

Chapter 1: Introduction

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is held as one of the most common childhood behavioural conditions (Barkley, 1997). It is estimated that, on average, at least one child expressing characteristics of ADHD is present in every classroom (Barkley, 1990). This has been supported by a recent meta-analysis of 102 studies comprising 171,756 participants (Polanczyk, de Lima, Horta, Biederman, & Rohde, 2007). The meta-analysis showed the worldwide pooled prevalence rate of children and adolescents attracting a diagnosis of ADHD was 5.3% (Polanczyk et al., 2007). This diagnosis was more prevalent in males (10%) than females (4%), and more prevalent in children (7%) than adolescents (3%) (Polanczyk et al., 2007). In Australia, the most recent statistics available are from the 1998 Child and Adolescent component of the National Survey of Mental Health and Wellbeing (Sawyer et al., 2000). For those aged 6-14 years it was reported that 13% of all children, 18% of boys and 8% of girls, met the criteria for ADHD. Sawyer et al. (2000) suggested that these rates were inflated due to the procedures used in the survey. They argued that some children's symptoms could be accounted for by other conditions that were not included in the survey. The Polanczyk et al. (2007) meta-analysis included six studies from the Oceanic region, including Australia, and estimated the pooled prevalence rate at just under 5%, which is similar to the worldwide rate.

ADHD is a chronic condition characterised by developmentally inappropriate inattention, impulsivity and hyperactivity (Barkley, 1990). The characteristic behaviours associated with ADHD are noticeable in school settings because children are required to behave in ways that are discrepant with the symptoms of the disorder (Kos, Richdale, & Hay, 2006; Salmelainen, 2002). Children who express the symptoms of ADHD are challenging to teach as they cause disruption in the classroom, have problems interacting with their peers, such as acting aggressively, and often show symptoms of other problems such as learning

disorders, anxiety, depression and other developmental disorders (Ohan, Visser, Strain & Allen, 2011; Salmelainen, 2002). To date, the causes of ADHD are unknown, although it is suspected to have a neurological basis, and its treatment with stimulant medication is reported as the most effective intervention (MTA Cooperative Group, 1999a; Salmelainen, 2002).

Often the characteristics of ADHD are first noticed when a child begins formal schooling (Salmelainen, 2002). Not surprisingly, many studies identify teachers as the most frequent initial referral source by recommending to parents that their child receive assessment for ADHD (e.g., Snider, Busch, & Arrowood, 2003; Stroh, Frankengerger, Cornell-Swanson, Wood, & Pahl, 2008). Additionally, teachers' observations about the child's functioning in task oriented and social situations are used in classification and treatment decisions (Vereb & DiPerna, 2004). As noted by some scholars, teachers are also often responsible for implementing and evaluating interventions for ADHD in the classroom (Ohan, Cormier, Hepp, Visser, & Strain, 2008; Vereb & DiPerna, 2004). The prevalence and salience of ADHD in school settings, and teachers' roles in reporting symptoms, advising parents and assisting such children to achieve academically and socially, makes it an important topic for teachers, school psychologists, and teacher trainers at both pre-service and in-service levels.

The likelihood of new graduates teaching a child displaying the characteristics of ADHD early in their career is high. The research reported in this thesis included samples of in-service and pre-service teachers and examined how increased classroom experience and training impacts on knowledge of ADHD and the formation of attitudes towards teaching children who exhibit the characteristics of ADHD. The phrase *exhibits the characteristics of ADHD* is used throughout the thesis rather than *diagnosed with ADHD* to reflect the lack of a systematic or formal reporting process of children diagnosed with ADHD to the New South Wales Department of Education (Rachel Weymouth, personal communication, 6th June, 2012). A teacher may not know whether a child in their classroom has a diagnosis of ADHD,

but they would observe the child's behaviours. The teacher's belief that a certain child exhibits the characteristics of ADHD is likely to be a crucial factor that influences their attitude and behaviours towards that child, even if they do not know of the child's diagnostic status.

In the mid-1990s it was suggested that teacher characteristics, such as their knowledge of ADHD, their attitude toward ADHD (Greene, 1995; Power, Hess, & Bennett, 1995), and their training and classroom teaching experiences (Greene, 1995), may impact on academic and social outcomes for children expressing features of ADHD. Thirteen years later, in a review of teacher characteristics and their impact on outcomes, Sherman, Rasmussen and Baydala (2008) stated that empirical research supporting these suggestions was only beginning to emerge. While there is little empirical work so far on the consequences of teacher characteristics for children, several authors have proposed ways that teacher knowledge and attitudes may affect child outcomes. For example, it has been suggested that teachers who lack knowledge about ADHD may overlook behaviours signifying a child in need of assistance (Ohan et al., 2008) and they may provide unreliable information to medical practitioners about the effects of medication (Kasten, Coury, & Heron, 1992). Similarly, a concern of some scholars has been that teachers' attitudes about ADHD may impact on their selection of a teaching approach (Westwood, 1996), their willingness to implement interventions (Vereb & DiPerna, 2004), their chosen behavioural management strategies, and classmates' perception of the child (Atkinson, Robinson, & Shute, 1997).

Given this background it is valuable to examine teachers' knowledge, attitudes and experiences regarding ADHD. The present research program was undertaken in response to Kos, Richdale and Hay's (2006) call for theoretically guided research on this subject. Teachers' attitudes have not been clearly measured to date and there is limited literature providing a theoretical understanding of their attitudes and knowledge of ADHD (Kos et al.,

2006). Empirical research would benefit from more systematic and theoretical guidance to assist identification of relevant teacher characteristics, such as knowledge, attitudes and prior experience. Once identified, teacher characteristics may be used as independent variables in future research on outcomes for children and guide curriculum development in teacher training at both the pre-service and in-service levels. A theoretically-grounded and deeper understanding of teachers' knowledge and attitudes regarding ADHD would also assist school psychologists in their advisory and support roles with teachers and children in schools.

Teachers are exposed to numerous sources of anecdotal evidence and information about the causes, treatments and characteristics of ADHD during training courses, the media, interactions with children, and through personal experience with ADHD. This results in many inconsistencies in information and demonstrates the complexity of attitude formation. To address the issue of how these complex attitudes develop, the present research used models of attitude content, structure and strength from a social psychological perspective to systematically investigate the formation of teachers' knowledge and attitudes regarding ADHD. The theoretical perspectives relevant to the research program are described below, followed by an introduction to the structure of the research program and how the models were applied in each phase of the study.

Attitude Models

Attitudes are the evaluations people make when they meet others, experience events, or receive information (Eagly & Chaiken, 1993). Attitudes may be either favourable or unfavourable evaluations of these people, events and topics, which are referred to as the *attitude object* (Eagly & Chaiken, 1993). Attitudes manifest as how much we “like a person, favour a brand or support a policy” (Tormala & Rucker, 2007, p. 469). As discussed below, theories and models have been developed by social psychologists to assist understanding of attitude content, structure and strength.

Models of attitude content.

Two main perspectives on attitude content have been theorised. The traditional view was that an attitude reflected a person's total or overall beliefs about an attitude object (Eagly & Chaiken, 1993). This view was extended in the expectancy-value model (Fishbein & Ajzen, 1975), which posits that overall attitudes are derived from combining the evaluation of each attribute of an attitude object as either favourable or unfavourable with beliefs about the probability that the object possesses each attribute. For example, according to this model, if a teacher believed that children who exhibit the characteristics of ADHD are disruptive, waste valuable teaching time, but motivate the creation of engaging lessons, the evaluation of the first two attributes would be unfavourable, while the latter would be favourable. If the teacher believed that the probability of classroom disruption and wasting time was highly likely, but that motivation for producing engaging lessons was not probable, then their overall attitude would be unfavourable.

The other main perspective on attitude content views attitudes as multifaceted and not based solely on beliefs (Eagly & Chaiken, 1993; Haddock & Zanna, 1998; Maio & Haddock, 2004). This tripartite model identifies three elements of attitude content: cognition, affect and behaviour (Eagly & Chaiken, 1993; Zanna & Rempel, 1988). The cognitive component refers to thoughts and beliefs. Previous authors working with the tripartite model have identified two types of cognitions or beliefs. *Stereotypic beliefs* refer to beliefs about a group of people's characteristics (Haddock & Zanna, 1999). For example, stereotypic beliefs about children with ADHD are that they are male, naughty and have short attention spans. *Symbolic beliefs* refer to beliefs about the values, customs or traditions that are held or practiced by typical members of a target group (Esses & Maio, 2002; Haddock & Zanna, 1999). Teachers' symbolic beliefs may relate to how children with characteristics of ADHD impact on the teaching process and classroom environment. For example, a teacher may think that teaching

“ADHD children” is too time consuming. Alternatively, they may have positive beliefs, such as thinking that teaching such children creates a vibrant classroom. The affective component of the tripartite model refers to emotional responses, such as feeling frustrated when teaching such a child, or feeling pleased when a child achieves a goal. The behavioural component of the tripartite model refers to past actions, such as a teacher giving a child a special job to do in the classroom, or reprimanding a child for their lack of attention.

Models of attitude structure.

While models of attitude content focus on the nature of an attitude’s constituent elements, models of attitude structure focus on how favourable and unfavourable evaluations combine to form an attitude (Maio & Haddock, 2004). Two key perspectives on attitude structure are the uni-dimensional and bi-dimensional models. Uni-dimensional models view attitudes as overall evaluations that are either favourable or unfavourable, but not both at the same time (Eagly & Chaiken, 1993; Maio & Haddock, 2004). The uni-dimensional model views attitudes on a single favourable-unfavourable continuum. In contrast, a bi-dimensional model of attitude structure theorises that people may hold favourable and unfavourable attitudes simultaneously, that is, they may have ambivalent attitudes (Eagly & Chaiken, 1993).

The tripartite model of attitude content allows for a bi-dimensional structure in that respondents may report mixed favourable and unfavourable evaluations *between* their cognitions, affect and behaviours. This type of mixed valence is termed *inter-component ambivalence* (Eagly & Chaiken, 1993). For example, teachers may believe that using behavioural management strategies is beneficial (a favourable cognition) but at the same time feel frustrated about implementing these strategies (an unfavourable affect). They would therefore exhibit conflict between the cognitive and affective components of their attitude and thus report inter-component ambivalence. Similarly, a teacher may experience frustration in

response to teaching a child who is impulsive and inattentive (an unfavourable affect) simultaneously with implementing engaging teaching strategies (favourable actions).

The tripartite model of attitude content is also bi-dimensional in structure because it allows measurement of mixed valence *within* each component (Eagly & Chaiken, 1993). *Intra-component ambivalence* occurs when a person reports conflicting valence within a single attitude component, such as experiencing simultaneous favourable and unfavourable cognitions, affects or behaviours (Eagly & Chaiken, 1993). Teachers may simultaneously believe that using behavioural management strategies is beneficial (a favourable cognition), but also believe that implementing these strategies requires too much time (an unfavourable cognition). They would therefore exhibit intra-component ambivalence within the cognitive element of their attitude.

The expectancy-value model of attitude content is limited to identifying intra-component ambivalence because it views attitudes as composed solely of beliefs. In contrast, integrating the tripartite model of attitude content and the bi-dimensional model of attitude structure allows measurement of different types of ambivalence that may occur within a complex attitude (Haddock & Zanna, 1998; Maio & Haddock, 2004). It is important to identify teachers' ambivalent attitudes, as well as their global attitude, as these different perspectives may produce unique consequences (Maio & Haddock, 2004). As described below, ambivalence is thought to have implications for understanding attitude strength (Maio & Haddock, 2004; Thompson, Zanna, & Griffin, 1995), which may also impact on teachers' roles with children. For example, teachers who have ambivalent attitudes may be inconsistent in their choice and implementation of behavioural and pedagogical strategies, and in their communication and actions toward children.

Multi-dimensional models of attitude strength.

Attitudes are of interest to researchers and practitioners because they affect future thoughts, judgements and behaviours. Some attitudes are held more strongly than others; they have greater influence on thoughts and behaviours, they last longer and are more resistant to opposing viewpoints than weaker attitudes (Krosnick & Petty, 1995). Thus, attitude researchers and theorists have been interested in analysing the components of strong attitudes. More than 20 attributes or dimensions of attitude strength have been proposed (e.g., Raden, 1985; Scott, 1968). The dimensions include aspects of the cognitive structure of the attitude, such as extent of knowledge about a topic (Wood, 1982; Wood, Rhodes, & Biek, 1995), how quickly the attitude can be accessed in memory (Fazio, 1995), and its ambivalence: the degree of unfavourable and favourable components of the attitude (Thompson et al., 1995). Other dimensions refer to subjective beliefs about the attitude, such as a sense of personal involvement (Thomsen, Borgida, & Lavine, 1995) and how certain a person is about their attitude (Gross, Holtz, & Miller, 1995). Other attitude strength dimensions include having first-hand experience with the attitude object (Fazio & Zanna, 1978) and experience gained through secondary sources, such as the media, training courses or study (Eagly & Chaiken, 1998). Cognitive elaboration, or the extent of prior thought about the merits and limitations of an attitude object, is another dimension of strength and is based on the extent of information processing (Petty, Haugtvedt, & Smith, 1995). There is general consensus that the various attitude dimensions are distinct constructs rather than reflecting a single underlying one (Visser, Bizer, & Krosnick, 2006). Thus a multidimensional model of attitude strength has been supported.

Bassili (1996) identified two types of attitude strength dimensions based on the way the dimensions are measured. The first comprises operative indices, which measure attitude strength objectively, for example, using an empirically derived questionnaire to measure actual knowledge of a topic, or counting the number of responses on a list of thoughts to

measure actual cognitive elaboration. The second comprises metacognitive indices, which measure attitude strength subjectively, for example using Likert scales to assess perceived knowledge of a topic, or perceived amount of thought about a topic. Generally, objective measures and subjective measures have been found to be only weakly correlated, therefore both types of measures have been recommended to be included in research (Bassili, 1996; Krosnick, Boninger, Chuang, Berent, & Carnot, 1993; Krosnick & Petty, 1995).

A particular focus of the current research program was how teachers' prior experience related to their knowledge of ADHD and attitudes toward teaching children who exhibit the characteristics of ADHD. The multi-dimensional model of attitude strength guided identification of types of prior experiences that may be relevant to development of knowledge and attitudes. This focus on experience echoed a definition of attitudes by Allport, one of the founders of attitude theory, who stated that an "attitude is a mental and neural state of readiness, *organised through experience* [emphasis added], exerting directive and dynamic influence upon the individual's response to all objects with which it is related" (1935, p. 810). Allport's phrase, "organised through experience" holds attitudes as formed through learning and interactions with the environment. In the education literature, prior experiences are usually treated as demographic variables or as aspects of professional background (e.g., Bekle, 2004; Kos, Richdale, & Jackson, 2004; Ohan, Visser, Strain, & Allen, 2011; Sciutto, Terjesen, & Bender Frank, 2000; Vereb & DiPerna, 2004), however in the multi-dimensional model of attitude strength, different types of prior experience, such as direct experience teaching children who demonstrate the characteristics of ADHD (direct experience, Fazio & Zanna, 1978), indirect experience with ADHD via in-service and pre-service teacher training (indirect experience, Eagly & Chaiken, 1998) and teachers' personal experience with ADHD (personal involvement, Thomsen et al., 1995), are seen as dimensions of an attitude's strength that act as antecedents of other dimensions, such as knowledge. The current study extended

Allport's (1935) definition of an attitude to models of attitude formation that position the experience variables as antecedents of strong attitudes.

A Model of the Origins of Attitude Certainty

Recent research on multi-dimensional models of attitude strength have focused on identifying how particular strength dimensions form and become strong. One of the most important and frequently researched dimensions is attitude certainty (Barden & Petty, 2008). Certainty is the level of confidence a person attaches to their attitude (Gross et al., 1995). Attitude certainty is important because attitudes held with high levels of certainty impact on behaviours more strongly than those with low certainty (e.g., Bizer, Tormala, Rucker, & Petty, 2006; Fazio & Zanna, 1978), they are more durable (e.g., Bassili, 1996) and show greater resistance to persuasion (e.g., Tormala & Petty, 2002; Wu & Shaffer, 1987). Low attitude certainty produces psychological aversion, which people are motivated to reduce (Gerard & Greenbaum, 1962). Research that identifies the origins of attitude certainty has theoretical and practical utility and will improve understanding of the psychological processes involved in forming, maintaining and changing attitudes, as well as predicting and intervening in attitudes, choices and behaviours (Tormala, Clarkson, & Henderson, 2011).

Several antecedents of attitude certainty have been suggested (e.g., Smith, Fabrigar, Macdougall, & Weisenthal, 2008; Tormala & Rucker, 2007) but understanding of their relationship with attitude certainty is far from established. For example, Smith et al. (2008) argue that although theory suggests informational sources, such as the volume of knowledge and amount of thought, should predict attitude certainty, mixed results have been reported. Similarly, empirical studies of the structural consistency of information have failed to clarify its relationship with attitude certainty (Smith et al., 2008). Structural consistency refers to the configuration of favourable and unfavourable valence of information about an attitude object (Chaiken, Pomerantz, & Giner-Sorolla, 1995). That is, information may be consistently

favourable or unfavourable, or it may have mixed valence. Consistent information is thought to lead to greater attitude certainty, while inconsistency is thought to lead to less attitude certainty (Smith et al., 2008). Thus, the research on objectively measured attitude strength dimensions as sources of attitude certainty has produced mixed results.

In their recent review of empirical research on attitude certainty, Tormala and Rucker (2007) argued that metacognitive appraisals (see Bassili, 1996), such as subjective ratings of thought quality and processing effort, are potential antecedents of attitude certainty. Metacognitive appraisals refer to thoughts about other thought processes, such as subjective ratings of thought quality and processing effort (Tormala & Rucker, 2007). For example, if a person perceives that they have thought a lot about a topic, irrespective of how much they have actually thought about it, then they are also likely to perceive themselves to be certain of their attitude. There remains confusion about the extent to which attitude certainty originates from objective cognitive/structural sources or subjective sources, or both (Tormala & Rucker, 2007). There is little understanding of how these dimensions relate to one another and of the psychological processes that underlie the process of forming attitude certainty (Holland, Verplanken, & Knippenberg, 2003).

The first study to test a multi-dimensional model of the antecedents of attitude certainty that clearly distinguished between objective and subjective attitude strength dimensions was by Smith et al. (2008). Subjective dimensions were often previously used as proxies for their objective counterparts or as manipulation checks, but Smith et al. placed them as mediators between cognitive/structural dimensions of attitude strength and attitude certainty. They hypothesised that subjective appraisals of attitude strength were more proximal sources of attitude certainty than structural and cognitive dimensions. They also hypothesised that subjective attitude strength dimensions may produce stronger correlations with attitude certainty than objective dimensions because they may have a joint impact

sourced from more than one objective dimension. For example, perceived amount of knowledge may be sourced from objective or actual knowledge as well as the actual amount of thought. Smith et al.'s model was chosen to inform the present research project as it was the first to test how multiple attitude strength dimensions combine to produce attitude certainty, rather than testing them in isolation, and its factorial design, as described next, ruled out possible reverse causality.

Smith et al. (2008) used a factorial design to manipulate the amount of information (i.e., amount of actual knowledge) provided about a novel construct, the amount of cognitive elaboration of the information and the structural consistency of the information. They measured the concomitant metacognitive attitude strength dimensions of perceived knowledge, perceived thought and perceived ambivalence. Results showed support for a causal model, whereby metacognitive dimensions of attitude strength acted as mediators of objective indices of attitude strength (i.e., actual knowledge, cognitive elaboration and structural consistency) to determine attitude certainty (see Figure 4.1, p. 115). Mediation refers to a sequence of causal relations by which an independent variable (*X*) affects a dependent variable (*Y*) by influencing an intervening, or mediator variable (*M*) (Hayes, 2009).

As shown in Figure 4.1 (p. 115), four full-mediational effects were present: (a) perceived knowledge mediated the relationship between amount of knowledge and attitude certainty; (b) perceived knowledge mediated cognitive elaboration and attitude certainty; (c) perceived ambivalence mediated structural consistency and attitude certainty; and (d) perceived ambivalence mediated amount of knowledge and attitude certainty (Smith et al., 2008). One partial mediation effect was also supported: Perceived thought mediated cognitive elaboration and attitude certainty, however the direct relationship between elaboration and attitude certainty was also significant.

These results aid understanding of the psychological processes by which informational factors and structural consistency influence attitude certainty (Smith et al., 2008). For example, they show that perceived knowledge is a more proximal source of attitude certainty than actual knowledge and that actual knowledge has no direct relationship with attitude certainty (Smith et al., 2008). Additionally, these results suggest possible reasons why attitude certainty impacts on attitude strength. For example, people who are highly certain of their attitudes may be more likely to base their behaviours on their attitudes because their high degree of perceived knowledge about the issue, which is based on the actual amount of information they have been exposed to and their actual amount of thought about that information, enables them to see the relevance of their behaviour (Smith et al., 2008).

Extensions to Smith et al.'s (2008) model.

While Smith et al.'s (2008) results develop understanding of how strong attitudes are formed, it is also important to test other potential antecedents and mediators of attitude certainty. For example, Holland et al. (2003) showed that when attitudes were perceived to be easily recalled and readily accessible, they led to greater attitude certainty compared to when they were perceived as difficult to access. Smith et al. suggested future research should explore whether perceived accessibility is another mediator in their model. They suggested that perceived accessibility may mediate the elaboration-attitude certainty relationship, as well as the structural consistency-attitude certainty relationship. To date, no published studies have tested these hypotheses.

Similarly, prior experience with an attitude object in the form of direct experience, indirect experience and personal experience (see above) are likely to influence attitude formation, and also attitude certainty. Smith et al. (2008) acknowledge direct experience may act as a potential antecedent of attitude certainty and suggest it should be added to their model. Direct experience and indirect experience are thought to impact on attitude certainty

by influencing volume of knowledge (Tormala & Rucker, 2007). The relationships between direct experience, indirect experience and attitude certainty would likely be mediated by perceived knowledge. No studies to date have tested these hypotheses.

Barden and Petty (2008) noted that causal inferences based on Smith et al.'s (2008) findings were limited because the impact of the distraction task they used to manipulate elaboration was not checked with a measure of objective elaboration. This critique can be extended to the other manipulated variables, in that measures of objective knowledge and objective ambivalence were not undertaken. While addition of these manipulation checks would improve the internal validity of the findings, perhaps the most important extension of Smith et al.'s laboratory experiment is that the findings have not yet been validated for attitudes formed in natural settings based on complex and real-life attitude objects.

Ecological Validity of Laboratory Derived Models

In their seminal guide to attitude theories and research, Eagly and Chaiken (1993) identified the lack of research on how attitudes form and become strong as a serious omission in attitude research. They stated that this limitation was in part due to the restrictions of laboratory experiments, in that “emotion-arousing, value-linked, behaviour-impelling attitudes” that are likely to be important in development of attitudes in natural settings, are difficult to create in a single laboratory session (Eagly & Chaiken, 1993, p. 681). In a recent analysis of 217 studies that reported both laboratory and field results from 82 meta-analyses (Mitchell, 2012), it was reported that laboratory and field effects in social psychology had the lowest correlation ($r = .53$) compared with other sub-fields in psychology (e.g., industrial organisational psychology, $r = .89$). Within social psychology, studies on the topics of social perception and cognition had the lowest correlation between laboratory and field results of ($r = .53$). Moreover, the majority of laboratory results that changed signs (i.e., from positive to negative or vice versa) in the field were from social psychology (Mitchell, 2012).

Specifically, 21 out of 80 (26.3%) social psychology studies changed signs between research paradigms. In comparison, only 1 of 22 (4.5%) studies changed signs in personality psychology, and 2 of 71 (2.8%) changed in industrial-organisational psychology (Mitchell, 2012). These findings demonstrate that Eagly and Chaiken's call for more extensive use of field research to supplement laboratory studies remains valid. The trade-offs for theory development between internal validity and external validity may be circumvented if both types of study contribute to research (Harackiewicz & Barron, 2004; Hovland, 1959).

Findings from the attitude strength literature provide an indication of how laboratory results may differ from those in more natural settings. Variables that have been found to impact on attitude strength, such as social context (Festinger, 1954; Petrocelli, Tormala, & Rucker, 2007; Visser & Mirabile, 2004), attentional processes (Tormala et al., 2011; Tormala & Rucker, 2007) and self-interest or personal importance (Eaton, Majka, & Visser, 2008; Holbrook, Berent, Krosnick, Visser, & Boninger, 2005), are likely to differ in the laboratory compared to those in field research. Laboratory settings lack the long-term relationships between people that are evident in natural settings, impression management is less likely in laboratories compared to natural settings, and information is presented via written documents, videos or audio files, which adds to the remoteness of relationships compared to face-to-face dialogue in natural settings (Eagly & Chaiken, 1993). Laboratory settings demand a constant, high level of attention to stimuli, participants are often asked to respond in the most "correct" way, and to decide quickly on their attitude toward novel stimuli (Eagly & Chaiken, 1993; Tormala et al., 2011; Tormala & Rucker, 2007). In contrast, in natural settings, attention is more variable (Eagly & Chaiken, 1993), attitudes are formed over longer time periods toward real and complex attitude objects, and they may be expressed repeatedly prior to being measured during research (Tormala et al., 2011). Self-interest or personal significance is also likely to be more prevalent in natural settings than in laboratory experiments in which

hypothetical attitude objects, of which participants have no prior experience, are used as stimuli.

Eagly and Chaiken (1993) called for use of samples other than psychology undergraduates to aid generalisation of results to the broader population. Due to their academic skills, college samples may be more likely to favour cognitive processes over affective processes when responding to research stimuli (Eagly & Chaiken, 1993). Such biases may be important when testing models of attitudes, such as the tripartite model described earlier, which contain cognitive and affective components. Application of attitude models to applied settings, such as education, enables more diverse samples to be tested. While recent research has focused on identifying the antecedents of attitude strength dimensions, including attitude certainty (e.g., Bizer et al., 2006; Haddock, Rothman, Reber, & Schwarz, 1999; Holland et al., 2003; Smith et al., 2008; Tormala et al., 2011), almost 20 years after Eagly and Chaiken's review, there remains a lack of research in applied settings.

Aim

The present research program had two aims, reflecting a perspective that bridged social, educational and clinical psychology. The aims and accompanying research questions are elaborated in the remainder of this chapter. The first aim was to provide a theoretical structure to applied research in the area of attitudes toward teaching children who exhibit the characteristics of ADHD. The present research program integrated models of attitude content and structure to provide a detailed and systematic analysis of teachers' attitudes toward ADHD. Each study forming the research program also drew on multi-dimensional models of attitude strength and included both operative and meta-attitudinal indices of attitude strength. This approach allowed identification of attitudes that may impact on teachers' roles in working with the children in question. The second aim addressed Eagly and Chaiken's (1993) call for research that tests the ecological validity of laboratory-derived models by applying a

multi-dimensional model of how attitudes form and become strong to samples of pre-service and in-service teachers. Specifically, Smith, Fabrigar, Macdougall and Weisenthal's (2008) model of the antecedents of attitude certainty was applied to teaching children with characteristics of ADHD, using both survey and experimental methods that tested and extended the scope of the model.

In order to achieve these aims a survey and experiment were conducted. Different aspects of the survey results are presented in Chapters 2, 3 and 4 of this thesis and each chapter builds on the findings of the previous one. Results from the experiment are reported in Chapter 4.

Research Objectives

Six research objectives stemmed from these broad aims and the results are reported in Chapters 2 to 4 in journal article format. The article presented as Chapter 2 has been published in a peer reviewed journal, and those presented in Chapters 3 and 4 have been submitted as separate articles to different journals. Chapter 2 reported the findings for the following research objectives:

1. To identify and describe the content, structure, and strength of pre-service teachers' and in-service teachers' attitudes toward teaching children showing characteristics of ADHD.
2. To identify whether in-service teachers and pre-service teachers differed in their knowledge and attitudes toward ADHD, thereby identifying the stage of teachers' careers in which their knowledge and attitudes were formed.

In Chapter 3 the construct of teachers' prior experience was refined by drawing on the multidimensional model of attitude strength to identify three types of experience with ADHD. The three types were (a) direct experience teaching a child with ADHD; (b) indirect experience gained via pre-service university courses, in-service training or the media; and (c)

personal experience with ADHD. These types of experience were conceptualised as dimensions of attitude strength. Chapter 3 reported results that addressed the following objective:

3. To identify how pre-service teachers' and in-service teachers' direct, indirect and personal experiences with ADHD were related to their knowledge of ADHD and their attitudes toward teaching children who exhibit characteristics of ADHD.

Chapter 4 applied and extended Smith et al.'s (2008) model of the origins of attitude certainty using experimental (Study 1) and survey (Study 2) procedures. The following objectives were addressed:

4. To test the external validity of Smith et al.'s (2008) model of attitude certainty on a real and complex attitude object (i.e., attitudes toward teaching children who exhibit the behaviours associated with ADHD) using both survey and experimental procedures.
5. To extend Smith et al.'s (2008) model by adding perceived accessibility of an attitude as another mediator in the model.
6. To extend Smith et al.'s (2008) model by adding direct, indirect and personal experience with ADHD as potential antecedents of attitude certainty.

Methodological Concerns

Methodological limitations in published literature are considered below for the purpose of identifying methodological concerns that are addressed in the studies reported in Chapters 2 to 4. This section is followed by an introduction to each chapter in which the purpose, methodology and theoretical base of each chapter are described.

Measurement of attitudes.

In their review of research on teachers' knowledge and attitudes toward ADHD, Kos et al. (2006) found that the existing number of studies worldwide on teachers' attitudes to ADHD was scant and they suffered from mixed results, problematic methodology and an atheoretical perspective (Kos et al., 2006). Several studies have measured teachers' knowledge about ADHD (i.e., knowing specific information about ADHD) and while some also claim to measure attitudes, they either do not differentiate between attitudes and knowledge (e.g., Hepperlen, Clay, Henly, & Barke, 2002; Jerome, Gordon, & Hustler, 1994), measure narrower constructs such as beliefs about medication (e.g., Kasten et al., 1992), or measure opinions about mainstream versus special education settings for children with ADHD (e.g., Brook, Watemberg, & Geva, 2000). One Australian study measured teachers' attitudes to ADHD (Bekle, 2004), albeit with a single item and small sample size. Other studies (e.g., Ohan et al., 2008; 2011) have measured teachers' expectations of children with ADHD, emotional responses to teaching these children, and intention to implement treatments, but these aspects were not conceptualised as attitude components.

The present research program addressed these concerns by drawing on attitude models to guide methodology. Thurstone (1928) acknowledged that attitudes are complicated, and stated "It will be conceded at the outset that an attitude is a complex affair which cannot be wholly described by any single numerical index" (p. 530). As described above, the present research used multiple methods of measurement. Global attitude toward teaching children with ADHD was rated on an attitude thermometer scale (Esses & Maio, 2002; Haddock & Zanna, 1998), where 0 represented an extremely unfavourable attitude and 100 represented an extremely favourable attitude. Thermometer scales correlate highly with multiple-item measures of attitudes, such as semantic differential scales (Haddock & Zanna, 1999; Stangor, Sullivan, & Ford, 1991). Global attitude is an example of a single component model of attitude content, and a uni-dimensional model of attitude structure. Components of attitude

content based on the tripartite model were also measured. Stereotypic and symbolic beliefs (Haddock & Zanna, 1999), affect and behaviour were assessed using open-ended responses and self-reported valence ratings (Esses & Maio, 2002; Haddock & Zanna, 1998).

Respondents listed their thoughts, emotions and past behaviours toward children who displayed the characteristics of ADHD and then rated each listed item along a favourable-unfavourable continuum. The present research extended the open-ended response method of measuring attitudes to a new population of interest, thus adding to its generalisation.

As noted above, use of a tripartite model of attitude content and bi-dimensional structure of attitudes allows measurement of attitudinal ambivalence (Maio & Haddock, 2004). In addition, the open-ended responses and self-rated valence data were used to calculate an objective measure of cognitive elaboration (by averaging the frequency of listed stereotypic and teaching beliefs) and objective ambivalence (using a formula provided by Esses & Maio, 2002, pp. 86-87). These objective measures of elaboration and ambivalence were used to check respective manipulations in the experiment, thus extending Smith et al.'s (2008) methods. Additionally, these measures were used to test Smith et al.'s model on survey data in Chapter 4, thus positioning objective elaboration and objective ambivalence as antecedents of attitude certainty in a multi-dimensional model of attitude strength.

Measurement of knowledge of ADHD.

Objective knowledge. The present research program also measured objective knowledge of ADHD by synthesising previous methodologies and extending them to pre-service and in-service teacher samples. Most surveys that measure teachers' knowledge of ADHD are based on one of two North American questionnaires: Jerome, Gordon and Hustler's (1994) 20-item untitled scale, or Sciutto, Terjesen and Bender Frank's (2000) 36-item Knowledge of Attention Deficit Disorders Scale (KADDS). Respondents to Jerome et al.'s questionnaire read statements regarding ADHD and respond either true or false and the

percent of correct answers is calculated. Sciutto et al. improved Jerome et al.'s methodology by including three response options; true, false and don't know, which reduced the chance of a respondent correctly guessing the answer. They also included three knowledge of ADHD subscales; (a) symptoms (b) general information and causes and (c) treatments. An Australian study by West, Taylor, Houghton and Hudyma (2005) extended Sciutto et al.'s scale to 67 items to improve the content validity of the scale. Sciutto et al.'s and West et al.'s results suggested teachers have differential knowledge of characteristics, causes and treatments regarding ADHD. Another Australian study, by Murray (2009), used a 27-item questionnaire that originated from both Sciutto et al.'s and Jerome et al.'s questionnaires to measure in-service teacher's knowledge of ADHD. Although this questionnaire was not designed with subscales and inferential analyses were not conducted due to methodological concerns, Murray described teachers as scoring more items correct in regard to characteristics of ADHD than treatments for ADHD. These previous studies suggest knowledge of ADHD is a heterogeneous construct and they support the use of subscales when measuring knowledge of ADHD. Use of subscales allows researchers to detect gaps and strengths in teachers' knowledge.

West et al.'s (2005) 67 item Knowledge about Attention Deficit Disorder Questionnaire (KADD-Q) was adapted for the research reported in this thesis because the items had been tested and developed in an Australian context. It was shortened to 33 items for the present research to maintain a reasonable overall length for the survey that would not be off-putting for very busy teachers. Eleven items for each for three subscales measuring characteristics, causes and treatments of ADHD were selected (see Appendix A). Items measuring characteristics of ADHD were selected if they pertained to behaviours exhibited in the classroom environment, while those for causes and treatments of ADHD were selected to include a broad range of content and to limit multiple items on similar content.

It appears that no studies to date have identified gaps and strengths in pre-service teachers' knowledge of the different components of ADHD (causes, characteristics and treatments of ADHD). Furthermore, no previous studies have tested knowledge of these specific components at various stages of pre-service teachers' careers, or compared them to in-service teachers' knowledge. Such research would help to identify the stage of teachers' careers during which their knowledge of characteristics, causes and treatments of ADHD develops, and would have implications for teacher training at both pre-service and in-service levels.

The objective measure of knowledge of ADHD was also used to examine how direct, indirect and personal experience with ADHD are related to knowledge of ADHD (Chapter 3). In addition, the questionnaire was used to check the manipulation of the amount of information provided to pre-service teachers in the experiment (Chapter 4), thereby addressing a limitation of Smith et al.'s (2008) research. The knowledge questionnaire scores were also used to test Smith et al.'s model on survey data, thus positioning objective knowledge as an antecedent of attitude certainty and testing the external validity of a laboratory derived model.

Perceived knowledge. A meta-attitudinal measure of knowledge of ADHD was also used in the present research. Perceived knowledge refers to participants' subjective ratings of their knowledge (Kos et al., 2004). Perceived knowledge, as well as objective knowledge, is likely to impact on teachers' decisions and behaviours in the classroom, affecting student outcomes. Discrepancies between teachers' objective levels of knowledge and perceived knowledge may lead to misguided decisions about behavioural management and pedagogical approaches, or mistakes in reporting children's symptoms and the effectiveness of treatments. Kos et al. (2004) previously used a 10cm visual analogue scale to measure perceived knowledge. The present research program used four items measuring perceived knowledge on

7-point Likert scales adapted from Smith et al. (2008) to suit teaching children with ADHD characteristics. The use of different methods to Kos et al. enables validation of findings.

In summary, the present research program integrated methodologies based on theories and research of attitude content, structure and strength, as well as applied research in education, to provide new information on attitude formation. The specific research questions, theories and implementation of the above methods in Chapters 2 to 4 are described below.

Chapter Outlines

Chapter 2: Knowledge of Attention-Deficit/Hyperactivity Disorder (ADHD) and attitudes toward teaching children with characteristics of ADHD: The role of teaching experience.¹

The research reported in Chapter 2 aimed to identify the stage of their career in which teachers acquire knowledge of ADHD and form attitudes toward teaching children who show characteristics of ADHD. Do knowledge and attitudes develop during formal academic training or as a product of classroom experience? Specifically, Chapter 2 tested whether pre-service teachers with and without practical experience in the classroom and in-service teachers differed in objective knowledge of ADHD, knowledge of aspects of ADHD (characteristics, treatments and causes), perceived knowledge, global attitude and cognitive, affective and behavioural components of attitudes. Survey data from pre-service and in-service teachers were used to test the above research questions. For the pre-service teachers, classroom experience included the record of placements in schools as part of their education degree or having previous or current experience as a teacher's aide. Classroom experience may be a source of information about ADHD and thus pre-service teachers with and without classroom experience were analysed as separate groups in Chapter 2.

¹ The journal article presented as Chapter 2 is published in a shorter version: Anderson, D.L., Watt, S.E., Noble, W., & Shanley, D.C. (2012). Knowledge of Attention Deficit Hyperactivity Disorder (ADHD) and attitudes towards teaching children with ADHD: The role of teaching experience. *Psychology in the Schools*, 49, 6, 511-525. doi: 10.1002/pits.21617

Chapter 2 examined knowledge and experience variables within a theoretical perspective based on the multidimensional model of attitude strength. Attitude strength dimensions include the extent of a person's knowledge about a topic (Wood et al., 1995) and the extent of their prior experience regarding the topic (Eagly & Chaiken, 1998; Fazio & Zanna, 1981). The multidimensional model of attitude strength also differentiates between objective measures of attitude strength (for example, measuring objective knowledge of ADHD using a scale based on empirically supported statements about ADHD) and subjective attitude strength (for example, measuring perceived knowledge of ADHD using Likert scales) (Bassili, 1996). The greater the extent of a person's objective and perceived knowledge and the more experience they have with a topic the more information they have to guide their evaluations and behaviour and thus their attitudes are stronger (Eagly & Chaiken, 1998; Wood et al., 1995). Chapter two uses objective knowledge, perceived knowledge and classroom experience as dimensions of attitude strength.

Chapter 2 also draws on models of attitude content and structure to address gaps in previous literature and provide a systematic approach to measurement of attitudes toward teaching children with characteristics of ADHD. Measuring global attitudes, as theorised by the uni-dimensional model, provides a broad overview of teachers' attitudes across their different levels of training and experience. Measuring the finer aspects of attitudes, such as beliefs, emotions and behaviours, as theorised by the tripartite model, provides a detailed analysis of these aspects of attitudes, including identification of ambivalent attitudes. Chapter 2 addresses both global attitudes and attitude components, providing the first comprehensive analysis of teachers' attitudes, as well as a cohesive framework based on models of attitude content and structure.

Chapter 3: Effects of teachers' experience on their knowledge and attitudes toward Attention-Deficit/Hyperactivity Disorder.

Chapter 3 extends Chapter 2 by undertaking a more refined analysis of different types of experience with ADHD. The aim of Chapter 3 was to identify types of experience that are important in the formation of pre-service and in-service teachers' knowledge of ADHD and attitudes toward teaching children who exhibit the characteristics of ADHD.

Chapter 3 draws on the multi-dimensional model of attitude strength to identify three types of prior experience with ADHD; direct experience teaching such a child (Eagly & Chaiken, 1993; Fazio & Zanna, 1981), indirect experience gained via secondary sources, such as pre-service or in-service training or the media (Eagly & Chaiken, 1998; Maio, Olson, Bernard, & Luke, 2003), and personal experience with ADHD. Personal experience was exemplified by knowing someone closely, such as a sibling or friend who had either received a diagnosis of ADHD, or who was believed to exhibit the characteristics of ADHD. Personal experience also referred to the person either having a diagnosis of ADHD, or believing that they exhibited the characteristics of ADHD. More experience, either direct, indirect, or personal, provides more information, which then affects future decisions and behaviours and thus leads to stronger attitudes (Eagly & Chaiken, 1998). Direct experience and training have previously been measured in the education literature, but the current program of research was the first to place them in a cohesive theoretical base. Chapter 3 conceptualised direct experience teaching children who express features of ADHD, indirect experience via training and personal experience with ADHD in a social psychological framework.

Chapter 3 used survey data to test whether direct experience, indirect experience and personal experience with ADHD were associated with differences in pre-service and in-service teachers' objective and perceived knowledge of ADHD and global attitudes to teaching children who express characteristics of ADHD. It was expected that pre-service teachers and in-service teachers who had more direct experience, more indirect experience, and more personal experience would have more objective knowledge of ADHD, more

knowledge of aspects of ADHD (characteristics, causes and treatments), more perceived knowledge and a more favourable overall attitude to teaching children with features of ADHD than those with less experience. Interaction effects of direct experience, indirect experience and personal experience were also explored. The current program extended the education literature by examining the influence of specific types of experience on knowledge and attitudes, while controlling for in-service teachers' extent of general teaching experience and pre-service teachers' age in years. Pre-service teachers' age, and the extent of in-service teachers' teaching experience were expected to significantly predict knowledge of and attitudes toward ADHD. Using pre-service and in-service samples allowed comparison of knowledge and attitudes across groups with increasing levels of experience, thus allowing identification of the stage of teachers' careers in which knowledge and strong attitudes were formed.

Chapter 4: A multi-dimensional model of the origins of attitude certainty:

Teachers' attitudes toward attention-deficit/hyperactivity disorder.

As noted above, a crucial question for researchers, theorists and practitioners, is whether laboratory-derived models hold in the real world (Eagly & Chaiken, 1993). The aim in Chapter 4 was to test and extend Smith et al.'s (2008) model of attitude certainty by applying it to attitudes toward teaching children who express characteristics of ADHD. In Smith et al.'s study, psychology student participants were provided with information about three departments in a hypothetical general store, such as listing the strengths and limitations of a camera department, a sporting goods department and a gardening supply department (e.g., the department sells a limited range of products). The amount of information provided about the store, the amount of cognitive elaboration, and the structural consistency of the information were manipulated. Participants then responded with their attitude toward the store and their responses to several attitude strength variables. The research reported in Chapter 4

investigated whether this model had external validity for a real and complex attitude issue and used samples of adults from a non-psychology population. It extends research reported in Chapters 2 and 3 by using survey and experimental designs, thereby moving from correlational to causal findings. It also develops theory by providing models of relations between various attitude strength dimensions that show how strong attitudes are formed.

In Chapter 4, the laboratory-derived model of the origins of attitude certainty tested by Smith et al. (2008) was applied to a real attitude object: Teaching children who express characteristics of ADHD. Study 1 in that chapter was an experiment which manipulated the amount of information, thought, and consistency of information delivered to pre-service teachers with no prior experience with ADHD. Structural equation modelling (SEM) was used to test whether relationships between attitude certainty and objective knowledge, thought and consistency were mediated by perceived knowledge, thought, and ambivalence. Study 2 in Chapter 4 tested and extended Smith et al.'s model on survey data from in-service and pre-service teachers. To test the model on survey data, objective measures of knowledge of ADHD, cognitive elaboration and ambivalence were used as antecedent variables of attitude certainty instead of manipulating them, as was done in the experiment. In addition, Study 2 tested whether the three types of experience with ADHD (direct, indirect, and personal) that were identified in Chapter 3, were additional antecedents of attitude certainty. Perceived accessibility was added to the model as a potential mediator.

The models tested in Chapter 4 extend Chapters 2 and 3 by testing objective knowledge of ADHD and ambivalence as antecedents of attitude certainty. They also test perceived knowledge and perceived ambivalence as potential mediator variables. Thus, in Chapter 4, variables reported in Chapter 2 and Chapter 3 were included in a multi-dimensional model of the formation of attitude certainty. Together, the experiment and survey

results reported in Chapter 4 investigate the psychological processes underlying strong attitude certainty.

Significance of the Research Program

The present research program focuses on attitudes to teaching children who exhibit the characteristics of ADHD and bridges the domains of educational, social and clinical psychology. It extends an area in education that has lacked theoretical guidance and systematic research (Kos et al., 2006). It tests and extends a social psychological model of attitude formation using an applied setting to supplement laboratory research, thereby helping to address a gap in validation of attitude strength theories (Eagly & Chaiken, 2003; Mitchell, 2012). The results will have practical application for teacher training in the area of special education. For example, results have potential to guide the quality and quantity of information and practical experiences provided by academic institutions and in-service teacher workshops. Results also have relevance for school psychologists in their support roles with teachers, parents and children. The research reported in this thesis is driven by the need to investigate complex attitudes in ecologically valid ways. If ecologically valid models of how attitudes form and become strong are developed, they may be applied more broadly to other topics of social concern in which opinions are polarised and there are large amounts of structurally inconsistent and multifaceted information. The research reported in this thesis pertains to the formation of complex, real-life attitudes and may generalise to other multifaceted, personally relevant attitude objects.

Chapter 2: Knowledge of Attention-Deficit/Hyperactivity Disorder (ADHD) and Attitudes toward Teaching Children with ADHD: The Role of Teaching Experience.

The following journal article was published in a shorter version to suit the journal's word limit as:

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**Chapter 3: Effects of Teachers' Experience on their Knowledge and Attitudes Toward
Attention-Deficit/Hyperactivity Disorder**

**Chapter 4: A Multi-Dimensional Model of the Origins of Attitude Certainty: Teachers'
Attitudes Toward Attention-Deficit/Hyperactivity Disorder**

Chapter 5: Summary and Conclusion

Summary and Conclusion

The research program reported in the previous chapters systematically investigated the formation of teachers' knowledge of ADHD and attitudes towards teaching children with characteristics of this disorder. Children with characteristics of ADHD are challenging to teach because they cause disruption in the classroom, have problems interacting with their peers, and often have other problems such as learning disorders, anxiety, depression and other developmental disorders (Ohan, Visser, Strain, & Allen, 2011). Teacher training courses, the media, classroom experience, and personal experience with ADHD, provide teachers with numerous sources of anecdotal evidence and more formal information about the causes, treatments and characteristics of ADHD. This results in many inconsistencies in information and demonstrates the complexity of attitude formation. To address the issue of how these complex attitudes develop, the present research used models of attitude content, structure and strength to investigate the formation of teachers' knowledge and attitudes regarding ADHD. It also applied a model of the formation of attitude certainty (Smith, Fabrigar, MacDougall & Wiesensthal, 2008) that was initially developed using hypothetical attitude objects, to a real and personally relevant attitude object, that is, attitudes toward teaching children who express the characteristics of ADHD.

The present research found that teachers' knowledge and attitudes develop during pre-service training, and also continue to change with increased classroom experience. While knowledge of ADHD generally increased with teaching experience, in some instances more experience was associated with weaker knowledge and more ambivalent attitudes. For example, teachers with more experience teaching children who express characteristics of ADHD and more personal experience, had weaker knowledge of treatments for ADHD than teachers with less experience. Strong attitudes were shown to develop via combinations of direct, indirect and personal experiences with ADHD, as well as the amount and structural

consistency of information and amount of thought about ADHD. The overall findings highlight the need to investigate such complex attitudes in ecologically valid ways.

In this final chapter, the broad aims, specific research objectives and key findings are revisited. The implications of the present results for attitude models, future research in education, and practice within education settings are discussed. The chapter concludes with discussion of how the present results and models may be usefully applied to broader contemporary social issues and other complex, multifaceted attitude objects.

Aims

The first aim was to provide a theoretical basis for applied research in the area of attitudes toward teaching children who exhibit the characteristics of ADHD. This would enable description of the content, structure and strength of pre-service and in-service teachers' knowledge of and attitudes to ADHD, and how these features change with increased teaching experience. The second aim was to test the ecological validity of a multi-dimensional model of how attitudes form and become strong and to extend the model's scope. Specifically, Smith et al.'s (2008) model of the antecedents of attitude certainty was applied to laboratory and field studies of in-service and pre-service teachers' attitudes to teaching children with characteristics of ADHD. Six research objectives stemmed from these broad aims and the results were reported in Chapters 2 to 4 in journal article format.

Research Objectives

Chapter 2. Chapter 2 reported survey results that tested differences in knowledge of ADHD and attitudes toward teaching children with characteristics of ADHD across three levels of teaching experience; (a) in-service teachers, (b) pre-service teachers who already had practical teaching experience, and (c) pre-service teachers without practical experience. Chapter 2 reported the findings for the following research objectives:

1. To identify and describe the content, structure, and strength of pre-service teachers' and in-service teachers' attitudes toward teaching children showing characteristics of ADHD.
2. To identify whether in-service teachers and pre-service teachers differed in their knowledge and attitudes toward ADHD, thereby identifying the period of teachers' careers in which their knowledge and attitudes were formed.

Summary of results. Results from Chapter 2 showed that as teachers gained experience in the classroom, their knowledge of ADHD increased. Specifically, in-service teachers had significantly more total objective knowledge of ADHD, higher perceived knowledge, and more knowledge of characteristics and treatments of ADHD, than both groups of pre-service teachers.

Results from Chapter 2 showed that for all teacher groups, overall attitudes toward teaching children with characteristics of ADHD were slightly favourable and significantly different from the mid-point, while average stereotypic and teaching beliefs were moderately unfavourable and significantly different from the mid-point. These beliefs and attitudes did not change significantly with increased teaching experience. Pre-service teachers with classroom experience and in-service teachers both had significantly unfavourable affect and significantly favourable past behaviours. Pre-service teachers without classroom experience reported slightly favourable affect, but this was not significantly different from the scale mid-point. Teachers with in-service experience reported more favourable behaviours toward children with ADHD than pre-service teachers with experience, but less favourable emotions compared to pre-service teachers without experience. Inter-component ambivalence was observed, especially in the in-service teacher sample, whereby negative beliefs and emotions were accompanied by positive past behaviours towards children believed to have ADHD.

Chapter 3. In this chapter the construct of teachers' prior experience was refined by drawing on the multidimensional model of attitude strength to identify three types of experience with ADHD. The three types were (a) direct experience teaching a child with ADHD; (b) indirect experience gained via pre-service university courses, in-service training or the media; and (c) personal experience with ADHD. These types of experience were conceptualised as dimensions of attitude strength. Chapter 3 reported results that addressed the following objective:

3. To identify how pre-service teachers' and in-service teachers' direct, indirect and personal experiences with ADHD were related to their knowledge of ADHD and their attitudes toward teaching children who exhibit characteristics of ADHD.

Summary of results. The results from Chapter 3 showed that pre-service teachers with personal experience had stronger perceived knowledge and knowledge of causes of ADHD than those without personal experience. Those with four or more instances of exposure to information via indirect experience had stronger objective knowledge (total and treatments) and stronger perceived knowledge than pre-service teachers with less indirect experience. In comparison, in-service teachers who had more direct experience perceived their knowledge as stronger than those with less direct experience. Indirect experience appears to compensate for in-service teachers' lack of personal experience in regard to their knowledge of causes of ADHD. However, personal experience and strong direct experience were associated with weaker scores for knowledge of treatments than those of teachers with less experience. This counterintuitive relationship may have been due to greater awareness of individual differences in responsiveness to treatments, and/or awareness of controversies about treatments.

The results showed that overall attitudes were positively and significantly related to in-service teachers' number of years of teaching experience after controlling for direct,

personal and indirect experiences. Pre-service teachers' age was positively and significantly associated with their overall attitude: after controlling for direct, indirect and personal experience, this relationship was non-significant.

Chapter 4. Chapter 4 applied and extended Smith et al.'s (2008) model of the origins of attitude certainty using experimental (Study 1) and survey (Study 2) procedures. The following objectives were addressed:

4. To test the external validity of Smith et al.'s (2008) model of attitude certainty on a real and complex attitude object (i.e., attitudes toward teaching children who exhibit the behaviours associated with ADHD) using survey and experimental procedures.
5. To extend Smith et al.'s (2008) model by adding the perceived accessibility of an attitude as another mediator in the model.
6. To extend Smith et al.'s (2008) model by adding direct, indirect and personal experience with ADHD as potential antecedents of attitude certainty.

Summary of results. Structural equation models (SEM) showed that Study 1 did not support the mediated relationships reported by Smith et al. (2008). Instead, the manipulated variables had moderated relationships with attitude certainty. The simple effects results implied that when there was a large amount of information available, attitude certainty depended on both the degree of elaboration and the structural consistency of the information. When the amount of information was low, the interaction of elaboration and structural consistency was not significant, and simple main effects showed high elaboration alone produced stronger attitude certainty.

In contrast, SEM analysis on the results from Study 2 partially supported Smith et al.'s (2008) model, and found that perceived knowledge fully mediated the relations between objective knowledge and attitude certainty. Other predictions based on Smith et al.'s results

were not supported, and unlike Study 1, no moderation effects were found. However, as discussed in more detail below, the results of Study 2 supported perceived accessibility as a mediator variable and the experience variables as antecedents of attitude certainty.

Contributions to Attitude Models and Attitude Measurement

Models of attitude content and structure. The research reported in Chapters 2 and 3 addressed Kos, Richdale and Hay's (2006) call for theoretically-driven research on teachers' knowledge of and attitudes toward ADHD. As noted above, the present research drew on social psychological models of attitude content, structure and strength to guide measurement of teachers' knowledge, attitudes and experiences in relation to ADHD. Thurstone (1928), one of the founders of attitude measurement, claimed that attitudes are too complex to measure using a single numerical index. Multiple methods of measuring attitudes were adopted in the present research. In Chapters 2 and 3, global, or overall attitude toward teaching children with ADHD, was rated on an attitude thermometer scale (Esses & Maio, 2002; Haddock & Zanna, 1998). Overall attitudes were based on a uni-dimensional model of attitude structure. In Chapter 2, the tripartite model of attitude content guided measurements of cognitive, affective and behavioural components of attitudes (Eagly & Chaiken, 1993; Zanna & Rempel, 1988). Stereotypic and symbolic beliefs (Haddock & Zanna, 1999), affect and behaviour were assessed using open-ended responses and self-reported valence ratings (Esses & Maio, 2002; Haddock & Zanna, 1998). The research reported in Chapter 2 extended the open-ended response method of measuring attitudes to a new population of interest, thus adding to generalisation of this method.

Use of the tripartite model of attitude content also allowed measurement of a bi-dimensional structure, whereby favourable and unfavourable evaluations can be held simultaneously (Eagly & Chaiken, 1993). This bi-dimensional structure allowed identification of ambivalence and its trajectory as teachers progress through their university studies and

teaching career. Pre-service teachers without classroom experience had negative beliefs and positive emotions. Both pre-service teachers with classroom experience and in-service teachers had negative beliefs and emotions, but positive past behaviours towards children they believed to have ADHD. Furthermore, ambivalence became stronger with increased classroom teaching experience. These results converge with those of Ohan, Cormier, Hepp, Visser and Strain (2008). While Ohan et al. did not conceptualise their findings within an attitude strength model, they found that teachers with higher knowledge of ADHD in comparison to those with lower knowledge, reported more helpful behaviours toward children with ADHD, believed these children would cause greater classroom disruption, and felt less confident in managing such children. Ohan et al. used different methods to measure beliefs, emotions and behaviours than the present research, thus their study adds convergent validity to the open-ended measures of attitude components. Future research on ambivalence in teachers' attitudes toward ADHD could usefully look at why unfavourable affect and beliefs develop, when at the same time, positive behaviours are reported. It may also be useful to identify different types of inter-component and intra-component ambivalence in teachers' attitudes so that strategies can be developed to assist them to cope in their roles with such children.

The results from Chapter 2 concerning attitudinal ambivalence suggest that single component models of attitudes are not able to detect the subtle aspects of attitudes towards multi-faceted issues such as ADHD. The lack of significant correlations of overall attitude with the attitude components and the total attitude component score suggest it is important to measure both overall attitude and attitude components, as they appear to be addressing separate constructs. Results from Chapter 3 showed that overall attitude was positively associated with the extent of teaching experience. This suggests that attitudes measured with broad scales, such as the thermometer scale, are associated with broad experiences, rather

than specific experiences, such as direct, indirect and personal experience. These results indicate the complexity of evaluation that is “summarised” by the concept of *attitude* and that casting a wide net by use of multiple measures is warranted.

The multi-dimensional model of attitude strength. The research reported in Chapters 2, 3 and 4 conceptualised teachers’ objective knowledge of ADHD, perceived knowledge, and experience with ADHD, as dimensions of attitude strength. The results reported in Chapters 3 and 4 were consistent with attitude strength literature that identifies direct experience, indirect experience (Eagly & Chaiken, 1998; Maio, Olson, Bernard, & Luke, 2003), and personal involvement (Eaton, Majka, & Visser, 2008; Holbrook, Berent, Krosnick, Visser, & Boninger, 2005; Thomsen, Borgida, & Lavine, 1995) as antecedents of strong attitudes. Results from Chapter 3 showed that in-service teachers’ direct experience, but not their indirect experience, was positively associated with perceived knowledge. This is consistent with literature that showed direct experience had more of an effect on other strength variables than indirect experience (Ajzen & Fishbein, 2000; Fazio & Zanna, 1981; Maio et al., 2003).

Applying the multi-dimensional model of attitude strength to the education literature is useful for understanding the relations between teachers’ experience, knowledge and other strength dimensions. This theoretical base also suggests the likely consequences of strong attitudes. For example, Krosnick and Petty (1995) found that strong knowledge was associated with stable attitudes that manifest in behaviours towards attitude objects. Thus, having strong knowledge of ADHD and perceiving oneself as having strong knowledge are likely to provide stable attitudes that manifest in behaviours and decisions toward children who display the characteristics of ADHD.

The results reported in Chapter 3 for pre-service and in-service teacher samples suggest that strong knowledge may form from different sources for populations with varying

degrees and types of experience. Strong knowledge appeared to develop via indirect experience when direct experience was not available, but as direct experience increased, strong knowledge depended on complex interactions among indirect, direct and personal experiences. Future research may benefit from developing models of strong knowledge in which populations with and without direct experience are catered for separately, or in which direct experience is a moderator variable.

Modelling the origins of attitude certainty. The results reported in Chapter 4 add to the literature on antecedents of attitude certainty and extend Smith et al.'s (2008) findings on this topic. The models tested in Chapter 4 identified subjective attitude strength variables as mediators of the relations between objective attitude strength variables and attitude certainty. As noted above, Study 1 did not support the predicted mediated relationships. Instead, the manipulated variables of amount of information and thought, and structural consistency interacted to impact on attitude certainty. These interactions were not included in the SEM analyses due to an inadequate sample size, so potential mediation effects may have been concealed.

In contrast, results from Study 2 supported mediated relationships but not moderated relationships, and found that direct, indirect and personal experiences with ADHD were additional antecedents of attitude certainty. It is notable that Study 2 showed that perceived accessibility mediated the relations between antecedents and attitude certainty. Having more training in ADHD, having taught more children believed to have ADHD, knowing more about ADHD, and thinking more about that information, were all associated with stronger perceived accessibility, which was positively associated with attitude certainty. Unlike Smith et al.'s (2008) results, perceived thought did not act as a mediator variable, suggesting that the psychological process of forming strong attitude certainty is acquired through perceived accessibility of the attitude, rather than perceived amount of thought.

Results from Study 2 also showed that perceived knowledge mediated the relations between attitude certainty and objective knowledge, and between attitude certainty and objective ambivalence. Stronger objective ambivalence was associated with stronger perceived knowledge, which was then associated with stronger attitude certainty. This counterintuitive result was similar to the simple effects results from Study 1, which found that when elaboration was prevented, high amounts of structurally inconsistent information led to stronger attitude certainty than consistent information. Together, Study 1 and Study 2 provide examples of high objective ambivalence being associated with stronger attitude certainty. In both instances, structural complexity may have been inferred as conveying accuracy of information, which then may have led to stronger attitude certainty (Rucker, Petty, & Briñol, 2008). The discrepant results between Study 1 (experiment) and Study 2 (survey) mirror Mitchell's (2012) meta-analysis findings, which found that laboratory and field effects in social psychology had the lowest correlation compared with other sub-fields in psychology. The implications for theory and research, as well as potential reasons for the different results across studies, were elucidated in Chapter 4 and are revisited below.

Implications for theory and research. Differences between hypothetical attitude objects and real-life attitude objects may explain the differences between Smith et al.'s (2008) study and the results of Study 1. Attitudes pertaining to real life, such as in Study 1, are likely to have more complexity and personal relevance than those evoked in an artificial scenario (Haslam & McGarty, 2004), such as that used by Smith et al. The ambivalence identified in Chapter 2 indicated that ADHD was an attitude object with complex bi-dimensional structure and multi-component content. Greater personal importance has been shown to promote attention, elaboration and memory for relevant information in laboratory conditions (Eaton et al., 2008; Holbrook et al., 2005). It has also been shown that people are not good at predicting emotions from various hypothetical situations (Wilson & Gilbert, 2005), thus hypothetical

scenarios are not likely to be good substitutes for real attitude objects that have affective elements, such as teaching children with characteristics of ADHD. Furthermore, attitudes formed by psychology students in response to hypothetical attitude objects may emphasise cognitive processes (Sears, 1986), such as abstract thinking (Ledgerwood & Callahan, 2012) and complex inferential thinking (Harmon-Jones, Peterson, & Harris, 2009), while attitude objects of personal significance are also likely to evoke emotional responses (Harmon-Jones et al., 2009).

This personal relevance and complexity of ADHD attitudes may have led to the complex interactions observed in Study 1. With complex attitude objects of personal relevance, attitude certainty reported under controlled laboratory settings may depend on combinations of antecedent variables working through complex non-linear relationships, such as moderated mediation or mediated moderation. With simpler hypothetical attitude objects that have little personal relevance or affective content, the relationships may be linear, as found by Smith et al. (2008). Future research can usefully test models of attitude strength on other attitude objects, so that the conditions in which different types of relationships occur (e.g., mediated vs. moderated) are identified. Future research could explore models where the products (i.e., interaction effects) of the three manipulated variables are additional antecedent variables that have indirect paths to attitude certainty through the subjective attitude strength mediators. Such research would increase understanding of how strong attitude certainty forms under various circumstances. In order to test moderated relationships or more complex models using structural equation modelling, very large samples would be required for results to be reliable (Kline, 2005).

Differences between the results of the experiment and survey may be accounted for by participants' differing degrees of prior experience, familiarity with teaching children with characteristics of ADHD, and the different stage and circumstances of attitude formation.

Tormala, Clarkson and Henderson (2011) found that the degree of familiarity with an attitude object and the stage and circumstances of attitude formation affected whether perceived speed of evaluation led to attitude certainty. Perception of slow evaluation promoted certainty with unfamiliar attitude objects, but perception of fast evaluation led to greater attitude certainty when objects were familiar (Tormala et al., 2011). The majority of participants in the present Study 2 had prior teaching experience as well as direct, personal and/or indirect experience with ADHD, whereas Study 1 sampled only education students who lacked any prior experience with ADHD. Study 1 participants formed their attitudes in the laboratory based on the information provided, while those in Study 2 formed their attitudes in natural settings over longer time periods. Laboratory settings demand a constant, high level of attention to stimuli, participants are often asked to decide quickly on their attitude toward novel stimuli (Eagly & Chaiken, 1993; Tormala et al., 2011; Tormala & Rucker, 2007) and do so in comparative social isolation (Eagly & Chaiken, 1993). In natural settings, attention is more variable than the laboratory (Eagly & Chaiken, 1993), attitudes are formed over longer time periods and they may be expressed repeatedly prior to being measured (Tormala et al., 2011). These differences in attentional and social processes, familiarity with the attitude object, and formation versus expression of attitudes may account for the different results of the laboratory and survey studies.

In summary, the discrepancies between the findings reported in Chapter 4 and those reported by Smith et al. (2008), coupled with the differences in results between Study 1 and Study 2, imply that different psychological processes may be relevant for each circumstance. Models of attitude formation should differentiate between participants' prior experiences and self-interest pertaining to the attitude object. Mediated relationships were found in circumstances where there was little self-interest in relation to an attitude object (e.g., Smith et al, 2008) and where self-interest was apparent but attitudes had already been constructed

over time and may have been readily accessed in memory (Study 2). When self-interest was evident for unfamiliar attitude objects and where attitudes were formed on demand in laboratory conditions (Study 1), moderated relationships were observed. Whether attitude objects are hypothetical, novel-real, or familiar-real, and the stage and conditions of attitude formation (i.e., elicited in the laboratory vs. formed over time in natural settings), may impact differentially on the nature of the psychological processes underlying the formation of strong attitudes. Future research should test these factors in laboratory and field settings by applying multi-dimensional models of the origins of attitude certainty about both hypothetical and real attitude objects. Research that develops models that have both internal and ecological validity would increase understanding of how strong attitude certainty forms and is maintained, and would enhance prediction and intervention in regard to attitudes, choices and behaviours (Tormala et al., 2011).

Limitations

Design limitations. The survey of pre-service and in-service teacher samples that informed Chapters 2, 3 and 4, was a cross-sectional design. Interpretations of results are thus limited to between group differences because individual differences were not controlled. Future researchers may consider longitudinal designs that repeatedly measure pre-service teachers' knowledge and attitudes from the beginning of their education studies through to working in schools as a classroom teacher, so that the development of knowledge of ADHD and attitudes toward teaching children who demonstrate its characteristic behaviours can be more rigorously measured by controlling for individual differences.

The experiment that informed Chapter 4 allowed causal statements to be made about the direct effect of the amount of information, amount of thought and structural consistency of information on the endogenous variable, attitude certainty, and mediator variables. The present study improved the design by using objective measures of knowledge, thought and

ambivalence as manipulation checks. However, a design limitation was that the mediator variables were not manipulated, and as such, causal statements could not be made about their relationships with attitude certainty. Future research could design such manipulations so that all of the paths in the model can demonstrate casual relations with attitude certainty.

Measurement limitations. Some limitations regarding measurement of objective knowledge of ADHD, objective ambivalence and attitude certainty were noted in previous chapters and are briefly revisited below.

Knowledge of ADHD. The questionnaire used to measure actual knowledge of ADHD in both the survey and experiment was a shorter version of West et al.'s, (2005) questionnaire. It was shortened to reduce repetitive content and to keep participation time practical. A potential limitation concerns the internal validity of the characteristics, causes and treatments subscales. While all three subscales had acceptable internal consistency ($> .73$) and validity of the characteristics subscale was supported by teachers with more experience scoring higher on this subscale than those with less experience, the mix of correct true-false answers across subscales was inconsistent. The treatment subscale had a mix of true and false correct answers. The majority of correct answers for the characteristics subscale were *true*, while for the causes subscale they were *false*. The different patterns of correct responses across subscales may confound results due to a response bias. Future research would benefit from developing subscales with a consistent number of true/false correct responses. Despite these methodological concerns, the use of subscales to measure knowledge of ADHD was supported and showed that subscales are useful to indicate strengths and gaps in knowledge.

Objective Ambivalence. Scores for objective ambivalence were calculated based on instructions from Esses and Maio (2002). In the survey for Chapter 4, results showed that objective ambivalence predicted attitude certainty, but unexpectedly, it did not predict perceived ambivalence. Concerns were raised in Chapter 4 about the construct validity of the

measure of objective ambivalence. It was based only on conflicted beliefs to align with Smith et al.,'s (2008) and the present experiments' manipulation of beliefs/cognition and not other components of attitudes, such as affect or behaviour. The measure of perceived ambivalence is likely to assess broader aspects of ambivalence than its objective counterpart, such as affective and behavioural conflict as well as cognition. In future research, objective scores for ambivalence may be improved by including affective and behavioural components as well as cognition (see Esses & Maio, 2002).

Attitude certainty. Chapter 4 measured attitude certainty using a single factor structure to enable replication of Smith et al.'s (2008) model. However, Petrocelli, Tormala and Rucker (2007) found support for two factors of attitude certainty: Attitude clarity, which is 'the subjective sense that one knows what one's attitude is', and attitude correctness, which is 'the subjective sense that one's attitude is correct' (p. 31). As explained in Chapter 4, the antecedents of attitude certainty are likely to impact on clarity and correctness in distinct ways. For example, structural consistency is likely to impact on attitude clarity, while correctness could be impacted by social context and perceiving that others to hold similar attitudes to one's own (see Visser & Mirabile. 2004). Petrocelli et al. provide suggestions for measuring clarity and correctness that future researchers may find useful.

Implications for Practice

Chapter 2 showed that as teachers gained experience in the classroom, their knowledge of ADHD increased moderately and significantly. These results are similar to previous Australian studies on total objective knowledge (Bekle, 2004; Kos, Richdale, & Jackson, 2004) and perceived knowledge (Kos et al., 2004).

Gaps in knowledge. The results reported in Chapter 2 found that in-service teachers knew more about characteristics and treatments of ADHD than pre-service teachers. These results imply that pre-service training programs need to increase information provided about

characteristics and treatments of ADHD in university course work and to foster practical placements in schools that provide the opportunity to teach children who exhibit the characteristics of ADHD. Knowledge of treatments was the lowest scoring knowledge subscale for in-service and pre-service groups. Although knowledge of treatments was stronger in pre-service teachers with more indirect experience (Chapter 3), the results suggest that there is neglect of this aspect of information about ADHD in university courses and in-service training. Treatment information is most likely not taught to teachers because, technically, they do not treat ADHD. However, while school psychologists devise behavioural interventions for ADHD and medical practitioners prescribe medication, teachers are often responsible for implementing and evaluating interventions for ADHD in the classroom (Ohan et al., 2008; Vereb & DiPerna, 2004). Teachers are the main carers of children during the school day, and as the facilitators of children's learning and development, teachers' roles include supervising and administering individual treatment plans for children diagnosed with ADHD. It is important that educational institutions and in-service trainers increase coverage in their courses of information about treatments for ADHD so that teachers know more about the interventions that they administer. These results also carry implications for school psychologists, who may be a vital link between medical practitioners and teachers in their role in conveying information about medication to teachers, and in helping teachers implement and monitor the effects of behavioural and medical interventions. Given the high likelihood that new graduates will teach a child diagnosed with ADHD in their first class, pre-service training institutes should foster development of sound knowledge of all aspects of ADHD prior to entry into a teaching career.

Pre-service teacher training. The results reported in Chapter 3 found that pre-service teachers' indirect experience, which included university courses on ADHD, was positively associated with knowledge of ADHD with moderate (objective knowledge) to large

(perceived knowledge) effect sizes. These results suggest that pre-service teacher training is an important source of information about ADHD. The experiment results reported in Chapter 4 showed that the amount of information provided to education students about teaching children with ADHD, the extent of elaboration of that information, and its structural consistency, all interacted to form attitude certainty. Stronger certainty is likely to lead to teachers' behaviours that are consistent with their attitude (Bizer, Tormala, Rucker, & Petty, 2006; Fazio & Zanna, 1978), attitudes that are not amenable to persuasion (Tormala & Petty, 2002; Wu & Shaffer, 1987) and are more durable over time (Bassili, 1996). Consistency in pedagogical practices and behavioural management strategies are likely outcomes of strong attitude certainty. Considering the unresolved controversies in the literature surrounding ADHD (e.g., Salmelainen, 2002; Wilens et al., 2008), it is likely that pre-service teachers will be exposed to information that is structurally inconsistent. Teacher trainers should ensure that education students have access to comprehensive, empirically sound information about ADHD. To achieve this, the amount of information needs to be substantial. Chapter 3 results found that four or more instances of exposure to information about ADHD was required to impact on objective knowledge and perceived knowledge of ADHD. Additionally, based on the findings reported in Chapter 4, learning experiences need to allow deep cognitive elaboration of the information so that strong attitudes are formed. Discussion lessons, whereby different viewpoints and concerns can be raised and discussed at length, or written essays that involve development of an argument that debates controversies in the literature, may be useful learning experiences that foster deep cognitive elaboration. Results from the survey reported in Chapter 4 showed that direct, indirect and personal experience with ADHD were antecedents of attitude certainty. These results imply that teacher trainers should provide favourable direct experiences, such as exposure to positive interactions with children diagnosed with ADHD during school placements, and favourable indirect experiences, such

as provision of information about how to manage dysfunctional behaviours and facilitate learning for children diagnosed with ADHD, so that strong and favourable attitudes are formed and the subsequent consequences for children are beneficial.

In-service teacher training. The results from Chapter 3 showed that in-service teachers' direct experience teaching a child with ADHD was associated with moderately and significantly higher perceived knowledge, but not objective knowledge. Thus, practical experience was not enough on its own to build comprehensive knowledge of ADHD. The moderate effect size and significant interaction showed that in-service teachers with personal experience and more direct experience scored lower on knowledge of treatments than less experienced teachers. This suggests that provision of comprehensive information about ADHD would assist teachers in processing mixed or controversial information.

As reported in Chapter 2, in-service teachers reported ambivalent attitudes towards teaching children with characteristics of ADHD. These teachers reported moderately unfavourable beliefs and affect, accompanied by moderately favourable behaviours. There is growing evidence that ambivalent attitudes are less stable over time, are less likely to guide information processing and behaviours, and are more pliable under persuasive communication than attitudes that are low in ambivalence (Armitage & Conner, 2000; Jonas, Broemer, & Diehl, 2000). Teachers who are ambivalent may therefore hold unstable attitudes and be inconsistent in their actions, decisions and evaluations in regard to children with characteristics of ADHD. Identification of ambivalence is important because such an attitude may have an unmeasured impact on academic and psychosocial outcomes for children with symptoms of the disorder and consequences for the teachers themselves. School psychologists could have a role in helping raise teachers' awareness of ambivalence and identifying and implementing coping strategies. The results of Chapter 3 showed that in-service teachers who had greater teaching experience held more favourable attitudes than teachers with less

teaching experience. This suggests that these experienced teachers could be beneficial as mentors for less experienced staff.

Broader Implications

The approach of the present research may be extended to application outside the field of education and ADHD. The focus on complex, real-life attitudes and the formation of attitude strength may generalise to other multifaceted attitude objects that have personal and practical relevance. Development of reliable and valid models of how attitudes form and become strong would be useful for understanding other social issues in which people are required to process large amounts of structurally inconsistent information. Many of the most important concerns faced by individuals in contemporary societies are those that are controversial, perplexing, tend to polarise opinions and have serious and enduring consequences. Topics such as global warming and climate change, asylum seekers, genetic engineering, organ donation, legalisation of marijuana, euthanasia and assisted suicide, abortion and same sex marriage, all require people to process large amounts of structurally inconsistent, multifaceted information.

Consider for example, the global warming debate. A search on Google (12th July 2012) for ‘climate change’ produced over 770 million results, while ‘global warming’ produced 319 million results, demonstrating the very large amount of information available about this topic on the internet alone. Much of the information about climate change is presented in the media as structurally inconsistent. For example, a content analysis of prestigious newspapers in the United States found that press coverage contributed to divergent popular discourse by giving equal space to the anthropogenic and non-anthropogenic sides of the global warming debate (Boycoff & Boycoff, 2004). For a person to be certain of their attitude about disputed topics such as global warming, they are faced with evaluating a vast array of information for its relevance and accuracy, and carefully considering both sides of the

debate. Development of multi-dimensional models of attitude certainty, such as the model presented in Chapter 4 of this thesis, may assist understanding of how people come to be certain in their attitudes about complex issues such as global warming. Such models of strong attitudes would assist accurate prediction of related behaviours (e.g., recycling household waste, voting for a carbon tax, installing solar power, or using car pools and bicycles to commute to work) and could also be used to inform creation of effective interventions aimed at assisting people to make decisions (e.g., about environmental policy or law). A clear understanding of how attitudes form and become strong will aid those involved in forming, maintaining and changing attitudes, and will foster attitudes that are stable, enduring, and that manifest in decisive action.

Conclusion

The initial impetus for this research project was the observation that teachers are exposed to numerous sources of inconsistent information about ADHD during their training, in the classroom, and from the media. The present research formed links between the domains of education and social psychology to investigate the development of teachers' knowledge of ADHD and their attitudes toward teaching children who exhibit the characteristics of the disorder. The content, structure and strength of these attitudes were modelled. The addition of a theoretical platform to the applied education literature offers systematic guidance to research on teachers' knowledge and attitudes regarding ADHD. The laboratory-derived models of attitude content, structure and strength were tested on a real attitude object, thereby adding to what is known about their ecological validity.

The results showed gaps in teachers' knowledge and increasing ambivalent attitudes as teachers gained classroom experience. Ambivalent attitudes were shown to accompany strong knowledge, and in some circumstances, strong attitude certainty. This suggests that when attitude objects have complex structure and multifaceted content, ambivalence may be an

indicator of attitude strength. The present results also supported direct, indirect and personal experiences as antecedents of knowledge and attitude certainty, and they showed perceived accessibility was a mediator of relations between these antecedent variables and attitude certainty. Mixed results from survey and experimental procedures, and in comparison to Smith et al.'s (2008) results, suggested that the process of attitude formation depends on: (a) the degree of prior experience with the attitude object, (b) whether the attitude object has personal and/or practical relevance, (c) the nature of the attitude object (i.e., hypothetical vs. novel-real vs. familiar-real), and (d) the stage and conditions of attitude formation (i.e., elicited in the laboratory vs. formed over time in natural settings). These results highlight the need to investigate such complex attitudes in ecologically valid ways. Research that establishes models that have both internal and ecological validity would increase understanding of how strong attitudes form and are maintained, and would enhance prediction and intervention in regard to attitudes, choices and behaviours. Such models have broad implications for attitudes toward complex and pressing social issues other than that of ADHD, such as global warming or genetic modification of crops.

In sum, the research reported in the previous chapters extends what is known about teachers' knowledge and attitudes in regard to ADHD. The findings carry implications for attitude theories, attitude research and its broad application, and practice in teacher training and school settings. The prevalence and salience of ADHD in school settings, and teachers' roles in facilitating children's academic and social development, make future research that systematically develops an understanding of how teachers' knowledge and attitudes forms and becomes strong as important. An understanding of these processes will cultivate teachers' strong knowledge and strong positive attitudes that will promote positive academic and psychosocial outcomes for children with characteristics of ADHD.

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Appendices

Appendix A

Adapted 33-item Knowledge of ADHD Questionnaire

- The correct answers are indicated by an “X”
- There are 3 subscales.
 - Characteristics (CH) (11 items) (items 3,7, 10, 15, 17, 19, 21, 25, 26, 30, 33)
 - Treatments (T) (11 items) (items 1, 2, 5, 8, 9, 16, 18, 20, 23, 27, 29)
 - Causes (C) (11 items) (items 4, 6, 11, 12, 13, 14, 22, 24, 28, 31, 32)

	TRUE	FALSE	DON'T KNOW
1. Following stimulant medication, children with ADHD may become highly anxious (e.g., crying or worrying excessively)	X (T)		
2. Providing a child with a firm male role model is an effective treatment for ADHD		X (T)	
3. Children who have ADHD tend to talk excessively in class	X (CH)		
4. ADHD is caused by ineffective discipline at home		X (C)	
5. Stimulant medication increases a child's ability to follow rules	X (T)		
6. ADHD is caused by an allergic reaction		X (C)	
7. Children who have ADHD tend not to finish their assignments	X (CH)		
8. Special diets (e.g., reduced sugar, wheat free, milk free, additive free) are an effective treatment for ADHD		X (T)	
9. Dietary supplements such as fish oils are an effective treatment for ADHD See below: current studies support use of fish oils as a treatment	X (T)		
10. Children who have ADHD tend to blurt out answers in class	X (CH)		
11. ADHD is caused by family problems		X (C)	

12. ADHD runs in families	X (C)		
13. ADHD is caused by a diet high in junk food		X (C)	
14. ADHD is caused by the inconsistent application of rules and consequences		X (C)	
15. Children who have ADHD tend to have difficulties following rules	X (CH)		
16. Following stimulant medication children with ADHD may experience tics (motor movements and uncontrolled vocal sounds)	X (T)		
17. Children who have ADHD tend to have poor handwriting	X (CH)		
18. Electroconvulsive therapy (ECT) is an effective treatment for ADHD		X (T)	
19. Children who have ADHD tend to be disorganized	X (CH)		
20. Stimulant medication reduces or suppresses appetite	X (T)		
21. Most children who have ADHD act impulsively (they do things without thinking)	X (CH)		
22. ADHD is caused by a child not trying hard enough to control his/her behaviour		X (C)	
23. Stimulant medication is addictive		X (T)	
24. ADHD is caused by excessive exposure to environmental substances such as lead		X (C)	
25. All children who have ADHD appear to be constantly on the go		X (CH)	
26. Children who have ADHD tend to have poor concentration	X (CH)		
27. Stimulant medication works within five minutes of taking it		X (T)	

28. ADHD is caused by inoculations		X (C)	
29. Homeopathic remedies are an effective treatment for ADHD		X (T)	
30. Children who have ADHD tend to have poor body posture (e.g. they appear to slouch, slump in their chair, or sprawl across their desk)		X (CH)	
31. ADHD is caused by food sensitivities		X (C)	
32. ADHD is caused by inconsistent parenting		X (C)	
33. Children who have ADHD tend to make careless errors	X (CH)		

Appendix B

Pre-service Questionnaire for Online Survey

1. Are you: Male or Female?
2. What age did you turn last birthday?
3. Are you training to be a Primary or Secondary school teacher?
Primary/Secondary
4. Which university do you attend? UNE/SCU
5. How many semesters of your education degree or diploma have you competed?
6. Have you completed any university units that covered information about ADHD? Yes/ No
7. If 'Yes', how many units have you completed that covered information about ADHD? _____
8. In the last year have you read or viewed any of the following that contained information about ADHD? Yes/No
9. In the last year have you read or viewed any of the following that contained information about ADHD? (please tick the responses that apply to you)
 Book
 Journal article
 Website
 Newspaper article
 Magazine article
 Television program
 Radio program
 Movie
 Other?
 Please specify.....
10. Have you ever worked as a teacher's aide or in a similar role in a school?
Yes/No
11. Have you completed any practice teaching units? Yes/No
 (If participants responded 'No' to question 10 and 11 the program automatically skipped to question 14; If participants answered 'Yes' to question 10 or 11 the program continued to question 12)
12. In your experience in schools did you teach any children who you believed had ADHD? Yes/No

(If participants answered 'No' to question 12 the program automatically skipped to question 14. If participants responded 'Yes' to question 12 the program continued to question 13):

13. Please estimate how many children you have taught who you believed to have ADHD

14. Below you will see something that looks like a thermometer. We would like you to use this thermometer to write a number between 0 and 100 in the box at the bottom of the page that shows your attitude toward teaching children who have ADHD.

If you have a favourable attitude you would provide a score somewhere between 50° and 100°. On the other hand, if you have an unfavourable attitude you would give a score somewhere between 0° and 50°.

You are not restricted to the numbers written on the thermometer – feel free to write any number between 0 and 100 in the box at the bottom of the page.

FAVOURABLE	100°	Extremely favourable
	-	
	90°	Very favourable
	-	
	80°	Quite favourable
	-	
	70°	Fairly favourable
	-	
	60°	Slightly favourable
	-	
	50°	Neither favourable nor unfavourable
	-	
	40°	Slightly unfavourable
	-	
	30°	Fairly unfavourable
	-	
	20°	Quite unfavourable
	-	
	10°	Very unfavourable
	-	
UNFAVOURABLE	0°	Extremely unfavourable

Please write a number between 0 and 100 to indicate your attitude toward teaching children who have ADHD:

The next set of questions asks you about your knowledge and attitudes towards ADHD. You need to circle a number on a scale that reflects the most accurate response for **you**. **There are no right or wrong answers.**

15. How much information do you feel you have about ADHD?

1 2 3 4 5 6 7

Very little

A great deal

16. How knowledgeable do you feel about ADHD?

1 2 3 4 5 6 7

Not at all
knowledgeable

Extremely
knowledgeable

17. How well informed are you about ADHD?

1 2 3 4 5 6 7

Completely
uninformed

Completely
informed

18. If you had to write a list of everything you knew about ADHD, how long a list could you produce?

1 2 3 4 5 6 7

Very short

Very long

19. How much have you thought about teaching children with ADHD?

1 2 3 4 5 6 7

Never

Very often

20. How carefully have you thought about teaching children with ADHD?

1 2 3 4 5 6 7

Not at
all carefully

Extremely
carefully

21. How much time have you spent thinking about teaching children with ADHD?

1 2 3 4 5 6 7

Very little

A great deal

22. When you think about teaching children who have ADHD to what extent are your reactions completely one-sided (i.e., positive or negative) versus mixed?

1	2	3	4	5	6	7
Completely one-sided				Completely mixed		

23. How much conflict do you experience when considering the good and bad aspects of teaching children who have ADHD?

1	2	3	4	5	6	7
No conflict at all				Extreme conflict		

24. To what extent are your evaluations about teaching children who have ADHD completely positive, mixed or completely negative?

1	2	3	4	5	6	7
Completely positive			Mixed			Completely negative

25. How certain do you feel about your attitude toward teaching children who have ADHD?

1	2	3	4	5	6	7
Not at all certain				Completely certain		

26. How confident do you feel that your attitude toward teaching children who have ADHD is correct?

1	2	3	4	5	6	7
Not at all confident				Very confident		

27. How easily does your attitude about teaching children who have ADHD come to mind?

1	2	3	4	5	6	7
Extremely difficult				Extremely easily		

28. How quickly does your attitude about teaching children who have ADHD come to mind?

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Extremely slowly						Extremely quickly

29. How often do you talk about teaching children with ADHD?

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Never						Daily/All the time.

Please turn the page

Following are a set of statements regarding ADHD. Some of these statements are true and some are false. We are interested in which statements you believe are true or false. For each statement in this section please select either TRUE, FALSE or DON'T KNOW to indicate your response.

It is important to select a response to every statement.

	TRUE	FALSE	DON'T KNOW
30. Following stimulant medication, children with ADHD may become highly anxious (e.g., crying or worrying excessively)			
31. Providing a child with a firm male role model is an effective treatment for ADHD			
32. Children who have ADHD tend to talk excessively in class			
33. ADHD is caused by ineffective discipline at home			
34. Stimulant medication increases a child's ability to follow rules			
35. ADHD is caused by an allergic reaction			
36. Children who have ADHD tend not to finish their assignments			
37. Special diets (e.g., reduced sugar, wheat free, milk free, additive free) are an effective treatment for ADHD			
38. Dietary supplements such as fish oils are an effective treatment for ADHD			
39. Children who have ADHD tend to blurt out answers in class			
40. ADHD is caused by family problems			
41. ADHD runs in families			
42. ADHD is caused by the inconsistent application of rules and consequences			
43. Children who have ADHD tend to have difficulties following rules			
44. Children who have ADHD tend to have poor handwriting			

	TRUE	FALSE	DON'T KNOW
45. Children who have ADHD tend to be disorganized			
46. Stimulant medication reduces or suppresses appetite			
47. Most children who have ADHD act impulsively (they do things without thinking)			
48. Stimulant medication is addictive			
49. ADHD is caused by excessive exposure to environmental substances such as lead			
50. All children who have ADHD appear to be constantly on the go			
51. Children who have ADHD tend to have poor concentration			
52. Stimulant medication works within five minutes of taking it			
53. ADHD is caused by inoculations			
54. Homeopathic remedies are an effective treatment for ADHD			
55. Children who have ADHD tend to have poor body posture (e.g. they appear to slouch, slump in their chair, or sprawl across their desk)			
56. ADHD is caused by food sensitivities			
57. ADHD is caused by inconsistent parenting			
58. Children who have ADHD tend to make careless errors			

Please turn the page

In this section of the questionnaire we want you to list your thoughts, feelings and actions toward teaching children who have ADHD. In this section of the survey there are 4 parts:

1. CHARACTERISTICS of typical children with ADHD
2. Your THOUGHTS about teaching children with ADHD
3. Your FEELINGS about teaching children with ADHD
4. Your ACTIONS in regards to teaching children who have ADHD.

Please note there are no right or wrong answers for this section of the questionnaire.

Please turn the page

59. CHARACTERISTICS of typical children with ADHD

We are interested in the characteristics that education students use to describe children with ADHD. Your task is to provide a description of typical children with ADHD. You may use single words or short phrases. Please provide a list of up to 12 words or short phrases as you need to accurately convey your impressions of a typical child who has ADHD. Please be honest. Your responses will be kept strictly confidential.

Children with ADHD are:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....
- 11.....
- 12.....

60. Please read back through the list you wrote for the previous question. Decide for each characteristic whether it is positive, negative or neutral as you have used it to describe typical children who have ADHD. Give your immediate first impression. Don't spend too much time on any one characteristic. Write a rating beside each word or phrase in the list above of how negative or positive each characteristic is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

61. Your THOUGHTS about teaching children with ADHD

We are also interested in education students' impressions of how teaching children who have ADHD impacts on the teaching process. Your task is to provide a list of up to 12 ways that **you** think children with ADHD impact on the teaching process. Please be honest. Your responses will be kept strictly confidential.

Children who have ADHD effect or may affect the teaching process in the following ways:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....
- 11.....
- 12.....

62. Please read back through the responses you wrote for the previous question. Decide for each response whether it is positive, negative or neutral as you have used it to convey your impression of the effect that children with ADHD have on the teaching process. Give your immediate first impression. Don't spend too much time on any one response. Write a rating beside each response of how negative or positive each effect is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

63. Your FEELINGS about teaching children with ADHD

We are interested in the feelings or emotions that you experience when you see, meet or think about teaching children who have ADHD. Your task is to provide a list of up to 12 feelings that you experience. Please be honest. Your responses will be kept strictly confidential.

When I think about teaching children who have ADHD, I feel:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....
- 11.....
- 12.....

64. Please read back through the responses you wrote for the previous question. Decide for each feeling whether it is positive, negative or neutral as you have used it to convey your emotions about teaching children with ADHD. Give your immediate first impression. Don't spend too much time on any one characteristic. Write a rating beside each response of how negative or positive each feeling is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

65. Your ACTIONS in regards to teaching children who have ADHD

We are interested in your actions or behaviours in regards to teaching children with ADHD. **If you do not have any experience teaching children who have ADHD then please go to the next page.**

Your task is to list up to 12 of your actions or behaviours in regards to teaching children with ADHD. Please be honest. Your responses will be kept strictly confidential.

In the past I have acted in the following ways when teaching a child with ADHD:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....
- 11.....
- 12.....

66. Please read back through the responses you wrote for the previous question. Decide for each action you listed whether it is a positive, negative or neutral action in regards to teaching children with ADHD. Give your immediate first impression. Don't spend too much time on any one characteristic. Write a rating beside each response of how negative or positive each characteristic is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

67. Do you believe that **you** have ADHD?

Yes/ No/Unsure

68. Have **you** been diagnosed with ADHD?

Yes/ No /Unsure

69. Do you believe that anyone close to you has ADHD? (such as your own child, a sibling, partner, parent, friend or work colleague)

Yes/ No/ Unsure

70. Has anyone close to you been diagnosed with ADHD?

Yes/ No/ Unsure

71. If you would like to add any other comments about ADHD or share your thoughts, feelings or experiences regarding ADHD, please do so here:

Thank you for sharing your thoughts and experiences with us.

Appendix C

In-service Questionnaire for Online Survey

1. Are you: Male or Female?
2. What age did you turn last birthday?
3. Are you a Primary or Secondary school teacher? Primary/Secondary
4. What years do you currently teach?
Kindergarten 1 2 3 4 5 6 7 8 9 10 11 12
5. Are you employed on a Full-time/ Part time/ or Casual basis?
6. For how many years have you been a teacher?
7. Have you ever taught a Special Education class? Yes/ No
If you answered 'Yes' for Question 7, for how many years have you taught a Special Education class?
8. Have you completed any university units that covered information about ADHD?
Yes/ No
If 'Yes', how many units have you completed that covered information about ADHD?

9. Have you ever completed in-service training on ADHD?
Yes/ No
If 'Yes', how many training courses have you completed? _____
10. In the last year have you read or viewed any of the following that contained information about ADHD? (please tick the responses that apply to you)
Book
Journal article
Website
Newspaper article
Magazine article
Television program
Radio program
Movie
Other? Please specify.....
11. Have you taught a child who you believed had ADHD?
Yes/ No
If you answered 'Yes' to Question 11 please estimate how many children you have taught who you believed had ADHD: _____

12. Below you will see something that looks like a thermometer. We would like you to use this thermometer to write a number between 0 and 100 in the box at the bottom of the page that shows your attitude toward teaching children who have ADHD.

If you have a favourable attitude you would provide a score somewhere between 50° and 100°. On the other hand, if you have an unfavourable attitude you would give a score somewhere between 0° and 50°.

You are not restricted to the numbers written on the thermometer – feel free to write any number between 0 and 100 in the box at the bottom of the page.

FAVOURABLE	100°	Extremely favourable
	-	
	90°	Very favourable
	-	
	80°	Quite favourable
	-	
	70°	Fairly favourable
	-	
	60°	Slightly favourable
	-	
	50°	Neither favourable nor unfavourable
UNFAVOURABLE	-	
	40°	Slightly unfavourable
	-	
	30°	Fairly unfavourable
	-	
	20°	Quite unfavourable
	-	
	10°	Very unfavourable
	-	
UNFAVOURABLE	0°	Extremely unfavourable

Please write a number between 0 and 100 to indicate your attitude toward teaching children who have ADHD:

The next set of questions asks you about your knowledge and attitudes towards ADHD. You need to circle a number on a scale that reflects the most accurate response for **you**. **There are no right or wrong answers.**

13. How much information do you feel you have about ADHD?

1 2 3 4 5 6 7

Very little

A great deal

14. How knowledgeable do you feel about ADHD?

1 2 3 4 5 6 7

Not at all
knowledgeable

Extremely
knowledgeable

15. How well informed are you about ADHD?

1 2 3 4 5 6 7

Completely
uninformed

Completely
informed

16. If you had to write a list of everything you knew about ADHD, how long a list could you produce?

1 2 3 4 5 6 7

Very short

Very long

17. How much have you thought about teaching children with ADHD?

1 2 3 4 5 6 7

Never

Very often

18. How carefully have you thought about teaching children with ADHD?

1 2 3 4 5 6 7

Not at
all carefully

Extremely
carefully

19. How much time have you spent thinking about teaching children with ADHD?

1 2 3 4 5 6 7

Very little

A great deal

20. When you think about teaching children who have ADHD to what extent are your reactions completely one-sided (i.e., positive or negative) versus mixed?

1	2	3	4	5	6	7
Completely one-sided			Completely mixed			

21. How much conflict do you experience when considering the good and bad aspects of teaching children who have ADHD?

1	2	3	4	5	6	7
No conflict at all			Extreme conflict			

22. To what extent are your evaluations about teaching children who have ADHD completely positive, mixed or completely negative?

1	2	3	4	5	6	7
Completely positive		Mixed		Completely negative		

23. How certain do you feel about your attitude toward teaching children who have ADHD?

1	2	3	4	5	6	7
Not at all certain			Completely certain			

24. How confident do you feel that your attitude toward teaching children who have ADHD is correct?

1	2	3	4	5	6	7
Not at all confident			Very confident			

25. How easily does your attitude about teaching children who have ADHD come to mind?

1	2	3	4	5	6	7
Extremely difficult			Extremely easily			

26. How quickly does your attitude about teaching children who have ADHD come to mind?

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Extremely slowly						Extremely quickly

27. How often do you talk about teaching children with ADHD?

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
Never						Daily/All the time.

Please turn the page

Following are a set of statements regarding ADHD. Some of these statements are true and some are false. We are interested in which statements you believe are true or false. For each statement in this section please select either TRUE, FALSE or DON'T KNOW to indicate your response.

It is important to select a response to every statement.

	TRUE	FALSE	DON'T KNOW
28. Following stimulant medication, children with ADHD may become highly anxious (e.g., crying or worrying excessively)			
29. Providing a child with a firm male role model is an effective treatment for ADHD			
30. Children who have ADHD tend to talk excessively in class			
31. ADHD is caused by ineffective discipline at home			
32. Stimulant medication increases a child's ability to follow rules			
33. ADHD is caused by an allergic reaction			
34. Children who have ADHD tend not to finish their assignments			
35. Special diets (e.g., reduced sugar, wheat free, milk free, additive free) are an effective treatment for ADHD			
36. Dietary supplements such as fish oils are an effective treatment for ADHD			
37. Children who have ADHD tend to blurt out answers in class			
38. ADHD is caused by family problems			
39. ADHD runs in families			
40. ADHD is caused by the inconsistent application of rules and consequences			
41. Children who have ADHD tend to have difficulties following rules			

	TRUE	FALSE	DON'T KNOW
42. Children who have ADHD tend to have poor handwriting			
43. Children who have ADHD tend to be disorganized			
44. Stimulant medication reduces or suppresses appetite			
45. Most children who have ADHD act impulsively (they do things without thinking)			
46. Stimulant medication is addictive			
47. ADHD is caused by excessive exposure to environmental substances such as lead			
48. All children who have ADHD appear to be constantly on the go			
49. Children who have ADHD tend to have poor concentration			
50. Stimulant medication works within five minutes of taking it			
51. ADHD is caused by inoculations			
52. Homeopathic remedies are an effective treatment for ADHD			
53. Children who have ADHD tend to have poor body posture (e.g. they appear to slouch, slump in their chair, or sprawl across their desk)			
54. ADHD is caused by food sensitivities			
55. ADHD is caused by inconsistent parenting			
56. Children who have ADHD tend to make careless errors			

In this section of the questionnaire we want you to list your thoughts, feelings and actions toward teaching children who have ADHD. In this section of the survey there are 4 parts:

1. CHARACTERISTICS of typical children with ADHD
2. Your THOUGHTS about teaching children with ADHD
3. Your FEELINGS about teaching children with ADHD
4. Your ACTIONS in regards to teaching children who have ADHD.

Please note there are no right or wrong answers for this section of the questionnaire.

Please turn the page

57. CHARACTERISTICS of typical children with ADHD

We are interested in the characteristics that teachers use to describe children with ADHD.

Your task is to provide a description of typical children with ADHD. You may use single words or short phrases. Please provide a list of up to 12 words or short phrases as you need to accurately convey your impressions of a typical child who has ADHD. Please be honest. Your responses will be kept strictly confidential.

Children with ADHD are:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....
- 11.....
- 12.....

58. Please read back through the list you wrote for the previous question. Decide for each characteristic whether it is positive, negative or neutral as you have used it to describe typical children who have ADHD. Give your immediate first impression. Don't spend too much time on any one characteristic. Write a rating beside each word or phrase in the list above of how negative or positive each characteristic is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

59. Your THOUGHTS about teaching children with ADHD

We are also interested in teachers' impressions of how teaching children who have ADHD impacts on the teaching process. Your task is to provide a list of up to 12 ways that **you** think children with ADHD impact on the teaching process. Please be honest. Your responses will be kept strictly confidential.

Children who have ADHD effect or may affect the teaching process in the following ways:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....
- 11.....
- 12.....

60. Please read back through the responses you wrote for the previous question. Decide for each response whether it is positive, negative or neutral as you have used it to convey your impression of the effect that children with ADHD have on the teaching process. Give your immediate first impression. Don't spend too much time on any one response. Write a rating beside each response of how negative or positive each effect is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

61. Your FEELINGS about teaching children with ADHD

We are interested in the feelings or emotions that you experience when you see, meet or even think about teaching children who have ADHD. Your task is to provide a list of up to 12 feelings that you experience. Please be honest. Your responses will be kept strictly confidential.

When I think about teaching children who have ADHD, I feel:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....
- 11.....
- 12.....

62. Please read back through the responses you wrote for the previous question. Decide for each feeling whether it is positive, negative or neutral as you have used it to convey your emotions about teaching children with ADHD. Give your immediate first impression. Don't spend too much time on any one characteristic. Write a rating beside each response of how negative or positive each feeling is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

63. Your ACTIONS in regards to teaching children who have ADHD

We are interested in your actions or behaviours in regards to teaching children with ADHD. **If you do not have any experience teaching children who have ADHD then please go to the next page.**

Your task is to list up to 12 of your actions or behaviours in regards to teaching children with ADHD. Please be honest. Your responses will be kept strictly confidential.

In the past I have acted in the following ways when teaching a child with ADHD:

- 1.....
- 2.....
- 3.....
- 4.....
- 5.....
- 6.....
- 7.....
- 8.....
- 9.....
- 10.....
- 11.....
- 12.....

64. Please read back through the responses you wrote for the previous question. Decide for each action you listed whether it is a positive, negative or neutral action in regards to teaching children with ADHD. Give your immediate first impression. Don't spend too much time on any one characteristic. Write a rating beside each response of how negative or positive each characteristic is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

65. Do you believe that you have ADHD?

Yes/ No/Unsure

66. Have you been diagnosed with ADHD?

Yes/ No /Unsure

67. Do you believe that anyone close to you has ADHD? (such as your own child, a sibling, partner, parent, friend or work colleague)

Yes/ No/ Unsure

68. Has anyone close to you been diagnosed with ADHD?

Yes/ No/ Unsure

69. If you would like to add any other comments about ADHD or share your thoughts, feelings or experiences regarding ADHD, please do so here:

Thank you for sharing your thoughts and experiences with us. Your valuable time and thoughtful responses are very much appreciated.

Appendix D

Summary of Key Results Provided to Survey Participants and School Principals

Teachers' and education students' attitudes to teaching children with attention-deficit/hyperactivity disorder (ADHD).

Researcher: Donnah Anderson, PhD candidate, University of New England.

The sample:

In total 454 people completed the survey (94 males and 360 females). 328 education students and 126 public school teachers took part. Education students were from University of New England ($N = 174$) and Southern Cross University ($N = 175$), and practicing teachers were from public schools in the North Coast and New England regions of NSW. The sample of education students consisted of 111 students who had no experience working in schools, while 217 students had either practice teaching experience or other experience, such as working as a teacher's aide. The average age of students was 30.48 years ($SD = 0.58$ years) and the average age of teachers was 40.99 years ($SD = 0.95$ years).

Findings:

Attitudes toward teaching children who have ADHD:

On average both teachers and education students rated their attitude toward teaching children with ADHD as favourable. On a 0-100 scale, where zero represented an extremely unfavourable attitude and 100 represented an extremely favourable attitude, participants' attitude scores ranged from zero to 100. Experienced teachers rated their attitude as slightly favourable ($M = 61.98$, $SD = 22.12$) and although the mean for education students was slightly higher ($M = 65.49$, $SD = 21.44$), the difference in attitude between teachers and education students was not statistically significant.

Knowledge about ADHD:

Participants completed a 33-item knowledge questionnaire about ADHD. Eleven items measured knowledge about characteristics of typical children with ADHD, another 11 items measured knowledge about treatments for ADHD and the remaining 11 items measured knowledge about causes of ADHD. Participants answered either *True*, *False* or *Don't know* for all 33 items. Participants scored one point for each item that they answered correctly, so the lowest possible score was zero and the highest was 33.00. Results showed that participants' total knowledge scores ranged from 1.00 to 31.00.

In general, experienced teachers' knowledge of ADHD ($M = 19.98$, $SD = 4.48$) was significantly higher than that of education students with no experience in schools ($M = 17.34$, $SD = 5.57$) and education students with some experience in schools ($M = 17.35$, $SD = 5.29$). Teachers' knowledge was higher than education students' knowledge as regards characteristics of ADHD and treatments for ADHD, but not as regards knowledge of what causes ADHD. That is, teachers and education students did not differ in their knowledge of what is known to cause ADHD, but they did differ in their knowledge about typical characteristics of a child with ADHD and what treatments are effective for ADHD. These differences suggest that as teacher's gain experience they also improve their knowledge of ADHD, especially as regards characteristics of typical children with ADHD and treatments for ADHD.

In general, participants knew most about causes of ADHD ($M = 7.31$, $SD = 2.78$), followed by knowledge about characteristics of children with ADHD ($M = 6.99$, $SD = 2.43$) and they knew least about treatments for ADHD ($M = 3.79$, $SD = 2.19$).

Practicing teachers' positive strategies for teaching students with ADHD

Below is a summary of strategies listed by experienced teachers of children they believed to have ADHD. The strategies are arranged in five categories, (1) Communication, (2) Research and knowledge, (3) Classroom and behavioural management, (4) Pedagogy, and (5) Strategies to help manage your own responses and emotions. These strategies were all rated positively by the teachers who used them.

Communication strategies

- maintain open communication with parents, the child and learning support team
- look at the child directly when speaking to them
- spend one-on-one time with student with ADHD
- refer the child and parents to the school counsellor
- be very direct and clear with instructions
- write down the instructions in steps for the child
- model behaviours and approaches for support staff
- spend time with the child outside the classroom if possible (e.g. lunch time)
- listen to the child
- try to connect with the child and develop rapport
- ask the child to repeat what they hear you say
- repeat instructions in various modes (verbal, write on board etc)
- sit with child and speak quietly
- advise the Principal if a student is not receiving medication appropriately
- speak clearly and slowly
- talk to the child about their life and interests
- make sure the child knows you like them but that you did not like their behaviour;
- give written reminder notes to the child
- write positive comments on reports
- explain ADHD to the rest of the class
- teach empathy and tolerance of diversity to the whole class

Research/knowledge strategies

- observe the child
- discuss strategies with health professionals and talk to the doctor on the phone
- consult with special education teachers, school counsellors and welfare teachers
- ask for advice from other teachers
- read student files
- read books and websites on ADHD
- read about classroom management for children with ADHD
- spend time thinking about the child, ADHD and what to do
- involve the student and parent in planning
- talk to the child's previous teacher to find out what worked
- attend workshops on ADHD and behaviour problems
- talk to parents and siblings in order to get an insight into the personality of the

student

Classroom & behavioural management strategies

- set simple and clear rules and instructions
- move the child to the front of the room
- seat the child with pupils who are focussed and will not distract him/her
- explain the rules carefully
- use the school disciplinary system
- follow school rules
- use consistent consequences and have a consistent approach to class discipline
- model behaviours and approaches for students
- use active play to help them use up their energy!
- talk to the child after the lesson about their behaviour and the teacher's expectations
- give rewards for good behaviour, such as praise
- have a seating plan
- avoid escalating conflict by defusing the situation
- inappropriate behaviours can quickly escalate if not carefully handled
- negotiate behaviours and consequences
- allow time out
- joke around with them
- ignore minor negative behaviour
- be better organised
- have a box in the classroom and all students place their books in this box at the end of the lesson
- sit near the child
- play games to get the class settled (e.g., Simon says)
- remind the child what they should be doing
- hold a class discussion about expected behaviours
- remove the child from the room when they are disruptive and defiant
- move around the classroom to keep an eye on the class
- remove privileges for off-task behaviour
- modify approaches in mid-stream to effect changes in behaviour
- take the class outside to expend extra energy
- move the child to a position where they can be reached quickly
- have an area of the room for quiet play and time out
- explain the consequences of misbehaviour
- have additional tasks ready for when they finish
- allow students to do things out of seats
- give them jobs to do to give them brief out-of-seat time
- allow partial attendance
- have a desk that is close to where the lesson is conducted - if a student is having trouble, have them sit there
- limit potential distractions for the child
- involve them in the lesson (ask them questions, give them jobs)

- allow them special privileges, like writing responses on the board
- give children and parents strategies for being more organised
- involve the child in the design of the day's plan
- develop visual rules
- plan time-out activities
- have a letter that is pasted in the front of their books which simply lists the requirements of the classroom
- give more structure to lessons (and less room for misbehaviour)
- use calming music during lessons to maintain a calm mood in the room
- used well-behaved children as examples of appropriate behaviour and praise them
- write on the board a list of things that should be done in the class and at the end of the lesson go through the list to make sure everyone has completed it
- use a whistle as a signal to stop, look at the teacher, and listen, instead of yelling
- "time-out" options - used as calming time
- create lots of checklists
- monitor the child's progress at short intervals
- devise strategies that could be used at home and at school
- leave them alone when they need it
- try to give as much one-on-one time while the task is being set up
- use visual timetables and visuals for rules
- don't make 'minor' infractions into major discipline issues
- learn what the child likes and responds to

Pedagogical strategies

- keep lessons short
- try to be specific and clear
- break the lesson into smaller steps
- plan lessons to engage the particular child
- set a clear structure
- write instructions down
- make lessons more physically active
- give individual support as needed during lessons
- repeat instructions as needed
- provide lots of variety in lessons to keep them occupied and interested
- use cues (visual and verbal) to get the student back on track
- set short-term goals
- ensure they have the right material
- find opportunities for kids to bring in their topics/ideas of interest
- re-write units to accommodate the child's needs
- repeat instructions in various modes (verbal, pictorial, write on board etc)
- give more time for assessment tasks
- restructure tasks they are struggling with
- at the end of each teaching cycle check their books and put rewards inside for

those who have completed all the work

- be available to help the child when tasks are multi-staged
- give hands-on practical tasks whenever possible
- give the student individualised work to do that they will enjoy
- use scaffolds to assist them in the completion of their work
- give easy tasks to build confidence and self esteem
- use Information and Computer Technologies (ICT) and media to attempt to engage them
- find things for them to do with their hands
- prepare work so student can achieve, particularly in practical areas
- for younger children, use toys to engage them in lessons
- for older children, have the student teach the class about something they are interested in
- teach social skills (e.g. turn-taking, listening, saying thank you/please)

Strategies for managing your own responses and emotions

- try to be calm
- take a sympathetic attitude
- be compassionate
- be positive and low key
- model behaviours and approaches for students
- be flexible
- try to ignore minor misbehaviours
- be kind and patient
- joking around helps keep the intensity down
- be understanding of where they are coming from
- try to treat the child fairly
- follow welfare & behaviour policy
- deal with difficult issues only when you are feeling calmer
- make an effort to seek the child out and get to know them
- enlist support of teacher's aides
- try to be more imaginative when planning lessons
- be very structured and well planned
- use a team approach to teaching
- drop expectations of how much could be done in a lesson
- try to build up the child's self-esteem
- focus on the positives and the child's strengths
- leave the room for a few minutes to regain one's cool
- give the child space
- more structure in teaching style
- get advice and debrief with the school counsellor
- debrief with staff and students
- set firm boundaries on some issues and pick battles on others
- ask the teacher's aide to give the child attention
- always remain calm and in control because children feel secure in a calm

environment

- encourage the child to do their best
- keep a sense of humour!
- practice selective deafness!

Appendix E

Statements about ADHD used in the Experiment

Set 1: Low amount of information provided (6 statements), high structural consistency, negative valence

- Doctors and scientists still do not know what causes ADHD
- Children who have ADHD tend to talk excessively in class
- Children who have ADHD tend to have difficulties following rules
- Following stimulant medication children who have ADHD may experience tics (uncontrolled motor movements and vocal sounds)
- Children who have ADHD tend to be quarrelsome
- Children who have ADHD tend to have poor concentration

Set 2: Low amount of information provided (6 statements), high structural consistency, positive valence

- Children from any walk of life can have ADHD
- Stimulant medication increases a child's ability to follow rules
- ADHD is caused by neurological impairments and it is not the child's fault
- Stimulant medication increases concentration
- Children who have ADHD are likeable children
- Teachers' use of behavioural management techniques with children who have ADHD, such as rewarding a child for good behaviour, is a powerful strategy to help meet a child's learning needs

Set 3: High amount of information provided (18 statements), high structural consistency, negative valence

- Doctors and scientists still do not know what causes ADHD
- Following stimulant medication, children who have ADHD may become highly anxious (e.g., crying or worrying excessively)
- Children who have ADHD tend to talk excessively in class
- Children who have ADHD tend to be accident prone
- Children who have ADHD tend not to finish their assignments
- Children who have ADHD tend to blurt out answers in class

- Children who have ADHD tend to have difficulties following rules
- Following stimulant medication children who have ADHD may experience tics (motor movements and uncontrolled vocal sounds)
- Children who have ADHD tend to engage in dangerous activities
- Children who have ADHD tend to have poor hand writing
- Children who have ADHD tend to be disorganised
- Most children who have ADHD act impulsively (they do things without thinking)
- Children who have ADHD tend to be quarrelsome
- Children who have ADHD tend to be inattentive
- Children who have ADHD tend to have poor concentration
- Adolescents who have ADHD are more likely than adolescents who do not have ADHD to receive a driving conviction
- Children who have ADHD tend to be verbally aggressive
- Children who have ADHD tend to make careless errors

Set 4: High amount of information provided (18 statements), high structural consistency, positive valence

- Children from any walk of life can have ADHD
- Children who have ADHD and take stimulant medication are less likely to become addicted to other drugs
- Stimulant medication increases a child's ability to follow rules
- Following stimulant medication, children who have ADHD are more able to pay attention
- Currently, a combination of medication and behaviour management are used to successfully manage ADHD
- Children who have ADHD are able to establish normal family bonds
- Following stimulant medication, children who have ADHD tend to experience improvements in their relationships with peers, parents and teachers
- ADHD is caused by neurological impairments and it is not the child's fault
- Children who have ADHD have potential just like any other child
- Parenting practices are not responsible for causing ADHD
- Stimulant medication is not addictive
- Slow-release stimulant medication needs to be taken only once during the school day

- Stimulant medication increases concentration
- Stimulant medication is the single most effective treatment of ADHD
- Behaviours associated with ADHD have been recognised by the medical profession for over one hundred years
- Children who have ADHD are likeable children
- Teachers' use of behavioural management techniques with children who have ADHD, such as rewarding a child for good behaviour, is a powerful strategy to help meet a child's learning needs
- Teachers can provide valuable information to parents and medical practitioners regarding the effects of medication on children and adolescents who have ADHD

Set 5: Low amount of information provided (6 statements), low structural consistency (i.e., mixed valence)

- Stimulant medication increases concentration
- Following stimulant medication children who have ADHD may experience tics (motor movements and uncontrolled vocal sounds)
- Children who have ADHD tend to be quarrelsome
- Children who have ADHD are likeable children
- Children who have ADHD tend to have difficulties following rules
- Teachers' use of behavioural management techniques with children who have ADHD, such as rewarding a child for good behaviour, is a powerful strategy to help meet a child's learning needs

Set 6: High amount of information provided (18 statements), low structural consistency (i.e., mixed valence)

- Children who have ADHD tend to talk excessively in class
- Children who have ADHD are able to establish normal family bonds
- Slow-release stimulant medication needs to be taken only once during the school day
- Following stimulant medication, children who have ADHD may become highly anxious (e.g., crying or worrying excessively)
- Doctors and scientists still do not know what causes ADHD
- ADHD is caused by neurological impairments and it is not the child's fault
- Children who have ADHD tend to blurt out answers in class

- Stimulant medication increases concentration
- Children from any walk of life can have ADHD
- Stimulant medication increases a child's ability to follow rules
- Following stimulant medication children who have ADHD may experience tics (uncontrolled motor movements and vocal sounds)
- Children who have ADHD tend to have poor concentration
- Children who have ADHD tend to make careless errors
- Children who have ADHD are likeable children
- Children who have ADHD tend to be quarrelsome
- Teachers' use of behavioural management techniques with children who have ADHD, such as rewarding a child for good behaviour, is a powerful strategy to help meet a child's learning needs
- Following stimulant medication, children who have ADHD tend to experience improvements in their relationships with peers, parents and teachers
- Children who have ADHD tend to have difficulties following rules

Appendix F

Pre-Testing of Statements about ADHD

Eleven third year psychology students pre-tested the valence and extremity of information sets by rating each of the 36 statements as either conveying a negative, positive or neutral tone in regard to children with ADHD. For 18 of the statements all of the participants provided the same judgement of valence. For the other 18 statements, the majority of dissenters rated the statement as neutral. The tendency for a few participants to rate some statements as neutral supported the goal to create mildly valenced information. None of the statements were deleted or altered.

To ensure that valence of information was comparable across high and low knowledge conditions participants rated the valence of each of the six sets of information on a 7-point Likert scale, where 1 represented ‘extremely negative’ and 7 represented ‘extremely positive’. Mean valence scores were calculated for the three low and three high sets of information. Sets with low amounts of information ($M = 3.88$, $SD = .71$) and sets with high amounts of information ($M = 3.88$, $SD = .69$) did not differ significantly in their valence, $t(10) = 0.00$, $p = 1.00$.

For the high structural consistency condition, tests were run to check that the extremity conveyed by the negatively valenced and positively valenced sets of information was equivalent. The absolute distance from each score to the midpoint of the 7-point Likert scale was calculated for the two negatively valenced sets (sets 1 and 3) and the two positively valenced sets (sets 2 and 4). Four dependent measures t-tests using a Bonferroni adjusted alpha of .0125 showed that the negative and positive sets of information did not differ significantly in their extremity. Set 1 ($M = 1.73$, $SD = .47$) did not differ significantly in extremity from set 2 ($M = 1.72$, $SD = 1.37$), $t(10) = .41$, $p = .69$, or from set 4 ($M = 1.81$, SD

$= 1.40$), $t(10) = -0.20$, $p = .846$. Similarly, set 3 ($M = 2.18$, $SD = .98$) did not differ significantly from set 2, $t(10) = 1.88$, $p = .089$, or from set 4, $t(10) = 1.08$, $p = .307$.

Appendix G

Questionnaire used in the Experiment

1. Are you: Male or Female? (please circle the correct response)
2. What age did you turn last birthday?.....
3. Are you training to be a Primary or Secondary school teacher? Primary/Secondary
(please circle the correct response)
4. Which university do you attend? UNE/SCU (please circle the correct response)
5. In the last year have you read or viewed any of the following that contained
information about ADHD? (Please circle all relevant responses and write how many
items you have read or viewed in the space provided)

Book	How many?.....
Journal article	How many?.....
Website	How many?.....
Newspaper article	How many?.....
Magazine article	How many?.....
Television program	How many?.....
Radio program	How many?.....
Movie	How many?.....
Other? Please specify.....	

Please turn the page and complete the next question

6. Below you will see something that looks like a thermometer. We would like you to use this thermometer to indicate your attitude toward teaching children who have ADHD based on the information you have just been provided with at the start of the study. Here's how it works: If you have a favourable attitude toward teaching children with ADHD, you would provide a score somewhere between 50° and 100°, depending on how favourable you are toward teaching children who have ADHD. On the other hand, if you have an unfavourable attitude toward teaching children who have ADHD, you would give them a score somewhere between 0° and 50°, depending on how unfavourable you are. The degree labels will help you to locate your attitude on the thermometer. However, you are **not** restricted to the numbers indicated – feel free to use any number between 0° and 100°. **Please be honest.** Your responses will be kept strictly confidential.

FAVOURABLE	100°	Extremely favourable
	-	
	90°	Very favourable
	-	
	80°	Quite favourable
	-	
	70°	Fairly favourable
	-	
	60°	Slightly favourable
	-	
	50°	Neither favourable nor unfavourable
	-	
	40°	Slightly unfavourable
	-	
	30°	Fairly unfavourable
	-	
	20°	Quite unfavourable
	-	
	10°	Very unfavourable
	-	
UNFAVOURABLE	0°	Extremely unfavourable

Please provide a number between 0° and 100° to indicate your attitude toward teaching children who have ADHD: _____

Please turn the page

The next set of questions asks you about your knowledge and attitudes in regards to ADHD.

You need to select a number on a scale that reflects the most accurate response for **you**.

There are no right or wrong answers.

7. How much information do you feel you have about ADHD?

1	2	3	4	5	6	7
Very little			A great deal			

8. How knowledgeable do you feel about ADHD?

1	2	3	4	5	6	7
Not at all knowledgeable			Extremely knowledgeable			

9. How well informed are you about ADHD?

1	2	3	4	5	6	7
Completely Uninformed			Completely informed			

10. If you had to write a list of everything you knew about ADHD, how long a list could you produce?

1	2	3	4	5	6	7
Very short			Very long			

11. How much have you thought about teaching children with ADHD?

1	2	3	4	5	6	7
Never			Very often			

12. How carefully have you thought about teaching children with ADHD ?

1	2	3	4	5	6	7
Not at all carefully			Extremely carefully			

13. How much time have you spent thinking about teaching children with ADHD?

1	2	3	4	5	6	7
Very little			A great deal			

14. When you think about teaching children who have ADHD to what extent are your reactions completely one-sided (i.e., positive or negative) versus mixed?

1	2	3	4	5	6	7
Completely one-sided			Completely mixed			

15. How much conflict do you experience when considering the good and bad aspects of teaching children who have ADHD?

1	2	3	4	5	6	7
No conflict at all			Extreme conflict			

16. To what extent are your evaluations about teaching children who have ADHD completely positive, mixed or completely negative?

1	2	3	4	5	6	7
Completely Positive		Mixed		Completely Negative		

17. How certain do you feel about your attitude toward teaching children who have ADHD?

1	2	3	4	5	6	7
Not at all			Completely			
Certain			certain			

18. How confident do you feel that your attitude toward teaching children who have ADHD is correct?

1	2	3	4	5	6	7
Not at all			Very			
Confident			confident			

19. How easily does your attitude about teaching children who have ADHD come to mind?

1	2	3	4	5	6	7
Extremely			Extremely			
difficult			easily			

20. How quickly does your attitude about teaching children who have ADHD come to mind?

1	2	3	4	5	6	7
Extremely			Extremely			
slowly			quickly			

21. How often do you talk about teaching children with ADHD ?

1	2	3	4	5	6	7
Never			Daily/All the time.			

Please turn the page

22. We are interested in the characteristics that education students use to describe children with ADHD. Your next task is to provide a description of typical children with ADHD. You may want to use single words or short phrases. Please write a list of as many words or short phrases as you need to accurately convey your impressions of a typical child who has ADHD. If you need to write a longer list than the spaces provided please continue your list below the lines or at the side of the page. Please be honest. There are no right or wrong answers. Your responses will be kept strictly confidential.

Children with ADHD are:

23. Please read back through the list you wrote for Question 22 (the previous question). Decide for each characteristic listed whether it is positive, negative or neutral as you have used it to describe typical children who have ADHD. Give your immediate first impression. Don't spend too much time on any one characteristic. Write a rating of how negative or positive each characteristic is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

24. We are also interested in education students' thoughts about how teaching children who have ADHD may impact on the teaching process. Your task is to provide a list of ways that **you** think children with ADHD may impact on your teaching process. Provide as many words or short phrases as you need to accurately convey your thoughts. If you need to write a longer list than the spaces provided please continue your list below the lines or at the side of the page. Please be honest. There are no right or wrong answers. Your responses will be kept strictly confidential.

Children who have ADHD may impact on my teaching process in the following ways:

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. There are no margins, text, or other markings on the paper.

25. Please read back through the list you wrote for Question 24 (the previous question). Decide for each response whether it is positive, negative or neutral as you have used it to convey your impression of the effect that children with ADHD may have on your teaching process. Give your immediate first impression. Don't spend too much time on any one characteristic. Write a rating of how negative or positive each characteristic is using the following scale:

1. If the characteristic is positive, write a (+) beside it. If it is very positive write two pluses (++) beside it.
2. If the characteristic is neutral write a (0) beside it.
3. If the characteristic is negative, write a minus (-) beside it. If it is very negative, write two minuses (--) beside it.

Please turn the page

This is the final section of the questionnaire. Following are a set of statements regarding ADHD. Some of these statements are true and some are false. We are interested in which statements you believe are true or false. For each statement in this section please select either TRUE, FALSE or DON'T KNOW to indicate your response.

It is important to select a response to every statement.

	TRUE	FALSE	DON'T KNOW
26. Following stimulant medication, children with ADHD may become highly anxious (e.g., crying or worrying excessively)			
27. Providing a child with a firm male role model is an effective treatment for ADHD			
28. Children who have ADHD tend to talk excessively in class			
29. Children diagnosed with ADHD tend to be accident prone			
30. Stimulant medication increases a child's ability to follow rules			
31. ADHD is caused by an allergic reaction			
32. Children diagnosed with ADHD tend not to finish their assignments			
33. Special diets (e.g., reduced sugar, wheat free, milk free, additive free) are an effective treatment for ADHD			
34. Dietary supplements such as fish oils are an effective treatment for ADHD			
35. Children diagnosed with ADHD tend to blurt out answers in class			
36. ADHD is caused by family problems			
37. ADHD runs in families			
38. Children with ADHD experience difficulties in establishing strong family bonds			

	TRUE	FALSE	DON'T KNOW
39. ADHD is caused by the inconsistent application of rules and consequences			
40. Children diagnosed with ADHD tend to have difficulties following rules			
41. Following stimulant medication children with ADHD may experience tics (motor movements and uncontrolled vocal sounds)			
42. Children diagnosed with an Attention Deficit Disorder tend to engage in dangerous activities			
43. Children diagnosed with ADHD tend to have poor handwriting			
44. Electroconvulsive therapy (ECT) is an effective treatment for ADHD			
45. Children diagnosed with ADHD tend to be disorganized			
46. Stimulant medication reduces or suppresses appetite			
47. Most children diagnosed with ADHD act impulsively (they do things without thinking)			
48. ADHD is caused by a child not trying hard enough to control his/her behaviour			
49. Stimulant medication is addictive			
50. ADHD is caused by excessive exposure to environmental substances such as lead			
51. All children diagnosed with ADHD appear to be constantly on the go			
52. Children diagnosed with ADHD tend to have poor concentration			
53. Stimulant medication works within five minutes of taking it			
54. ADHD is caused by inoculations			
55. Homeopathic remedies are an effective treatment for ADHD			

56. Children diagnosed with ADHD tend to have poor body posture (e.g. they appear to slouch, slump in their chair, or sprawl across their desk)			
57. ADHD is caused by food sensitivities			
58. ADHD is caused by inconsistent parenting			
59. Children diagnosed with ADHD tend to make careless errors			

If you would like to add any other comments about ADHD or comment on your experience participating in this research project, please do so here:

Thank you for completing this questionnaire. Your responses are very valued.

Appendix H

Assumption Tests for Chapter 4

Study 1: Following MacCallum, Browne and Sugawara's (1996) power tables for 72 degrees of freedom, $N = 168$ was needed for power of .80 and a close fit. Close fit refers to testing the null hypothesis that the model fits the population at $p < .05$ (MacCallum et al., 1996). The achieved sample size of 224 pre-service teachers was satisfactory. Multivariate normality, multicollinearity, linearity, homoscedasticity and multivariate outlier assumptions were met. Due to concerns about significant positive skewness at $p < .001$ for five variables, PK2 ($z_{\text{skew}} = 3.65$), C1 ($z_{\text{skew}} = 3.44$), C2 ($z_{\text{skew}} = 3.42$), PT1 ($z_{\text{skew}} = 3.78$), and PT3 ($z_{\text{skew}} = 4.06$), bias-corrected bootstrapped standard errors were used in the structural equation analyses (Byrne, 2001). The bootstrapped procedure is free of assumptions of normality and provides more accurate estimates of parameter values than parametric methods when there are non-normal variables (Byrne, 2001). All variables were left untransformed to maintain interpretability and to allow comparison to Smith et al.'s (2008) results.

Study 2:

Missing data: Combined sample. Data were collected from 327 pre-service teachers and 127 in-service teachers. Contrasts of missing cases (five cases on total knowledge, 63 cases on objective elaboration and objective ambivalence) versus complete cases on all the perceived attitude strength variables and total knowledge were non-significant ($p > .001$). Thus, data was Missing Completely at Random (MCAR) (Byrne, 2001; Kline, 2005). Considering the large sample size and MCAR evidence, the 63 cases with missing data, which included 5 cases with missing scores on total knowledge, were excluded from the analysis, leaving complete cases for 111 in-service teachers and 280 pre-service teachers.

Model 1 assumptions. Assumptions for univariate outliers, homoscedasticity and linearity were met. Exclusion of 11 multivariate outliers using Mahalanobis distances for 15

predictors, $p < .001$ (Tabachnick & Fidell, 2007), left a sample of 269 pre-service teachers, which had good statistical power (MacCallum et al., 1996). Due to concerns about normality (Mardia criterion for multivariate kurtosis, $z = 5.98$, PAM3, $z_{skew} = -8.61$) bias corrected bootstrapped standard errors were used in the analyses (Byrne, 2001). The variables were left untransformed to aid interpretability. A multicollinearity issue was detected. The items PK2 and PK3 were strongly correlated, $r(267) = .94$, $p < .001$, and loaded onto the smallest eigenvalue at .73 and .76, respectively. This was resolved by using the average of the two variables (abbreviated PK2a, see Table 2) in the SEM analyses (Tabachnick & Fidell, 2007). The final Durbin-Watson statistic was 2.06, which supported independence of errors among the endogenous variables.

Model 2 assumptions. Exclusion of 14 multivariate outliers detected using Mahalanobis distances for 19 predictors at $p < .001$, left a sample size of 366 (267 education students and 99 in-service teachers). Linearity assumptions were met, however heteroscedasticity was detected. Due to concerns about normality (direct experience, $z_{skew} = 17.92$, $z_{kurtosis} = 23.19$; personal experience, $z_{skew} = 6.98$; indirect experience, $z_{skew} = 5.10$; Mardia criterion for multivariate kurtosis, $z = 8.82$), bootstrapped bias corrected standard errors were used (Byrne, 2001). The variables were left untransformed to aid interpretability. The items PK2 and PK3 were strongly correlated, $r(364) = .93$, $p < .001$, and loaded onto the smallest eigenvalue at .77 and .75, respectively. The average of these two variables was used in the SEM (PK2a).

Appendix I

Chapter 4, Study 1 (Experiment): Zero-order Correlations Between Predictor Variables, Potential Mediating Variables and Attitude Certainty with Descriptive Statistics

		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>
1.	C1	1.00														
2.	C2	.74**	1.00													
3.	PK1	.74**	.74**	1.00												
4.	PK2	.75**	.74**	.69**	1.00											
5.	PK3	.70**	.71**	.71**	.67**	1.00										
6.	PK4	.68**	.65**	.60**	.70**	.58**	1.00									
7.	PT1	.63**	.66**	.54**	.59**	.52**	.49**	1.00								
8.	PT2	.65**	.67**	.58**	.58**	.55**	.52**	.74**	1.00							
9.	PT3	.63**	.59**	.56**	.53**	.53**	.46**	.66**	.75**	1.00						
10.	AMB1	-.19**	-.29**	-.24**	-.19*	-.19*	-.13*	-.19**	-.15*	-.19**	1.00					
11.	AMB2	-.26**	-.34**	-.30**	-.29**	-.26**	-.22*	-.29**	-.23*	-.27**	.54**	1.00				
12.	AMB3	-.06	-.07	-.04	-.12	-.02	-.02	-.04	-.01	-.07	.33**	.39**	1.00			
13.	Amount of information	.32**	.33**	.49**	.43**	.42**	.49**	.10	.15*	.06	-.06	-.15*	.04	1.00		

Appendix I continued.

		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>
14.	Amount of elaboration	.56**	.59**	.51**	.54**	.58**	.43**	.72**	.74**	.74**	-.16*	-.19**	.10	.00	1.00	
15.	Structural consistency	.20**	.23**	.24**	.24**	.15*	.15*	.17*	.10	.17*	-.55**	-.57**	-.58**	.00	.00	1.00
	<i>M</i>	2.7	2.7	2.7	2.6	2.6	2.6	2.8	2.7	2.4	3.9	3.5	4.7	--	--	--
	<i>SD</i>	1.4	1.4	1.3	1.2	1.1	1.3	1.5	1.5	1.4	1.6	1.5	1.7			

Note. Abbreviations for the variables are shown in the materials section of Chapter 4.

Appendix J

Chapter 4, Study 2 Survey: Zero-order Correlations Between Predictor Variables, Potential Mediating Variables and Attitude Certainty for Pre-service Teachers (above the diagonal) and Combined In-service and Pre-service Sample (below the diagonal) with Descriptive Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. C1	1.00	.72**	.46**	.48**	.48**	.52**	.42**	.55**	.44**	-.08	-.21**	-.43**	.60**	.54**	.32**	.08	.17**	.24**	.29**	.19**
2. C2	.71**	1.00	.48**	.48**	.48**	.47**	.29**	.46**	.32**	-.04	-.29**	-.29**	.59**	.52**	.26**	.03	.18**	.19**	.21**	.21**
3. PK1	.49**	.49**	1.00	.87**	.89**	.80**	.51**	.55**	.52**	-.06	-.02	-.20**	.38**	.37**	.42**	.11	.18**	.32**	.44**	.24**
4. PK2	.51**	.51**	.87**	1.00	.93**	.84**	.52**	.58**	.53**	-.05	-.01	-.21**	.41**	.36**	.47**	.09	.19**	.31**	.39**	.27**
5. PK3	.52**	.51**	.88**	.94**	1.00	.84**	.53**	.58**	.54**	-.08	.01	-.21**	.40**	.39**	.47**	.07	.16**	.32**	.41**	.29**
6. PK4	.50**	.46**	.79**	.83**	.84**	1.00	.54**	.60**	.56**	-.07	-.00	-.26**	.44**	.45**	.44**	.15*	.20**	.34**	.45**	.36**
7. PT1	.44**	.34**	.53**	.54**	.55**	.56**	1.00	.81**	.86**	-.03	.08	-.28**	.44**	.36**	.27**	.21**	.09	.28**	.40**	.23**
8. PT2	.55**	.47**	.56**	.60**	.61**	.62**	.82**	1.00	.86**	-.04	-.01	-.33**	.55**	.46**	.29**	.23**	.11	.33**	.42**	.25**
9. PT3	.43**	.33**	.53**	.53**	.54**	.57**	.84**	.85**	1.00	.01	.10	-.24**	.43**	.36**	.29**	.22**	.06	.32**	.43**	.26**
10. PAM1	-.09	-.05	.00	.01	-.01	-.00	-.01	.01	.02	1.00	.30**	.38**	-.09	-.15*	-.08	-.08	.06	.06	.04	.02
11. PAM2	-.27**	-.34**	-.06	-.06	-.04	-.02	.03	-.03	.05	.35**	1.00	.38**	-.16**	-.19**	.01	.02	-.00	-.10	.12	.03
12. PAM3	-.44**	-.29**	-.19**	-.18**	-.19**	-.21**	-.25**	-.29**	-.20**	.41**	.37**	1.00	-.34**	-.43**	-.09	-.21**	.01	-.15*	-.06	-.07
13. PAC1	.62**	.59**	.43**	.43**	.43**	.44**	.44**	.55**	.43**	-.09	-.21**	-.38**	1.00	.78**	.29**	.15*	.12	.22**	.24**	.17**
14. PAC2	.55**	.51**	.39**	.37**	.39**	.42**	.37**	.47**	.36**	-.12*	-.21**	-.44**	.79**	1.00	.22**	.13*	.10	.15*	.20**	.17**
15. Total	.36**	.29**	.44**	.49**	.49*	.45**	.31**	.34**	.32**	-.01	.00	-.14**	.33**	.28**	1.00	.06	.06	.18**	.20**	.19**
Knowledge																				
16.	.11*	.06	.16**	.13*	.12*	.20**	.25**	.28**	.26**	-.00	.05	-.15**	.17**	.16**	.12*	1.00	.04	.09	.11	.05
Elaboration																				
17. Observed	.07	.12*	.05	.05	.02	.07	.01	.00	.00	-.08	-.06	.02	.03	.03	-.03	.01	1.00	.13*	.00	.15*
Ambivalence																				

Appendix J continued.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
18. Direct Experience	.32**	.26**	.32**	.32**	.35**	.30**	.28**	.37**	.29**	.11*	-.05	-.15**	.25**	.23**	.22**	.12*	-.09	1.00	.16*	.16**
19. Indirect Experience	.28**	.23**	.43**	.36**	.39**	.43**	.36**	.38**	.38**	.10	.07	-.02	.22**	.20**	.26**	.18**	-.04	.16**	1.00	.08
20. Personal Experience	.16**	.21**	.24**	.25**	.27**	.32**	.19**	.20**	.21**	.04	.04	-.04	.15**	.14**	.13*	.06	.11*	.06	.10	1.00
Pre-service teachers:																				
<i>M</i>	4.2	4.1	3.8	3.6	3.5	3.4	4.2	3.9	3.6	4.5	3.7	5.7	4.6	4.6	17.5	7.5	21.7	2.1	3.1	0.7
<i>SD</i>	1.6	1.6	1.7	1.4	1.5	1.6	1.6	1.7	1.7	1.5	1.4	1.7	1.4	1.3	5.3	5.3	7.4	3.8	2.3	0.9
Combined sample:																				
<i>M</i>	4.4	4.1	3.9	3.8	3.7	3.5	4.3	4.2	3.8	4.6	3.7	5.7	4.7	4.7	18.2	7.6	21.1	4.9	3.5	0.7
<i>SD</i>	1.6	1.4	1.6	1.4	1.5	1.5	1.6	1.6	1.7	1.6	1.5	1.8	1.4	1.3	5.3	3.2	7.4	7.6	2.4	0.9

Note. Abbreviations for the variables are shown in the materials section of Chapter 4.