on her and her partner to accept medication as a treatment:
I’m not sure what else they offer. We were turned down by doctors for any kind of help other than give your child medication and go out the door please. After begging that’s what we got. Sorry, you give your kid medication or we can’t help you, see you later, showed us the door. That was the help we got from doctors [Pt4].

Another parent who accepted the ADHD diagnosis, though she does not like using medication for her child, did so because she felt she had no other option:

I started medication last year. . . . to medicate him at school. So whilst I don’t even support the decision, I just want him to be comfortable and secure in a school environment and that has been something that has changed. He’s not the naughty kid anymore, he’s just like all the other kids. So that’s what made me continue with that path of treatment. It’s not something that I agree with, I have a drug addict mother so obviously I have a very strong aversion to medication [Pt12].

Side-effects are a common concern for parents of children displaying ADHD behaviours. On this matter, one parent who accepts the diagnosis told of her experience:

I think that if it helps, then go for it, give it a try but I do think it needs to be watched quite carefully. Three of my boys have tried Concerta now and all three of them have had really quite violent responses to it and have become really uncharacteristically aggressive. . . . My 19 year old tried it for a few weeks and he said he just couldn’t work, he felt so wound up he had to stop taking it. The younger two, my nine year old, he took it. We gave it a trial for a few weeks and he got more and more aggressive and we stopped. Went back to the paediatrician, he’d had a break of probably three months. He tried it again, exactly the same response so we stopped. [Child’s name] stayed on it for a while longer. [Child’s name] probably took it for maybe six months all told but throughout that six months his aggression built and built until we got to a point where he was fighting at school every day and within a week of stopping the medication that stopped [Pt8].
Conclusion. Acceptance of the ADHD diagnosis and the treatment of medication are closely related topics. As these responses show, parents have strong views on medication. Parents’ responses to medication were mixed. There are some who gladly embrace it, others who refuse, and some who will use it for their child, but do so with reservations. While parents who accept the ADHD diagnosis generally accept medication, this is not always the case; some parents who accept the diagnosis are also opposed to medication for treatment.

Summary for Interviews With Parents

Parents, regardless of their decision to accept or reject the ADHD diagnosis for their child, have widely differing experiences in relation to ADHD. What they do have in common, is that usually there is an initial concern where they recognise that there is some problem with their child’s behaviour, which they need to address. Another issue common to all these parents, is the decision whether to use medication or not. While parents accepting the diagnosis are more likely to accept medication as a treatment, this is not always the case. Further, when parents do use medication, many recognise that it is not a panacea.

Interviews With Paediatricians

Overview

As a professional group who are qualified to give an official diagnosis of ADHD, paediatricians are well positioned to comment on ADHD and its impact on families. For this research, five paediatricians kindly volunteered their time for phone interviews. Where a school paediatrician is directly quoted, the quote is identified with a code from P1 to P5.

Research Question 3.6.1: What do health professionals initially do when a parent or teacher expresses concern about a child who displays ADHD-type behaviours?

Results. Four of the five paediatricians said that they either do some form of assessment (e.g., Connor’s rating scale) or take a history. Another paediatrician said that he tries to analyse the behaviours to see if the child’s behaviours are due to ADHD or something else that can look like ADHD. A sample of responses from those paediatricians who do an assessment or take a history is as follows:
I take a full history from the parents, exactly what their concerns are about, both at home and at school and out socially [P1].

I take a history, try and work out whether, in my mind, it might fit with a possible ADHD. I’m also looking for other possible diagnoses such as ASD, behavioural issues, attachment issues, lots of things that I’d be looking for [P2].

Another common practice, amongst three of the five paediatricians, is to involve the child’s school and teacher. When asked “How important is it to speak with the teacher?” one paediatrician answered with:

Extremely important . . . And, although school reports give you some idea, there’s nothing like actually speaking to the teacher to get their feel for the child [P1].

Other statements reflecting the paediatricians’ desire to speak with teachers are as follows:

Then if I’m suspecting ADHD I would ring the school or the child care and have a chat to them, all the other interested parties [P2].

Sometimes they’ll produce these but you see I’ll also try and track down a teacher, especially if I’m not really sure of what’s going or if the parents are telling me that the school told them to bring their kids in and they don’t think there’s anything wrong, I will then sometimes try to track the teacher or the school counsellor down [P3].

For a diagnosis of ADHD to be given, the behaviours need to occur in at least two settings. Hence, the accounts given by teachers (in addition to the parents’ accounts) are a very important source of information for paediatricians in assessing whether or not the ADHD diagnosis is applicable. As one paediatrician remarked, “Most, well, a lot of the consequences and the impacts of ADHD are felt in the classroom and in education” [P1]. In addition to using teachers’ accounts for the purpose of making an
assessment and diagnosis, one paediatrician remarked that the involvement of teachers is important for managing the ADHD:

*The best treatment’s going to involve getting the teachers onside, getting them to understand that this is a neurological disability rather than a naughty child and get them to try and see it as that and to be therefore as supportive as possible rather than punitive . . . I always speak to the teachers. I often send out a fact sheet to teachers about some strategies that they can use [P2].*

Once a history is taken and/or some form of assessment is done for the purposes of establishing or excluding a diagnosis of ADHD, usually the paediatricians then focus on treatment or management options with parents. The responses from paediatricians were varied, but included explaining what ADHD is, referring the parents to a psychologist, providing parents with information and links to websites, and discussing specific treatment strategies.

The advice that paediatricians give is influenced firstly by whether or not the child’s behaviours are deemed to be attributable to ADHD, and secondly, whether or not the parent is accepting of the ADHD diagnosis. With regard to the parents’ acceptance, two paediatricians remarked as follows:

*It’s variable. It depends where they are in the process of acceptance. So I have some parents that come in saying there’s nothing wrong with my child, the school made me come. That’s then very difficult especially if they say it’s only at school, it’s not at home [P3].*

*But some sort of come with more information and more ideas of their own. Some of them come in absolute denial and try to talk about it out of the context of ADHD, so that makes it very hard if they’re in denial about the diagnosis. . . . It depends on the diagnosis, what I’d advise you do. If you think the diagnosis is ADHD, well the answer is to explain that particular condition and what it means and its implications and talk about the intervention options [P5].*
Another very important factor that influences what advice paediatricians give parents, is the parents’ acceptance or rejection of medication as a treatment. The topic of medication is discussed shortly, but one paediatrician said this in relation to what influences a parent’s acceptance of medication:

*Depending on the parent’s response, there are some parents that know that their kids have got ADHD and they basically come for the medication. Other parents come in and it’s like no, we don’t want medication. So in those instances, I give them the information and say look if they would like to have a try of medication, they have to come back rather than prescribe it at the time [P3].*

**Conclusion.** Parents consult with paediatricians to address their children’s ADHD-type behaviours. Before deciding if the diagnosis is warranted, the paediatricians usually do an assessment of the child by way of a standard test, and/or take a family history. The advice paediatricians give is usually influenced by three factors: Whether or not a diagnosis is warranted, parents’ acceptance of a diagnosis, and their acceptance of medication as a treatment.

**Research Question 3.7.1: What do paediatricians think are the relevant factors that influence parents to accept or reject a diagnosis?**

**Results.** One paediatrician, when answering why some parents accept and others reject the diagnosis, succinctly stated “Everybody comes from a different place and everybody’s heard different things” [P2]. It is not surprising then, that the paediatricians gave a variety of responses to this research question.

Perhaps an obvious reason why parents accept the diagnosis is because, as stated by one paediatrician, they readily see ADHD as a “neurological and brain based impairment” [P1]. Another paediatrician said “They accept it because they’re a bit more pragmatic, they want a solution and they might trust us” [P5]. Chapter 7 examined whether acceptance of the ADHD was associated with feelings of relief. One paediatrician’s opinion was consistent with this notion:

*I guess if they’ve got a diagnosis then that can be seen as a reason why their child might not be as easy to manage, so I guess it takes a bit of pressure off*
themselves and some people might use that as an excuse, oh he’s ADHD or her ADHD, rather than I’m not providing the appropriate limits and etcetera. Some people find it helpful in that way I guess. . . . Some parents, I guess, feel a little bit relieved that maybe there is something a bit – it’s not that they’re failing totally as parents, the child is a more challenging child and needs a lot more energy put into them from a behavioural point of view . . . . Well I guess sometimes they just feel maybe reassured that maybe there is a problem and therefore that explains why they’ve been having more than normal difficulties [P4].

Another paediatrician had a similar opinion:

*Look, most parents I see they’ve come because they’re worried about their child. And they’ve been worried for quite some time that the child’s not focusing or concentrating and getting into trouble. And it’s often a relief and it’s a validation for them, that there was something wrong. That it’s not just in their mind and it’s not their fault [P1].*

The paediatricians offered more reasons for why parents reject the diagnosis than for why they do accept it. The most commonly reported reason by paediatricians related to the media. Four of the five paediatricians suggested that one reason why parents may reject a diagnosis is because ADHD is portrayed very negatively in the current affairs shows. Three examples of their responses are:

*And I think still others, and this is partly because of the media, see the severe ADHD-type children and think their child doesn’t have it because they don’t behave like that. I’m talking about the Current Affair type pictures of children with ADHD [P1].*

*Certainly the people that read the trashy magazines and watch A Current Affair, 60 Minutes, and some other newspapers – The Telegraph, where they really bombard ADHD and the treatment of it – are less likely to accept the diagnosis [P3].*
That’s the problem, a lot of media people pick on extreme cases to illustrate the diagnosis and that’s what puts people off [P5].

Other factors that paediatricians believe influence parents to reject the ADHD diagnosis where one is warranted are: a diagnosis implies the parents are to blame, some parents are “very anti western medicine” [P3], and they do not like labels. Interestingly, one paediatrician said “Sometimes they just don’t trust us and that happens fairly frequently” [P5].

Another important reason why parents may not accept the ADHD diagnosis is because of the associated treatment options. One paediatrician said:

Sometimes they come along and they say look I don’t think there’s anything wrong with my child, but I’m coming along because I feel under pressure from the school to come along. I’m not saying I haven’t had a lot of parents that have rejected it, what they reject is what sort of strategies might be available to help them, help the child [P4].

Such parents could be considered a third group who accept the diagnosis, but reject the medication treatment (the first and second groups being those who accept, and those who reject the diagnosis).

Conclusion. Given the complexity of the whole issue of ADHD and the diversity of parents, a variety of factors influence parents’ acceptance or rejection of ADHD. One factor which most of the paediatricians believe significantly influences parents in their decision to reject the diagnosis for their child is the media’s negative portrayal of ADHD (particularly in current affairs shows). Other reasons for rejecting an ADHD diagnosis include: Accepting the diagnosis implies blame on the parents’ part; being against the use of medication to control children’s behaviour; and being against the use of labels. Reasons why parents might accept the diagnosis are that they believe ADHD is a brain/neurological condition, and the possibility that the diagnosis will offer some relief.
Research Question 3.7.2: What do paediatricians think are the relevant factors that influence parents to accept or reject medication as a treatment?

Results. Paediatricians reported a variety of answers to why parents reject medication as a treatment. Also, similar to the last question, the paediatricians spent more time talking about why parents reject medication as a treatment rather than why they accept it. This is perhaps because the paediatricians believe there are many obvious benefits to medication, and they are therefore more concerned for the minority of families where medication is not accepted as a treatment. For example, one paediatrician said:

But I find the majority of my families, probably about 80 per cent, they do accept giving medication and do use it with their children. And often get such a great response that they have no long lasting qualms about using it [P1].

However, it is not always the case that parents initially accept medication as a treatment, as another paediatrician noted:

Most parents don’t want to give their kids medication but when you actually explain what it does or how it helps, the majority actually do turn around and accept [P3].

There was only one paediatrician who gave reasons for why parents accept medication as a treatment. His response is included here.

I think that the families that are in crisis because of the different behaviour of this child really accept anything and if you offer it to them not as a lifelong treatment but as a why don’t we try this for a week or two and see whether it makes a difference to your life, they’re very, very accepting of it if it works [P2].

Two paediatricians suggest, similarly to the reasons for parents’ rejection of the ADHD diagnosis, that negative portrayal by the media significantly influences parents. Other reasons suggested by the paediatricians for why parents reject medication as treatment include: concern with side effects, a previous bad
experience, perceiving a stigma attached to medication, having a personal history of substance abuse themselves, and preferring alternative complementary medicines (e.g., fish oil).

Another interesting reason why parents may reject medication initially, is suggested by one of the paediatricians as follows:

*I think this comes back to understanding what the medications are and what they do. I can understand why parents have trouble getting their head around medication, I think I probably would too if it was my child. I think it’s very abstract, you can’t measure it, you can’t measure what’s wrong with the brain, you can’t actually measure what the drugs are doing, you can see what’s happened clinically. But on the other hand, you can explain to them that your child is not a guinea pig, it needs medication that’s been here for a long time and they can be dramatically effective. I think there are some people that don’t want to go with medication and try a lot of alternative strategies, but often in the end they do come back to medication [P4].*

**Conclusion.** Although medicine is the recommended treatment (typically in combination with other, non-medical treatment), there are some parents who, upon seeing a paediatrician, refuse the medication treatment option. Paediatricians generally spoke more about why they think parents reject medication than about why they accept it. The most common reason they reported was the negative portrayal of ADHD in the media (e.g., current affairs shows). Other reasons for rejection include concerns about side effects and previous bad experiences with medication.

*Research Question 3.7.3: What do paediatricians believe causes ADHD or contributes to the rise in ADHD diagnoses?*

**Results.** In response to this question, one paediatrician aptly responded with “That’s a difficult question” [P2]. Nonetheless, the paediatricians had certain ideas, some of which are presented here. A variety of answers were given, but one of the most common answers (with three paediatricians making similar comments) related to awareness and more open discussion. One paediatrician remarked “It’s something that was a dirty word before” [P2]. This greater awareness has perhaps led to
parents’ willingness to discuss the topic openly. For example, in regard to openness, one paediatrician said:

*I guess people are more self conscious of their children’s behaviour these days and may be more willing to discuss the problem. . . . There might be a bit more self reflection on management strategies, because they hear a lot about it in the popular press, and that sort of thing [P5].*

Another common explanation offered by three of the paediatricians related to community expectations, particularly in relation to education.

*Well I think the community expectations. I think that the lack of extensive families means that – I think there’s been a medicalisation of children’s behaviours and that there has to be a medical reason for a problem rather than the fact that it may just be a temperamental problem or just a normal developmental process. So I think as a community we’ve become over medicalised for a lot of these things. . . . maybe there’s a lot more concern that children do well at school these days for job possibilities, general stress I guess in the community, that things aren’t as relaxed as they were 20 years ago [P4].*

*In the past maybe some with mild symptoms managed to get through and now because there is such – the requirements made by schools these days are so huge I guess kids are struggling . . . . I guess the more demands that are placed on kids at a younger age, you see kids with more mild symptoms, more likely to be having difficulty functioning [P3].*

*I think overall greater scrutiny of academic performance. If someone’s not performing well we’re more inclined to look closely at it to see if something else can be done about it, he’s just a bit dull or a bit like his parents. So on the academic side it’s, I guess, higher scrutiny and I guess higher expectations; why can’t we make this child do better at school, something might make him perform better [P5].*
These opinions resonate with the claims of students using stimulant medication to improve study habits and exam performance (see White, Becker-Blease, & Grace-Bishop, 2006).

**Conclusion.** As doctors, paediatricians will likely see ADHD as a medical condition. However, based on their responses, they recognise social factors that may contribute to the rise in diagnosis of ADHD. For example, they suggested that an important contributor to the rise in ADHD diagnoses is the open discussion on the topic that is taking place (i.e., parents are more willing to talk openly about ADHD), perhaps more so than an actual increase in prevalence. The paediatricians further suggested that a change in community and parents’ expectations regarding school performance has contributed to the observed rise in diagnosis of ADHD.

**Research Question 3.8.1: What are the paediatricians’ views/practices with regard to medication?**

**Results.** All the paediatricians said that they prescribe medication, though one said she is reluctant to prescribe it to children under six years of age. So not surprisingly, paediatricians endorse medication as an effective treatment, with three of them suggesting that they think medication is generally the best treatment or at least is the first option to be considered. A selection of responses in regard to their preference for medication as treatment is as follows:

Yeah, well that multi-site trial in MDAP, that really showed that it was medication, was number one. And then medication and behavioural modification can add some extra improvement. But without the medication, for most kids, they won’t improve [P1].

It depends on how old the child is. I think if it’s true ADHD that I like to start with the medication and I always speak to the teachers [P2].

So I’m pretty focused on medication if I think that’s the diagnosis, if the condition is having an impact on a child’s social or educational process . . . . So I guess in a nutshell, yes, medication I think is the best approach [P5].
When suggesting medication, all the paediatricians interviewed were mindful of the need to inform parents about the potential side-effects, its limitations, and how to get the most benefit from its use. For example, one paediatrician said:

_They need to know what the options are. They need to know what to expect from the treatment, that it’s not going to make everything perfect, that it might help their distractibility or their impulsive behaviours to some extent [P2]._

However, some acknowledge that it is subject to misuse. For example, one paediatrician said:

_Well I think there are probably too many children on medication and I think some of them probably don’t have the condition. I mean I do believe there is a medical condition, but I also believe that a lot of these – the problems are being medicalised unnecessarily. I think what’s happened with that is that I think the general practitioners have been left out of the loop a lot, well that’s my experience locally. They sense this community pressure that there’s a fix to this, so you have to go to the doctor and get it fixed, and the medications will fix it and it will all be better [P4]._

**Summary for Interviews With Paediatricians**

Five paediatricians were interviewed for this study. As health professionals who routinely assess children for ADHD and who often prescribe medication, their insights into the family dynamics where a child displays ADHD-type behaviours are very valuable for this research. Responses were gained for three research questions, and an additional two questions were constructed in order to capture some of the rich data available from the interviews. Topics discussed included: How they as paediatricians respond when presented with a child displaying ADHD-type behaviours; what they believe are the reasons for parents accepting or rejecting the ADHD diagnosis and its associated treatment, medication; more general comments on medication; and reasons for the observed rise in ADHD diagnosis.
Interviews With School Counsellors

Overview

Given the amount of time children spend in schools, children with ADHD are likely to display ADHD-type behaviours in the classroom, which is often problematic for the child, other students, and the teacher. For many students displaying ADHD-type behaviours, the school counsellor may be the first professional the parent communicates with when deciding how to manage their child’s behaviour. Most schools have a referral system where the teacher identifies concerns and provides some background information to the counsellor. Parents are then asked for their permission to involve the counsellor, particularly if any sort of formal assessment is to be involved. Sometimes parents may be the ones to initiate involvement of a counsellor.

The insights of school counsellors therefore provide a valuable insight into understanding how parents perceive and respond to their child’s ADHD-type behaviours. For this research, only three school counsellors were available for interview. Direct quotes from a school counsellor are identified with the code of SC1, SC2, or SC3, to represent the counsellor being quoted.

Research Question 3.6.1: What do counsellors do initially when a parent or teacher expresses concern about a child who displays ADHD-type behaviours?

Results. Before giving advice to parents, all three counsellors mentioned that they like to do a thorough interview with the parent, to gather relevant background information (e.g., are there other children in the family with ADHD, what are the family dynamics?). If a diagnosis has not already been given, they may do a formal assessment. One school counsellor described the process as:

Yeah, so pretty much elicit more information from the parents. Find out if they are on medication, and if so what it is; if we can, communicate with the paediatrician who’s given them the medication. If they’re not, what strategies they’re doing to address the child’s behaviour [SC3].

With regard to what advice the counsellors offer to parents, the counsellors generally focus on addressing the child’s behaviour rather than seeking a diagnosis. For example, one counsellor said:
Yeah and I suppose I try to give some behavioural guidelines for managing the issue. I certainly don’t pressure the parents either to get a diagnosis or to medicate their child. It’s a personal decision [SC1].

One counsellor said she gives the same advice to all parents, though she tries to cater to a family’s individual needs, while another counsellor said the response given to each parent (and sometimes their teachers) varies from child to child. Factors that influence what advice counsellors give to the parents include parents’ finances (i.e., their ability to afford specialist treatment), English proficiency, and parents’ assertiveness (i.e., their capacity to implement a behavioural strategy).

**Conclusion.** Although different counsellors deal with ADHD differently, they generally commence by interviewing the parents to gather relevant background information which can be used to make recommendations. The recommendations usually include implementing a behavioural strategy.

**Research Question 3.7.1: What do counsellors think are the relevant factors that influence parents to accept or reject a diagnosis?**

**Results.** The reasons counsellors offered, for why they believe parents accept the diagnosis, include: The problem is framed as a medical problem and legitimises the use of medication, and it enables them to cope and to avoid criticisms. Interestingly, when the counsellors were asked what they thought were the relevant factors that influence parents to accept or reject ADHD as an explanation for their child’s behaviour, none responded with what may be considered the most expected response: that being, simple trust in the authorities making the diagnosis. One possible explanation for this result (or lack thereof) may simply be that the counsellors were looking past the most obvious answer in an attempt to further extrapolate the diversity of factors that may influence the final decision of the parent. This experience was not unlike that of the paediatricians, when asked why they thought parents accept the ADHD diagnosis.

Reasons counsellors offered as to why parents may reject the diagnosis are that the behaviour is seen as normal, that the suggestion of ADHD is a shameful event, and that parents do not wish to medicate their child. For example:
I think some parents accept ADHD as an explanation because it helps them to treat their child with an extrinsic element such as medication. It gives them a legitimate reason to seek medical support, where they may not have otherwise sought support from medical professionals. It may help them to feel a reason for their behaviour is now validated, explains their behaviour. That’s for the parents that would accept it I guess. It also helps them to perhaps get people around them who they feel may judge them – such as teachers and people within the community – off their backs by saying well he can’t help that he’s got ADHD. It’s really hard and I can’t really do much about it, but he has ADHD. . . . I’ve met parents who actively seek out that diagnosis, in spite of professionals saying we don’t quite think it’s ADHD. The teacher reports that his behaviour is generally fine. So they’ll actually look for it and be extremely relieved once it’s been given, because it’s now something the parents can blame or use as an excuse [SC3].

More concisely, and consistent with the previous quote, one counsellor said:

I suppose a label might help some people [SC2].

It should be noted that, in relation to the reference to “parents who actively seek out that diagnosis,” SC3 later said that in her experience, this is quite a rare occurrence.

Although some parents have concerns with medication, many parents see it as an effective treatment. One counsellor suggested that viewing ADHD as a medical condition can then legitimise the use of medication as a suitable treatment:

Look sometimes parents, sometimes, it’s a small minority of parents and at times teachers, might want that diagnosis and want a child on medication and want a short, sharp apparent solution to the issue [SC1].

While many parents accept the ADHD diagnosis for their child, there are many who reject it. One possible reason why parents reject the diagnosis, is that some see the behaviours as normal, albeit problematic. Once counsellor expressed it this way:
For parents that reject, I think the reason would be that they possibly felt that there are other reasons that contribute to their child’s behaviour. In my experience that’s been a very blaming type of attitude, where they would perhaps blame the school for their child’s behaviour and not want to address the issue. They may feel that their behaviour is quite normal, because they may have other children within the family that display the same behaviour, or they may have grown up in a very similar way themselves, and have not actually seen anything else to compare it to. For example one particular parent, when her child’s behaviour was explained to her, said that she didn’t feel anything was wrong with the behaviour. When the child was behaving quite overtly and jumping up and down within the principal’s room, and the principal asked do you not see that there’s a problem with this, they said no, because that’s all they were ever used to [SC3].

However, one counsellor mentioned that the suggestion of the ADHD diagnosis for some parents, may be interpreted as a diagnosis implying that there is something wrong with their child:

*Right through to parents become very defensive and angry, perhaps offended and insulted that somebody has said there’s something wrong with their child [SC3]*.

For many people, ADHD is very closely linked with medication, and it is the medication they oppose (see Chapter 2). A parent’s view on medication is likely to influence their decision to accept or reject the ADHD diagnosis. For example:

*Well I think also there’s often the implication that if you have ADHD you’re going to be on medication [SC1].*

*Other people are probably very anti-medication and just think that it’s normal behaviour so they try to normalise something that’s a little bit abnormal [SC2].*

*They also may fear that their child is going to be medicated, and they don’t feel that their child should be on medication. They may feel they’re too young to be*
on medication, or as a child not require an extrinsic thing like medication to address it [SC3].

**Conclusion.** In keeping with the overarching theme of this thesis, all three counsellors acknowledged that some parents accept a diagnosis and others reject it. Counsellors suggested that those parents who accept the diagnosis do so because it assists them in coping, while those who reject it, do so because they attribute the ADHD behaviours to a non-medical cause or may see the diagnosis as an indicator of blame.

**Research Question 3.7.2: What do counsellors think are the relevant factors that influence parents to accept or reject medication as a treatment?**

**Results.** This question is closely related to Research Question 3.2.2, given the link between ADHD and medication. One counsellor believes that acceptance of medication as a treatment may help parents to cope.

>I think some parents accept [medication] because they're finding it very hard to cope with their child’s behaviour. Again, within the regions I’ve worked, they’re very stressed themselves. Maybe – I’m trying to put this nicely – abusing substances themselves, and quite absent from their child’s life because of their own social struggles. So this is a very typical way for them to manage their child’s behaviour. I’ve found it’s purely a coping strategy, management strategy for parents that accept [SC3].

Consistent with the previous quote, another counsellor said the following:

>But some parents – I know there’s one boy whose mother’s very happy and eager for him to have medication because it makes her life easier, easier to manage him at home as well [SC2].

However, not all parents seek medication as the first option, as evidenced by one counsellor’s comment, “[Parents] want the teachers and the school to do as much as possible before considering medication” [SC1]. With regard to not accepting medication as a treatment, two counsellors made the following comments:
Just the fear of the side-effects, including the sleeplessness, not being able to fall asleep at night. There’s not a cure, perhaps; the idea that their child would have to be medicated for, maybe not the rest of their lives but for the long-term, might be something they can’t deal with; the cost if they don’t have a healthcare card [SC2].

I’ve heard things from parents that find out that perhaps it is used on adult heart patients, and that’s as far as the information-seeking goes. They get angry and say well I’m not giving my child an adult heart medication, without really looking into it very deeply. I think they may see that it’s not an organic problem that needs medication but rather a behavioural thing that needs to be addressed [SC3].

Such comments reflect the concerns of parents, health professionals, and the general public. It would seem that the general public (parents in particular) are just as divided on the issue of medication as they are on the issue of ADHD being a valid medical condition. As will be shown shortly, the counsellors interviewed for this study have a balanced (and perhaps conservative) view on medication.

**Conclusion.** Similarly to Research Question 3.2.2, coping was a theme that emerged in relation to medication. The counsellors suggested that some parents recognise the limitations of medication, and so avoid using it as a treatment. The topic of counsellors’ own views on medication is explored next.

**Research Question 3.7.3: What do the counsellors believe causes ADHD or contributes to the rise in ADHD diagnosis?**

**Results.** A variety of answers were given here. Reasons offered included nutrition/diet, unhealthy sleep patterns, greater awareness and more information available, and lack of support for parents. A sample of responses is as follows:

*The nutritional elements of some foods [SC3].*

*One factor I’m looking into is lack of sleep. I think that’s a common reason why a child, like you said, like an ADHD student, when in fact they’re not, but it also exacerbates ADHD [SC1].*
Just more information out in the public [SC2].

In our area, that’s largely related to the fact that the parents are often very young parents themselves, and lack a lot of support. [SC3].

These explanations are all well discussed in the literature, and this only further demonstrates that ADHD is a complex issue, often leaving parents confused and in search of answers and help.

Finally, what follows is an email received from a school principal, offering her reasons for why she believes there is an increase in ADHD-type behaviours:

Probably there are a number of reasons, maybe starting with a decline in basic foods cooked at home as there was when I was a child. All the additives must have some impact given that certain areas such as Western Sydney traditionally are some of the highest consumers of take-away along with dearer food prices for healthy produce – Maccas is the affordable alternative.

Secondly, there is an increase of the Quick Fix Solution by some medical practitioners who go for that diagnosis without any input from the school re the student’s behaviours. Quite a profitable business.

A decline in parenting skills may also have some impact – more dysfunctional families or families that are time strapped with a dose of Dex taking the place of parental authority and guidance in the home.

Finally, we live in an age where backyard cricket pitches are no longer the norm or for that matter, backyards themselves. Children are entertained by every electronic device known to man and therefore have the instant gratification attention span that rewards them for the push of a button. Unfortunately teachers are not Game Boys and when children have been trained in minimal concentration techniques we have difficulty in maintaining focus during the lesson sequence. Poor performance is often misinterpreted and labelled ADD or ADHD, when in fact they have a learned behaviour i.e., a short concentration span suitable for a Game Boy, but not in class.
Conclusion. The counsellors and one principal, in their capacity as non-medical professionals, suggested a variety of psychosocial explanations (e.g., lack of support for parents) and reasons related to diet, that they believed contribute to the rise in ADHD diagnosis. Their opinions are valuable, as they generally get to observe children for longer periods, engaged in a variety of activities (e.g., learning, playing) than medical specialists. The suggestions offered are ones over which counsellors and teachers have very little influence, thus demonstrating that schools face challenges in their attempts to respond to children with diverse needs (such as children with the ADHD diagnosis).

Research Question 3.8.1: What are the counsellors’ views on medication?

Results. Similarly to parents, counsellors are exposed to a range of information on medication for ADHD. For example, Vaughan, Roberts, and Needelman (2009) suggest to school counsellors that “stimulant medication is the single most effective treatment for ADHD” (p. 847). One of the counsellors spoke of her experience at one school, where children with an intellectual disability or an emotional disturbance, were very often diagnosed with ADHD.

But I think about half the school was medicated, and there was such a huge difference in their behaviour. From being quite lively and difficult to handle for the teachers, where they were wriggling out of their seat and shouting and running around, to the extreme opposite within an instant. So after the medication kicked in, extremely docile, extremely withdrawn, extremely slow, very hard to elicit information [SC3].

This counsellor reported that an important implication of these medication effects is the difficulty of knowing when to test or assess the child who is strongly affected by medication: should the child be assessed before or after the effects of medication occur? With this experience, it is likely that the counsellor would have reservations about the use of medication for ADHD. Indeed, the response that follows would suggest that she did have reservations, or at least does not see medication as the total solution.
Medication may be part of the outcome but I encourage them to realise that medication shouldn’t be the whole part of the approach. It should be a multi-factorial approach, like how you manage it. You might teach him self-management skills, social skills, and perhaps medication will be part of the whole [addressing of the] issue [SC1].

The other two counsellors held similar views:

It’s not a cure and that behavioural interventions need to be put in place as well [SC2].

I think they need to know that they are making a choice, and that people are on their side with this and trying to help them, but it may not be the only answer. If they’re going to choose to medicate their child, they need to really consider several other options. I think parents need to know that medication is not the only answer, and that it’s not going to fix them but that they need to be mindful that other things need to be addressed to [SC3].

A view shared by all three counsellors regarding medication was that if used, parents should know how it works and what its limitations are. This view is reflected in the previous quotes. Another quote that shows counsellors believe parents should have a sound knowledge of medication is the following:

I think they need to know what the medication actually does, so why they’re actually using this medication for them. How it works on the brain as a stimulant and what it’s actually doing for them in the meantime [SC3].

It is recognised that although the negative effects of medication are acknowledged, the results of medication are often perceived to be very positive. For example, one counsellor remarked:

Medication sometimes works like a miracle with some of the younger kids we’ve had. Then I’ve read that those medications would help anyone . . . see
the difference it’s made in some of these infant school kids that I’ve worked with is amazing [SC2].

Such remarks are not unusual, and are to be expected, given the popularity of medication and the endorsement of the medical community. It is unclear in the comment above though, exactly what is meant by “works,” as the term is very subjective. It may mean that children are more attentive and better able to focus (i.e., works for the child), which is often the interpretation given by those who favour medication, or it may mean that from the teacher’s perspective the child is easier to manage (i.e., works for the teacher/parent), which is typically the interpretation given by those who oppose medication. However, it is interesting that, based on the aforementioned quotations from the interviews, counsellors are well aware of the limitations of medication for dealing with ADHD, in spite of the scientific literature that actively promotes medication as a first choice treatment (e.g., Vaughan, Roberts, & Needelman, 2009).

**Conclusion.** Although individual counsellors deal with ADHD differently, they generally try to work with families. While the counsellors may advocate the use of medication, they view the behaviours as more than just a biological/medical phenomenon and work on a range of strategies that are responsive to parents’ particular circumstances.

**Summary for Interviews With Counsellors**

Three counsellors were interviewed for this study. Their experiences with children displaying ADHD-type behaviours and their families, ideally positions them to provide valuable information on parents’ perceptions and experiences of ADHD. The topics to which the counsellors responded to were the same topics discussed with paediatricians, which included: how they as counsellors respond when presented with a child displaying ADHD-type behaviours, perceived reasons for parents accepting or rejecting the ADHD diagnosis and the associated treatment of medication, general thoughts on medication, and the reasons why there is a rise in ADHD diagnosis.
Chapter Summary

Three interviewee groups (parents, paediatricians, and school counsellors) were interviewed for Study 3 to give an insight into the parents’ experiences of having a child who displays ADHD behaviours. The research questions focused on parents’ understanding and personal experiences of ADHD and medical treatment, as well as their opinions on the role of health professionals. The diversity of interviewee groups resulted in insights from multiple perspectives that were both diverse and complementary. While the different participants may have different views on ADHD, its causes and the best treatments, they generally recognise that parenting a child who displays ADHD behaviours is challenging, and that the provision of support is helpful. With regard to the use of medication, parents were polarised in their views. That is, some were very accepting and supportive of its use, while others found it totally unacceptable. The findings also suggest that, irrespective of one’s views of medication, parents feel that the best outcomes for their child result from all stakeholders (i.e., the medical community, counsellors, schools, and parents) working collaboratively. Another important finding was the recognition by professionals of the psychosocial factors contributing to the rise in the number of children being given the ADHD diagnosis. Hence, the findings emanating from Study 3 have enriched the findings of the present investigation, providing insights into parents’ experiences that are not easily identified using quantitative methodology.
CHAPTER 9

DISCUSSION AND IMPLICATIONS FOR THEORY, RESEARCH, AND PRACTICE

“Some parents feel relieved at being told their child has a brain disease. They no longer feel as though the problems are caused by their own mistakes or by some other mysterious dynamic, and they no longer feel guilty about seeking help from other doctors to control the child” (H. Glasser, 2005).

Introduction

This chapter continues from the previous three chapters, the results of which are discussed in greater detail, with interpretations given in the context of theory, research, and practice. The discussion commences with three separate sections that correspond to the three studies that make up this research. Each section discusses the results of the study, its strengths, and limitations. After discussing the three studies, general recommendations are introduced, followed by a chapter summary. Given that research and theory are inextricably linked (Marsh & Hattie, 1996), appropriate reference is also made to prior chapters (most notably, the literature reviews and the methodology chapter) as a means of linking theory with the research findings.

Study 1: Psychometric Properties of the Parents'/Guardians’ Perceptions of ADHD Questionnaire (PPAQ)

Results (Psychometric Properties of the PPAQ)

Overview. Assessing the psychometric properties of the PPAQ and investigating the group differences for each of its 12 subscales was guided by the nomological network (Cronbach & Meehl, 1955) introduced in Chapter 3. According to the nomological network, the internal structure of constructs should be investigated before investigating relations between constructs and categorical variables (Marsh, Ellis, Parada, Richards, & Heubeck, 2005). Investigating the
internal structure of the constructs entails assessing reliabilities, structural validity, and invariance, using confirmatory factor analysis (CFA) techniques. The results for Study 1 were provided in Chapter 6.

**Reliability.** Furr and Bacharach (2008) suggest that “the results of a study should always be interpreted in the context of reliability” (p. 147), as scores that are not reliable are essentially random numbers which measure nothing (R. B. Kline, 2009). Subsequently, assessing reliability is a convenient and important place to start when assessing the psychometric properties of a survey instrument, as it has implications throughout the entirety of the research process. To assess reliability, Cronbach’s alphas were reported for each subscale of the PPAQ for the total sample, and for the specific subgroups of interest. The alpha values for all subscales were above the recommended desirable value of .7 for the total sample (Netemeyer et al., 2003). For the subgroups, the vast majority of alpha values were above .7, with only four exceptions. However, these exceptions were well above .6, a value which is still considered acceptable (Aron & Aron, 2003). These results show all the subscales used in this research to be reliable measures of the constructs they were designed to measure for the total sample, and across the groupings of child’s gender, official diagnosis status, and parents’ acceptance/rejection of ADHD. Essentially, these results mean that differences in observed measures are more likely to reflect true differences in the measures rather than to be the result of measurement error. This is particularly important for discussion of the group differences for each of the four measurement scales of the PPAQ, later in this section.

**Structural validity.** The structural validity of the PPAQ was assessed by investigating the factor structure of each measurement scale of the PPAQ, the factor correlations, and item-to-factor loadings. The results in Chapter 4 showed the measurement scales of the PPAQ to possess robust structural validity. Further, the structural validity of each measurement scale was maintained when all subscales were included in a mass CFA. While all the hypotheses for Study 1 (see Chapter 6) were accepted, given the moderate to high correlations between factors of the PSCS, support was also gained for a second-order factor model. Subsequently, when using the PSCS for predictive purposes (see Study 2), it is useful to use the higher order factor model of the PSCS, as using the higher order model overcomes the potential problems of multicollinearity and suppression (see Chapter 5).
**Invariance.** What remained to be tested was whether or not the PPAQ was applicable to the various subgroups of the sample. Byrne (2003) notes that an incorrect assumption in research, when examining mean differences across groups, is that the measuring instrument is operating exactly the same way for each group being studied. The requirement that the measuring instrument is operating exactly the same way across all subgroups of a sample is a necessary condition for construct validity. This requirement cannot be assessed based on tests applied to the sample as a whole, but requires testing for invariance across the different subgroups of interest identified within the sample. Invariance testing across the subgroups demonstrated that each measurement scale met the desirable minimal level for invariance across all subgroups of interest, with the exception of one measurement scale – the PSCS across child’s gender. While the base level of invariance considered necessary for invariance was achieved, the implications of not attaining the minimal desirable level of invariance will be discussed in greater detail when discussing the results for the PSCS later in this chapter.

**Summary.** Due to the considerable investment in the careful selecting and defining of constructs of interest for this research, the psychometric tests conducted show the PPAQ to possess strong psychometric properties, thus providing strong support for the structural validity of the PPAQ’s measurement scales. These results apply to both the total sample of parents, and to parents when divided into the subgroups of interest. It is expected that when applied to another sample as a means for revalidation of the instrument’s psychometric properties, the results obtained should replicate those found in this present investigation.

**Results: Group Differences Across the Subscales of the PPAQ**

**Overview.** Once the psychometric properties of the PPAQ are established, inter-group differences can be confidently explored across the PPAQ subscales using CFA techniques. Each measurement scale of the PPAQ (PPEAS, PBCS, PSS, PSCS) was examined to determine if parents differed in their responses according to the grouping criteria previously mentioned (i.e., acceptance or rejection of the ADHD diagnosis, child’s gender, and whether or not an official diagnosis of ADHD was given to the child). The results for group differences are discussed under separate headings for each measurement scale of the PPAQ.
Effect sizes. Before discussing the results, it is important to discuss effect sizes and how they were used in this research. Effect sizes are used to indicate the extent to which sample results diverge from the results expected in the null hypothesis (J. Cohen, 1994). While a variety of effect sizes are available, the most appropriate for this research was the squared value of the correlation coefficient ($r^2$), referred to as the “variance-accounted-for-effect size,” or more simply as the “proportion of explained (shared) variance” (R. B. Kline, 2009, p. 157). An advantage of using $r^2$ is that it can be interpreted as a percentage. For example, an effect size given by $r^2 = .09$ is equivalent to 9.00% and would be interpreted as meaning that 9.00% of the variance in the dependent (outcome) variable was shared with, or accounted for by the independent (predictor) variables. Fern and Monroe (1996) have suggested that the interpretation of estimates of effect size is influenced by several factors, such as the research context, the research history, and the actual and expected applications of the results. Hence, for new research, it is difficult to define exactly what constitutes a “small” or a “large” effect size. Given that this is new research, even results yielding effect sizes of small magnitude are considered to be of some value.

PPEAS. Perhaps the most important finding for group differences in relation to the PPEAS, is the difference between parents who accept the ADHD diagnosis and those who reject it on the Helpfulness subscale (see Table 6.29, p. 150). Specifically, those parents accepting the ADHD diagnosis scored significantly higher than those parents who rejected the diagnosis (mean scores of 6.61 and 4.48 respectively; $r = -.62, p < .05; r^2 = .38$). Given that a diagnosis does not explain why a child behaves the way he or she does, but only provides a descriptive label for the behaviours (see Chapter 2), the question that needs to be asked is, “How does acceptance of the ADHD diagnosis help?” This finding of a substantive proportion of shared variance (37.94%) between parents’ acceptance of the ADHD diagnosis and scores on the Helpfulness subscale is consistent with the claims of Smelter et al. (1996), who have suggested that acceptance of the ADHD diagnosis provides relief to the parents. Hoza et al. (p. 569) have also suggested that parents are more easily upset by their child’s misbehaviour if they view it as intentional (see also Miller, 1995). Therefore, accepting the ADHD explanation for their child, perhaps may serve to lessen any upset associated with their child’s behaviour, as the behaviours may no longer be seen as intentional. More generally though, Carlat (2010), when
discussing mental illnesses, has remarked “Even providing patients with a diagnosis, which psychiatrists typically do at the end of the first visit, is a form of therapy. Part of what makes mental illness so painful is its terrible mystery” (p. 201). It is possible therefore, that the diagnosis of ADHD solves the “mystery” of why the child behaves the way he or she does. Although Carlat is referring to the relief experienced by the patient (upon hearing the diagnosis), parents are likely to experience the same relief when a diagnosis is offered for their children – particularly one that places the cause of the child’s behaviour within the child’s biology (DeGrandpre, 2000), and not with the parents’ parenting skills. Specifically, with regard to ADHD, Neve et al. (2002) have commented that “A purely medical approach positions the problem firmly within the child and apparently relieves the parents and family of a sense of guilt or blame” (p. 4). While proponents of the medical model of ADHD may suggest that providing relief to parents is a worthwhile endeavour, Neve et al. (2002) have further suggested that portraying ADHD as a medical illness might preclude the consideration of a broader context and lead to misdirected treatment – namely, medication.

Consistent with the finding that parents accepting the ADHD diagnosis are more likely to find the diagnosis helpful, is that these parents are more likely to favour the use of medication (see Table 6.29, p. 150). Specifically, those parents accepting the ADHD diagnosis scored significantly higher than those parents who rejected the diagnosis on the Medication Attitudes subscale (respective mean scores of 6.10 and 3.78; \( r = -.49, p < .05; r^2 = .24 \)). This finding is not surprising, given that ADHD is so closely linked with medication.

Finally, with regard to parents’ perceptions of their children’s peer relations, although the proportion of shared variance between parents’ acceptance/rejection of the ADHD diagnosis and their scores on the Peer Relations subscale was only 2.3% \((p < .05)\), a tentative interpretation for this finding is offered. The data in Table 6.29 show that parents rejecting the ADHD diagnosis scored significantly higher than those parents who accepted the diagnosis on the Peer Relations subscale (respective mean scores of 5.21 and 4.43; \( r = .15, p < .05; r^2 = .02 \)). For example, if a parent has observed that the child is experiencing difficulties in his or her peer relations, this could be one factor which, when combined with others (e.g., poor school performance), could lead a parent to accept the ADHD diagnosis. Conversely, once a parent accepts the ADHD diagnosis, it is possible that any perceived difficulties the
child has with his or peer relations will be interpreted as confirmatory evidence by the parent that the child does indeed have ADHD, and hence that the parent has apparently made the right decision by accepting the diagnosis.

With regard to status of the diagnosis (official versus unofficial), the results parallel those of parents’ acceptance or rejection of the ADHD diagnosis (compare Table 6.34, p. 158 with Table 6.29, p. 150). For example, parents whose child had an official diagnosis, on average scored significantly higher than those parents whose child did not have an official diagnosis on the Medication Attitudes subscale (respective mean scores of 6.00 and 4.94; $r = -.26$, $p < .05$; $r^2 = .07$). By comparison, parents who accepted the diagnosis, on average scored significantly higher than those parents who did not accept the diagnosis, on the Medication Attitudes subscale (respective mean scores of 6.10 and 3.78; $r = -.25$, $p < .05$; $r^2 = .23$). A possible explanation for these parallel findings is that parents who find the diagnosis helpful are more likely to seek an official diagnosis (i.e., diagnosis from paediatrician or psychiatrist) to verify their opinion.

Table 6.32 (p. 155) shows that the parents of boys scored significantly higher than the parents of girls for the subscales of Peer Relations and Medication Attitudes. However, although these differences are significant, the proportion of shared variance between gender of the child and each subscale was less than 1.5% ($p < .05$). For the Helpfulness subscale there was no significant difference between the parents of boys and the parents of girls. Null or small findings should not be dismissed, as they can also potentially be important. What these results show, is that with respect to the subscales of the PPEAS (Peer Relations, Medication Attitudes, Helpfulness), the child’s gender has very little influence on parents’ attitudes and beliefs regarding these three factors.

**PBCS.** As discussed in the results for Research Question 1.7.2, there were no significant differences between the parents of boys and the parents of girls for each of the subscales of the PBCS (Home Environment, Child’s Behaviour, Brain Disorder). What this finding suggests is that what parents believe to be the cause of the ADHD-type behaviours in children, is the same for both boys and girls.

Based on the results shown in Table 6.30 (p. 152), parents who accept the ADHD diagnosis are more likely to believe that ADHD is the result of a brain disorder, compared with parents who reject the diagnosis (respective mean scores for the Brain Disorder factor of 6.49 and 4.96; $r = -.40$, $p < .05$; $r^2 = .16$). These results
are not surprising, given that ADHD is typically portrayed as an illness of the brain (see Chapter 2). It was previously discussed that parents accepting the ADHD diagnosis are more likely to find acceptance of the diagnosis helpful than those parents who reject it (mean scores of 6.61 and 4.48 on the Helpfulness subscale respectively; \( r = -.61, p < .05; r^2 = .38 \); see Table 6.29, p. 150). Together, these results tend to suggest that parents find the acceptance of a diagnosis that they believe implicates their child’s brain (as opposed to the home environment or the child’s disposition) helpful for them in trying to understand their child’s behaviours. That is, parents experience some relief and find the ADHD diagnosis helpful when they believe that their child’s ADHD-type behaviours are due to a brain condition. This is consistent with the positive correlation of \( r = .51 (p < .05) \) between the Brain Disorder subscale and the Helpfulness subscale. The results of Table 6.30 (p. 152) further show that parents who reject the ADHD diagnosis score significantly higher on the Home Environment subscale than parents who accept it (respective mean scores of 4.15 and 3.19; \( r = .24, p < .05; r^2 = .06 \)), suggesting that these parents are more likely to accept that the home environment (which includes their parenting) contributes to their child’s ADHD-type behaviours. These findings show that parents’ scores on the Brain Disorder subscale are a stronger predictor of their acceptance or rejection of the ADHD diagnosis than their scores on the Home Environment subscale (respective shared variances of 16.08% and 5.90%), suggesting that beliefs in a brain condition for ADHD-type behaviours may play a strong role in whether a parent rejects or accepts an ADHD diagnosis for their child, at least when compared to beliefs about the influence of the child’s home environment.

For the Child’s Behaviour factor, parents who reject the ADHD diagnosis score significantly higher on this factor than parents who accept it (respective mean scores of 5.16 and 4.46; \( r = .20, p < .05; r^2 = .04 \)). Although the effect size indicated by the proportion of shared variance is small (3.84%), it is consistent with the findings for the Home Environment factor, in that both factors can be considered non-biological.

Finally, for the grouping variable of diagnosis status (official versus unofficial), the results are similar to those of parents’ acceptance or rejection of the ADHD diagnosis (compare Table 6.30, p. 152 with Table 6.35, p. 159). For example, of the three subscales, Brain accounted for the largest proportion of shared variance
between a subscale of the PBCS and the outcome variable of diagnosis status \((r = -.24, p < .05; r^2 = .06)\). A possible explanation for this finding is the same as that offered when discussing the PPEAS, that is, if parents believe the ADHD diagnosis will be helpful for them, they may be more likely to seek an official diagnosis (i.e., diagnosis from paediatrician or psychiatrist) to verify their opinion.

**PSS.** There were no significant differences between the mean scores of the parents of the boys and the parents of girls for the three factors of the PSS. Similarly to the PBSC, this null finding suggests that the stress experienced from having a child display ADHD-type behaviours, is on average the same for the parents of boys and the parents of girls.

With regard to parents’ decision to either accept or reject the ADHD diagnosis, the results of Table 6.31 (p. 153) show that significant differences exist across the subscales of Family Stress and Individual Stress. For the Family Stress subscale, parents accepting the ADHD diagnosis scored significantly higher than those parents rejecting the diagnosis (respective mean scores of 6.14 and 5.54; \(r = -.17, p < .05; r^2 = .03\)). Although the shared variance between parents’ decision to either accept or reject the ADHD diagnosis and scores on the Family Stress subscale was moderate (2.85%, \(p < .05\)), the finding does suggest that parents accepting the ADHD diagnosis report experiencing higher levels of stress for their family than parents rejecting the diagnosis. For the Individual Stress subscale, parents accepting the ADHD diagnosis scored significantly higher than those parents rejecting the diagnosis (respective mean scores of 5.64 and 4.95; \(r = -.20, p < .05; r^2 = .04\)). Similarly to the Family Stress subscale, the shared variance between parents’ decision to either accept or reject the ADHD diagnosis and scores on the Individual Stress subscale is moderate, being 4.16%, \((p < .05)\). This finding is revisited shortly, in the discussion of the PSCS.

With regard to whether or not an official diagnosis for ADHD was received, the results parallel those of Research Question 1.6.3 (see Table 6.31, p. 153 & Table 6.36, p. 161). That is, the pattern of relations between parents whose child has an official diagnosis, compared with those parents whose child does not have an official diagnosis, is similar to the pattern of relations between parents who accept the diagnosis and those who reject it (as was the case with the PPEAS and PSS). Specifically, parents of children with an official diagnosis of ADHD are more likely to have significantly higher mean scores for the Family Stress subscale (respective
mean scores of 6.16 and 5.72; \( r = -0.14, p < .05; r^2 = .019 \), and parents of children with an official diagnosis of ADHD are more likely to have significantly higher mean scores for the Individual Stress subscale (respective mean scores of 5.60 and 5.31; \( r = -0.12, p < .05; r^2 = .015 \)). These results demonstrate that there is only a small proportion of shared variance (i.e., less than 2%) between the diagnosis status (i.e., official or unofficial) and parents’ mean scores on the Family Stress and Individual Stress subscales. There was no significant mean difference between the parents of children with an official diagnosis of ADHD and those parents whose children did not have an official diagnosis for the Criticism subscale. This finding suggests that the stress experienced by parents and their families is relatively independent of whether or not the child has an official diagnosis of ADHD.

**PSCS.** For the PSCS, although the desirable minimal level of invariance was not achieved with regard to child’s gender, the base level of invariance was achieved. An implication of this is that there is a small chance that the parents of boys may interpret the parenting self-concept questions differently from the parents of girls. This is unlikely however, for two reasons. Firstly, the results in Chapter 6 show that although only the base level of invariance was attained according to the requirement that the change in CFI values between the base model (M1) and subsequent models be less than .01 to be considered invariant (Cheung & Rensvold, 2002), other criteria offered by Bodkin-Andrews, Denson, et al. (2010) and B. M Byrne (1998) support invariance beyond the minimum level (see Chapter 6). Secondly, there would seem to be no strong theoretical grounds to suggest that the parents of boys with ADHD perceive their parenting self-concepts any differently to the parents of girls. Certainly Table 6.33 (p. 157) shows consistent and significant differences between mean scores between the parents of boys and the parents of girls across each of the three subscales of the PSCS. This is an interesting finding in itself (and a possible interpretation is offered next), but is not necessarily an indication that the parents of boys interpret the parenting self-concept survey items differently to the parents of girls. Invariance testing seeks to determine if the scale items have the same interpretation across different subgroups of a sample, and is not concerned with observed differences in mean scores. Indeed, differences in mean scores of a construct between different groups are expected in quantitative research.

The consistent difference in the parenting self-concept scores between parents of girls and parents of boys is partly attributable to the fact that, for the total
sample, the subscales themselves are highly correlated with each other (mean correlation of .71, see Table 6.25, p. 145). However, there is also another potential explanation worthy of consideration. Boys are known to be more likely to receive a diagnosis of ADHD (Neven, et al., 2002). It is possible that if a son displays ADHD-type behaviours, the parent is more accepting of an ADHD diagnosis because ADHD is more readily offered as an explanation for boys who display these behaviours. However, for girls who display ADHD-type behaviours, although their parents may consider the ADHD diagnosis as an explanation for their child’s behaviour, they may also consider other explanations, as the diagnosis of ADHD is less often given to girls. Other explanations considered may include non-medical causes that could implicate their effectiveness as parents. Such considerations potentially have implications for their parenting self-concept. Of course this is purely speculation, and would require further research. But the consistent (albeit small) difference in mean scores for the parenting self-concept scores between the parents of boys and the parents of girls, does suggest that further investigation in the future is warranted. A further consideration in interpreting this difference is that no control group was used in this research. That is, there were no parents surveyed whose children did not qualify for the ADHD diagnosis. Due to this, it is not possible to determine if parents of boys in general are likely to score higher on the PSCS than parents of girls. Future research involving the PPAQ would benefit from including a control group.

With regard to differences between parents who accept the ADHD diagnosis and those who reject it, there was no significant difference in scores on any of the subscales of the PSCS. An obvious reason for this finding could very well be that there are indeed no differences between these two groups in regard to their parenting self-concepts. However, there are other potential reasons worthy of consideration in investigating why no differences were observed, particularly given that some researchers have suggested a link between parents’ self-concept and having a child with the ADHD diagnosis (e.g., Mash & Johnston, 1983). Three reasons why the results of this investigation are not consistent with Mash and Johnston’s speculation are presented in the paragraphs that follow. The reasons are: (a) this investigation is making different comparisons to that of Mash and Johnston, (b) the PSCS is not sensitive enough to detect significant differences (i.e., lacks construct validity), and (c) response bias.
Firstly, with regard to the claims of Mash and Johnston (1983), they were comparing the parents of children with ADHD with parents of children who did not have ADHD. In contrast, for this investigation, parents who accept the ADHD diagnosis for their child were compared with parents who do not accept the diagnosis, where each parent had a child who qualifies for the ADHD diagnosis. Therefore, it could be argued that the difference between the self-concepts of parents who accept the ADHD diagnosis and those who reject it, is not as pronounced as the difference between the self-concepts of parents of children with ADHD and parents of children who do not have ADHD. Secondly, when the results of an experiment or survey are different to what a theory predicts, Allen and Yen (2002) suggest that one reason for the difference could be that the measure is not measuring what it is supposed to be measuring – or in other words, there is a lack of construct validity (Carmines & Zeller, 1979). With regard to the PSCS, it may be that it is not sensitive enough for the purposes of this investigation, as it contained no items that asked questions directly related to ADHD. This is in stark contrast to the other three measurement scales of the PPAQ, which all included items specific to ADHD. While it may be desirable, when choosing items that measure the parenting self-concept, to include items that are specific to the context being investigated (e.g., parenting experiences with children displaying ADHD behaviours), this is not always easily accomplished. For example, in this research a subscale item like “My child’s ADHD-type behaviours are partly a reflection of my parenting ability,” though having excellent face validity, may invoke a response bias from parents. Specifically, it is likely that parents may try to present a favourable image of themselves when completing a survey that asks about their parenting skills and experiences (see Chapter 3). This is likely, given that some parents feel under pressure from others for their child to be better behaved (see Chapter 8, interview with parents). The idea that parents may give a favourable impression of their parenting experiences relates to the third reason why no differences were observed between parents who accept the ADHD diagnosis and those who reject it – the potential for response bias. As commented on in Chapter 6, the mean scores for the PSCS factors were generally higher than what might be expected, suggesting that parents may strive to give favourable impressions regarding their parenting experiences and abilities.

To address the potential impact of a response bias (i.e., parents presenting a favourable image of themselves) as a moderating influence on the relations between
the parenting self-concept and parents’ acceptance or rejection of the ADHD diagnosis, it is worthwhile investigating other constructs related to the self-concept. For example, parents’ experience of stress (as measured by subscales of the PSS) and feelings of relief (as measured by the Helpfulness subscale of the PPEAS), though distinct factors, are related to the self-concept (see Chapter 3). Specifically, people with a positive self-concept are less susceptible to feelings of stress and therefore do not need to seek relief. This relation is consistent with the findings of Marsh, Parada, and Ayotte (2004), who examined relations between the self-concept of young Canadian students (mean age = 12.6 years, \(SD = 0.82\)) and selected mental health issues. Results from Chapter 6 show that parents who accepted the ADHD diagnosis had significantly higher mean scores on the Helpfulness subscale compared to parents who rejected the diagnosis for their child (mean scores of 6.61 and 4.48 respectively; \(r = -0.62, p < 0.05; r^2 = 0.38\); see Table 6.29, p. 150). This subscale asks specifically about helpfulness and relief in relation to accepting the ADHD diagnosis. Further, as previously discussed, in relation to the Individual Stress subscale, parents who accepted the diagnosis for their child reported experiencing more stress on average than parents who rejected the diagnosis (mean scores of 5.64 and 4.95 respectively; \(r = -0.20, p < 0.05, r^2 = 0.04\); see Table 6.31, p. 153). In relation to the Family Stress subscale, parents who accept the diagnosis for their child on average reported experiencing moderately more stress than parents who rejected the diagnosis (mean scores of 6.14 and 5.54 respectively; \(r = -0.17, p < 0.05, r^2 = 0.03\); see Table 6.31). One possible interpretation of these results is that parents rejecting the ADHD diagnosis as an explanation for their child’s behaviour have less difficulty accepting that their parenting skills may play a part in the behaviours they witness in their child, compared to parents who accept the diagnosis. That is, they can accept that their child’s behaviour is partly (perhaps even fully) due to their parenting skills, yet still feel good about themselves as parents, and hence not feel as stressed. Further, they may also feel comfortable with their child’s behaviour and not see it as a problem, and not be overly concerned about other people’s opinions of their child and their parenting practices. Indeed two of the parents interviewed believed ADHD was just normal childhood behaviour. If parents are less concerned about other people’s opinions, they are also less likely to experience stress, and subsequently, are less likely to have the need to reduce or eliminate stress.
With regard to whether or not an official diagnosis of ADHD was given, there was no significant variation in scores on the PSCS. One possible interpretation of this null finding is that parents of children displaying ADHD-type behaviours have similar experiences, whether their child has an official diagnosis (i.e., has been diagnosed by a suitable health professional) or whether an official diagnosis has not been given.

**Strengths of Study 1**

The above discussion and the findings presented in Chapter 6 show that the PPAQ possesses the essential attributes of reliability, structural validity, and invariance, which is a key strength for the present investigation. As discussed in Chapter 3, establishing structural validity is a necessary though insufficient condition for determining construct validity (Netemeyer et al., 2003). It is therefore important to be aware of what claims can be made in regard to the validity of the PPAQ. This is not a weakness of the study, as establishing the validity of a measurement scale is an ongoing process (see Chapter 3), but rather it is something that the researcher needs to be aware of when presenting results and drawing conclusions. However, the results of Study 1 thus far, demonstrate that a high degree of structural validity is evident for the measurement scales of the PPAQ, and is hence, supportive of construct validity.

An ongoing theme throughout this research is that construct validity is not a characteristic of a test or scale, but relates to the inferences or interpretations made on survey scale scores (T. J. B. Kline, 2005). These inferences or interpretations usually relate to how individuals who rank high on a subscale differ to those who rank lowly on the subscale, where the differences usually relate to relative standings on other constructs within a nomological network. Study 2 examines relations between factors, and so can be used to gather more support for the validity of the PPAQ. The results of Study 1 provide a strong foundation for proceeding with Study 2.

**Limitations of Study 1**

One implication of not fully establishing construct validity is the potential problem of response bias. Given the very high mean scores for the three PSCS factors, it is quite possible that a response bias was operating. The possibility of bias
is not something that is easily detected from the CFA fit statistics. That is, a scale may possess structural validity and consist of items that possess face validity, yet the scale may not be measuring the construct it was intended to measure, due to a response bias. On this matter, R. B. Kline (2011) states that although a proposed factor structure may fit the data, this does not mean that the labels assigned by the researcher are correct. Noar (2003) has proposed that the evidence for construct validity accrues over time and is achieved through many studies. Hence, problems in establishing construct validity for a newly developed survey instrument should not be surprising.

**Summary of Study 1**

The aim of Study 1 was to demonstrate that the PPAQ is a psychometrically sound instrument, thus allowing it to be used to measure group differences and to be confidently used in Study 2. Using the nomological network proposed by Cronbach and Meehl (1955), the psychometric tests conducted on the instrument provide strong evidence of reliability and structural validity for the PPAQ. The psychometric results were obtained from analyses based on one sample. Retesting on another sample would further demonstrate the psychometric properties of the survey instrument, and is something that could be considered in a future study.

Group differences were also discussed for the four different measurement scales of the PPAQ. One of the most important findings was in relation to the Helpfulness subscale of the PPEAS. Specifically, it was shown that parents accepting the ADHD diagnosis as a medical condition are more likely to derive benefit from the diagnosis than parents who reject the diagnosis.

**Study 2: Predicting a Parent’s Decision to Accept or Reject a Diagnosis of ADHD for their Child**

**Overview**

SEM techniques were used in Study 2 to examine whether or not two or more latent variables (predictor variables) from the PPAQ could be used to predict parents’ acceptance or rejection of the ADHD diagnosis, as well as whether or not parents find acceptance of the ADHD diagnosis helpful. To achieve this, a series of structural equation models were developed and tested. Similarly to the discussion on
Study 1, the results are discussed under headings matching the four measurement scales of the PPAQ (PPEAS, PBCS, PSS, PSCS). The results for Study 2 are presented in Chapter 7.

**Discussion on Findings for Individual Subscales**

**PPEAS.** The results of Chapter 7 (see Research Questions 2.1.1 & 2.1.2; pp. 164 - 166) show that of the two predictor variables tested in the PPEAS (Medication Attitudes, Peer Relations), Medication Attitudes was the most substantial in predicting the outcome variables (parents’ acceptance of the ADHD diagnosis, and perceived helpfulness of the diagnosis). These findings are consistent with the results of Research Question 1.6.1 in showing that parents’ attitude towards medication is a strong predictor of whether or not they accept the ADHD diagnosis ($r = -.49$, $p < .05$; $r^2 = .22$; see Table 7.1, p. 165). With regard to predicting whether or not parents find acceptance of the ADHD helpful, parents’ attitudes towards medication was an even stronger predictor ($r = .61$, $p < .05$; $r^2 = .36$; see Table 7.2, p. 166). These results demonstrate that parents’ attitudes towards medication is a strong predictor of the outcome variables and that its predictive strength is only marginally improved by inclusion of parents’ opinions of their child’s peer relations.

Although the proportion of shared variance between parents’ attitudes towards medication and the outcome variables is substantial, it is perhaps not as strong as would be expected, given the emphasis and priority given to medication as a preferred treatment (see Chapter 2). A probable reason for this is that it is not always the case that parents who accept the ADHD diagnosis medicate their child, and equally that some of those parents who reject that diagnosis may still choose to medicate. For example, in the interviews, some parents spoke of how they opposed medication as a treatment option, yet accepted the diagnosis. Further, one paediatrician mentioned how he believes some parents are desperate, and keen to use medication. It is possible therefore that some parents will accept medication for their child, even if they do not believe their child has ADHD.

**PBCS.** Both Table 7.3 (p. 167) and Table 7.4 (p. 168) show the variance accounted for by the predictor variables (Brain Disorder, Home Environment, Child) in the outcome variables to be substantial (22.30%, $p < .05$, for parents’ acceptance of the diagnosis; and 29.10%, $p < .05$, for parents’ perceived helpfulness of the diagnosis). Both Tables show the differences between the beta coefficients and their
respective correlations for the subscales of Home Environment and Child’s
Behaviour to be substantial enough to suggest that a suppression effect is occurring.
For example, as shown in Table 7.3, the correlation between the Child’s Behaviour
factor and the outcome variable of acceptance, is statistically significant at .20, yet
the corresponding beta coefficient is not statistically significant, at -.09.
Interpretations of suppression effects are often difficult, are subjective, and are not
easily proven to be correct (see Chapter 5); hence, some explanation is warranted
before giving an interpretation.

With the exception of sign (i.e., positive or negative), the results for Table 7.3
parallel those of Table 7.4. The difference in the sign is due to the parents’
acceptance variable being negatively scored (i.e., lower scores mean acceptance
while higher scores mean rejection or less likely to accept), and the Helpfulness
subscale being positively scored (i.e., higher scores mean acceptance and lower
scores mean rejection or less likely to accept). Given the similarity, the one
interpretation of the suppression effect is given for both sets of results. The results of
both Table 7.3 and Table 7.4 show that there is very little difference in the beta
coefficients and their respective correlations for the Brain Disorder factor; hence the
inference that a suppression effect is occurring between the Home Environment and
Child’s Behaviour factors. The suppression effect occurring between these factors is
consistent with the high correlation between them ($r = .76$). If there were little or no
correlation between these factors, there would likely be no suppression effect.

A tentative interpretation for the suppression effect is that, given that there is
an overlap in the explained variance of the outcome variable (i.e., acceptance or
Helpfulness) with regard to the predictive power of Home Environment and Child’s
Behaviour, the suppression effects which have taken place suggest that the Home
Environment factor has been allocated the shared positive explained variance over
the outcome variable, at the expense of Child’s Behaviour. With regard to the
negative predictive path of Child Behaviour, it can be argued that what positive
predictive power Child Behaviour may have had over the outcome variable of
acceptance of the ADHD diagnosis, has now been allocated to Home Environment,
so all that remains is a mild (and non-significant) negative effect. Thus it may be
argued that with regard to accepting or rejecting the diagnosis, parents would place
more importance on the home environment influencing this decision, thus making
the issue of the Child’s behaviour less important.
PSS. The results of Tables 7.5 (p. 169) and 7.6 (p. 171) show evidence of suppression effects. For example, in Table 7.5, while the correlation between the Criticisms subscale and the outcome variable of acceptance is not statistically significant, the beta coefficient is significant at .16. While the presence of suppressor variables does not necessarily affect the predictions that can be made from an SEM, there is the additional problem of potential multicollinearity, given the moderate to high degree of correlation amongst the PSS factors (mean $r = .65$). Given these characteristics (i.e., suppression and multicollinearity), a higher-order factor model for the PSS was used to assess the strength and usefulness of the subscales of the PSS as predictors of parents’ acceptance and perceived helpfulness of the ADHD diagnosis.

The proportion of shared variance between the higher-order Stress model and the outcome variable of parents’ acceptance of the ADHD diagnosis is 3.57% ($p < .05$), while the correlation is -.19 ($p < .05$). The negative correlation indicates that those parents accepting the ADHD diagnosis are more likely to experience stress. The proportion of shared variance between the higher-order Stress model and the outcome variable of the Helpfulness subscale is 5.52% ($p < .05$), while the correlation is .24 ($p < .05$), where the positive correlation indicates that those parents who report finding the ADHD diagnosis helpful are more likely to experience stress. These results are consistent with the results of Research Question 1.6.3 (p. 153), where it was found that parents who accept the ADHD diagnosis are more likely to report significantly higher scores on the Individual Stress and Family Stress subscales.

An interesting observation from Table 7.5 is that with respect to the outcome variable of parents’ acceptance of the diagnosis, the Individual Stress factor was the most substantive predictor, while the Family Stress factor was the most substantive predictor for the outcome variable of parents’ perceived helpfulness of the ADHD diagnosis. A tentative interpretation for this finding is that when parents consider the ADHD diagnosis to be helpful, they may mean that it is helpful for the whole family. For example, perhaps attributing a child’s behaviours to a medical condition will prevent jealousy or discord with siblings. That is, other children in the family may be more understanding of a brother or sister’s ADHD behaviours when they believe the behaviours are the result of a medical condition. This suggestion would need to be clarified by further research.
While the individual factors of the PSCS may be assessed for their predictive strength regarding an outcome variable (e.g., acceptance and helpfulness of the ADHD diagnosis), due to the potential problems associated with multicollinearity, a higher-order factor model should be used when the highly correlated factors are used simultaneously to predict outcome variables (see Chapters 5 & 6). Given that none of the factors of the PSCS factors correlated significantly with parents’ acceptance of the ADHD diagnosis (see the results for Research Question 1.6.4, p. 154), it is unlikely that the higher-order factor model of the PSCS factors would correlate with parents’ acceptance of the ADHD diagnosis. Indeed, this was the case (see the results for Research Question 2.4.1, p. 172). While this null finding may suggest that the parenting self-concept is not a predictor of parents’ acceptance of the ADHD diagnosis, it may also be the case that the PSCS is not a sensitive measure of the parenting self-concept in the context of this investigation, as previously mentioned when addressing the findings of Study 1 in this chapter. With regard to the Helpfulness subscale, there was a small but significant correlation of .14 (p < .05) between it and the higher-order factor model of the PSCS. The proportion of shared variance between the higher-order self-concept model and the Helpfulness factor is small at 1.85% (p < .05), while the correlation is .14 (p < .05), thereby suggesting that parents with a positive self-concept are more likely (albeit very slightly) to accept the ADHD diagnosis. This finding could mean that within the framework of this analysis, accepting the diagnosis serves to enhance parents’ parenting self-concept. Alternatively, it could mean that due to having a positive parenting self-concept, parents are more accepting of the ADHD diagnosis to explain their child’s ADHD behaviours.

As highlighted in Chapter 3, the tendency for self-enhancement is well accepted as a common phenomenon in a wide array of settings (Leary & Downs, 1995; Pyszczynski, et al., 2004). Suffice to say that people may distort their responses to items in order to create a favourable impression of themselves (Fisher, 1993; Piedmont, et al., 2000). Hence, with regard to attempts to measure the self-concept, Combs (1981) has suggested that measures of the self-concept are actually measures of self-report, where the two are not the same (see Chapter 3). It is therefore likely that for an emotive topic such as ADHD, particularly in relation to parenting, parents will be guarded or unwittingly biased in their responses. This is particularly likely given that the majority of parents who are familiar with ADHD
are also familiar with the suggestion (by friends, the lay public, critics of medication, the media, etc.) that parenting is a contributing factor towards the increased prevalence of ADHD.

An implication for this research, and for any future research where self-enhancement is likely to influence peoples’ responses to survey items, is the difficulty in developing a measurement instrument that is unaffected (to a reasonable degree) by the social desirability response bias. For the current investigation, while the PSCS may be a reasonable measure of a general parenting self-concept, it may not be a valid measure of the parenting self-concept if its purpose is to determine if parents who accept the ADHD diagnosis differ from parents who reject the ADHD diagnosis in regard to their parenting self-concepts. As previously mentioned, when discussing the results of Study 1, it seems that there is very little difference in the parenting self-concepts of those who accept and those who reject the ADHD diagnosis. However, scores on the Helpfulness subscale of the PPEAS, and the Family Stress and Individual Stress subscales of the PSS are supportive of differences (refer to the previous discussion on Study 1, group differences, in this chapter), given the interrelatedness of the self-concept, stress, and relief.

Such problems in establishing construct validity for a measurement scale can occur despite the use of advanced statistical techniques such as SEM and CFA. This is perhaps why McCoach, et al. (2007), when discussing SEM techniques, state: “no analytic method can replace the need for critical appraisal and common sense” (p. 469). Further, based on the advice of Marsh and Craven (2006), research involving the self-concept is likely to be more useful when specific components of self-concept that are logically related to the aims of a particular study are utilised. Applied here, a measure of the parenting self-concept that considers parents’ experiences and beliefs regarding ADHD may be more useful. Other strategies that can be used to ensure that an adequate level of construct validity is achieved for a measurement instrument, include using less direct measures related to the self-concept (e.g., locus of control, self-efficacy), or using measures from other sources (e.g., evaluations provided by others who know the parent), or using qualitative approaches (see McGrath & Johnson, 1994).
**Strengths of Study 2**

The results of Chapter 7 clearly show that there exist specific variables that can be confidently used to make predictions about parents’ acceptance or rejection of the ADHD diagnosis. Specifically, parents’ attitudes towards ADHD medication and what they believe are the causes of ADHD behaviours, would seem to be the strongest predictors. Further, other variables measured by the PPAQ, such as stress and the perceived helpfulness of accepting the ADHD diagnosis (i.e., relief attained from accepting the diagnosis) suggest that helping parents to be less concerned about the negative evaluations of others in regard to their parenting skills may enable them to better understand their child’s behaviour in such a way that responses other than acceptance of a medical diagnosis that often entails medication, are considered when dealing with the behaviours.

**Limitations of Study 2**

Though possessing some strong psychometric properties, it is possible that the PSCS, in its current form, is not appropriate for the measurement of the parenting self-concept in the context of the aims of this investigation. Further investigation is required to assess the construct validity of the PSCS. A further consideration of this study is that, while significant relations were shown to exist between specific predictor variables (e.g., beliefs about the causes of ADHD) and the outcome variables (acceptance and perceived helpfulness of the diagnosis), these findings are correlational in nature; hence, causality cannot be inferred. Future studies therefore, could benefit by incorporating a longitudinal research design.

**Summary of Study 2**

The matrix of factors that describe and predict human behaviours is complex. However, sound predictions can be made using advanced statistical methodology. Having assessed the psychometric properties of the PPAQ and explored group differences amongst the parents used in this investigation, the variables measured by the PPAQ were used to make predictions regarding parents’ acceptance of the ADHD diagnosis. The results (see Chapter 7) show that there exist certain variables that can be used to make confident predictions about parents’ acceptance or rejection of the ADHD diagnosis and whether or not they find it helpful. In sum, the results show that knowledge of parents’ attitudes towards ADHD medication and what they
believe are the causes of ADHD behaviours is associated with parents’ acceptance of the ADHD diagnosis and the perceived helpfulness of accepting the diagnosis.
Study 3

Overview

J. E. McGrath and Johnson (1994) have argued that under the positivistic paradigm, there is the assumption that quantitative approaches capture fundamental aspects of real-world phenomena, and do so very well. However, the previous discussion (particularly in relation to the potential for response bias) shows that there is value in utilising qualitative methods. While Chapter 8 reported the qualitative results (i.e., general findings of the interviews in the context of the research questions of Study 3 were reported), minimal interpretation was given. Once basic descriptive results are given, it is appropriate that the data be interpreted to extract some meaning. Patton (2002) advises that the challenge for the qualitative researcher is making sense of the huge amount of data. This section aims to make sense of the substantial amount of qualitative data. To achieve this, consistent with the sequential explanatory design for mixed-methods research used in this investigation (see Hanson et al. 2005), qualitative findings relating to the most significant topics presented in Studies 1 and 2 are addressed (parents’ beliefs about causes, helpfulness of the diagnosis, and medication/treatments) from the perspectives of all interviewee groups (parents, paediatricians, and school counsellors) where appropriate.

Causes of ADHD

This research has been premised on the observation that parents vary in their beliefs about what causes ADHD behaviours, and the interviews with parents support this observation. Those parents who accept the diagnosis typically embrace the medical model of ADHD, while those rejecting it, though acknowledging the defining behaviours of ADHD (hyperactivity, impulsivity, etc.), see those behaviours as something other than evidence of a medical or biological condition. However, parents’ beliefs were not always as clear as “biological” versus “non-biological” explanations. Some parents believe that both biology and environment have a role to play. However, their views and opinions were generally more polarised when it came to the treatment option of medication (to be discussed shortly). A believed cause of ADHD, mentioned both by parents who accepted and those who rejected the diagnosis, is diet. This is a topic that has been well discussed in the literature (e.g., Breaky, 1997; Schnoll, Burshteyn, & Cea-Aravena, 2003). Given the claims by some
parents who have modified their children’s diet, there is little doubt that for some children at least, diet is a contributing factor to those behaviours that define ADHD. However, generally speaking, once a cause such as diet has been identified, the diagnosis may cease to be ADHD, and is perhaps more aptly changed to food intolerance.

Three paediatricians have suggested that higher expectations of school performance are a possible reason for the high incidence of ADHD – a finding that has been written about extensively by critics of the medical model of ADHD (e.g., Rosemond & Ravenel, 2008). However, based on the brief interviews with the paediatricians, it was not possible to determine whether they believe that higher scholastic expectations have contributed to more children displaying ADHD behaviours (hence a real rise in the prevalence of ADHD), or whether it has just contributed to more children receiving the diagnosis. More simply stated, is the rise in the number of children with ADHD because there are more children with ADHD, or simply because more children are being given the ADHD label?

**Factors Contributing to Acceptance or Rejection of the ADHD Diagnosis**

Once being told that their child may have ADHD, parents often conduct their own research. Access to the Internet means that parents have access to a wide range of information on ADHD and its treatments. In addition to online research, parents are able to consult with a professional, such as a paediatrician or school counsellor. As discussed in Chapter 2, the role of professionals is particularly influential in matters about which a person is uncertain. Part of the uncertainty is likely due to the conflicting information parents have access to. Given that knowledge of brain functioning and brain scan technology is beyond the grasp of most parents, it is likely that the parent will perceive the professional as the expert and as being more knowledgeable than themselves. This is perhaps why parents’ beliefs that ADHD is a brain condition was a strong predictor for their acceptance of the ADHD diagnosis. With regard to professionals’ opinions and influence, M. Whitely (2010) has suggested: “While some parents actively seek a diagnosis of ADHD for their child, the majority of parents are like their children, passive victims, who take professional advice at face value” (pp. 79–80). Professionals therefore, play an important role in the decision-making process of parents.
Results from Studies 1 and 2 show that parents who accept the ADHD diagnosis are more likely to find the diagnosis helpful, particularly in terms of gaining some sense of relief. Responses from parents, paediatricians, and school counsellors support this finding. While knowing the name of a condition or cluster of behaviours can be helpful (Carlat, 2010; DeGrandpre, 2000; Weathers, 1998), the problem with ADHD, as previously discussed, is that the term is purely descriptive, and does not explain why the child behaves the way he or she does. However, given the dominance of the medical model of ADHD, many parents who derive benefit from accepting the diagnosis, probably do so because they believe that their child’s behaviour is the result of a medical condition, and not environmental factors, which may include their parenting practices. One parent reported that blame from others is replaced with sympathy when a diagnosis of ADHD is given, while one paediatrician mentioned that there is relief and validation that it is not the parents’ fault when the diagnosis is given. These findings are consistent with the suggestion by Timimi (2006) that a post-modern analysis of discourse and power suggests that “mother blaming” (p. 174) may be one factor contributing to the rise of ADHD diagnoses. Timimi further suggests that when put in contact with the “ADHD industry” (p. 174), the parent is freed from blame. Further, one paediatrician mentioned that with a diagnosis, the child’s behaviour is validated: that is, an explanation (not involving the parents’ parenting ability) is provided for the child’s behaviour. These observations (i.e., blame, relief, validation) are consistent with Festinger’s (1957), cognitive dissonance theory (see Chapter 3). Applied here, the theory suggests that if parents hold the two cognitions: “I’m a good parent,” and “My child is misbehaving,” then dissonance will likely be produced, as the misbehaviour could be interpreted as evidence of ineffective parenting. Attributing the misbehaviour to a medical condition (or any external factor beyond their parent’s control) will serve to diminish the dissonance. Further application of cognitive dissonance theory (see Tarvis & Aronson, 2007; Aronson, 2004) suggests that once a decision is made to accept the diagnosis, parents will adhere to the decision strongly, even in the face of evidence which would show that ADHD does not have a proven physical aetiology.

**Medication**

Medication is perhaps the most contentious issue in the ADHD debate, for two main reasons: firstly, there are safety and efficacy concerns (e.g., Baughman &
Hovey, 2006); and secondly, there are concerns that a chemical intervention is being used to control childhood behaviours that have not been shown to be due to a medical condition (Breggin, 2001). It is only the former reason (safety and efficacy) that was spoken of in the interviews. Parents were mixed in their support for medication. Not surprisingly, paediatricians are generally supportive of medication. One paediatrician mentioned that about 80% of families who consult her, use medication and report favourably on it. However, paediatricians also recognise the limitations of medication and generally advise parents on the side effects, as well as on what other measures they can take to address their child’s ADHD behaviours while medication is being used.

Similarly to parents, counsellors are exposed to competing views on the use of medication to address ADHD – information which likely influences their practices. For example, the Australian Psychological Society (APS) is urging people to consider psychological interventions instead of medical interventions, because of the risk of side effects and misuse of these drugs (APS, 2007). In contrast, Vaughan, Roberts, and Needelman (2009) have suggested to school counsellors specifically that “stimulant medication is the single most effective treatment for ADHD” (p. 847). Not surprisingly then, school counsellors are likely to hold diverse views on the appropriateness of medication for treating ADHD. Counsellors mentioned that they believe medication enables some parents to cope and that it makes their life easier. Further, one counsellor suggested that parents accept ADHD as an explanation of their child’s behaviour because it enables them to treat their child with an “extrinsic element” such as medication. There can be no denying then, that for many parents, medication is helpful. The coping likely relates to the expectations of others. For example, parents often spoke of feeling pressure for their child to behave appropriately, while one parent spoke of feeling pressured to medicate her child. Instances of schools pressuring parents to medicate have been reported and have featured on current affairs shows (see Graham, 2008; M. Whitely, 2010).

**Strengths of Study 3**

The richness of data obtained from 21 interviews provides an insight into this study that is not easily obtainable from quantitative methodologies. Further, the range of stakeholders canvassed (parents, paediatricians, school counsellors) means that diverse viewpoints on a series of related topics were obtained. The interview
findings are not only informative in their own right, but provide further insights when applied to analysis of the quantitative data. Perhaps the most important (and unexpected) strength of this study, was the openness with which parents spoke, and their willingness to be interviewed. It is likely that talking about their personal experiences is a therapeutic experience in itself for parents.

Limitations of Study 3

Due to time constraints with this research, interviews were of short duration (average time 15–20 minutes). Consequently, interviews were focussed and semi-structured. Inclusion of a few longer, open interviews (where parents are encouraged to initiate topics of their choice) would be desirable for future research and would allow for a smaller number of topics to be explored in greater detail.

Summary of Study 3

Three stakeholder groups were used in Study 3 to produce a rich source of qualitative data that served as a valuable source of information itself, as well as providing further insight into the previous two studies. The most informative stakeholder group interviewed in addressing the aims of this research was the parents. For future research on this topic, similar interviews could be conducted again (given the success of this current set of interviews), with the inclusion of some longer interviews focussing on fewer topics, to provide greater depth and insight into those topics considered most important to the overarching aims of the research.

Implications for Theory, Research, and Practice

Overview

An important finding drawn from all three studies of this investigation is that specific factors exist that can be used to predict the likelihood of parents’ acceptance or rejection of the ADHD diagnosis. Based on this finding, this section presents the implications for theory, research, and practice that have not been discussed in earlier sections.

Implications for Theory

The research findings make a valuable contribution to advancing theory and understandings about the role of psycho-social determinants in parents’
understandings and practices regarding ADHD. Although critics have suggested that parents accept the ADHD diagnosis because it is beneficial to them as parents (e.g., alleviates stress, maintains their self-image as an effective parent), very little empirical data exists to support this claim. The findings of this investigation provide a rare demonstration that psycho-social determinants are significantly involved in parents’ decision-making regarding the ADHD diagnosis. The findings are also consistent with predictions from cognitive dissonance theories (Aronson, 2004) and general self-enhancement theories of social psychology (see Leary and Downs, 1995).

Barkley (2006d) has suggested that a theory of ADHD is sorely needed, because the current clinical view of ADHD is purely descriptive. Although it is likely that Barkley is referring to a biologically-based theory, given his writings suggesting that ADHD has a biological basis, the findings in this research (although not discounting the possibility of biological or genetic contributions to ADHD) suggest that a theory about ADHD would benefit from including consideration of the psychosocial drivers that significantly influence parents in their decision-making processes. In addition, perhaps the child-focussed paradigm of “Why do children have ADHD?” would be better revised to emphasise a new parent-focussed paradigm, of “Why do parents accept the ADHD diagnosis as an explanation of their child’s behaviours?” The former paradigm is of course consistent with the increasing trend to medicalise aberrant behaviours (see Spillane, 2009), while the latter paradigm is psychosocial in nature and as such could capitalise on advances in positive psychology research (see Craven & Marsh, 2008; Seligman & Csikszentmihalyi, 2000) to inform theory development, testing, and revision.

Implications for Research

SEM and CFA. Although this research adopted a confirmatory approach, some minor modifications were made to improve model fit. In practice, modifications are permissible and in fact are common (B. M. Byrne, 2006; Gerbing & Anderson, 1988), but should be based on theoretical grounds. On this matter, Hair et al. (2006) suggest, “Given the strong theoretical basis for CFA, the researcher should avoid making changes based solely on empirical criteria such as the diagnostics provided by CFA” (p. 795). The reason for this advice is that modifications based solely on ensuring better fit statistics for a given sample can
capitalise on chance; that is, can fit the model to the peculiarities of the current sample (Klem, 2000), thereby affecting generalisability and validity.

For this research, convergence and proper solutions (i.e., the absence of negative variances) were attained for all analyses. Hence, only minor modifications that were theoretically justified, were made. For example, upon testing, some items produced cross loadings (i.e., items that were significantly correlated with more than one factor) or had error components that were significantly correlated with each other (suggesting that another source other than the hypothesised factor was contributing to the item’s variability). The presence of such items results in weakening a factor’s construct validity (Hair et al. 2006) and hence they were deleted. In every case where an item was deleted, closer examination revealed that the item was likely a measure of more than one factor and therefore warranted deletion. In other words, the modifications made theoretical sense and were not just performed to yield a better model fit according to SEM statistical output.

Breckler (1990) notes “the entire logic of confirmatory analysis is undermined when the same set of data is used to both develop a model and evaluate its fit” (p. 268). Given this use of model modification, B. M. Byrne (2006) suggests that ideally, the modified model should then be tested on another sample, though she acknowledges that this is not always possible. Testing with another sample was not feasible with this research, given the difficulties of attracting participants (see Chapter 5). Furthermore, as previously discussed, the modifications made to the a priori factor structure were minor (i.e., deletion of items) and theoretically justified. However, testing on another sample is something that should be considered for future research.

Response bias. The results of Chapter 7 suggest the potential problems, or at least the uncertainty, associated with trying to determine what influence the parenting self-concept has on parents’ decision to accept or reject the ADHD diagnosis for their child, due to the likelihood of a response bias on surveys. Response bias relates to the tendency to self-enhance (see Chapter 3). Self-enhancement, according to Colvin, Block, and Funder (1995) is related to maladjustment and poor social skills. As parenting is a social skill, there is the possibility that response biases on the PPAQ will be present. Further, research by Sedikides (1993) suggests that people are oriented more towards self-enhancement than accurate self-assessment, and this has obvious implications for survey-based
research such as this study. In addressing this problem, one option is to seek alternative measures of the parenting self-concept used in this investigation. For example, Fisher (1993) has mentioned the value of using “indirect questioning” when using self-report data that are susceptible to response bias. This approach uses a methodology where parents are blind to the purposes of the investigation. However, ethical requirements make such an option difficult. Finally, perhaps self-report methods (i.e., a self-administered survey) are inadequate for measuring some constructs, particularly where there is the likelihood of a response bias that results in parents projecting a favourable image of themselves.

**Qualitative Methodology.** The strengths of quantitative methodology for a topic of this nature are well demonstrated throughout this investigation. However, as shown in Studies 1 and 2, measuring or gaining insights into parents’ parenting self-concepts can be problematic, particularly within the context of an emotive topic like ADHD. In-depth interviews may provide an opportunity to delve into the parenting experiences of parents more easily. Indeed, even with the brief interviews conducted, parents demonstrated an openness to talk about the difficulties associated with being the parent of a child who displays ADHD behaviours. Further, for future research, interviews (both standard and in-depth) could be conducted before administering a questionnaire. Findings from interviews could then be used to add to or modify the existing PPAQ.

**Parents.** While parents’ practices in regard to ADHD are relatively easy to observe and measure, understanding parents’ perceptions and cognitive processes is more difficult. However, the findings of this research have demonstrated that valuable and quantifiable insights into parents’ decision-making processes can be gained using both quantitative and qualitative research methodology. Given that there is a paucity of research about parents’ perceptions of ADHD and that the results of the present investigation demonstrate that psycho-social constructs are implied in parental decision-making, it would be valuable for further research to continue to explicate the psycho-social determinants of parents’ decision-making processes in relation to ADHD-type behaviours. For example, it would be useful for further research to include longitudinal research designs to enable causal modelling studies to determine which specific psycho-social constructs impact on decision-making processes. Another area worthy of further study is the extent of influence that the information parents are exposed to, has on their decision making. It would
also be worthwhile to examine if there exist interaction effects between the information parents are exposed to, and the psychosocial drivers explored in this research. For example, does the influence of information available to parents potentially depend on the degree of stress the parent experiences? Further, once parents have experienced success with medication, can information that highlights the safety concerns of medication, or information that informs parents of the benefits of behavioural interventions, change parents’ decisions on medicating? Further explicating such issues, to unravel the rich tapestry of relations that parents’ decision-making shares in relation to attitudes and actions about ADHD-type behaviours, has the potential to result in advancing the knowledge base in regard to parents’ reasoning and management of ADHD-type behaviours, and to inform theory development and intervention.

**Implications for Practice**

*Parents at the crossroads.* Based on the analyses conducted in Chapter 7, parents’ decision to either accept or reject the ADHD diagnosis is clearly associated with: (a) whether acceptance of the diagnosis has benefit for them, (b) their beliefs about the appropriateness of medication for managing ADHD behaviours, (c) the assumed causes of ADHD (i.e., is it brain related, or related to parents’ parenting practices), and (d) the amount of stress experienced by the parent and his or her family. Other factors, such as the information they are exposed to, as well as societal expectations and pressures (e.g., from schools, relatives, friends) also influence parents in their decision-making process regarding whether or not they will accept the ADHD diagnosis as an explanation for their child’s behaviour. What parents believe causes their child to display ADHD behaviours is important, as their beliefs about causality may influence treatment choice and compliance (Hoza et al., 2000). However, while parents have the right to choose whatever treatment option they feel is most appropriate for their child, choices should ideally be made only once they have accessed information on ADHD and its recommended treatments from both proponents and critics of the medical model of ADHD. Further, when making their decisions, parents should be relatively unaffected by stress, pressure from others, or the need to conform to the expectations of others. As such, parents should possess a sense of autonomy when making decisions that impact on their child.
Educating parents. Ghanizadeh (2007) has recommended that the education and counselling of parents of children with ADHD should be directed towards emphasising ADHD as a biological condition. This practice, according to Kean (2006), has resulted in parents making a decision to accept the ADHD diagnosis and drug treatments, based upon incomplete or misleading information. While parents have ready access to much information that promotes the medical model of ADHD, there is considerably less information readily available relating to psychosocial interventions, such as modifying parenting techniques for dealing with these children. Access to such information is important, as a change in parenting skills seems to be a key requirement for change in a child’s behaviour (Gardner, Burton, & Klimes, 2006). To modify parenting practices, typically requires the need for structure, guidance, consistency, and establishing boundaries, which contribute to children learning new behaviours (D. B. Stein, 2001b; Rosemond & Ravenel, 2008). In contrast to the advice of Ghanizadeh (2007), D. B. Stein (2001a), has suggested that “Having children learn correct behaviour is the best thing we can do for that child. A pill does not teach correct behaviour” (p. 51).

The above-mentioned parenting practices were considered normal in previous generations (Rosemond, 2007). However, with the changing dynamics of families and societies in general, busier lifestyles, and increased levels of family breakdown (Neven, et al., 2002), it is likely that parents do not have ready access to the advice of their parents on parenting matters. This societal change has been matched with an increase in the prevalence of ADHD diagnoses. The problem then becomes: “How to teach today’s parents effective parenting strategies?” While many parenting courses and books are available to parents, the advice given has strayed from the basics of discipline and recognising behaviour that is inappropriate, and moved towards viewing childhood behaviours as a disorder of some kind (Conrad, 2007; Rosemond & Ravenel, 2008). For example, Diller (2006) has stated: “Today’s biological psychiatrists . . . would opine ‘he can’t self-regulate’ because of a genetic predisposition to ADHD and chemical imbalance” (p. 71). While a genetic or biological contribution to ADHD cannot be ruled out, the results of Chapter 7 (see also earlier discussion on Study 2 in relation to the PPEAS), suggest that parents, in their decision to either accept or reject the ADHD diagnosis, are significantly influenced by whether or not they view ADHD as a brain condition. Hence, having information accessible to parents that informs them that the medical model that
infers brain illness is still a theory, may help them consider non-medical interventions such as behavioural interventions. Further, the results of Chapter 7 show that parents’ decision to either accept or reject the ADHD diagnosis correlates with their beliefs about what contribution the home environment (which includes their parenting practices) plays. Hence, helping parents to acquire more effective parenting skills has the potential to influence how they view their child’s behaviour, and thus how to manage that behaviour.

Supporting Parents. The advice given by those advocating a psychosocial intervention is often more difficult to apply, as it requires the parents to be confident and competent. It also requires parents to be content with solutions that often are not immediate. If a solution is not immediate (unlike medication, which by comparison has a fast response), parents can often become discouraged and find it difficult to cope with their child’s behaviour. They may also face criticism from others because their child is still behaving inappropriately. This is perhaps why several interviewees in Study 3 spoke of the need for support. While support should be available to all parents, it is not always the case, given that we live in an evaluating society where we are continually judged. Helping parents to deal with the negative judgements of others and better manage stress, may be helpful in enabling them also to consider non-medical treatments, which are often more difficult to implement. The ability to effectively deal with stress and criticisms relates to high self-esteem, a desirable quality for any parent.

Possessing high self-esteem, generally relates to more effective behaviour and better adjustment (Combs & Gonzales, 1994; Deci & Ryan, 1995). Therefore, helping parents acquire high self-esteem or a positive self-concept is likely to result in parents being more able to make decisions regarding their children that are not influenced by the criticisms or expectations of others. Although much has been written about self-esteem and the self-concept (see Chapter 3), much confusion exists about these central topics to psychology. Salmivalli, Kaukiainen, Kaistaniemi, and Lagerspetz (1999) have suggested that high self-esteem can either be healthy or unhealthy (see also Deci & Ryan, 1995), as they highlight the difference between genuine high self-esteem and false (although seemingly high, is narcissistic in nature) self-esteem. Naturally, when assisting parents, the goal should always be to promote a genuine high self-esteem. Ted Scott and Harker (1998) have suggested that personal adjustment (i.e., genuine high self-esteem) is the foundation upon
which interpersonal skills (which include parenting skills) become effective. In the context of this discussion then, ideally, parenting skills should be taught to parents after, or concurrently with efforts to help them acquire more positive self-concepts.

Assisting Professionals. While this investigation is primarily about parents, it is recognised that parenting does not occur in a vacuum – parents and their children are influenced by professionals, particularly on matters which they are uncertain about (see Chapter 2). Hence, the importance of educating professionals is discussed in this section. This discussion focuses on non-medical professionals (e.g., teachers, school counsellors, and psychologists) as well as medical professionals (e.g., doctors). The purpose in this section is not to prescribe specific practices for professionals (as that is beyond the scope of this investigation) but rather to emphasise the importance of recognising the role that professionals play in a society where parents are increasingly seeking their services.

Schooling has become more competitive in recent times, with more being expected of children at earlier ages (Timimi, 2007). Further, with families facing more problems (e.g., family breakdown and discord, unemployment, poverty), these problems are likely to affect children during the schooling years. Sometimes it is possible that parents will try to shift some responsibility for managing children on to schools. Hence, school staff have more problems to deal with, and are also likely to experience more stress and to require more support and understanding. At one time, teachers did not experience the multitude of behavioural problems they have to deal with today. In addition to the problems at home just mentioned, something else has happened. Graham (2010, p. 213) has suggested that “teachers are becoming increasingly dispossessed of their own expert knowledge by others who rebadge ordinary commonsense with mystifying psycho-biological jargon,” resulting in teachers who are reluctant to work with children who display challenging behaviour – which incidentally, has always been part of the classroom. As an example of the trend to use psycho-biological jargon to explain children’s behaviour, Breggin (2002) asserts that what was once referred to as “underachieving” by parents and teachers is now referred to as a “learning disorder,” a concept he claims provides lucrative careers for many professionals. In sum, while the provision of more support to school staff would be helpful, teachers should also be allowed and empowered to get on with the task of teaching.
Given that ADHD is used as a medical explanation for problematic behaviours, schools are able to out-source children displaying ADHD behaviours to the medical profession (Graham, 2008). With such a referral system in place, medical professionals are important stakeholders, where their recommendations can potentially influence school policy and practice. While medication is often prescribed when a parent takes their child to a specialist, doctors are becoming increasingly aware that other options exist, apart from medication. For example, the Paediatric and Child Health Division of The Royal Australasian College of Physicians (2009) advocates a multimodal approach to dealing with ADHD which may include the use of medication, but further suggests that it is not recommended for every case. To advocate a multimodal approach to dealing with ADHD is a move in the right direction, as it provides more options for parents. To ensure that families have the option to consider non-medical interventions (perhaps in place of, or in addition to medication), doctors could be encouraged to work more with psychologists and school counsellors. Incorporating a multimodal approach simply recognises that ADHD is situated within a broader context (i.e., parents, society, schools), and not just the child, and recognises the interplay between biological, social, and psychological factors.

Chapter Summary

This chapter has discussed the results from three separate interrelated studies that comprise the present investigation. The results converge to address the overarching aim of this investigation, which is to explicate the relation of psychosocial constructs (e.g., parenting self-concepts, stress, relief) to parents’ acceptance or rejection of a diagnosis of ADHD as a medical condition. Attainment of this aim provides a rare empirical study elucidating the role of research-identified psychosocial drivers that inform parental decision-making. A critical look at the strengths and limitations of the studies clearly shows the synergistic strength of a multi-method design whereby qualitative findings are used to supplement quantitative findings. The PPAQ was shown to possess good psychometric properties, and adds to the literature a new, sound measure for collecting quantitative data.

While results from the qualitative study show that parents often favour the use of medication, they further show that they may not always prefer medication as a treatment option for their child. The results from the quantitative studies show that
there is merit in focusing on psychosocial determinants of parents that can result in their viewing ADHD as something other than a medical construct. Viewing ADHD as something other than a medical construct may enable parents to choose a response to their child’s ADHD behaviours that is effective, and one with which they feel more comfortable. Given the strong belief amongst parents who readily accept the ADHD diagnosis that ADHD is a brain condition, and the dominance of the medical model, which strongly advocates medication (in conjunction with psychosocial interventions), efforts should be directed to making information available to parents that considers a psychosocial explanation for ADHD and advocates alternative non-medical responses, to enable parents to have greater autonomy over how they will respond to their child’s ADHD-type behaviours.
CHAPTER 10

CONCLUSION

“If we all worked on the assumption that what was accepted as true really is true, there would be little hope of advance.” (Orville Wright)

The aims of this investigation were introduced in Chapter 1. A literature review followed, which challenged the widely presumed assumption that ADHD is a medical condition with a proven biological aetiology. Although the medical conceptualisation of ADHD is widely accepted amongst the scientific community and in the general public alike, a review of the scientific literature of scholars, both those who are supportive and those who are critical of the medical model, clearly shows that although a consensus seems to have been reached regarding the validity of the medical model of ADHD, critics have shown that this consensus is in need of a re-evaluation. A review further shows that parents are divided in their views on the exact nature of ADHD (i.e., is it biological or is it psychosocial?). It is from this observation, that a set of research aims was generated to explore parents’ perceptions of ADHD, why some parents accept the ADHD diagnosis, and why some reject it.

The importance of addressing these research aims is twofold. Firstly, concerns are held by critics that problematic behaviour (in both adults and children) is increasingly and erroneously being presented as medical in nature and in need of a medical intervention, as opposed to being viewed as psychosocial in nature. Secondly, there are increasing concerns about the safety and effectiveness of medication to manage specific behaviours that have not yet been shown to be medical conditions involving brain pathologies or abnormalities. Until the precise nature of ADHD (i.e., Is ADHD medical/biological or psychosocial?) and the efficacy of medication for treatment are firmly established, then an understanding of why parents accept the medical view and why others reject it, may be useful in enabling or encouraging parents to select treatment options that are generally
considered safer options and which they feel more comfortable accepting. This is particularly important because parents, in their role as the primary care provider of children, are the ones who typically decide what treatment options a child receives in regard to ADHD behaviours.

While much research has been undertaken regarding the nature of ADHD in relation to the child, comparatively little research has examined ADHD from the perspective of parents. Hence, this research potentially makes a valuable contribution to expanding the literature in this field. This research is also timely for two important reasons. Firstly, the DSM-V (American Psychiatric Association, 2010), which is intended to replace the DSM-IV (American Psychiatric Association, 1994), is currently being developed: hence, the heated controversy surrounding the nature of mental illness is not likely to subside. Secondly, where increased demands are being placed on children to perform at higher levels and much earlier than in previous years, as well as schools being held more accountable to boost performance, ADHD is likely to be a topic of interest for educators, doctors, psychologists and parents for quite some time.

By using advanced statistical methodology (e.g., SEM and CFA), a set of predictor variables that seek to measure psychosocial characteristics of parents were identified and shown to be reliable predictors of which parents were likely to accept the ADHD diagnosis and which ones were likely to reject it. While the outcome variable of parents’ acceptance of the ADHD diagnosis may be considered a fairly objective and unambiguous opinion to measure, the variables used to predict parents’ acceptance were psychological constructs and are not as easily measured. Hence, a second literature review was introduced, to explain the limitations associated with measuring and incorporating latent variables in statistical analyses. Further, in recognition of the unique features of latent variables, as well as the limitations of quantitative methodology, a qualitative study was incorporated into this investigation. Hence, a mixed-methods approach was adopted, thus yielding results that were more valid and reliable than would be expected using a single-method design.

The aim of Study 1 was to assess the psychometric properties of the PPAQ. Assessment using advanced statistical techniques showed it to be a reliable survey instrument possessing sound structural validity and that was applicable across the different groups of parents that were of interest for this research. Once establishing
these psychometric properties, the remaining aims of Study 1 could be explored using CFA, namely: how do parents vary in their response to the subscales of the PPAQ according to specific grouping criteria, where the grouping criteria are: (a) parents’ acceptance or rejection of the ADHD diagnosis, (b) parents of boys and parents of girls, and (c) whether the child has an official or unofficial diagnosis of ADHD. Perhaps the most important results of Study 1 were that parents who accept the ADHD diagnosis are more likely to report finding the diagnosis helpful for them, in that it helps provide a sense of relief, are more likely to see medication as an appropriate treatment, more likely to experience stress, and more likely to view ADHD as a brain disorder. Conversely, parents rejecting the diagnosis are less likely to perceive that the diagnosis was helpful for them, less likely to see medication as an appropriate treatment, less likely to report feeling stressed, and more likely to believe that ADHD is the result of non-biological factors. The results further show that generally the parents of boys had similar experiences to the parents of girls, with the exception of their parenting experiences as shown by the PSCS scores, where the parents of boys had moderately and significantly higher scores on the parenting self-concept factors. With regard to the grouping variable of official status of diagnosis, the findings generally parallel those of parents’ acceptance or rejection of ADHD.

Study 2 used SEM to evaluate linear regression models where the predictor variables were latent factors. The results from Study 2 are largely consistent with those of Study 1. The most noteworthy findings are the relations between the outcome variables (i.e., parents’ acceptance of the ADHD diagnosis, and their perceived helpfulness of the diagnosis) and parents’ believed causes of ADHD, attitudes towards medication, and stress.

An important methodological issue identified, that was common to both Study 1 and Study 2, was the uncertainty of obtaining a valid measure of the parenting self-concept. Given the potential for and likelihood of response bias (i.e., parents like to believe they are good parents), it was suggested either that alternative measurement scales of this construct be developed, or that alternative methods for measuring it be utilised. Problems of this nature, though written about extensively in the literature, are perhaps more common than is generally realised. Given the success in distinguishing parents who accept the diagnosis from those who reject it using the measures of stress (from the PSS) and perceived helpfulness of the diagnosis (from
the Helpfulness subscale of the PPEAS), future research in this area could benefit from utilising these “indirect measures” (see Fisher, 1993).

An important consideration for interpreting the statistical results is that the diagnosis of ADHD is a descriptive label that does not explain why a child displays those defining behaviours of ADHD. Specifically, in relation to the result that parents who accept the diagnosis for their child are more likely to find the diagnosis helpful for them, the obvious question resulting from this finding is, “How does a descriptive label help the parent?” This finding, in combination with other findings (e.g., parents’ reported levels of stress and their assumed causes of ADHD), suggests that acceptance of the ADHD diagnosis may serve to enhance or protect parents’ parenting self-concept. This finding illustrates the importance of recognising the broader context in which the results are situated, when explaining or interpreting the results of statistical analyses. On this matter, the use of qualitative methodology is useful for providing additional insights into the phenomena being studied.

Study 3 provided supplementary data consistent with the findings of the quantitative studies. For example, parents do sometimes experience guilt in relation to having a child who displays ADHD behaviours, and can experience a sense of relief when a diagnosis is offered. Naturally, this is not the experience of all parents, as some parents made no mention of guilt. What was most commonly reported by parents is that raising a child with ADHD is challenging. When faced with these challenges, parents often refer to paediatricians or school counsellors. The insights gained from interviewing these two groups of professionals further illustrate that ADHD (regardless of how it is conceptualised) is a serious problem for families, schools, and communities.

Currently, there is still a debate as to what ADHD is and what is the best way to manage it. Many researchers and commentators (e.g., Biederman, 2005; Graham, 2010; Spillane, 2009; D. B. Stein, 2001b) from a range of disciplines (e.g., child and adolescent mental health, psychology, medicine, education) have spoken at length on the nature of ADHD, its causes, and how best to respond to those children who have been assigned the ADHD label. Contributions from these disciplines and other interested parties (e.g., the media, parenting groups), have shown that how ADHD, and child mental health in general, is conceptualised and understood, has implications, not only for children, but for their families, schools, and society in general. While open discussions and ongoing research have increased our
understanding of ADHD, it has also generated important questions. Questions flowing from the ADHD debate include: “Who is responsible for managing the children?”, “Should we medicate, and who decides?”, “Is there the risk of future legal action, given the growing concerns regarding the safety of medication for treatment?” and “What other childhood behaviours may one day be cast as a medical condition?” These are important questions that society needs to carefully consider. While this thesis cannot hope to provide a definitive answer to each of these questions, the research findings have the potential to change people’s perceptions and practices, and this may result in a new set of questions being asked – questions that may better reflect the world we live in. Examples might include: “How can parents modify their parenting practices so that children are allowed to flourish and express their individuality, while still adhering to social norms?”, “How can teaching practices and policies be modified to be more inclusive of individual differences?” and “How can society change such that behaviours in children considered problematic by (some) adults do not become medicalised or pathologised to the point that medication is used to control such behaviours?” In sum, the findings of this investigation imply that how we as individuals, and society as a whole, respond to the ADHD child is largely shaped by how we view the nature of ADHD and its assumed causes. Perhaps we, the caretakers of our children, need to critically analyse and test our views before we try to change our children. Future research should therefore focus on how parents view themselves in their role as parents and their perceptions and understanding of childhood behaviours. Such research should also be matched with the provision of support services for parents (e.g., parenting courses, information, counselling) that recognise the challenges today’s families face. While research that focuses on children should still continue, the recommendation of focusing on parents, simply recognises the important role that parents play in the health and well-being of their children.
REFERENCES


Block, M. A. (2001). *No more ADHD: 10 steps to help improve your child's attention & behavior without drugs!* Hurst, TX: The Block System.


and Psychological Measurement, 56(2), 197 - 208. doi: 10.1177/0013164496056002001


Appendix A

The Parents'/Guardians Perceptions of Attention Deficit Hyperactivity Disorder (ADHD) Questionnaire (PPAQ)

Please remove this front page
(this page will be stored separately to the survey responses to ensure confidentiality)

Parents'/Guardians' Perceptions of Attention Deficit Hyperactivity Disorder (ADHD) Questionnaire (PPAQ)

Purpose

This survey is being conducted by Mr Anthony Dillon who is a PhD student from the University of Western Sydney, supervised by Professor Rhonda Craven. The purpose of this survey is to find out what parents/guardians with a child who has been diagnosed with ADHD or displays what parents consider to be ADHD type behaviours think about the nature, causes, and management of ADHD in relation to their child. Any questions relating to this research should be directed to Professor Rhonda Craven, Telephone: 02 9772 6557; Email: r.craven@uws.edu.au or Mr Anthony Dillon, 02 9772 6202; Email: a.dillon@uws.edu.au

Background

Some parents view ADHD as an illness, while others view it as a term used to describe certain childhood behaviours. Everybody’s experiences and beliefs are different; therefore, there are no wrong or right answers in this survey. As the parent/guardian of your child, for this survey, you are the expert. Whether you believe ADHD is a medical condition or not, you are simply asked to respond to what you think best describes your situation or opinion. To assist you in completing this survey, please note the following:

- The term ‘your child’ will be used throughout this survey to acknowledge that you may be a parent or guardian.
- Your child may or may not have been officially diagnosed with ADHD, but he or she would at least regularly display those behaviours typically associated with ADHD.
- If you are the parent/guardian for more than one child who displays ADHD-type behaviours, where relevant, please provide information only for your oldest child who displays these behaviours.
- It is assumed that your child is 18 years old or younger.
- Purely for convenience, terms such as ‘has ADHD’ and ‘ADHD-type behaviours’ will be used to describe observable behaviours without necessarily making inferences that the behaviours are evidence of a medical condition.

Consent for an optional telephone interview

In addition to completing this survey, we would like to interview some parents. Would you be willing to participate in a 15 minute telephone interview session to discuss your views?

☐ Yes, I am agreeable to an interview
☐ No, I am not agreeable to an interview

Parent/guardian’s name (please print) _______________________________________

(If yes), my telephone number is ____________________________ and the preferred time to call me is ____________________________

(Only a sample of people indicating ‘Yes’ will be interviewed.)
How to complete this survey

For some sections in this survey you will be required to use the following scale:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Somewhat disagree</td>
<td>Disagree more than agree</td>
<td>Agree more than disagree</td>
<td>Somewhat agree</td>
<td>Agree</td>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

So for example, if you strongly agree with the statement, then circle the 8. If you are not sure, but think you might slightly disagree with the statement, then circle 4.

### About Your Child

1. Child’s age in years

2. Child’s gender

   - [ ] Male
   - [ ] Female

3. Child’s country of birth

   - [ ] Australia
   - [ ] Other (please specify) __________________________

### About You and your Family

1. Your age in years

2. Your gender

   - [ ] Male
   - [ ] Female

3. Your country of birth

   - [ ] Australia
   - [ ] Other (please specify) __________________________

4. Which best describes your marital status?

   - [ ] Single, never married
   - [ ] Married / De facto
   - [ ] Divorced
   - [ ] Separated but not divorced
   - [ ] Widowed
   - [ ] Long-term partnership

5. Please describe your relationship to the child?

   - [ ] I am a parent
   - [ ] I am a step parent
   - [ ] I am a foster parent
   - [ ] I am a grand parent
   - [ ] Other (please specify) __________________________

6. Do you, or have you ever had ADHD or regularly displayed ADHD-type behaviours?

   - [ ] Yes
   - [ ] No

7. Do any of your family (in addition to the child being considered in this survey) currently have ADHD/ADHD-type behaviours or have in the past?

   - [ ] There are no family members with ADHD that I know of
   - [ ] One (1) family member
   - [ ] Two (2) family members
   - [ ] Three (3) or more family members

8. Which best describes the access arrangements you have with your child?

   - [ ] I live with my child
   - [ ] I do not live with my child but do have access
   - [ ] Other (please specify) __________________________
### Your Initial Experiences Regarding your Child’s ADHD-type Behaviours

1. Approximately how old was your child when you first became aware of, or concerned about his or her ADHD-type behaviours?  
   
   __________ (years)

2. After the initial consideration that their child may have ADHD, parents usually reach a decision as to whether they accept or reject ADHD as a diagnosis for their child. What decision have you made? (Tick only one)
   
   1. Accepted ADHD as a diagnosis for my child
   2. Mostly accepted ADHD as a diagnosis for my child, but have some reservations
   3. Mostly rejected ADHD as a diagnosis for my child, but acknowledge it as a possibility
   4. Rejected ADHD as a diagnosis for my child

3. Approximately how old was your child when you made this decision?  
   
   __________ (years)

4. Who helped you reach your decision? (Tick as many as apply)
   
   1. Nobody else
   2. Teacher
   3. School principal
   4. Child care worker
   5. Social worker
   6. School counsellor
   7. Specialist (paediatrician)
   8. Specialist (psychiatrist)
   9. Psychologist
   10. Doctor
   11. Friend
   12. Relative
   13. Partner
   14. Other (please specify) ___________

5. Did your child ever receive a diagnosis for ADHD from a medical practitioner?  
   
   1. Yes
   2. No

### Your initial response to an ADHD diagnosis

1. Please select the response that best describes how you felt when you considered (or it was suggested to you) that your child’s ADHD-type behaviours may be due to the medical condition known as “ADHD”.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Somewhat agree</th>
<th>Disagree</th>
<th>Somewhat more than disagree</th>
<th>More than disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

1. The suggestion helped me understand why my child behaved the way he or she did

2. It was of no help to me

3. I experienced a sense of relief

4. I wanted to know what treatment or response options were available

### Your Child’s Learning Needs and Friendships

1. Most other kids like my child

2. My child gets along with other kids easily

3. My child is popular with kids of his or her own age

4. My child has lots of friends
Your Parenting Experiences

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Somewhat disagree</th>
<th>Disagree more than agree</th>
<th>Agree more than disagree</th>
<th>Somewhat agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I like being a parent</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>I gain satisfaction from parenting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Overall, I’d say I’m a competent parent</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>7</td>
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</tr>
<tr>
<td>4</td>
<td>In general, I am a good parent</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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<td>7</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Parenting is definitely one of the best roles I have played</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Overall, I think I am doing a good job as a parent</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>5</td>
<td>6</td>
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<td>8</td>
</tr>
<tr>
<td>7</td>
<td>I enjoy being a parent</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>In general I get along well with my child</td>
<td>1</td>
<td>2</td>
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</tr>
<tr>
<td>9</td>
<td>My child and I share a good relationship</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>10</td>
<td>Overall, I have a good relationship with my child</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<td>8</td>
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</tbody>
</table>

Causes of ADHD-Type Behaviours

1. Please circle the response that best describes your opinion for each of the listed factors considered by some to be possible contributors to ADHD-type behaviours (adapted from Dryer, Kiernan, & Tyson, 2006). **Be sure to give a response to each of the options.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Somewhat disagree</th>
<th>Disagree more than agree</th>
<th>Agree more than disagree</th>
<th>Somewhat agree</th>
<th>Agree</th>
<th>Strongly agree</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Inappropriate behaviour that has been learned</td>
<td>1</td>
<td>2</td>
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<tr>
<td>2</td>
<td>Boredom</td>
<td>1</td>
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<tr>
<td>3</td>
<td>Lack of child’s self-discipline/control</td>
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<td>2</td>
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<tr>
<td>4</td>
<td>Child seeking attention</td>
<td>1</td>
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<tr>
<td>5</td>
<td>Care-giver’s lack of tolerance for some types of behaviours</td>
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</tr>
<tr>
<td>6</td>
<td>Lack of parental discipline</td>
<td>1</td>
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<tr>
<td>7</td>
<td>A chemical imbalance in the brain</td>
<td>1</td>
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<tr>
<td>8</td>
<td>Children are born that way (genetic predisposition)</td>
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<tr>
<td>9</td>
<td>Unstable family environment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>10</td>
<td>A problem in the way the brain functions</td>
<td>1</td>
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</table>
### Impact on Family

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Somewhat disagree</th>
<th>Disagree more than agree</th>
<th>Agree more than disagree</th>
<th>Somewhat agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Some family members have often felt stressed due to my child’s ADHD/ADHD-type behaviour</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>2 I have often wondered if I could cope because of my child’s ADHD/ADHD-type behaviour</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>3 I often don’t have much time left for myself after attending to my child because of his or her ADHD/ADHD-type behaviours</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>4 Friends have often been critical of my child regarding his or her ADHD/ADHD-type behaviour</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>5 My child’s ADHD/ADHD-type behaviour has not adversely affected other family members</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>6 Friends have often been critical of me as a parent regarding my child’s ADHD/ADHD-type behaviour</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>7 Fatigue is often a problem for me because of my child’s ADHD/ADHD-type behaviour</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>8 I have found other people to be generally understanding of me given my child’s ADHD/ADHD-type behaviour</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>9 My child’s ADHD/ADHD-type behaviour has created some tension between some family members</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>

### Medication

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Somewhat disagree</th>
<th>Disagree more than agree</th>
<th>Agree more than disagree</th>
<th>Somewhat agree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 I think that medication (such as Ritalin) is often an effective treatment for some children with ADHD in the short term</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>2 I think the way medication helps children with ADHD is similar to how insulin medication helps people with diabetes manage their condition</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>3 I think if a child with ADHD-type behaviours responds well to medication, then that strongly suggests that the behaviour is due to a medical condition such as ADHD</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
</tbody>
</table>
Management of ADHD/ADHD-type behaviours

1. Whether you accept ADHD as a diagnosis for your child or not, parents often have some form of plan for responding to their child's ADHD-type behaviour. Do you have a plan or response for dealing with your child's ADHD-type behaviour?

- Yes
- No

If you have selected 'No' please go to Question 4

2. If you selected ‘Yes’ for the previous question, please indicate the usefulness of the responses or strategies you use from the following options. For any of the options you do not use, please indicate by ticking the box under the heading 'I Do not Use.'

<table>
<thead>
<tr>
<th>I Do Not Use</th>
<th>Least Useful</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Most Useful</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Behavioural intervention</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Medication (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Counselling for you or other family members</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Counselling for the child</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Parenting course</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Using medical specialists</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Ignoring the behaviour</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>Diet modification</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Alternative therapies</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>Dore program</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>Using teachers</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12</td>
<td>Using a school counsellor</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td>Seeking respite assistance/care</td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>Other (please specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please describe how you reached your decision to either accept or reject the ADHD diagnosis, and what things influenced your decision?

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
If you would like further information on ADHD, the following website provides general advice, as well as information for seeking professional assistance.


Please refer any other interested parents you may know to this website

http://www.adhdsurvey.com.au

Alternatively, you can contact Anthony Dillon on (02) 9772 6202 or 0403 362 696 and a paper copy of the survey and replied paid envelope can be sent. All responses are anonymous.

Thank you for your participation in this important survey.
Appendix B

Letter of Invitation to School Principals

Centre for Educational Research
University of Western Sydney
Bankstown Campus
Locked bag 1797, Penrith South DC, NSW 1797, Australia

Dear Principal

**Parents’ perceptions and experiences with attention-deficit hyperactivity disorder (ADHD)**

We invite parents/guardians of students from your school to participate in a research project conducted by researchers from the University of Western Sydney. We are interested in exploring the experiences of parents/guardians who have a child who qualifies for a diagnosis of ADHD. **Children will not be required to participate in this research.** This research project has been approved by the State Education Research Approval Process (Approval No. 2008238) and is being led by Professor Craven.

Participation involves parents/guardians completing a survey at a time convenient to them in 2009 that will take about 30 – 40 minutes to complete. It is not necessary that the child has been officially diagnosed by a health professional, but rather, that the child is known to display those behaviours typically associated with ADHD. Participation in this project would typically entail parents being sent an invitation via a school newsletter telling them about the study, or school counsellors sending parents/guardians whom they believe to be suitable participants, an information letter, a consent form, and a survey form. Alternatively, parents/guardians may also be directed to a website where an electronic version can be completed. Parents/guardians will also be asked to indicate on the consent form if they would like to participate in an individual structured interview to explore issues related to the survey.

Your assistance in this study is voluntary. There will be no adverse consequences should you choose not to assist, or if the parents/guardians choose not to participate. You or the parents/guardians may cease involvement with the study at any time. Information provided in this study by individuals will not be given to others. Any results that are reported in research reports will be reported in group form, without identifying individuals or the school. The data will be kept in a locked file, accessible only to the researchers in this study, although the unidentified data may be further analysed by other researchers.

Please contact the researchers listed below if you have any questions relating to the study.

Professor Rhonda Craven, 9772 6557, r.craven@uws.edu.au
Dr. Gawaian Bodkin-Andrews, 9772 6149; g.bodkinandrews@uws.edu.au
Mr Anthony Dillon, 9772 6202; 16436712@uws.edu.au
We do hope you are interested in participating in this important project. A member of the research team will be in contact with you shortly to discuss relevant matters with you.

Sincerely,

Professor Rhonda Craven  
Centre for Educational Research, University of Western Sydney  
Locked Bag 1797, Penrith South DC, NSW 1797, Australia.  
Telephone: 02 9772 6557; Fax: 02 9772 6432; Email: r.craven@uws.edu.au

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee (Approval no. HREC H6608). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 02 47 360 883). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix C

Letter of Invitation to School Counsellors

Centre for Educational Research
University of Western Sydney
Bankstown Campus
Locked bag 1797, Penrith South DC, NSW 1797,
Australia
Dear School Counsellor

Parents’ perceptions and experiences with attention-deficit hyperactivity disorder (ADHD)

We invite parents/guardians of students from your school to participate in a research project conducted by researchers from the University of Western Sydney. We are interested in exploring the experiences of parents/guardians who have a child who qualifies for a diagnosis of ADHD. Children will not be required to participate in this research. This research project has been approved by the State Education Research Approval Process (Approval No. 2008238) and is being led by Professor Rhonda Craven.

Participation involves parents/guardians completing a survey at a time convenient to them that will take about 20 minutes to complete. It is not necessary that the child has been officially diagnosed by a health professional, but rather, that the child is known to display those behaviours typically associated with ADHD. Typically, such children will be known by you in your role as the school counsellor. Participation in this project would entail you sending parents/guardians whom you believe to be suitable participants an information letter, a consent form, and a copy of the survey. Alternatively, parents/guardians may also be directed to a website (www.adhdsurvey.com.au) where an electronic version can be completed. Parents/guardians will also be asked to indicate on the consent form if they would like to participate in an individual structured interview to explore issues related to the survey.

Your assistance in this study is voluntary. There will be no adverse consequences should you choose not to assist, or if the parents/guardians choose not to participate. You or the parents/guardians may cease involvement with the study at any time. Information provided in this study by individuals will not be given to others. Any results that are reported in research reports will be reported in group form, without identifying individuals or the school. The data will be kept in a locked file, accessible only to the researchers in this study, although the unidentified data may be further analysed by other researchers.

Please contact the researchers listed below if you have any questions relating to the study.

Professor Rhonda Craven, 9772 6557, r.craven@uws.edu.au
Mr Anthony Dillon, 9772 6202; 16436712@uws.edu.au
We do hope you are interested in participating in this important project. A member of the research team will be in contact with you shortly to discuss relevant matters with you.

Sincerely,

Professor Rhonda Craven
Centre for Educational Research, University of Western Sydney
Locked Bag 1797, Penrith South DC, NSW 1797, Australia.
Telephone: 02 9772 6557; Fax: 02 9772 6432; Email: r.craven@uws.edu.au

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee (Approval no. HREC H6608). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 02 47 360 883). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix D

Letter of Invitation to Parents

Centre for Educational Research
University of Western Sydney
Bankstown Campus
Locked bag 1797, Penrith South DC, NSW 1797, Australia

Dear Parent / Guardian

Parents’ Perceptions and Experiences of Attention-Deficit Hyperactivity Disorder (ADHD)

We seek your consideration of participating in a research project funded by the Australian Research Council and conducted by researchers from the University of Western Sydney. The purpose of this study is to find out what parents/guardians with a child who has been diagnosed with ADHD or displays what parents consider to be ADHD type behaviours (e.g., inattention, hyperactivity) think about the nature, causes, and management of ADHD in relation to their child and what factors may influence a parent in their acceptance or rejection of the ADHD diagnosis for their child.

If you have a child who has been diagnosed with ADHD or who regularly displays what are typically considered to be ADHD type behaviours we would appreciate your consideration of participating. It is not necessary that your child has been officially diagnosed by a professional, but rather, that your child regularly displays those behaviours typically associated with ADHD.

Participation involves completing a 30 minute survey. The survey can be completed by logging onto (web address to be added here) or alternatively we can post you a copy of the questionnaire and a reply paid envelope (contact Anthony Dillon, 02 9772 6202; Email: 16436712@student.uws.edu.au). A small number of parents will also be invited to participate in a 15 minute telephone interview. On the survey we will ask you whether or not you would like to volunteer to participate in a telephone interview.

This research project has been approved by the State Education Research Approval Process (Approval No. H6608) and is being conducted by Anthony Dillon who is a PhD student from the University of Western Sydney supervised by Professor Rhonda Craven and Dr. Gawaian Bodkin-Andrews. Any questions relating to this research should be directed to Professor Rhonda Craven, Telephone: 02 9772 6557; Email: r.craven@uws.edu.au; Dr. Gawaian Bodkin-Andrews, 97726149, Email: g.bodkinandrews@uws.edu.au or Anthony Dillon, 02 9772 6202; Email: 16436712@student.uws.edu.au.

Your assistance in this study is voluntary. There will be no adverse consequences should you choose not to assist. You may also withdraw your involvement in the study at any time. Information provided in this study by individuals will not be given
to others. Any results that are reported in research reports will be reported in group form, without identifying individuals or the school. The data will be kept in a locked file, accessible only to the researchers in this study, although the unidentified data may be further analysed by other university researchers. The results of the study will be reported back to your school and made available to you on the Centre for Educational Research website in March, 2010 (address here).

We do hope you are interested in assisting us with this important project.

Yours sincerely,

Professor Rhonda Craven
Centre for Educational Research, University of Western Sydney
Locked Bag 1797, Penrith South DC, NSW 1797, Australia.
Telephone: 02 9772 6557; Fax: 02 9772 6432; Email: r.craven@uws.edu.au

NOTE: This study has been approved by the University of Western Sydney Human Research Ethics Committee (Approval no. HREC H6608). If you have any complaints or reservations about the ethical conduct of this research, you may contact the Ethics Committee through the Research Ethics Officers (tel: 02 47 360 883). Any issues you raise will be treated in confidence and investigated fully, and you will be informed of the outcome.
Appendix E

Advertisement placed in “Sydney’s Child” and “Perth’s Child”

Does your child have ADHD?

or

Does your child regularly display ADHD-type behaviours?

You are invited to participate in an online survey regarding parents’ understanding of ADHD-type behaviours.

Whether you believe ADHD is a medical condition or not, YOU are the expert for your child and so your views will be highly regarded.

For further information or to participate in the online survey, go to:

www.adhdsurvey.com.au

Or if you would prefer, a paper copy of the survey can be sent to you.

Please contact Anthony:
(02) 9772 6202
16436712@student.uws.edu.au
Appendix F

Comparison of PPAQ Factor Loadings and Factor Correlations when each Measurement Scale of the PPAQ is run separately, and Combined in Mass CFA

Table F1
Standardised Factor Loadings for the Parents’ Perceptions, Experiences of ADHD Scale (PPEAS).

<table>
<thead>
<tr>
<th>Item number</th>
<th>Subscales</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer</td>
<td>.79 (.80)</td>
<td>.87 (.88)</td>
<td>.95 (.94)</td>
<td>.86 (.86)</td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td>.80 (.81)</td>
<td>.92 (.91)</td>
<td>.79 (.80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helpfulness</td>
<td>.89 (.88)</td>
<td>.55 (.54)</td>
<td>.69 (.69)</td>
<td>.61 (.63)</td>
<td></td>
</tr>
<tr>
<td>Family Environment</td>
<td>.70 (.70)</td>
<td>.79 (.79)</td>
<td>.74 (.73)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain</td>
<td>.55 (.57)</td>
<td>.74 (.76)</td>
<td>.86 (.82)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Child’s Behaviour</td>
<td>.72 (.72)</td>
<td>.66 (.65)</td>
<td>.53 (.52)</td>
<td>.69 (.69)</td>
<td></td>
</tr>
<tr>
<td>Criticism</td>
<td>.91 (.91)</td>
<td>.75 (.74)</td>
<td>.40 (.41)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Stress</td>
<td>.70 (.70)</td>
<td>.57 (.57)</td>
<td>.86 (.86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family Stress</td>
<td>.75 (.75)</td>
<td>.60 (.61)</td>
<td>.76 (.75)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Affect</td>
<td>.84 (.85)</td>
<td>.82 (.82)</td>
<td>.82 (.82)</td>
<td>.86 (.86)</td>
<td></td>
</tr>
<tr>
<td>Competency</td>
<td>.76 (.75)</td>
<td>.87 (.87)</td>
<td>.89 (.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relationship</td>
<td>.84 (.83)</td>
<td>.92 (.91)</td>
<td>.92 (.92)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Values not in parentheses are the factor loadings when a measurement scale is administered in isolation to other measurement scales. Values in parentheses are the factor loadings when all measurement scales are administered simultaneously.

* All factor loadings are significant at $p < .05$

Table F2
Factor Correlations for the Parents’ Perceptions, Experiences of ADHD Scale (PPEAS)

<table>
<thead>
<tr>
<th>PPEAS Factors</th>
<th>Peer</th>
<th>Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication</td>
<td>-.09 (-.10)</td>
<td></td>
</tr>
<tr>
<td>Helpfulness</td>
<td>-.06 (-.06)</td>
<td>.60* (.61*)</td>
</tr>
</tbody>
</table>

Note. Values not in parentheses are the factor loadings when a measurement scale is administered in isolation to other measurement scales. Values in parentheses are the factor loadings when all measurement scales are administered simultaneously.

* Significant at $p < .05$
Table F3

*Factor Correlations for the Parents’ Beliefs of Causes (PBCS)*

<table>
<thead>
<tr>
<th>PBCS Factors</th>
<th>Family Environment</th>
<th>Brain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain</td>
<td>.01 (.00)</td>
<td></td>
</tr>
<tr>
<td>Child’s Behaviour</td>
<td>.76* (.76*)</td>
<td>-.11 (-.11)</td>
</tr>
</tbody>
</table>

*Note.* Values not in parentheses are the correlations when a measurement scale is administered in isolation to other measurement scales. Values in parentheses are the factor loadings when all measurement scales are administered simultaneously.

* Significant at $p < .05$

Table F4

*Factor Correlations for the Parents’ Stress Scale (PSS)*

<table>
<thead>
<tr>
<th>PBCS Factors</th>
<th>Family</th>
<th>Criticism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Criticism</td>
<td>.58* (.58*)</td>
<td></td>
</tr>
<tr>
<td>Individual</td>
<td>.74* (.74*)</td>
<td>.64* (.63*)</td>
</tr>
</tbody>
</table>

*Note.* Values not in parentheses are the correlations when a measurement scale is administered in isolation to other measurement scales. Values in parentheses are the factor loadings when all measurement scales are administered simultaneously.

* Significant at $p < .05$

Table F5

*Factor Correlations for the Parenting Self-Concept Scale (PSCS)*

<table>
<thead>
<tr>
<th>PBCS Factors</th>
<th>Relationship</th>
<th>Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Affect</td>
<td>.63* (.63*)</td>
<td></td>
</tr>
<tr>
<td>Competency</td>
<td>.69* (.69*)</td>
<td>.81* (.81*)</td>
</tr>
</tbody>
</table>

*Note.* Values not in parentheses are the correlations when a measurement scale is administered in isolation to other measurement scales. Values in parentheses are the factor loadings when all measurement scales are administered simultaneously.

* Significant at $p < .05$