THE DIAGNOSIS OF ADHD AND ITS IMPLICATIONS

A Project

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MASTER OF SOCIAL WORK

by

Leidy Hernandez

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THE DIAGNOSIS OF ADHD AND ITS IMPLICATIONS

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Leidy Hernandez

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Division of Social Work
Abstract

of

THE DIAGNOSIS OF ADHD AND ITS IMPLICATIONS

by

Leidy Hernandez

This study focused on exploring factors related to misdiagnosis of children with ADHD from the perspectives of professionals (N=25) who work in the mental health settings. Study sample was a non-probability convenience sample recruited by the researcher. The study found that the majority of the participants perceived misdiagnosis as a common occurrence due to widely prevalent confusion between ADHD and other disorders. Independent samples t-test revealed that between the groups of professionals who felt the existence of misdiagnosis and the group that did not perceive misdiagnosis there was mean difference on the number of years of their practice and this mean difference was 10.23. However, this mean difference was not statistically significant (p=.09). Another significant finding was that the association between the reliability of measurements in the diagnosis of ADHD and the professional qualifications of the respondents and this association was strong (Cramer’s V= .698) which is statistically significant at p< .01. Additional reasons for misdiagnosis revealed through clinician’s suggestions and responses to open ended questions include the clinicians’ lack of training on differentiating ADHD from other disorders, inaccurate assessments completed by clinicians, lack of treatment for
preexisting conditions, and pressures from pharmaceutical and licensing companies to obtain a diagnosis. The majority of the therapists stated that a variety of disorders overlap and/or are comorbid with ADHD such as, anxiety, depression, bipolar disorder, oppositional defiant disorder, post-traumatic stress disorder with the likelihood of incorrectly diagnosing and providing treatment to children. The study concluded with therapists’ recommendations to help improve the current training that graduate students receive. Some of the recommendations that were made by the participants were: providing future professionals more extensive clinical practice in a one-to-one setting with children, increasing the understanding of the current assessment tools that are available, understanding the symptoms associated with ADHD and other mental health disorders, and providing training through additional class curriculum that focuses on properly assessing, diagnosing, and providing treatment to children.

_____________________, Committee Chair
Jude Antonyappan, Ph.D.

_____________________
Date
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I would like to acknowledge all therapists whose participation in this study has allowed me to expand on the understanding of ADHD and its diagnosis and has given me the opportunity to shed light on a topic that needed further research and is personally fulfilling.

I would also like to thank my advisor, Jude Antonyappan for helping me through the journey and completion of my project. The wisdom and dedication that she gave to the project facilitated the process and despite the tough times, her support allowed me to get to the end of this passage.

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Chapter 1

INTRODUCTION

The diagnosis of Attention Deficit Hyperactivity Disorder in children is widely controversial because of the recent increase of children being diagnosed with the disorder and then medicated. Research on the topic has been conducted but there are questions about its diagnosis, the assessments used to diagnose children, and the training that professionals receive to properly diagnose and provide treatment to children. This study will focus on therapists’ perspectives on the diagnosis of ADHD and its implication for children, in order to expand on the current understanding that exists on this topic. This chapter will focus on the background of the problem, the statement of the research problem, study purpose, theoretical framework, definition of terms, assumptions, social work research justification, and study limitations to provide a better understanding of the topic being studied by the researcher.

Background of the Problem

The increased number of children being diagnosed with ADHD has raised concerns amongst professionals and the community about the causal and contributing factors to the growing ADHD diagnostic rates. It has been hard for professionals to clearly distinguish and come to a consensus concerning what may be causing more children to be referred and diagnosed with ADHD in the current decade. Although many speculate it could be due to the inadequate training that professionals obtain in their
education and their resulting inability to appropriately distinguish ADHD symptoms from regular developmental behaviors that children display, the exact cause is still unclear.

Another possibility may be the fact that referrals of children suspected to have ADHD to therapists may result from the potentially misconstrued symptomatic behavior children with and without ADHD may exhibit (Sandre & Brock, 2008). For these reasons, many professionals and individuals believe that children are incorrectly evaluated and, consequently, misdiagnosed with ADHD, which may contribute to the alarmingly increasing rates of ADHD diagnosis in children. Regardless of the different factors that may come into play in the diagnosis of ADHD, it is clear that it is a prominent problem affecting many American families.

The misdiagnosis/over-diagnosis of ADHD is a topic that has been researched by many professionals; however, there appears to be a lack of consensus as to the extent of the problem of misdiagnosis/over-diagnosis of ADHD, or even, in one case, over the existence of the problem. There also appears to be debate regarding how these issues can affect a child’s life (Leroux & Levitt-Perlman, 2000; Hartnett, Nelson, and Rinn, 2004; Gupta and Kar, 2010; Stolzer, 2007; and Conner, 2006). Many researchers have emphasized the importance for clinicians, before they become practicing clinicians, to receive adequate training in graduate programs to be able to distinguish ADHD symptoms from normative childhood behavior, as well as the need to further evaluate the effectiveness of ADHD assessments and tests for children (Leroux, 2000; Hartnett, Nelson, and Rinn, 2004; and Gupta and Kar, 2010). The purpose of this work is to
explore therapists’ perspectives on the misdiagnosis/over-diagnosis of ADHD and its implications for children’s futures and outcomes in life. It is important to find out whether over-diagnosis/ misdiagnosis is a current problem in the United States in order to propose that better training be given to therapists. In the current study, therapists will be interviewed (Psychologists, MFT’s, and LCSW’s) in order to get their perspective on the over-diagnosis/misdiagnosis of ADHD in children based on participants’ encounters with different children who have been diagnosed with ADHD. The study will also gather therapists’ perspectives on how the misdiagnosis/over-diagnosis of ADHD in children can affect a child’s future outcome. In order to get the perspective of therapists who have different theoretical approaches and perspectives on the topic, therapists with different licensures (Ph.D, MFT, LCSW) will be interviewed, and semi-structured interviews and structured questionnaires will be used to reduce bias in the questions.

**Statement of the Research Problem**

Currently, many researchers question whether children diagnosed with ADHD are being assessed properly in distinguishing ADHD symptoms from other normative behaviors children display. In order to prevent misdiagnosis, it is necessary for therapists to distinguish the existing similarities that children with ADHD exhibit from other normative behaviors of children. Clinicians must be trained adequately to make an accurate diagnosis, and they must follow the appropriate steps and assessments to come to the correct diagnosis. There are other mental health disorders and personality traits children possess, such as Bipolar Disorder (BD), which also overlap with the symptoms
of ADHD (Sadre & Brock, 2007). These disorders and personality traits have to be considered before a therapist gives a final diagnosis. However, the assessments and tests used to diagnose children with ADHD are often not accurate and are subjective in nature (Seiter, 2006). Therefore, it is up to the clinician’s assessment regarding the child’s symptoms and the information they have gathered from others (e.g., parents, teachers, peers, family members, etc.) to determine their final diagnosis. Cases of misdiagnosis can be detrimental to the child’s life and health when it leads to prescription of unneeded medication (Seitler, 2006). For this reason, there is a need to further investigate the possibility of misdiagnosis/over-diagnosis in order to find ways to prevent it from happening through strengthening the current assessments used to diagnose ADHD and improve the education given to those who will eventually administer assessments.

**Purpose of the Study**

This study will investigate the misdiagnosis/over-diagnosis of ADHD and the implications of misdiagnosis for children. This study will analyze therapists’ perspectives regarding the misdiagnosis/over-diagnosis of ADHD and the assessments currently being used to diagnose children. The goal is to clarify some of the, as of yet, unanswered questions, including causes behind the recent increase in the diagnoses of ADHD in children and the effectiveness of the current measures used to diagnose children. The researcher will interview 30 psychologists, Marriage and Family Therapists (MFT’s), and Licensed Clinical Social Workers (LCSW’s), who have worked, or who are currently working, with children who have ADHD, to gather and analyze their perspectives.
regarding the misdiagnosis/over-diagnosis of ADHD and how these phenomena can impact children and their future. The study’s goals are to contribute to the social work profession by determining if better training should be provided to therapists to adequately train clinicians to distinguish ADHD symptoms from other behaviors children display, and by helping to evaluate the effectiveness and inform the current assessment practices used by clinicians to correctly diagnose ADHD.

There also appears to be debate regarding how these issues can affect a child’s life (Leroux & Levitt-Perlman, 2000; Hartnett, Nelson, and Rinn, 2004; Gupta and Kar, 2010; Stolzer, 2007; and Conner, 2006). Many researchers have emphasized the importance for clinicians, before they become practicing clinicians, to receive adequate training in graduate programs to be able to distinguish ADHD symptoms from normative childhood behavior, as well as the need to further evaluate the effectiveness of ADHD assessments and tests for children (Leroux, 2000; Hartnett, Nelson, and Rinn, 2004; and Gupta and Kar, 2010).

The purpose of this work is to explore therapists’ perspectives on the misdiagnosis/over-diagnosis of ADHD and its implications for children’s futures and outcomes in life. It is important to find out whether over-diagnosis/misdiagnosis is a current problem in the United States in order to propose that better training be given to therapists. In the current study, therapists will be interviewed (Psychologist, MFT’s, and LCSW’s) in order to get their perspective on the over-diagnosis/misdiagnosis of ADHD in children based on participants’ encounters with different children who have been
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**Research Questions/Anticipated Outcome**

1. Is over-diagnosis/misdiagnosis an existing problem? If so, what might be some of the contributing factors?

2. What are the implications of over-diagnosis/misdiagnosis of ADHD for a child’s future?

   The anticipated outcome of this study is that the misdiagnosis/over-diagnosis of ADHD in children is a current and escalating problem and that the implementation of qualified training for clinicians to distinguish ADHD symptoms from other behaviors children display is necessary. Furthermore, it is anticipated that this study will underscore the necessity to improve the current ADHD assessments and tests used by clinicians to better evaluate children for ADHD.

**Theoretical Framework**

Empowerment theory, self-efficacy theory, and the capacity theory of comprehension are all relevant to this study because they help explain the way therapists may interact with children. These theories explain the critical role of therapists to
negotiate the interaction between the therapist and the client, and how this negotiation can make a difference in the diagnostic process and treatment provided. Furthermore, these theories provide a better understanding of the practitioner-client interaction and the way that the therapeutic process is a matter of reciprocal interaction between both parties involved.

**Empowerment Theory**

According to Parkins and Zimmerman (1995), empowerment theory, research, and intervention have the possibility to link individuals’ well-being with societal and political networks that may help magnify their prospective for growth. Empowerment theory compels a more positive outlook in terms of wellness versus illness, competence versus deficits, and strength versus weakness. The research on empowerment theory focuses on identifying individual capabilities and exploring the environmental influence of social problems instead of categorizing risk factors and blaming victims. Intervention methods that use an empowerment approach help enhance the wellness of individuals while ameliorating the problems that they exhibit (Parkins & Zimmerman, 1995).

Empowerment-oriented interventions help enhance people’s wellness while aiming to reduce problems, provide opportunities for individuals to develop knowledge and skills, and engage the professionals as collaborators instead of authoritative experts. Empowerment theory can allow therapists to have a positive outlook in their performance as practicing clinicians and help in their own lives as professionals. Professionals utilizing empowerment theory can further propose these foundations to foster the growth
of their clients. Empowerment theory is helpful in explaining the work of clinicians when treating children, and allows clinicians to use their strengths and competencies, helping systems, and proactive behaviors, which can allow for social policy and social change, to make a positive difference in the lives of the clients they serve (Rappaport, 1981; Rappaport, 1984).

Empowerment theory can further explain the work of clinicians serving children with behavioral problems when taking into account the environmental and societal factors these individuals face, trying to gain a deeper understanding of them, and making an accurate assessment and treatment plan. Clinicians can implement empowerment theory as a way to work with their clients towards a more comprehensive and mutual understanding of the therapist and client relationship, which can allow the therapist and client to grow together.

Empowerment theory includes both processes and outcomes, suggesting that actions, activities, or structures may be empowering and that the outcome of such processes result in a level of being empowered (Swift & Levin, 1987; Zimmerman, in press). Both empowerment processes and outcomes vary in their outward form because no single standard can fully capture its meaning in all contexts or populations (Rappaport, 1984; Zimmerman, 1993). A distinction between empowering processes and outcomes is critical in order to clearly define empowerment theory. Empowering processes for individuals might include participation in community organizations and other sources of occupation. This means that the process of empowerment would be important for
clinicians to have in order to have a satisfying outcome. If the clinicians feel empowered in the work that they are conducting they will have higher standards for better outcomes in their work, and create a difference in the lives of the children and families they serve. Empowerment in a clinicians work is based on the effort that they have exerted with their clients, thus impacting the client’s outcomes and actions, and making a difference in their lives.

**Self-Efficacy Theory**

Self-efficacy theory (SET) stems from social cognitive theory and the belief that a person has the power to produce effective change by completing a task related to the part of their lives that they want to change and be more competent in. Self-efficacy relates to a person’s perception of their ability to reach a goal with the belief that they are capable of performing in a certain manner to attain certain goals. SET further conceptualizes the expectation that a person can master a situation and produce a positive outcome. There are three major intertwined components that influence self-efficacy: behaviors, environment, and personal/cognitive factors. Bandura (1995) explained that self-efficacy develops from mastering experiences in which goals are achieved through perseverance and overcoming obstacles and from observing others succeed through sustained effort.

Bandura (2000) further explained that motivation, performance, and feelings of frustration associated with repeated failures determine affect and behavior relations. SET can be applied in health behavior to foster change of the individuals which can explain the therapeutic interaction between clinician and client, allowing the therapists to feel
confident that they will be able to create change by enabling and understanding the problems that the client may be experiencing (Bandura, 2000). Self-efficacy influences thought patterns, actions, and emotional arousals by changing the way individuals view themselves. Perceived self-efficacy helps to account for diverse changes in a person’s life, such as changes in coping behavior, level of physiological stress reactions, self-regulation of unmanageable behavior, resignation and negativity to failure experiences, self-debilitating effects of control and illusory inefficaciousness, achievement strivings, growth of intrinsic interest, and career pursuits.

Perceived self-efficacy is concerned with judgments of how well one can execute courses of action required to deal with prospective situations. SET might play a role in the way therapists conduct their practice and the confidence they have in themselves to engage the clients and transfer the self-efficacy that they carry into their client. A therapist’s self-efficacy in their work is critical because it marks the beliefs and emotions they will have about the change that they are enabling. If therapists have self-efficacy, they will view their therapeutic encounters with their clients as positive, and this will help drive positive change in the lives of the children and their caregivers. A therapist’s life experiences and their particular circumstances have been shown to play a role in their self-efficacy. It is important that the therapist believes they are creating change in the lives of their clients and that they value their work when they evaluate and assess the child. If a therapist identifies with self-reliance and has the self-conception that they are creating change through their therapeutic encounter, this will transfer to the client, and
the therapist will be able to give the best services possible to their clients. Therapists can strengthen their clients’ self-perceptions and efficacy to create positive change with a positive attitude (Bandura, 2000).

Bandura (1995) stated that the higher the level of perceived self-efficacy, the greater the performance in accomplishments, meaning that the strength of self-efficacy predicts behavior change. This indicates that a therapist's perceived self-efficacy is crucial to their confidence, which will, consequently, make a difference on the way the clients feel, how they view themselves, and in their own self-efficacy. The stronger the perceived efficacy of the therapists, the better relationships that may arise to make the client feel comfortable and make the therapeutic process and treatment provided more successful. This will result in a positive reciprocal relationship between the therapist and the client and it will be more likely for the therapist and client to persist in their efforts to succeed.

**Capacity Theory of Comprehension**

According to Just and Carpenter (1992), capacity theory of comprehension explains individual differences that impact the way a person is able to understand reading, writing, and language. Comprehension is defined as processing a sequence of symbols that is produced and perceived over time. Storage and processing functions of working memory in language comprehension are all major components in understanding the stimuli in our surroundings which vary from person to person (Just & Carpenter, 1992). The way information is stored and processed in the brain is fueled by activation of
the stimuli. Capacity of comprehension can be expressed as the maximum amount of activation available in working memory to support either of the two functions, storage and processing. Capacity theory of comprehension can explain the interactions therapists have with their clients and the way they comprehend each other when they are engaging in a clinical setting. As explained by capacity theory of comprehension, every person understands the outer world differently, and their interactions will be based on the way they understand what is going on around them (Just, Carpenter & Keller, 1996). As a result, therapists screening and working with children will have unique perceptions based on their own understanding of their clients and what they perceive to be true when assessing clients.

The final diagnosis given by the therapist will be determined by how well the therapist and the client understand each other, and the ability of the therapist to comprehend the client’s language (Just, Carpenter & Keller, 1996). The interaction between the therapist and the client will be unique based on their surroundings and their perceptions of the world. Capacity theory of comprehension is relevant when a therapist is working with children and assessing them based on their behaviors and interactions with other people. The way the therapist have been trained and the way they perceive the world will shape how they assess the child and its manifesting behaviors. The interaction between therapist and client will also be affected by a therapist's view of the world and their way of processing information when building a relationship and assessing the client to make a diagnosis and appropriate treatment plan. The child will also be affected by its
surroundings and the way they react to the therapist because they have their own way of processing information and attending to what is in their environment which can affect their behavior. Therefore, both the therapist and the child retrieve, listen, and perceive information in their own manner and understand each other’s interactions differently, which affects the diagnosis and treatment plan developed.

**Definition of Terms**

*Therapist.* Therapist is a person skilled in a particular type of therapy. A person, who suffers from a disorder or emotional problem, may see a mental health professional or therapist. Therapists, sometimes known as a psychotherapist or counselor are an important part of the treatment plan.

*Bipolar Disorder.* According to the Diagnostic and Statistical Manual of Mental Disorders text revision (2000), bipolar disorder is recognized with the following symptoms: racing thoughts, distractibility, restlessness, silliness, rapid or pressured speech, mood swings, anger outbursts, temperamentality, oppositional defiance, fascination with gore or morbidity, risk taking, unrealistic beliefs in one’s abilities and powers, poor judgment, spending sprees, sleeplessness, and substance abuse. Bipolar disorder is a condition in which people go back and forth between periods of a very good mood and an irritable mood or depression. The "mood swings" between mania and depression experienced by individuals who have bipolar disorder can be very rapid (Sandre & Brock, 2012).
**Attention Deficit Hyperactivity Disorder (ADHD).** According to the Diagnostic and Statistical Manual of Mental Disorders (1994), ADHD is often identified by features such as “low frustration tolerance, temper outbursts, bossiness, stubbornness, excessive and frequent insistence that requests be met, mood lability, demoralization, dysphoria, rejection by peers, and poor self-esteem” (p. 80). In addition, academic performance is often impaired, which usually leads to conflict with family and school authorities. Symptoms of ADHD can also include lack of concentration, inability to finish tasks, daydreaming, and distractibility. The impulsive quality of ADHD includes engaging in physically dangerous activities without consideration for possible consequences, talking out of turn, impatience, disruptive and socially inappropriate behavior, taking action without thinking, solitary play, and disorganization. The hyperactive component of ADHD consists of restlessness and constant running around (Sandre & Brock, 2008).

**Learning Disorders.** Learning disorders affect a person’s ability to understand, remember and respond to new information. People with learning disorders may have problems with listening or paying attention, speaking, reading or writing, and doing math. Although learning disorders occur in very young children, they are usually not recognized until the child reaches school age (American Psychological Association, 2000).
**Anxiety Disorders.** Anxiety disorder is a blanket term covering several different forms of a type of common psychiatric disorder characterized by excessive rumination, worrying, uneasiness, apprehension and fear about future uncertainties either based on real or imagined events, which may affect both physical and psychological health (American Psychological Association, 2000).

**Oppositional Defiant Disorder (ODD).** Oppositional defiant disorder is a pattern of disobedient, hostile, and defiant behavior toward authority figures. This disorder is more common in boys than in girls. Some studies have shown that it affects 20% of school-age children. However, most experts believe this figure is high due to changing definitions of normal childhood behavior, and possible racial, cultural, and gender biases. This behavior typically starts by age 8, but it may start as early as the preschool years. This disorder is thought to be caused by a combination of biological, psychological, and social factors (American Psychological Association, 2000).

**Over-diagnosis.** Over-diagnosis is the diagnosis of "disease" that will never cause symptoms or death during a patient's lifetime. Over-diagnosis is a side effect of testing for early forms of disease which may turn people into patients unnecessarily, and may lead to treatments that do no good and perhaps do harm. Over-diagnosis occurs when a disease is diagnosed correctly, but the diagnosis is irrelevant. A correct diagnosis may be irrelevant because treatment for the disease is not available, not needed, or not wanted. Because most people who are diagnosed are also treated, it is difficult to assess whether over-diagnosis has occurred in an individual. Over-diagnosis is only certain when an
individual remains untreated, never develops symptoms of the disease and dies of something else (Kristjansson, 2009).

**Misdiagnosis.** An incorrect or inaccurate diagnosis given by a specialist or certified professional in the respective field of study.

**Psychologist.** Psychologist is a professional or academic title used by individuals who are either clinical, counseling, or school psychologists who work with patients in a variety of therapeutic contexts (contrast with psychiatrists, who are physician specialists).

**Marriage and Family Therapist (MFT).** Marriage and Family Therapists (MFTs) are relationship specialists who treat persons involved in interpersonal relationships. They are trained to assess, diagnose and treat individuals, couples, families and groups to achieve a more adequate, satisfying and productive marriage, family and social adjustment. The practice also includes premarital counseling, child counseling, divorce or separation counseling and other relationship counseling. Marriage and Family Therapists are psychotherapists and healing arts practitioners licensed by the State of California. (California Association of Marriage and Family Therapists, nd).

**Licensed Clinical Social Worker (LCSW).** A social worker trained in psychotherapy who helps individuals deal with a variety of mental health and daily living problems in order to improve overall functioning. A social worker usually has a master's degree in social work and has studied sociology, growth and development, mental health theory and practice, human behavior/social environment, psychology, and research methods.
**Test of Variables of Attention (T.O.V.A).** The T.O.V.A test, a test of variables of attention, is an objective, neuropsychological assessment that measures a person's attention while screening for attention deficit hyperactivity disorder, or ADHD. Generally, the test is 21.6 minutes long, and is presented as a simple computer game. The test is used to measure a number of variables involving the test takers response to either a visual or auditory stimulus. These measurements are then compared to the measurements of a group of people without attention disorders who took the T.O.V.A. This test should be used along with a battery of neuropsychological tests, such as a detailed history, subjective questionnaires, interviews, and symptom checklists before a diagnosis should be concluded (Chae, Kim, Noh, 2003).

**Freedom From Distractibility (FFD).** Consists of arithmetic, digit span, and Coding subtests (Kaufman, 1979). Support for the validity of this factor stems in part from studies that found significant correlations between the WISC–R FFD subtests and other established measures of attention, such as Continuous Performance Tests and teacher ratings (Reschly & Reschly, 1979).

**Peabody Picture Vocabulary Test (PPVT).** The PPVT-IV, updated in 2007, is an untimed test of receptive vocabulary for Standard American English providing a fast estimate of verbal ability and scholastic aptitude (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010).
**SNAP-IV.** The SNAP-IV is a revised rating scale for ADHD. The items from the DSM-IV (1994) criteria for Attention-Deficit/Hyperactivity Disorder (ADHD) are included for the two subsets of symptoms: inattention and hyperactivity/impulsivity. Also, items are included from the DSM-IV criteria for Oppositional Defiant Disorder since it often is present in children with ADHD. Items have been added to summarize the Inattention domain and the Hyperactivity/Impulsivity domain of ADHD. Two other items were added: an item from DSM-III-R that was not included in the DSM-IV list for ODD, and an item to summarize the ODD domain. In addition to the DSM-IV items for ADHD and ODD, the SNAP-IV contains items from the Conners Index Questionnaire and the Iowa Conners Questionnaire.

**McNemar.** McNemar's test is a normal approximation used on nominal data. It is applied to $2 \times 2$ contingency tables with a dichotomous trait, with matched pairs of subjects, to determine whether the row and column marginal frequencies are equal ("marginal homogeneity"). The McNemar test introduced in 1947 by Quinn McNemar, is an application of the test in genetics and transmission disequilibrium test for detecting genetic linkage (Zelnik, et al., 2012).

**Validity.** Validity is the extent to which a test measures what it claims to measure. It is vital for a test to be valid in order for the results to be accurately applied and interpreted. Validity is not determined by a single statistic, but by a body of research that demonstrates the relationship between the test and the behavior it is intended to measure.
**Gene x Environment (GxE).** Gene x environment is the phenotypic effect of interactions between genes and the environment (Nikolas, Klump, & Burt, 2011).

**Artificial Neural Network (ANN).** An artificial neural network, often just called a neural network, is a mathematical model inspired by biological neural networks. A neural network consists of an interconnected group of artificial neurons, and it processes information using a connectionist approach to computation. In most cases a neural network is an adaptive system that changes its structure during a learning phase. Neural networks are used to model complex relationships between inputs and outputs or to find patterns in data (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010).

**Multi-Layer Perceptron (MLP).** A multilayer perceptron (MLP) is a feed forward artificial neural network model that maps sets of input data onto a set of appropriate outputs. An MLP consists of multiple layers of nodes in a directed graph, with each layer fully connected to the next one. Except for the input nodes, each node is a neuron (or processing element) with a nonlinear activation function. MLP utilizes a supervised learning technique called back propagation for training the network. MLP is a modification of the standard linear perceptron and can distinguish data that is not linearly separable (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010).

**Radial Basis Function (RBF).** Radial basis function network is an artificial neural network that uses radial basis functions as activation functions. It is a linear combination of radial basis functions. They are used in function approximation, time series prediction, and control. Radial basis functions are means to approximate multivariable (also called
functions by linear combinations of terms based on a single univariate function (the radial basis function). This is radialised so that it can be used in more than one dimension. They are usually applied to approximate functions or data which are only known at a finite number of points (or too difficult to evaluate otherwise), so that then evaluations of the approximating function can take place often and efficiently (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010).

**Assumptions**

The assumptions for this study include the following: The basic assumption is that there is possible misdiagnosis and there are concerns with the increasing over-diagnosis rates of ADHD. The questionnaire was developed to allow the responses of participants to be accurate reflections and representations of the participants’ perspectives and viewpoints. It is further assumed that the sample of the study was representative of the population of interest and responses were independently completed. Lastly, the researcher independently collected and analyzed the data, and strove to remain free of bias.

**Social Research Justifications**

The misdiagnosis/over-diagnosis of ADHD is relevant in the United States because children are being diagnosed with ADHD at higher rates today than in the past (Mayes & Erkulwater, 2008). Mayes and Erkulwater (2008) found that ADHD is the most commonly diagnosed mental disorder among minors. It was found that almost 8 percent of youths ages 4 to 17 have a diagnosis of ADHD, and slightly more than 4
percent are taking medication for the diagnosis. It is estimated that one in every ten to fifteen children in the United States has been diagnosed with the disorder, and one in every twenty to twenty-five uses a stimulant medication for treatment. The increase in youth diagnosed with ADHD and subsequently prescribed a stimulant drug was observed during the early 1990’s. During this time the occurrence of physician visits for stimulant pharmacotherapy also increased fivefold. Today, it seems that children are getting diagnosed with ADHD at even higher rates and are often given prescription medication as one of the primary treatments for ADHD (Mayes and Erkulwater, 2008).

Therefore, the information provided by this study will contribute to the social work profession being better informed on misdiagnosis/over-diagnosis of ADHD in order to better serve this client population. Obtaining a better understanding of this topic will render suggestions regarding how to improve the quality of life for children which is one of the missions of social workers. It is hoped that this study may help to inform graduate programs regarding the need to provide appropriate training for clinicians concerning their ability to identify ADHD symptoms and distinguish them from other behaviors, and may help to identify the current effectiveness of assessment instruments used to identify ADHD symptoms. This study will contribute to the existing evidence of the misdiagnosis/over-diagnosis of ADHD, so that any necessary improvements may be made to properly evaluate children for ADHD and help enhance the well-being of children’s lives and continue to follow the ethics mandated of social workers in the field (NASW code of ethics, 2008).
Study Limitations

The current study focuses on the misdiagnosis/over-diagnosis of ADHD from the perspectives of therapists (psychologists, MFT’s, LCSW’s) who have treated or diagnosed children with ADHD in their lifetime. The sample size for this study was partially gained by using snowball sampling methods. This method of sampling allowed for participants to be identified, but it was not the preferred method as it created a sample that may not include the most knowledgeable therapists on the diagnosis of ADHD (Dudley, 2011).

The current study used semi-structured interviews and structured questionnaires on the diagnosis of ADHD to gain the participants' perspectives, which varied based on each participant's research, practice experience, bias, and theoretical framework. It may be possible that the participants neglected to include information relevant to the study, included evidence not based on their area of practice, or omitted information they did not want to share. Finally, in order to be able to generalize the findings to the statewide population, this subject requires further study. Subsequent studies should include a larger sample of therapists who have worked with children with ADHD, who are knowledgeable in the diagnosis of ADHD, and who have worked with children for many years (Dudley, 2011).
Organization of the Project

This project is organized into five chapters. Chapter 1 introduces the research topic and details the purpose of the current study. Chapter 2 examines the literature on the history of ADHD, misconceptions regarding the misdiagnosis/over-diagnosis of the disorder, the impact in the increase of the diagnosis of ADHD, the training professionals receive in graduate school to appropriately distinguish ADHD from other disorders, the frequency of the diagnosis of ADHD in children, the impact medication can have in a child’s development, the improvement of measures and assessments used to make an accurate diagnosis of ADHD, and ways to improve the training that professionals receive in graduate school in order to properly diagnose the children they evaluate for ADHD and other related disorders. Chapter 3 provides a description of the research methods used and a rationale for using such methods. Chapter 4 discusses the findings using both quantitative and qualitative methods discussed in chapter 3. Finally, chapter 5 provides a synopsis of the findings and a discussion as to the limitations of the study and implications for future practice and research.
Chapter 2

LITERATURE REVIEW

The frequency of the diagnosis of Attention Deficit Hyperactive Disorder (ADHD) in children has increased in the past decade in the United States, with more children being labeled and medicated than ever before (Sadre & Brock, 2008; Hartnett, Nelson, & Rinn, 2004; Stolzer, 2007; and Leroux & Levitt-Perlman, 2000). Today, ADHD is the most commonly diagnosed “mental illness” in children in the United States. Approximately 99% of children diagnosed with ADHD are prescribed daily doses of methylphenidate in order to control unwanted behaviors. ADHD also happens to be the most extensively studied pediatric mental disorder, and the most controversial (Stolzer, 2007). This seems to be due to ADHD being the most commonly diagnosed mental disorder among minors. Presently, close to 8 percent of youth from the ages of four to seventeen have been diagnosed with ADHD, and slightly more than 4 percent have both the diagnosis and are taking medication for ADHD. In the 1990s there was a tremendous increase in youth who were diagnosed with ADHD and prescribed a stimulant drug. The diagnostic labels for the symptoms of ADHD have also changed throughout time. Since the 1930s the ADHD diagnostic label has changed several times and has been referred to as “organic driveness,” “minimal brain damage,” “hyperkinetic impulse disorder,” “minimal brain dysfunction,” “hyperkinesis,” “hyperactive child syndrome,” and “attention deficit disorder” (Sadre & Brock, 2008; Mayes & Erkulwater, 2008; Stolzer, 2007; Hartnett, Nelson, & Rinn, 2004; and Leroux & Levitt-Perlman, 2000).
It is important to consider the shift that occurred in the 1990s with regards to ADHD and medication. In the early 1990s there were around nine hundred thousand youth in the United States diagnosed with ADHD, and most schools across the country had only a handful of children diagnosed with ADHD and using stimulants. In the mid- to late 1990s there was a tremendous increase in the number of children being diagnosed with ADHD and prescribed medication, with three to four million children diagnosed with the disorder and the majority of those using stimulants as treatment (Mayes & Erkulwater, 2008). Due to the rising rate of the diagnosis of ADHD in children, debates have emerged regarding the reasons children are referred for evaluations, the effectiveness of the diagnostic process and measurements used to diagnose children, and the treatment method given to treat children with ADHD.

Many researchers believe that misdiagnosis may be common due to the unwilling high percentage of children being diagnosed with ADHD since the end of the last century (Sadre & Brock, 2008; Mayes & Erkulwater, 2008; Stolzer, 2007; Hartnett, Nelson, & Rinn, 2004; and Leroux & Levitt-Perlman, 2000). Therefore, exploring ADHD related issues that seem to recurrently arise such as the over prescription of medication to children, the misdiagnosis of ADHD due to inadequate assessments, the failure to detect when a child is gifted, and the lack of training given to professionals working with children regarding the potential symptoms of ADHD is important. In fact, the literature review findings reveal that misdiagnoses of ADHD because of creative characteristics is possible, and they contend that mislabeling a child who displays creative behaviors with
an ADHD diagnosis can be detrimental to his or her self-esteem, and can silence and suppress his or her gifted characteristics (Hartnett, Nelson, & Rinn, 2004). This chapter explains the different perspectives on the diagnosis of ADHD and the deficits that exist when professionals evaluate and diagnose children, as well as possible techniques that can assist clinicians in reaching an accurate diagnosis.

ADHD has been studied by many researchers in order to find the etiology of the disorder and answers to the questions that remain. Some of those questions regarding the diagnosis of ADHD concern speculation over the inflated number of referrals for children to be evaluated by clinicians for ADHD, the effectiveness of the diagnostic process and measurements used to diagnose children, and the overall success of the treatment methods given to children. Even though many researchers have studied these areas there continues to be missing information and inefficiency at eliminating some of the current problems that exist. There continues to be a high volume of referrals of children that need to be evaluated which contributes to the disproportionate rate of children being diagnosed and labeled with ADHD. Therefore, it is critically important to study different aspects of ADHD and consider the possibility of misdiagnosis and over-diagnosis by examining the factors that may be contributing to this current problem in America.

This chapter presents the main findings and themes that emerged from the literature review, which include the following: the disproportional increase in diagnosis of ADHD; the impact of long term medication on learning; behavioral and social domains of misdiagnosed children; inadequate training for the professionals who treat
children with mental health issues, the need for studies on the long term side effects of medication used to manage ADHD, the economic costs associated with misdiagnosis, inadequacy in understanding the differentiation of ADHD from giftedness and other learning disabilities, professional training inadequacies that contribute to over-diagnosis of ADHD, economic and environmental factors that contribute to over-diagnosis/misdiagnosis of ADHD in children, and professional and ethical violations in the misdiagnosis/over-diagnosis of ADHD in children. By discussing these themes that arise in the literature review there will be a better understanding of the different perspectives that clinicians have regarding ADHD and its diagnosis.

Misdiagnosis of ADHD in Children

In an effort to understand some of the reasons misdiagnosis of ADHD occurs, Hartnett, Nelson, and Rinn (2004) investigated the diagnostic education and training that therapists receive. Hartnett, Nelson, and Rinn’s (2004) hypothetical case study, involving graduate students in a counseling program, provided empirical support for the possibility of misdiagnosis of gifted children as ADHD. Hartnett, Nelson, and Rinn’s (2004) study included Forty-four graduate students enrolled in a school counseling program who were given one of two forms. Form A, the form without diagnostic alternatives that allowed for free recall, and Form B, the form with diagnostic alternatives that required students, to choose a diagnosis among choices supplied, the passages described characteristics of a hypothetical seven-year-old boy.
The results of the study indicated that counselor training programs, specifically those offered in the first year of training, may not adequately clarify the differences between ADHD and giftedness. The study mentioned that if training programs do not provide appropriate training and education to students, they could lead to an inability to properly diagnose patients among future practicing clinicians. Since the study included only a small sample of graduate students in their first year of training in a counseling program, it is difficult to interpret and generalize the findings to other graduate programs. However, it is important to consider the findings for future research in order to identify how graduate counseling programs can improve the training they provide on ADHD and skilled practicing therapists working with children with possible ADHD characteristics (Hartnett, Nelson, & Rinn, 2004).

Rinn and Nelson (2009) discussed the potential for the misdiagnosis of giftedness and ADHD, as well as exploring teachers’ and pre-service teachers’ perceptions and diagnostic evaluation of ADHD and giftedness. Rinn and Nelson (2009) commented that if teachers were to act as diagnosticians, then ADHD would likely be over-diagnosed. The American Psychiatric Association (2000) suggested that ADHD existed in 3-7% of school-aged children, but if teachers were the ones making the diagnostic decisions, the prevalence rates would likely be between 8.1% and 15.9% of school-aged children (as cited in Rinn & Nelson, 2009). Rinn and Nelson (2009) suggested that teachers tend to incorrectly diagnose behaviors as symptoms of ADHD, which may result in over-referring students for evaluations. If teachers, or even preservice teachers, are the first to
make a student referral, they need to be aware of the characteristics of ADD/ADHD and
giftedness, as well as the implications of classifying a child with either label (Rinn &
Nelson, 2009). Rinn and Nelson (2009) stated that teachers are, for the most part, able to
identify ADHD correctly but also over-identify non-ADHD symptoms as being indicative
of ADHD, which can result in over-diagnosis.

The teachers likely to over-diagnose ADHD were found to be much more likely
to refer the children to a physician for medication to treat the ADHD symptoms (Rinn &
Nelson, 2009). Some teachers were found to be unaware that certain behavioral
characteristics of ADHD may appear when a gifted child is required to conform to an
al.’s (2004) study using a sample of pre-service teachers in order to examine the potential
for the misdiagnosis of giftedness and ADHD. Rinn and Nelson (2009) contributed to the
empirical literature concerning the potential for misdiagnosis of ADHD and giftedness by
expanding upon what is known about the diagnostic process of pre-service teachers.

Teachers are often used as support agents to gather information with regard to the
assessment and the treatment of ADHD and identify children as eligible for gifted
programs or reference for ADHD evaluation. This makes it particularly important to
better understand the readiness of teachers as evaluators in the decision making process,
and for the undergraduate curriculum in education to have more information related to
ADHD and giftedness, as well as direct information related to the potential overlap in
characteristics (Rinn & Nelson, 2009).
The study included two vignettes modeled after the ones used in Hartnett et al. (2004). The results were also similar to those found by Hartnett et al. (2004), which concluded that future counselors are unlikely to consider the possibility of giftedness as the explanation for behaviors typically associated with ADHD. In both studies, participants were given a description of a vignette of behaviors characteristic of ADHD. However, one group was given the suggestion of the possibility of giftedness as an explanation for the behaviors described in the vignette, and the control group was not provided with this suggestion. The study, much like Hartnett et al. (2004), found that the group given the suggestion of giftedness as an explanation for the characteristic behaviors the child was displaying was more likely to consider giftedness as a possible diagnosis and not ADHD than those participants that were not given such a suggestion (Rinn & Nelson, 2009). A proposed explanation of the results was the tendency of the participants to take a pathology-driven perspective when considering behaviors typically characterized as “negative,” unless given a positive explanation (i.e. giftedness) of such behavior (Rinn & Nelson, 2009).

Rinn and Nelson (2009) found a lack of correlation between amount of training and the suggestive effects, suggesting that even as pre-service teachers are nearing the end of their training, they might still be unclear about the overlap of behavioral characteristics of ADHD and giftedness. Overall, Rinn and Nelson (2009) indicated that pre-service teachers may not have an adequate understanding of the possible overlapping characteristics of children with ADHD and gifted children, and suggested that the people
who are involved in teacher-education programs need to evaluate their course offerings to begin to make adequate distinctions between giftedness and ADHD to prevent over-diagnosis.

**Misdiagnosis of ADHD Due to Creative Characteristics**

Sadre and Brock (2008) questioned the observed behaviors associated with the diagnosis of ADHD through two case studies, which document misdiagnosis of ADHD due to creative characteristics. Through the use of two case examples of children who have ADHD, the study detailed the misdiagnosis of ADHD due to its creative characteristics. The findings suggested that mislabeling a child who displays creative behaviors with an ADHD diagnosis can be detrimental to his or her self-esteem, and silence and suppress his or her gifted characteristics. The study further argued that it is important to remove the stigma of the diagnosis of ADHD to help improve the child’s life outcome, especially when they are creative children. Similarly, Leroux and Levitt-Perlman (2000) reviewed literature on ADHD traits, their similarity to gifted and creative behaviors, and the implications for educational interventions. The article provided a case study example of a child identified with ADHD who displayed characteristics of a gifted child.

Characteristics such as hyperactivity, challenging authority, disruptive behavior, and social and emotional development are similarly displayed in both gifted and ADHD children. For this reason it is important to identify and distinguish their differences, and acknowledge that many of the behaviors overlap, to prevent the possibility of
misdiagnosing a child with ADHD (Leroux & Levitt-Perlman, 2000). Leurox and Levitt-Perlman (2000) detailed the importance of acknowledging the characteristics of a gifted child in order to provide them with the tools to help them succeed and have their weaknesses identified so as to help remedy them. The study found that children who are gifted or gifted/ADHD need to be understood and challenged in order to put their skills and abilities to good use. Unfortunately, gifted or gifted/ADHD children are, for the most part, not pushed to succeed because of their misdiagnosis and the use of inappropriate treatment (Leurox & Levitt-Perlman, 2000).

Chae, Kim, and Noh (2003) sought to investigate the perceived prevalence of ADHD among gifted children to determine the social, cognitive, and attention characteristics of gifted children with ADHD. The study was expected to inform accurate assessment and treatment of gifted children with ADHD. The study compared the performances of gifted children on a comprehensive test of ability and a test designed to assess ADHD with the performance of non-gifted children on these tests.

Furthermore, Chae, Kim, and Noh (2003) found that gifted children performed better on measures of omission, commission errors, response variability and response sensitivity than the non-gifted children on the Test Of Variables Assessment (T.O.V.A). It was found that gifted children are also better at paying attention to the target stimuli, made fewer mistakes, and responded to the target in a more consistent manner than non-gifted children in a structured and non-distracting situation. The findings imply that gifted children with ADHD may utilize their internal control strategies to cope with
boring and tedious tasks, and perform better than non-gifted children with ADHD. Generally, gifted children may have better internal control strategies, and their high intelligence ability may compensate somewhat for their attention problems, depending upon the nature of the task (Chae, Kim, and Noh, 2003).

The study also found that gifted children without ADHD compared to gifted children with ADHD show no significant difference on any of the KEDI-WISC subtests except for Coding subtests. The results show that the Freedom from Distractibility (FD) factor is not a reliable indicator for assessing and diagnosing ADHD. The comparison further found that gifted children with ADHD scored poorly on social competence tests compared to gifted children without ADHD and non-gifted children (Chae, Kim, and Noh, 2003). Chae, Kim, and Noh (2003) stated that for accurate diagnosis of ADHD in gifted children, administration of a continuous performance test such as the T.O.V.A. is recommended in order to assess sustained attention. The study echoes previous studies in noting the importance and difficulty of correctly diagnosing a child because of the overlapping symptoms of ADHD and creativity and the inadequacy of tests to make the necessary distinctions for proper diagnosis (Chae, Kim, and Noh, 2003).

Chae, Kim, and Noh (2003) were also concerned over the fact that nonintellectual features of gifted children may have been misinterpreted as symptoms of ADHD and that many of these children are being incorrectly referred for attention disorders and inappropriately diagnosed. The study expands on the notion that misdiagnosing gifted
children with ADHD and incorrectly medicating them can inhibit creativity and intellectual curiosity (Chae, Kim, and Noh, 2003).

**Overlapping Characteristics of ADHD and Gifted Children**

Often, as discussed in the literature reviewed below, there is an overlap of diagnosis of gifted children with ADHD diagnosis. Chae, Kim, and Noh (2003) found that ADHD is characterized by inattention, impulsivity, and hyperactivity, but also importantly considered the fact that normal children may display some of these symptoms in the course of their development, making it difficult to make an accurate diagnosis. The study explained that it is important first to determine if symptoms are manifestations of a neurological disorder, possibly resulting in impaired functioning, or if they are expressions of over-excitability (Chae, Kim, and Noh, 2003). Chae, Kim, and Noh (2003) detected that people who score high on tests of creativity tend to show more hyperactivity than other children, and children diagnosed with ADHD score higher on tests of creativity, contributing to the growing body of research indicating that there is likely a very large overlap between ADHD and creativity (Chae, Kim, and Noh, 2003).

Rinn and Nelson (2009) similarly noted that gifted children can demonstrate behaviors that are symptomatic of ADHD. Some of the overlapping characteristics found were high activity levels, difficulty paying attention, impulsive behavior, trouble completing certain tasks, difficulty following rules and regulations, potential social difficulties, and potential underachievement (as cited in Guenther, 1995; Leroux & Levit-Perlman, 2000; Webb & Latimer, 1993), Rinn and Nelson (2009) stated that when gifted
students are mislabeled as possessing ADHD, they are likely to have lower expectations from teachers, are less likely to be identified as gifted, and are unnecessarily prescribed stimulant medication, which can negatively impact their cognitive performance and cause a variety of unpleasant side effects.

Antshel (2008) reported on a second investigation which followed the high IQ participants into adolescence and provided information on the same parameters. The results of this second investigation indicated that, compared to high IQ control participants, high IQ participants with ADHD performed less well on a measure of academic achievement in mathematics and were likely to require academic tutoring. An intriguing finding suggested that high IQ may insulate adolescents from ADHD from cigarette smoking/substance abuse and antisocial activities. Between the first investigation and the second investigation, 78% of the high-IQ youth with ADHD maintained their ADHD diagnostic status (Antshel et al., 2007, 2008). The treatment did not alter the course of ADHD, as those with and without treatment in the first investigation were similarly likely to continue to meet diagnostic criteria for ADHD in the second investigation. Over half of the ADHD sample required academic tutoring, far higher than the 7% of the control group who received tutoring. Antshel (2008) submitted that it is unclear if ADHD confers creativity in the giftedness population, or if it is the high IQ that is largely predictive of the creativity.

The study further implied that there are some associations between ADHD and creativity in the average IQ/ADHD population, but they are not common (Antshel, 2008).
The data suggested that ADHD in the context of a high IQ is very similar to average IQ/ADHD because, despite a high IQ, over half of the adolescents with ADHD required ongoing academic tutoring (Antshel, 2008). Antshel (2008) found that mood, anxiety, and disruptive behavior disorders are far more common in the ADHD group relative to the control group. Functional impairments in the social, family, and academic domains were also more likely in the ADHD group. An interesting finding was the lack of difference between the high IQ/ADHD group and high IQ/ control groups regarding substance use and antisocial behaviors. Overall, the study shows that ADHD negatively affects academic achievement and day-to-day classroom performance of children (Antshel, 2008). The study implies that ADHD may be valid in the high IQ/gifted population and ADHD in the high IQ/gifted population is very similar to ADHD in the average IQ population.

**Inadequacy in Understanding the Differentiation of ADHD from Both Giftedness and Other Learning Disabilities**

Hojman (2008) further explained the great difficulty in accurately diagnosing a child and underscored the importance for clinicians not to take any shortcuts when evaluating a child. Hojman (2008) claimed that the primary difficulty in properly diagnosing a child has to do with the multiple psychiatric disorders with overlapping symptoms to those of ADHD In other occasions, the study claimed, children may suffer from ADHD and a co-morbid disorder but only get diagnosed with ADHD, in which case the co-morbid disorder is left untreated and the treatment given may not provide the child
the help that they need. The most common disorders which can masquerade as ADHD or be co-morbid with ADHD are adjustment disorder, anxiety disorder, bipolar disorder, post-traumatic stress disorder, and learning disorders (Hojman, 2008). Children who struggle with intense psychosocial stressors experience difficulty concentrating properly while in school and completing their work. Psychosocial stressors can also cause children to develop adjustment disorders and anxiety but are often misdiagnosed as ADHD. ADHD can also be confused with bipolar disorder and PTSD (Hojman, 2008).

Hojman (2008) explained that when there is the presence of PTSD and a potential comorbid diagnosis with ADHD there has to be careful assessment of the developmental timing of the onset of symptoms, the pattern of problem behaviors and their association with trauma triggers. It was also seen as important to consider learning disorders as being co-morbid with ADHD because clinicians were noted as having a tendency to navigate through the most relevant psychiatric disorders without paying attention to learning disorders (Hojman, 2008).

To detail the impact that inappropriately distinguishing ADHD from other mental health disorders can have on a child, Hojman (2008), explained that when learning disabilities go undiagnosed children will continue to struggle in the learning process because their actual problems are not being identified and given the appropriate treatment. Delavarian, Towhidkhah, Dibajnia, and Gharibzadeh (2010) also took into account the misdiagnosis and over-diagnosis of ADHD, and the overlapping of ADHD symptoms with other disorders. Delavarian, Towhidkhah, Dibajnia, and Gharibzadeh
(2010) stated that there are other behavioral problems children exhibit such as conduct disorder and depression which may get misdiagnosed as ADHD. The study found that in some instances children with ADHD may also suffer from depression or conduct disorder but diagnostic differentials fail to detect the co-morbidity that exists between different behavioral disorders (Delavarian, Towhidkhah, Dibajnia, and Gharibzadeh, 2010). Regardless of the scenario, distinguishing whether a child suffers from depression, conduct disorder, ADHD, or other anxiety disorders is crucial to providing the appropriate treatment and preventing misdiagnosis (Delavarian, Towhidkhah, Dibajnia, and Gharibzadeh, 2010).

Similarly, many researchers suggest that ADHD is misdiagnosed in the high IQ/quotient population (Web and latimer, 1993; Lind and Silverman, 1994; Gallagher and Harradine, 1997; Leroux and Levitt-Perlman, 2000; Hartnett et al., 2004); however, the controversy of ADHD in the high IQ/gifted population extends beyond diagnostic accuracy (Antshel, 2008). Antshel (2008) reiterated the importance of early identification of ADHD and high IQ/giftedness in providing assistance enabling the use of creative abilities (Antshel, 2008). The study suggested that the overlapping characteristics of ADHD and ADHD/gifted children can make it difficult for professionals to differentiate and make an appropriate diagnosis. Antshel (2008) focuses on: (1) the relationship between intelligence and cognitive vulnerabilities commonly reported in ADHD such as attention, working memory, executive function deficits, (2) the validity of ADHD in the
high IQ/gifted population, (3) and characteristics of those with ADHD and a high IQ/giftedness with (4) a particular focus on education implications.

Antshel (2008) explained that the mere explanation of how giftedness is stipulated is itself hard to define, and IQ is only one criteria used to define it. The most common methods of the operationalization of giftedness include standardized measures of intelligence such as the WISC-IV and/or standardized measures of academic achievement, such as the WIAT-II, school grades can be used in conjunction with academic achievement measures. The range of IQ score varies but usually is around 130 and above. Clearly, even the definition used to define giftedness is an area of controversy and may have obvious implications for the diagnosis of ADHD. As of yet, there is not any strong evidence that supports the association between performance on tests of executive functions and IQ (Antshel, 2008).

As a way to investigate IQ scores and ADHD, Antshel (2008) and Antshel et al. (2007) investigated a subsample of children with an IQ > 120 from the Massachusetts General Hospital (MGH) Longitudinal Family Studies of ADHD. The results from the research revealed that in relation to control participants, children with ADHD and a high IQ repeated grades more often, needed more academic support, had more comorbid psychopathology, and were rated by parents as having more functional impairments across a number of domains (Antshel, 2008). It was found that despite having an IQ > 120, 22% of the high IQ/ADHD sample had previously repeated grade. Antshel (2008) stated that this finding was consistent with the contention that ADHD symptoms among
gifted/high IQ children were simply an expression of boredom with easy schoolwork. It was also found that the diagnosis of ADHD was valid among high IQ children indicating children with a high IQ and ADHD show a pattern of familial, cognitive, psychiatric, behavioral, and functional features consistent with the diagnosis of ADHD documented in children of average IQ.

**Economic, Environment, and Genetic Risk Factors Contributing to the Etiology, Diagnosis, and Medication Given to Children to Treat ADHD**

Stolzer (2007) noted the economic factors that may contribute to the increased number of children being referred and diagnosed with ADHD. It was noted that the public school system has a higher percentage of children diagnosed with ADHD than private schools. Stolzer (2007) hypothesized that this may be due to the fact that public schools receive larger amounts of money from the government if they have more children diagnosed with ADHD, whereas private schools do not receive government funding. Stolzer (2007) provided a similar rationalization for the high percentage of medications being prescribed to children without clearly understanding the consequences in the child’s life. From the study’s findings, it appeared that pharmaceutical companies, physicians, and public schools have an economic interest in promoting the diagnosis of ADHD.

Another issue when making an appropriate diagnosis of ADHD and providing the proper treatment was that pharmaceutical companies, physicians, and public schools discount environmental factors (e.g., living in a abusive household, living in scarcity,
lack of resources, etc.) and personality traits (e.g., easily irritable, and other systemic problems, highly active, overly sensitive, etc.) that may account for the behavioral problems children exhibit (Stolzer, 2007). Therefore, it was found to be important for clinicians to accurately assess children for ADHD symptom behavior and despite the information given to clinicians by the school system, the environmental factors need to be taken into account to make a complete and accurate diagnosis, and prevent overmedicating children (Stolzer, 2007).

Compounding the problem of “excessive medicalisation” and over-diagnosis of ADHD, are the persisting questions about the exact causes of the disorder, and whether they are primarily genetic or environmental. Literature regarding the etiology of ADHD has provided evidence that there are strong genetic influences (Bergen et al. 2007; Burt, 2009) compared with contributions from the environment which appear to be much smaller and appear to be child specific or non-shared environmental in origin (Burt, 2009). Some of the environmental variables identified as potentially affecting a child’s development included environmental intoxicants, inter-parental conflict, parenting styles, and childhood maltreatment (Nikolas, Klump & Burt, 2011).

Nikolas, Klump, and Burt (2011) investigated the remaining questions regarding the relationships between the environmental variables and ADHD due to the evidence that exists on the high estimates of genetic effects and ADHD. Nikolas, Klump, and Burt (2011) studied the relationships between the environmental variables involved in the etiology of ADHD through gene x environment (GxE). Nikolas, Klump, and Burt (2011)
proposed that this framework would clarify if interactions occur at the family level (e.g., AxC interactions) or at the child-specific level (e.g., AxE interactions) or both. The findings were hypothesized to inform any existence of GxE in ADHD and illuminate how environmental variables may interact with genetic risk for ADHD. The study used the variable “self-blame” as a moderator of genetic and environmental influences on ADHD (Nikolas, Klump, & Burt, 2011). The results of the study show that non-shared environmental influences on ADHD increase with higher levels of self-blame, while genetic influences on ADHD decrease.

The same results persisted even when controlling for potential GxE effects. The study showed that self-blame, possibly, functions differently than other risk factors and potentially as a “main effect” because there are some environmental risk factors that act as etiological “main effects,” with relatively little or no contribution from genetic factors (Nikolas, Klump, & Burt, 2011). It was found to be likely that psychosocial risk factors, like self-blame, may reflect the proximal end result of multiple risk processes. Nikolas, Klump, & Burt (2011) found that even as non-shared environmental influences on ADHD increased at higher levels of self-blame, genetic contribution to ADHD behaviors remained significant. This may indicate that among the multiple genes influencing ADHD, some can be involved in GxE processes and others may continue to exercise a main effect on ADHD despite the level of environmental risk.

Nikolas, Klump, & Burt (2011) suggested that when children blame themselves for their parents’ conflicts, the genetic influence on ADHD is less important. The
findings further suggest that the large genetic influences for ADHD may vary, at least somewhat, as a function of the level of psychosocial risk. Another implication for the increase in non-shared environmental variance is the contribution from AxE to ADHD which increases at high levels of self-blame (Nikolas, Klump, & Burt (2011). The results of the study indicated environmental factors play a potentially important role in the etiology of ADHD. The study’s findings showed that negative cognitive appraisals (e.g. self-blame) made by children in relation to inter-parental conflict increased non-shared environmental contributions but decreased genetic contributions to ADHD. These findings not only support additional examinations of family factors as moderators of genetic and environmental contributions to ADHD, but highlight the need for an evaluation of risk factors (e.g. self blame) as moderators of genetic risk in molecular genetic GxE studies of ADHD to help better understand the impact specific risk factors may play in the development of ADHD (Nikolas, Klump, & Burt, 2011).

Hojman (2008) explained that the difficulty in reaching an accurate diagnosis is biological in nature. The study noted that there are symptoms such as poor concentration, nervousness, not following instructions secondary to fears and worries, and somatic explanations for not keeping up with homework which are frequently seen in kids that are already being treated for ADHD (Hojman, 2008). In many cases, teachers and parents reported such symptoms as typical of ADHD without the knowledge that there may be a comorbid disorders as well. Seitler (2006) stated that creating a reliable test for ADHD is
important, and warned to be cognizant of the fact that ADHD is influenced by environmental factors.

**Professional Training Inadequacies that Contribute to the Over-Diagnosis of ADHD**

In order to ensure an appropriate diagnosis, and prevent the mislabeling of creative children, Sadre and Brock (2008) recommend the development of accurate assessment instruments to be used by therapists in the diagnosis of ADHD. Similarly, Leroux and Levitt-Perlman (2000) stated that giftedness is often misdiagnosed as ADHD by teachers and professionals due to inadequate assessment procedures.

Responding to previous literature, Gupta and Kar (2010) sought to inform diagnosis further by investigating the effects of assessment subjectivity on diagnosis. The study found that the tests used to assess children for ADHD are subjective, and the possibility of misdiagnosis becomes higher when therapists base their diagnosis primarily on subjective reports and clinical judgment. Findings indicate misdiagnosis is likely to happen when the therapist does not carefully analyze the cognitive mechanisms and behavioral symptoms children display. Gupta and Kar (2010) emphasized the need to incorporate information on cognitive mechanisms underlying ADHD and the need to use that information in the assessment as a specific tool for the deferential diagnosis of ADHD.

Gathje, Lewandowski, and Gordon (2008) explained that currently the diagnostic criteria used for ADHD requires the consideration of impairment when making a diagnosis but clinical and research definitions of ADHD rely heavily on the symptoms
that are reported. Gathje, Lewandowski, and Gordon (2008) focused on exploring the relationship between impairment and symptoms, variables predictive of impairment, and variation in ADHD identification when impairment criteria are added to symptom criteria. The study assessed ADHD symptoms and impairment, by using archived parent and teacher rating scale data in order to measure the reliability of the ADHD diagnosis. Stolzer (2007) also made particular mention of the subjectivity of ADHD assessment and the questions asked during diagnosis, which may limit the accuracy of ADHD diagnosis in children.

It appears to be that most continuous performance tests could properly differentiate children with ADHD from healthy asymptomatic children, but fail to separate children with ADHD from children with other functional difficulties such as learning and behavioral difficulties (Zelnik, 2012). All the children in the study had some amount of difficulty at school or at home, and none were healthy volunteers.

Consequently, even the children who eventually did not meet the required criteria for ADHD were found to display other functional difficulties such as learning problems, behavioral difficulties, or anxiety. As a result, it is not shocking that in the study, the specificity and negative predictive value of the TOVA were low (Zelnik, et al 2012). Generally, in daily practice, most of the children that were sent for evaluation as a result of problems in school have either ADHD with/or other comorbidities, it seems that reliance on TOVA might lead to over-diagnosis and superfluous use of the term ADHD as an umbrella for many conditions that contribute to school failure.
Improper Assessment and Treatment Given to Children with an ADHD Diagnosis

Compounding the problem, children misdiagnosed because of ADHD symptoms are also given inappropriate treatment because they are medicated to suppress their behavioral problems and hyperactivity assumed to be caused by ADHD, instead of properly treating behavioral problems in other effective ways (Stolzer, 2007). Stolzer (2007) discussed the massive increase of ADHD diagnosis in children (especially boys) in recent years and gave possible suggestions for misdiagnosis. About 90% of the children diagnosed with ADHD are prescribed with methylphenidate (Stolzer, 2007).

Many of these children have been misdiagnosed and given medication, which can be highly addictive and detrimental for their healthy development. Children are often referred by teachers, parents, and relatives who do not want to deal with the child’s problem behaviors (Stolzer, 2007). The clinicians’ evaluation in determining if a child has ADHD is then also influenced by the reports of the teachers. Therefore, Stolzer (2007) suggested, it is important to examine the effectiveness of teachers and parents' reports to prevent misdiagnosis and examine how useful the medication given to children is in the long run (Stolzer, 2007).

Kristjansson (2009) discussed some of the concepts of over-diagnosis and “medicalisation,” explaining that in recent decades there had been an increase in the number of life problems which were conceptualized and interpreted through the prism of disease. Kristjansson (2009) went further into describing the process where painful experiences, aberrant behaviors, and other human experiences, previously described in
moral, social or religious terms, became defined as objects of medical knowledge and had since been referred to as ‘medicalisation’ (as cited in Zola, 1972). Kristjansson (2009) referred to cases of “medicalisation” as “excessive medicalisation” rather than simply “medicalisation.” According to the study, attention Deficit (Hyperactivity) Disorder (ADD/ADHD) was considered a profitable venue for the exploration of putatively excessive “medicalisation.” Over-diagnosis of ADHD due to a simplistic diagnostic process is likely to be one factor responsible for the rising rates of stimulants used to treat children and adolescents because if more children are diagnosed with ADHD there will be more medication prescribed to these children. Today, there continues to be variability in diagnosis and prescribing rates depending on the different regions in the country (Connor, 2011).

This article elaborated on the continued controversy about ADHD and the use of medication, by claiming it is caused, primarily, by the fear that physicians are overprescribing medication, there is limited research to support evidence-based standards of ADHD evaluation and treatment, and the continued unease regarding the legitimacy of the ADHD diagnosis (Conner, 2011).
Recommendations to Improve the Training, Assessment, and Diagnosis of ADHD in Order to Provide Adequate Treatment for Children

In order to make an accurate diagnosis of ADHD at an early age it is imperative to have the appropriate measures and assessments to evaluate children for ADHD and their reliability. It is a clinical challenge to come to a consensus on the diagnosis of ADHD. Zelnik, Bennett-Back, Miari, Goez, and Fattal-Valevski (2012) reviewed files of children and adolescents who had been examined at the ADHD Neuropediatric Clinic of the Haifa Clalit Healthcare Services during 2005-2007. Zelnik, et al (2012) wanted to assess the effectiveness of the Test of Variables of Attention (TOVA) and its reliability when using it to evaluate children for the presence of ADHD for the first time. In the study, the probable diagnosis of ADHD was determined for children who fulfilled the criteria of the DSM-IV for ADHD (Zelnik, Bennett-Back, Miari, Goez, & Fattal-Valevski, 2012). Information from medical files regarding the diagnosis of ADHD was constructed separately by 2 researchers who were blinded to each other.

The McNemar test was used to compare the rate of the presence of ADHD between the standardized clinical assessment and the suggestive diagnosis derived from the TOVA procedure. Zelnik, et al (2012) showed that while the TOVA could identify 91.1% of the children with ADHD (sensitivity) and had a positive predictive value of 80.3%, it had a high rate of false positives and was still suggestive for ADHD in 78.4% of the children without ADHD, with a negative predictive value of 40.7%. The TOVA was not suggestive for ADHD in only 21.6% of the children who did not meet the clinical
criteria for ADHD (specificity). Zelnik, et al (2012) stated that there was no consensus regarding the use of continuous performance tests in the diagnostic workup of patients with ADHD. There was a lack of bias caused by personal subjectivity and uniform procedures; meaning that the laboratory procedures measured only one aspect of attention and did not match the requirements of a child in a classroom or home environment (Zelnik, et al, 2012).

Zelnik, et al (2012) found that the major drawback of the TOVA (as well as the other continuous performance tests) was the discrepancy between a satisfying sensitivity with a fair positive predictive value and inadequate specificity. Zelnik, et al (2012) concluded that this might also lead to the unnecessary and excessive use of stimulants. The study showed that the TOVA has sensitivity but inadequate specificity, which means that it cannot be regarded as an essential and/or only tool in the diagnostic process of ADHD, and its use should be reserved in situations where further analysis will be done. This will help prevent the misdiagnosis/overdiagnosis of ADHD and give the correct treatment to children without overprescribing unnecessary medication (Zelnik, Bennett-Back, Miari, Goez, & Fattal-Valevski, 2012). Seitzler (2006) stated that it is important to also consider the weaknesses in having a neuro-biochemical perspective when assessing children and diagnosing them with ADHD. Seitzler (2006) found it to be imperative to understand that there is not a single test that measures ADHD accurately because tests are subjective to therapists’ interpretations, there are problems with the definitions, there are logical fallacies, and many times a flawed research methodology is used.
Diagnostic Classifiers Helpful for Clinicians to Make the Appropriate Diagnosis

Currently, there are several diagnostic classifiers used to make distinctions between the different psychiatric disorders children may suffer. The study details three diagnostic classifiers, one of which is the current classifier for psychiatric disorders, the Artificial Neural Network (ANN), which is used in medical diagnosis as a nonlinear classification method. Another classification method mentioned was the Multi-Layer Perceptron (MLP) neural network which was more commonly used in medical diagnosis (Delavarian, Towhidkhah, Dibajnia, and Gharibzadeh, 2010). A third classifier was the radial basis function (RBF) neural network, commonly used in the detection of potential suicide using past history and past self-harm history. In this study, the RBF neural network was specifically used to compare with the MLP neural network to help design a suitable high accuracy classifier for the detection and categorization of behavioral disorders such as ADHD, conduct disorder, and depression (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010).

The results of the study confirmed that the RBF classifier is more accurate than the MLP, and categorizes the patients more precisely. The RBF classifier can categorize mentioned disorders with high accuracy and efficiency (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010). The study further found that the MLP classifier appears to categorize the cases quickly but is not useful for children with behavioral disorders. The MLP decision support system that was designed for diagnosing ADHD can in fact detect ADHD quickly but cannot differentiate similar behavioral disorders exhibited by
children. In the RBF, the misclassifications were most common when distinguishing between ADHD and conduct disorder, anxiety and ADHD, and anxiety and co-morbid depression and anxiety (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010).

The limited number of diagnostic errors using RBF in comparison with errors which were made by specialists makes the RBF useful as a tool to make an accurate diagnosis, as the average accuracy increased from 87.57% when specialists did not use the decision support system, to 96.62% when they did use the decision support system. Based on the high accuracy of this classifier, the RBF system can work as a decision tool for psychiatrists. The RBF can also be used in schools as a reliable screening device in order to predict the behavioral disorders in students (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010). This proposed system will help save time and cost, and increase the early diagnosis efficiency. With content, Delavarian, et al (2010) found the RBF classifier to be helpful in improving the accuracy of the diagnostic process and reducing the possibility for misdiagnosis.

Gupta and Kar (2010) explained that there are other mental disorders and disabilities with symptoms that are associated with ADHD, making it extremely important to have a deferential criterion that makes the distinctions of ADHD and other disorders clear. The authors suggested utilizing a diagnostic procedure that incorporates not only subjective information, but also objective data to help ensure a more accurate diagnosis of ADHD. The study explained that it is important to detect behavioral symptoms early in childhood because early detection can decrease the risk of mental
disorders, learning disabilities, neuropsychological disorders and borderline personality disorder. This further incentivizes informing accurate diagnosis at an early age to give proper intervention (Delavarian, Towhidkhah, Dibajnia, & Gharibzadeh, 2010).

Gathje, Lewandowski, and Gordon (2008) focused on the relationship among impairment symptoms, variables predictive of impairment and variation in ADHD identification when impairment criteria were added to symptom criteria. The sample size was composed of 314 consecutive patient referrals to an ADHD diagnostic clinic in central New York from 1996 to 2005. Gathje, Lewandowski, and Gordon (2008) stated that the DSM-IV-TR is not specifically clear how to assess a child for ADHD; instead a criterion is provided for the therapist to use to decide whether or not the child fits the diagnostic criteria. Clinicians are supposed to take into account the significant impairment in social, academic, or occupational functioning; however, some clinicians were found to base their entire ADHD assessment on the number and intensity of the symptoms reported (Gathje, Lewandowski, & Gordon, 2008).

The major findings were: symptom reports and single impairment measures were moderately correlated, indicating relationship and distinctiveness; the addition of a Global Impairment Index (GII) increased the average correlation slightly, but was still only moderately correlated with symptom report; attention subscale score, Peabody Picture Vocabulary Test (PPVT), and SNAP-IV (teacher and parent rating scale) symptoms were generally the best predictors of impairment but accounted for only a small percentage of the total variance in global impairment; and, the inclusion of both
symptoms and impairment criteria in diagnostic decision dramatically changed the “would-be” identification of ADHD in children (Gathje, Lewandowski, & Gordon, 2008). The study concluded that it is fundamental to consider impairment of a child and the number and intensity of the symptoms to make an appropriate assessment for ADHD.

Impact of Long Term Medication on Learning, Behavioral and Social Domains of Misdiagnosed Children

Van Der Oord, Prins, Ooserlaan, and Emmelkamp (2011) conducted a naturalistic study on ADHD. Van Der Oord, et al (2011) followed children suffering from ADHD who were receiving treatment in childhood and then looked at the same children in adolescence to examine the effects of the treatment given. The only existing naturalistic long term follow-up study was the MTA (Multimodal Treatment of Attention Deficit Hyperactivity Disorder) study and Van Der Oord, et al (2011) mirrored some of the same components of the MTA study and compared their results with the results of the MTA study.

Van Der Oord, et al (2011) compared the effectiveness of 10 weeks of treatment with optimally titrated methylphenidate versus 10 weeks of treatment with optimally titrated methylphenidate combined with multimodal (cognitive) behavioral therapy in an outpatient clinical setting using children ages 8 to 12 years old with ADHD. The children, then, were reassessed at adolescence (4.5 to 7.5 years after treatment), while being matched to a control group (Van Der Oord, Prins, Ooserlaan, & Emmelkamp, 2011). Of the 45 children in the initial study, 21 children did not participate in the follow up study.
for various reasons, but 24 children with a mean age of 15 years participated (11 participated in the Medicine treatment only and 13 in the Medicine and Behavioral treatment).

The assessments at follow up included the diagnostic statuses, ADHD symptoms, oppositional and conduct behavior, substance abuse symptoms and parental stress. Van Der Oord, et al (2011) found that out of the 24 adolescents participating in the follow up study, half still met the diagnostic criteria for ADHD. The effects on outcome measures were generally the same in the follow up study as with the short term effects. One of the differences found was that at post test of the initial study, treatment conditions did not differ in methylphenidate use, but at follow up conditions, it had differed. At the follow up, the adolescents in the combined treatment condition used significantly less medication than children in the methylphenidate condition, but there were no significant differences between the treatment conditions. Previous research has found that additive effects of behavioral treatment may only become evident after long follow up periods, causing children to stop or reduce medication easier (Klein, Abikoff, Hechtman, & Weiss, 2004). It has been speculated that in the long run the benefits of methylphenidate treatment often fade, possibly because with increasing behavior problems of the child, additional behavior therapy gives parents other options to change the behavior of their child than raising the dose of methylphenidate (Van Der Oord, Prins, Ooserlaan, & Emmelkamp, 2011).
The MTA study, on the other hand, found no differences between treatment conditions in medication use at six to eight year follow ups. The MTA 24 month follow up did provide data of significantly lower doses of methylphenidate in the combined condition compared with the methylphenidate alone condition (Swanson et al, 2007). Van Der Oord, et al (2011) found that there did not appear to be any significant differences between children who, in the initial study, were randomized to methylphenidate only and children who were randomized to methylphenidate combined with (cognitive) behavior therapy.

Also, there was a significant decline in the adolescents’ hyperactivity/impulsivity, oppositional and conduct disorder symptoms from pre-test to post-test levels for both groups but were non-significant from post-test to follow-up (but not back to baseline level). The study showed that adolescents who were originally diagnosed with ADHD fared significantly worse than matched controls on all outcomes, except on conduct disorder and substance abuse symptoms, but still fared worse than matched normal controls (Van Der Oord, et al, 2011). Van Der Oord, et al (2011) showed that there was no significant difference between adolescents at follow up and those lost for follow up.

Overall, the findings of the study show that in adolescents diagnosed with ADHD at childhood had a decline of ADHD symptoms, but still fared worse than matched normal control without ADHD. It is critically important, then, to diagnose children appropriately at an early age to help with the behavioral symptoms as well as provide
behavioral treatment instead of only prescribing medication without behavioral treatment to see better long term results later in life (Van Der Oord, et al, 2011).

The Impact of Medication and Diagnosis of ADHD in the School System

Kristjanson (2009) used excessive “medicalisation” to highlight the fact that ADD/ADHD is a disorder with controversy. ADD/ADHD diagnoses had proliferated in recent years, ADD/ADHD was of unclear etiology and it raised issues that were ubiquitous in school contexts. Kristjansson (2009) explored ADD/ADHD and stated that there was a tendency towards overdiagnosis of the disorder and excessive “medicalisation.” The research took into account some of the most common explanations of excessive “medicalisation” in the current literature, which Kristjansson (2009) referred to as conservative, existentialist, liberalist, and poststructuralist explanations. All of which implied that there was some personal or social conspiracy working to serve the interests of specific social factors or agencies, but found that none explained the excessive ADD/ADHD labeling that happens in the school system. By the late 1970s, the use of medication to treat ADD/ADHD had become a common procedure in the USA and was a treatment which, since that time, had spread throughout Western society (Kristjansson, 2009). The most common drug used to treat ADD/ADHD was Ritalin and the Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) indicated that 3-5% of school-aged children exhibit ADD/ADHD (as cited in Kristjansson, 2009). If Ritalin had previously helped ‘uncontrollable’ pupils focus on
schoolwork, there would have been nothing conceptually or factually wrong with calling their non-medicated state a disease (Kristjansson, 2009).

Kristjansson (2009) discussed that much of the recent literature on ADD/ADHD supported the conclusion that over-diagnosis of this disorder was a widespread problem with repercussions for health and school problems. Kristjansson (2009) claimed that the label (ADD/ADHD) had been overly used in some health and school systems, where over-diagnosis existed, and that this constituted an archetypal example of “excessive medicalisation.” Kristjansson (2009) explained the conservative, existentialist, liberalist and poststructuralist views fail to explain the excessive medicalisation of ADD/ADHD. Kristjansson (2009) stated that the eagerness of many parents and professionals to diminish hyperactive behavior in children, which is specified as a disease, may have been a major reason for “medicalisation,” which had fuelled over-diagnosis.

Kristjansson (2009) concluded by discussing three major findings: (1) The Western conception of the self is recent indicating that the way people have been socialized to view ADD/ADHD and the “medicalisation” of children can be changed with a view that will be more beneficial to children diagnosed with ADD/ADHD; (2) people do not need to think in extreme measures and find children diagnosed with ADD/ADHD to always need medication instead a treatment plan that does not always include “medication” can be provided (3) the traditions within the liberal structure accommodate non-subjective, substantive moral goods that provide the belief of “medicalisation” as having a solid grounding.
The excessive “medicalisation” has been a progressive process under conditions of substantial moral deprivation in school, home and society at large, and maybe the deprivation could be remedied through a combined moral and educational effort. The last observation is that research into the effects of teachers’ outlooks on “medicalisation” seems to indicate that teachers can be helpful in reducing the disproportionate amounts of “excessive medicalisation.” If teachers are aware that “excessive medicalisation” is a problem and are able to distinguish ADD/ADHD behaviors from other normative developmental behaviors children display, this can further help in reducing the overdiagnosis of ADD/ADHD (Kristjansson, 2009)

**Ways to Reduce the Misdiagnosis of ADHD and Over-Prescription of Medication**

It was found to be essential for clinicians to have first gathered enough information to give a child the correct diagnosis before a treatment plan is given (Mota-Castillo, 2007). Mota-Castillo (2007) explained a case study of a patient misdiagnosed with ADHD due to the failure of her previous therapist to gather adequate information before making a final diagnosis. Hojman (2008) also discussed other issues complicating an accurate diagnosis that are often overlooked including ethnic differences, sleep disorders and poor nutrition. For example, bilingual children would need to get assessed in the school setting where they may be having difficulties integrating into a new culture, which impacts their academic success, ability to make friends, and thrive in general.

Similarly, Seitler (2006), posited that believing ADHD has a neuro-bichemical basis often results in an organic treatment approach and using medication, which can
have negative long lasting effects on children. Seitler, 2006 contented that treating ADHD with just medication eliminates the need to look at the impact that the environment has on ADHD, and using a theoretical lens, rather than the neuro-biochemical approach, when diagnosing children with ADHD can prevent therapists from choosing medication as their only treatment option. Based on the cases of children diagnosed with ADHD, many of who had been successfully treated with therapy, Seitler (2006) emphasized that psychotherapy, rather than using medication as the sole mode of treatment, could be beneficial for children diagnosed with ADHD. Comprehensive physician ADHD evaluation practices were observed as being essential for ensuring medicine is prescribed on an evidence-based evaluation and unwanted variation in stimulant prescribing rates is reduced (Conner, 2011). Therefore, it is necessary for the therapists to take into account the various factors that may contribute to appropriately conducting an assessment of a child before a final ADHD diagnosis and medication to treat ADHD is given (Connor, 2011).

**Recommendations for Improving Assessments Tools in the Diagnosis of ADHD**

Hojman (2008) concluded that despite multiple pressures for answers, an immediate treatment plan, and results, it is important to consider that shortcuts in diagnosing children can lead to misdiagnosis and lack of effective treatment. The study reiterated, therefore, that taking adequate measures to make an accurate diagnosis with every child referred for an evaluation is paramount to avoiding misdiagnosis (Hojman, 2008).
American Academy of Pediatrics (2000) developed recommendations for improving the assessments to evaluate and more accurately diagnose school-aged children with ADHD. American Academy of Pediatrics (2000) selected experts in the field of neurology, psychology, child psychiatry, development, and education, as well as experts from epidemiology and pediatric practice to do research and develop possible recommendations for the assessment and diagnosis of children with ADHD. The recommendations that resulted from the study were: Clinicians need to evaluate children who present inattention, hyperactivity, impulsivity, academic underachievement, or behavior problems and recognize whether or not the behaviors are the result of ADHD or other disorder(s); another result was that in order to be diagnosed with ADHD, a child needs to meet the DSM-IV diagnostic criteria, meaning that pediatricians and primary care health professions should apply DSM-IV criteria in the context of their clinical assessment of a child;

1. The assessment of ADHD requires information from parents or caregivers regarding the core symptoms of ADHD in various settings, the age of onset, duration of symptoms, and degree of functional impairment. This will help one gather more valuable information about the children and understanding their behavior in different settings;

a. Using scales in a clinical practice when evaluating children for ADHD is beneficial in identifying ADHD symptom behaviors;
2. An assessment of ADHD needs to include information from the classroom teacher regarding the child’s daily functioning and impairment in class;
   
a. The use of scales is a clinical option when diagnosing a child for ADHD. The use of ADHD-specific questionnaires and rating scales correctly distinguish between children with and without the diagnosis of ADHD. Whether these scales provide added information further than narratives or descriptive interviews informed by DSM-IV criteria is unknown;

b. The use of teacher global questionnaires and rating scales are not recommended in diagnosing a child for ADHD, they may be useful for other purposes. Evidence shows that broadband scales are not a source to distinguish between children with and without ADHD;

3. Evaluation of the child should include assessments for coexisting conditions aside from ADHD;

4. Other diagnostic tests are not routinely indicated to establish the diagnosis of ADHD, therefore, they are not as important in determining or ruling out an ADHD diagnosis.

These possible recommendations are provided for clinicians to follow when evaluating a child with ADHD, which are valuable in helping them make an appropriate diagnosis and eliminate bias and subjectivity (American Academy of Pediatrics, 2000). In a similar note, Mota-Castillo (2007) recognized cases where children were misdiagnosed with ADHD because the therapist felt the behaviors displayed fit the diagnostic criteria of
ADHD without gathering information about the familial background and other essential factors that have been found to play a part in making an accurate diagnosis.

Mota-Castillo (2007) suggested that it is important for clinicians to understand they can reduce misdiagnosis and provide the appropriate treatment plan by considering the factors that commonly contribute to an incorrect diagnosis. These factors include: the failure to obtain a complete family history; cultural and linguistic barriers which can create diagnostic confusion and interfere with culturally competent treatment; failure to communicate with clinicians who know the patient; and misconstruing behaviors as causative explanations (Mota-Castillo, 2007). Therefore, it is imperative for clinicians to stay apprised of the appropriate steps and be informed regarding the correct procedures, which provide as much accurate and reliable information as possible about the child, to decrease the chance of incorrect diagnosis of a child (Mota-Castillo, 2007).

**Conclusions**

The literature reviewed provides fundamental information regarding the diagnosis of ADHD, the impact ADHD has in the lives of children, the potential factors contributing to the misdiagnosis/over-diagnosis of the disorder, and the behaviors that overlap with other behaviors children display (e.g., behavioral symptoms of psychiatric disorders, personality traits, and creative/gifted behaviors). Overwhelmingly, findings suggest the essentiality of being aware of the distinguishing characteristics of ADHD and other behaviors children display to ensure an appropriate diagnosis and provide the correct treatment plan, which increases the chances of a more successful life outcome.
The literature suggests making an appropriate diagnosis requires proper training for practicing clinicians, having the appropriate assessment tools for diagnosing children with ADHD, and equipping those who administer assessment with an understanding of the etiological factors that may contribute to the development of ADHD. Taking all of the information provided by the literature thus far into account will help clinicians be more successful at properly diagnosing children and prevent mistakes in the diagnosis and treatment of ADHD.

Perhaps the most significant suggestions echoed in the literature are the need for further research to understand the extent and full significance of over-diagnosing/misdiagnosing children, methods to provide better training to practicing clinicians, and analysis of the current tests and assessments used to diagnose children with ADHD. This study hopes to contribute to the literature by examining the perspectives that current therapists (30 therapists: Psychologist, Marriage and Family Therapists (MFT’s) and Licensed Clinical Social Workers (LCSW’s) have with regard to the misdiagnosis/over-diagnosis of children and its implications for children’s futures. The therapists’ perspectives on the diagnosis of ADHD and the problems they perceive will be considered and analyzed in order to inform considerations for changing current ADHD assessments, diagnosis, and treatment procedures.
Chapter 3

METHODS

This chapter presents the methods used to conduct this study and this chapter is organized into the following sub sections: study design, study sample, study questions, data collection procedures, protection of human subjects, and data analysis. This chapter will describe these sub sections in depth and discuss the data collection process to get a better perspective on the study and its main elements.

Study Objectives

The current study utilized an exploratory mixed method and inductive design (Dudley, 2011). Specifically, qualitative data was gathered on the therapists’ perspective regarding the misdiagnosis/over-diagnosis of ADHD and its implications to generate possible theoretical explanations of what was learned. Qualitative data was also used to get the therapists’ perspectives on the accuracy of the measurements and assessments used to diagnose children with ADHD and its implications for their future. Quantitative data were gathered on demographic information including: age, gender, ethnicity, level of education of the therapists, and number of years the therapists have worked with children.

Study Design

Quantitative survey methods with open ended and closed ended questions were chosen to gather data on overall themes utilizing semi-structured interviews and structured questionnaires. The study utilized a combination of questionnaires and interviews to gather the data in order to facilitate the process and collection of the data.
Due to the difficulty in obtaining therapists to participate the researcher utilized structured questionnaires in order to have a larger pool of therapists complete the questionnaire and participate in the study. The structured questionnaire for the interview with the therapists was formulated based on the knowledge about the diagnosis of ADHD gained through the literature review.

In order not to impose a biased position, a semi-structured interview was utilized which included 30 neutral forced and open-ended questions to allow therapist to give their opinion on the subject matter. A semi-structured interview is a flexible format which means that all of the questions are formulated prior to the interview (Dudley, 2011). The questions in a semi-structured interview can be asked in any order and additional questions can be added to probe or follow up on hunches. The questions in semi-structured interviews are for the most part open ended. The study utilized a semi-structured interview in order to have flexibility in the way the questions were asked and to ask additional questions if necessary. A structured questionnaire was utilized in order to allow more flexibility in the part of the participant to complete in their own time and space and return to researcher via email. Questionnaires are different from interviews in that the respondents read the questions to themselves and record their responses (Dudley, 2011).

Questionnaires are usually filled out on paper, in this case the questionnaires were filled out electronically on a computer file and sent via e-mail. A structured questionnaire was composed in order for the participants to answer each question easily with little
assistance from the researcher. Structured questionnaires are questionnaires with forced-response questions which are easy to answer without any assistance from the researcher. The initial instructions on a questionnaire are usually all the guidance that given to the participant. Structured questionnaires usually include forced-response questions because they are simple and easy to fill out but they can include open-ended questions if these questions are self-explanatory (Dudley, 2011).

The study utilized both forced-response questions and open-ended questions which required more time from the participant to complete the questionnaire. The semi-structured interviews were conducted in person or through the phone the structured questionnaires were done electronically and sent via email, the time to complete the interview and questionnaires was no longer than 30 minutes. The questionnaire was composed based on the researchers existing knowledge regarding the diagnosis of ADHD and allowed to follow up on hunches and themes that arose during the researchers’ theoretical research on ADHD. Specifically, on the misdiagnosis/over-diagnosis of ADHD, assessments used to diagnose children, and the training therapists receive in their graduate education. The interview and questionnaire responses were analyzed by the researcher for recurring themes. Once the data was gathered and responses analyzed, the themes that emerge were turned into categories/variables and entered into SPSS for statistical output.

The levels of measurement used in this study included nominal and ordinal variables because they were categorical, mutually exclusive, and exhaustive in all
possibilities (nominal variables) while others were also sequential (ordinal variables) in nature. Nominal variables have values that are categories. These categories have to be distinct, mutually exclusive, and exhaustive. Being distinct means that the label assigned to a category clearly identifies what it means. Second, nominal variables have values that are mutually exclusive or do not overlap. This means that no one is likely to select more than one of the categories. Third, nominal variables have an exhaustive set of categories, which means that there is one category that fits the circumstance of each of the respondents. The set of categories includes a value that will ensure a choice for every respondent such as “other”. Ordinal variables also have all three of the properties required of nominal variables. An additional property for ordinal variables is that these categories can be listed in sequential order, from higher to lower or greater to lesser such as a likert scale (e.g., strongly satisfied, satisfied, dissatisfied, strongly dissatisfied) listed in degree of satisfaction (Dudley, 2011). Forced-response questions use words to measure demographic questions eliciting a word response. Forced-response questions can restrict the respondent’s answer to a predetermined list of response categories (Dudley, 2011). Forced-response questions can also be referred to as closed-ended questions. Forced-response questions were utilized in the questionnaire to obtain demographic information and the attitude, belief, and feelings of the therapists. Open-ended questions are used for longer word forms, such as phrases, sentences, or more extended comments.

When open-ended questions are asked, they are likely to elicit responses in a longer word form. Respondents answer these questions in their own words. Open-ended
questions can elicit single-word responses but they are more likely to involve several words, a sentence or two, or lengthier comments (Dudley, 2011); Open-ended questions were used in the study in order to provide unrestricted responses. The therapists were able to answer the questions in their own words. The participants had the opportunity to give additional information or comments at the end of the interview in order to allow the therapists perspective be given on the diagnosis of ADHD in children.

The current study utilized semi-structured interviews and structured questionnaires as an instrument to collect data. Conducting face-to-face interviews provided access to people at specific sites but made it more difficult to find participants with availability to participate due to time constraints and availability. Conducting phone interviews allowed for the researcher to have easier access to people in the privacy of their own home; a greater possibility of maintaining anonymity; interviewing from a location of choice, and more flexibility in determining when to administer the interview (Dudley, 2010). Conducting phone interviews was also difficult due to the limited availability of participants to conduct the interview through the phone in which case structured questionnaire were utilized to give participants more time flexibility. Structured questionnaires allowed researchers to complete the questionnaire electronically in their own time and privacy and return to the researcher via email once completed. Dudley (2011) explained that semi-structured interviews use a more flexible format. Most of the questions are already formulated, but they can be asked in any order.
Additional questions can be added to probe or follow up on hunches which cannot be done when administering a structured questionnaire.

Many of the questions in semi-structured interviews can be open ended. There is flexibility built into semi-structured interviews making it useful when conducting an exploratory study (Dudley, 2011). The structured questionnaire in the study was composed to be self-explanatory with the possibility to ask the researcher questions on any uncertainties via email regarding the questionnaire. Structured questionnaires can include forced-response questions and open-ended questions that are easy to answer without any assistance from the researcher. The initial instructions on a questionnaire are usually all the guidance that is needed. Although structured questionnaires typically use forced-response questions because they are simple to fill out, they can also include open-ended questions. A drawback on open-ended questions is that they require more time to fill out (Dudley, 2011). In the study the researcher used structured questionnaires when participants were unable to conduct the interview in person or through the phone. Due to the nature of the current research questions (i.e., whether overdiagnosis/misdiagnosis exists; what measures and assessments are used to diagnose children with ADHD), the desire for a larger number of participants, and the limited research currently available on this topic, a structured questionnaire was chosen as the primary source of data collection (see Appendix B).
Study Questions

1. What are the perspectives of professionals regarding the diagnosis of ADHD?
2. How do professionals view the potential for misdiagnosis?
3. What are the views of professionals on ways to manage the potential for misdiagnosis?

Sampling Procedures

The sampling technique used was a non-probability purposive sampling—specifically snow ball sampling. Snowball sampling is appropriate to use when it is difficult to identity or locate the kinds of people who are the focus of a study. Such groups may be unseen or difficult to identify because they are a small group that is isolated from the mainstream or a group that is judged upon. First, in snowball sampling is to select and interview people who are known to fit the study’s criteria and then they are asked to identify others who fit the criteria. Each time new people are identified to be interviewed, they are asked to identify others. This continues until enough research participants have been found. Sometimes, participants who identify other people can also assist in reaching them or may offer their name as referral sources (Dudley, 2011).

Snowball sampling was appropriate to utilize in this study because therapists working with children with ADHD are difficult to identify. The researcher asked the initial identified therapists to identify other therapists that fit the criteria to participate in the study. The initial identified therapists provided the researcher with a name and contact information of the other therapists who fit the criteria to participate in the study.
Participants for this study were therapists residing around Sacramento, CA who have worked with children and have knowledge about the diagnosis of ADHD. The therapists included: Psychologist (PhD, PsyD), Licensed Clinical Social Workers (LCSW’s), Marriage and Family Therapists (MFT’s), and social workers (MSW’s).

The researcher began the human subject protocol process on May 2012. The human subject committee required the researcher to obtain a signed release form from the Psychology Department, Marriage and Family Therapy Department, and Counseling and Psychological Services Department from California State University, Sacramento. The signed consent form would allow the researcher to collect data from professionals meeting the criteria who are employed in any of these departments. This was an exhaustive process for the researcher as it required the creation of the release consent form. The researcher had to then distribute the consent form to each department and have the chair of the department sign the form. This would allow the researcher to recruit identified participants from that department. This process extended the amount of time in regards to getting the human subjects protocol application approved by the human subjects committee. The researcher was not able to begin collecting data until after the human subjects protocol application was approved on November 2012 (12-13-065, refer to appendix A).

Beginning December 2012, the researcher recruited professional clinicians working for agencies such as: Sacramento State University, La Familia, Dignity Health, Sacramento County Mental Health, San Juan Unified School District, and Terkensha
Associates. The researcher embarked in a difficult journey searching for agencies and contacting the program managers, whom have an overwhelming schedule, making it difficult to respond to the researchers’ phone call and/or email. The researcher contacted the program managers through phone and/or via email to explain the current study and ask to identify any participants who fit the criteria and might be interested to participate in the study. The email sent to the program managers included a letter identified as an invitation to be forwarded to the identified participants to respond to if they chose to participate in the study. Once possible participants were identified, the program managers forwarded the study information and invitation to them. Additional participants were recruited through snowball sampling (Dudley, 2011). The participants identified were asked if they knew of any other therapists who have worked with children and/or diagnosed children with ADHD and who were interested to participate in the current study.

The interviews began on December 18, 2012 through February 28, 2013. The researcher scheduled the interviews during a time and date that best accommodated the participant’s schedule. Due to the lack of availability on the identified participant’s side the researcher emailed the interview questionnaire and consent form to the therapists who were constricted in time availability but wanted to participate in the study. The participants completing the questionnaire via email were allowed to email the researcher with any questions on the questionnaire or if they needed any further clarifications. Once
the therapists completing the questionnaire via email completed the questionnaire they emailed it back to the researcher.

Within the first two weeks of contacting and sending out the information to the program managers of the agencies the researcher received a call back from only a few of the agencies (Dignity Health; Terkensha Associates). The researcher emailed the program managers from the remaining agencies once again. The researcher received a reply from all of the agencies except La Familia. Program managers from the agencies were able to provide identified participants for the researcher to interview. The program managers forwarded the email and invitation of the researcher to the identified researchers. The researcher received a direct email from the therapists that were willing to participate in the study. The researcher scheduled a date and time with the participants that accommodated with their schedule.

The main agencies of sampling were used to ensure a representative sample of the population and included participants with experience working with children. All participants in this study volunteered without any coercion on the part of the researcher and they were given the option to complete the interview in person, through the phone, or via email. The total number of participants that completed the questionnaire were 24. A total of 24 questionnaires were analyzed. The 24 participants were within the area of Sacramento California. Further description of participants will be described in chapter 4.
**Data Collection Procedures**

Once participants were identified through the program managers at the agencies, the program managers emailed the invitation to these identified participants. The identified participants emailed the researcher in order to set up a date and time that would accommodate within their schedule. As previously discussed, data for the current study was collected through interviews and questionnaires utilizing 30 open-ended questions. There were no incentives given to the therapists if they chose to participate in the current study.

The participants who decided to schedule a face-to-face interview were given the option to choose a location that would best accommodate them. The researcher met with the participants at this location. The participants who decided to schedule a phone interview were given the option to schedule a date and time that accommodated their schedule. The participants who decided to complete the questionnaire via email were given two weeks to complete the questionnaire and email the researcher with any questions regarding the questionnaire within the two weeks. Only 4 participants in the study were not able to answer all of the 31 questions in the questionnaire due to their lack of experience in that subject matter. There were only two questions in the questionnaire that the 4 participants were unable to respond to. The remaining 20 participants were able to answer all of the questions in the questionnaire. All of the identified participants were able to meet the deadline of February 28, 2013 to collect all of the data.
One limitation of the study is the fact that the researcher has no control over the honesty in the responses of the therapists to the interview questions. Secondly, the researcher has no control over the way the therapists will interpret the questions in the interview. The responses to the interview questions will be open to the therapists’ knowledge of the subject and the information that they are willing to provide during the interview.

**Data Analysis**

The analysis of the completed interview questionnaires began in February by compiling all of the questionnaire responses. The analysis then followed analyzing and comparing the responses. The findings were discussed regularly between the researcher and the researcher’s advisor via in person and phone consultation. Comparing the responses allowed for themes and theories to be developed, added, and revised throughout the course of the research based on new information being collected and analyzed. First the researcher read each questionnaire independently and noted emerging ideas and recurring statements. Next the researcher met together with the advisor to discuss the emerging ideas and developed a set of categories in which to continually code the data. The final product included themes and hypothesis about what the factors that might contribute to the diagnosis of ADHD; the reliability on the assessments used by clinicians to diagnose children; and the graduate training given to students to distinguish ADHD and other “normal” behaviors children display.
Extensive dedication and quality work were brought into this study through several methods that were utilized by the researcher. The researcher checked consistency of the categories used and the data that was coded within the categories used against the other analyses. The researcher looked for non-examples of the categories that emerged throughout the analysis in order to make sure that the categories were a true representation of the data and not forced coded. The researcher took into account potential bias prior to the data analysis and was conscious of these biases throughout the analysis. The researcher discussed the biases with the advisor and was cognizant if it was sensed that the bias was forming in the analyzing of the data. This help the researcher make sure that the bias was not intruding with their analysis or the themes that were developed. In the following chapter, the discussion of the findings from the analysis of participants’ responses to the interview questionnaires will be further discussed.

**Protection of Human Subjects**

During all phases of the research study, all information was kept confidential including the participants’ names, the agency where they are employed, and any other identifying information that was provided. All materials were kept confidential in a file on the researcher’s computer accessible only through entering a password limited to the researcher’s knowledge.

All participants were given a letter explaining the research prior to completing the interview questionnaire. To ensure anonymity participants were not required to return consent forms. On the email distributed to the participants it was noted that by
completing the interview questionnaire participants consented to the research and
analysis of their questionnaires. Participants were given the researchers information if
they had any questions in regards to the study. If at any time participants chose not to
have their interview questionnaires analyzed, they had the option to contact the
researchers and revoke their participation.
Chapter 4

STUDY FINDINGS AND DISCUSSION

This chapter presents the results of the study with an emphasis on thematic and quantitative analysis to examine the research question of professionals’ perspectives on the diagnosis of ADHD and its implications, the accuracy of the assessments used to diagnose children, and the training therapists receive as graduate students. It begins with demographic information pertaining to age, gender, and ethnicity, including the number of children with ADHD the therapists have screened, the clinical licensure the therapists have obtained, and the amount of years the therapists have been practicing.

The themes from the qualitative analysis focus on misdiagnosis of children with ADHD, factors contributing to misdiagnosis, therapists’ perceptions of the misdiagnosis of ADHD, accuracy and relevance of assessments used to diagnose children, incentives for misdiagnosis, and therapists’ training in graduate school. After reporting on demographic information and the themes, the responses to specific questions in regards to the disorders that typically overlap with ADHD, the most valuable assessments/tests/measurements used to diagnose children, therapists’ perspectives on bias, subjectivity, theoretical framework, and financial incentives as possible contributors to the diagnosis of ADHD are discussed.

The purpose of the study was to analyze therapists’ perspectives on the diagnosis of ADHD in children and its implications. A questionnaire designed by the researcher was distributed to therapists working in agencies in the Sacramento, California region to
get their observations regarding children with ADHD and the process of diagnosing the disorder. Twenty four respondents returned the study questionnaire. There were both male and female participants between 34 and 75 years of age (refer to table 1). The mixed methods research study used open-ended and scaled questions to obtain the therapists’ responses. The participants were asked 31 questions on their perspectives on the diagnosis of ADHD, the accuracy of assessments used to diagnose children, and the training therapists receive in graduate school.

**Overall Findings**

**Demographics of the Respondents**

The respondents indicated that the children they worked with are between the ages of 4 and 22 years, and were diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). Participants were from the California region; there were no participants from out-of-state. In the sections that follow, more detailed demographic information will be provided on therapists’ ages, the number of years the therapists have been practicing as clinicians, and the number of children the therapists have screened.

**Gender and Ethnicity**

Based on the information gathered from the questionnaires, there were 16 female participants and 6 male participants (refer to Figure 1). Three respondents did not specify their gender identity. Based on the research question of the study, gender difference does not have an impact on the results of the study.
The respondents varied in ethnic background with the majority of the participants being Caucasian ($n=16$). The study included participants who were Hispanic ($n=1$), African American ($n=1$), Asian ($n=2$), and participants who fell under the “other” ($n=4$).
category. The category of “other” included participants from ethnicities that were not listed (refer to Figure 2).

_Age, Years in Practice, and ADHD Caseload of the Respondents, and Type of Licensure._ The average age of the respondents (n=24) was 51.33. However, there is a standard deviation of 10.17 which indicates a wide dispersion from the mean (refer to Table 1). The minimum age of the participants (n=24) was 34.00 and the maximum was 75.00, indicating that the participants’ ages varied significantly. The participants’ (n=24) years in practice had a phenomenally wide range of difference with the minimum of years in practice being 3.50 and the maximum years in practice being 48.00. Thus, the respondent pool included those with very few years in practice and those who had decades in practice. Of the 24 participants, only 22 gave information regarding the number of ADHD children they have had on their caseload. A mean of 54.13 children seen by each therapist was reported, but there was a standard deviation of 77.78. This indicates that there were some therapists who had few to no children on their caseload with ADHD, and some therapists had hundreds of children with ADHD on their caseload (Refer to Table 1).
Table 1. Descriptives of Age, Years in Practice, and ADHD Caseload of the Respondents

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>M</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of the respondent</td>
<td>24</td>
<td>34.00</td>
<td>75.00</td>
<td>51.33</td>
<td>10.18</td>
</tr>
<tr>
<td>Years in practice</td>
<td>24</td>
<td>3.50</td>
<td>48</td>
<td>19.98</td>
<td>11.19</td>
</tr>
<tr>
<td>Number of ADHD caseload</td>
<td>22</td>
<td>.00</td>
<td>300.00</td>
<td>54.14</td>
<td>77.79</td>
</tr>
</tbody>
</table>

The study included participants with LCSW’s (n=9), MFT’s (n=9), PhD’s (n=4), and PsyD’s (n=1). The category of other (n=1) consisted of therapists with licensures that were not listed (refer to Figure 3).

Figure 3. Type of Licensure of Respondents
The therapist that was placed in the category of “other” had an LMFT licensure. More therapists with PhD’s and PsyD’s were needed in order to get more accurate results and extrapolate the findings to the entire population being studied.

**Specific Findings**

*Misdiagnosis of ADHD and Contributing factors.* The overwhelming majority of therapists (80.0%, \( n=20 \)) stated that misdiagnosis does exist, whereas only 16.00% (\( n=4 \)) of therapists stated that misdiagnosis does not exist. There were 4% (\( n=1 \)) of the therapists that did not give a response to this question (refer to Figure 4).

![Figure 4. Perception of Misdiagnosis Among Professionals](image)

When the participants were asked about the factors contributing to the misdiagnosis of ADHD there were a variety of responses. There were therapists (\( n=5 \)) who believed “quick fix to establish compliance” as contributing to the misdiagnosis of ADHD. There
were those \((n=4)\) who perceived “confusion between coexisting or misdiagnosed illness and ADHD” as contributing to the misdiagnosis of ADHD. There were therapist participants \((n=2)\) who stated “lack of treatment for preexisting conditions such as trauma” contributes to the misdiagnosis of ADHD. There was one therapist who stated that lack of training from parents contributes to the misdiagnosis of ADHD. The rest of the participants \((n=2)\) stated other factors contribute to the misdiagnosis of ADHD in children. Some of the responses by therapists \((n=2)\) who stated other factors contribute to the misdiagnosis of ADHD were: marketing of the drug companies, power of pharmaceutical companies, social problems that are underfunded and easy to give a pill, ignorance, incomplete assessments, and lack of understanding of DSM (refer to Table 5).

![Figure 5. Contributing Factors to Misdiagnosis](image-url)
The therapists were asked about disorders which can overlap with a diagnosis of ADHD and/or masquerade as ADHD. There were 16% \((n=4)\) of therapists that found anxiety to overlap with ADHD; there were 4% \((n=1)\) of therapists that found depression to overlap with ADHD; there were 8% \((n=2)\) of therapists that found bipolar disorder as overlapping with ADHD; there were 4% \((n=1)\) of therapists that found oppositional defiant disorder as overlapping with ADHD; there were 4% \((n=1)\) of therapists that found learning disabilities as overlapping with ADHD; there were 8% \((n=2)\) of therapists that found post-traumatic stress disorder as overlapping with ADHD. It appears that the majority of the therapists (52%, \(n=13\)) found three or more of the disorders mentioned.

Table 2.

*Overlap of Other Disorders with ADHD*

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>4</td>
<td>16.0</td>
<td>16.7</td>
<td>16.7</td>
</tr>
<tr>
<td>Depression</td>
<td>1</td>
<td>4.0</td>
<td>4.2</td>
<td>20.8</td>
</tr>
<tr>
<td>Bipolar</td>
<td>2</td>
<td>8.0</td>
<td>8.3</td>
<td>29.2</td>
</tr>
<tr>
<td>Oppositional Disorders</td>
<td>1</td>
<td>4.0</td>
<td>4.2</td>
<td>33.3</td>
</tr>
<tr>
<td>Learning Disability</td>
<td>1</td>
<td>4.0</td>
<td>4.2</td>
<td>37.5</td>
</tr>
<tr>
<td>PTSD</td>
<td>2</td>
<td>8.0</td>
<td>8.3</td>
<td>45.8</td>
</tr>
<tr>
<td>3 or more disorders</td>
<td>13</td>
<td>52.0</td>
<td>54.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>96.0</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing System</td>
<td>1</td>
<td>4.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
above to overlap with ADHD. The majority of the therapists (96%, n=24) perceived that there are other disorders which overlap with ADHD and/or can be misdiagnosed as ADHD in children (refer to Table 2).

**Therapists Perceptions of the Diagnosis of ADHD**

Therapists had differing perspectives regarding the impact an ADHD diagnosis has on a child’s daily behaviors. There were 34.78% of the therapists who perceived that the appropriate diagnosis of ADHD on a child is a relief from uncertainty. There were 34.78% of the therapists that stated that labeling a child with an ADHD diagnosis can affects a child’s self-esteem and self-efficacy. There were 13.04% of the therapists that perceived that diagnosing a child with ADHD lead teachers to have lower expectations of the child. There were 13.04% of therapists that did not know how an ADHD diagnosis would impact a child’s daily behaviors. There were 4.35% of therapists that found the diagnosis of ADHD on a child is helpful with education and accommodation. Based on the results found in this analysis it appears that the diagnosis of ADHD is perceived to be beneficial for children by some of the therapists (34.78%). On the other hand, an equal number of therapists perceived ADHD diagnosis can be detrimental for children (34.78%). Based on the responses the therapists provided, the effect that the ADHD diagnosis has on the children is based on the way the child, parents, and teachers understand the disorder and how well educated they are regarding ADHD (refer to Figure 6).
There were a variety of disorders (anxiety, depression, bipolar disorder, oppositional defiant disorder, learning disability, and post traumatic stress disorder) that therapists (96%, n=24) considered to be overlapping with ADHD. The majority of the participants (84%, n=21) stated that these disorders can contribute to the misdiagnosis of ADHD due to the lack of knowledge therapists have to correctly diagnose ADHD and other overlapping disorders. Eighty four percent (n=21) of the participants perceived that therapists cannot correctly differentiate ADHD symptoms from other disorders. There were 8% (n=2) of the therapists that perceived that sometimes therapists cannot differentiate ADHD symptoms from other disorders. There were 8% (n=2) of therapists that did not respond to this question. All responding participants (92%, n=23) perceived therapists cannot correctly differentiate ADHD symptoms from other disorders. Based on
this analysis and the responses to the questions, the majority of participants (92%, n=23) perceived that practicing therapists do not always differentiate ADHD symptoms from other disorders which makes the misdiagnosis of ADHD more likely to occur (refer to Table 3).

Table 3. *Mistaking Other Disorders for ADHD*

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>21</td>
</tr>
<tr>
<td>Sometimes</td>
<td>2</td>
</tr>
<tr>
<td>No response</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
</tr>
</tbody>
</table>

**Incentives for Misdiagnosis**

The study looked at the perspectives that therapists have regarding incentives as possible contributors to the diagnosis of ADHD. There were 36% (n=9) of the participants who stated that financial incentives such as additional government funding to public schools with a higher percentage of children diagnosed with ADHD and incentives from pharmaceutical companies can contribute to the diagnosis of ADHD in children. There were 28% (n=7) of the participants that stated financial incentives do not contribute to the misdiagnosis of ADHD. There were 32% (n=8) of the therapists that stated other factors contribute to the diagnosis of ADHD. Some therapists (32%, n=8) perceived other factors which contribute to the diagnosis of ADHD such as: ADHD
symptoms being easier to diagnose, especially in clinical settings working with Foster Families and social workers who may not have all of the history of the child; the extensive amount of money involved in the treatment of ADHD; children getting shunted to primary care physicians and then discouraged to make assessments for other beneficial services. The category of other also included therapists (32%, \(n=8\)) who responded they were not sure if financial incentives contribute to the diagnosis of ADHD. Based on the analysis there were therapists (36%, \(n=9\)) who perceive financial incentives can contribute to the diagnosis of ADHD, whereas other therapists (28%, \(n=7\)) do not perceive financial incentives contribute to the diagnosis of ADHD, and some therapists (32%, \(n=8\)) believe other factors contribute to the diagnosis of ADHD (refer to Table 4).

Table 4.

*Incentives for Misdiagnosis*

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
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<tbody>
<tr>
<td>Yes</td>
<td>9</td>
<td>36.0</td>
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<td>37.5</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>28.0</td>
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<td>66.7</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>32.0</td>
<td>33.3</td>
<td>100.0</td>
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<td>Total</td>
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<tr>
<td>Total</td>
<td>25</td>
<td>100.0</td>
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</tr>
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</table>
**Accuracy and Relevance of Assessments used to Diagnose Children**

Therapists’ responses on their perspectives on the accuracy of assessments used to diagnose children with ADHD were analyzed. There were 20% ($n=5$) of the participants who stated that there are multiple factors that contribute to accurately assessing a child for ADHD. Multiple factors included clinical judgment and therapists experience; therapists understanding of the DSM IV-TR criterion; using observations and parents history; assessments modified by recent research; multiple methods of assessments in the process including at least a few sessions with the parents/caretakers to determine their contribution to the problem and their role in alleviating the symptoms; and a combination of standardized tests, family information, child school interviews, and clinician observation to get a comprehensive view of the child’s life. There were 8% ($n=2$) of therapists that found an accurate assessment is achieved by considering the entire spectrum of behavior as important to diagnose a child. There were 48% ($n=12$) of the therapists that stated there are other factors that contribute to an accurate assessment of a child.

The category of other factors consisted of therapists reporting on factors such as: using brain scans to see what part of the brains are active which unfortunately do not pick up on co-occurring disorders; the tests used are too simplistic such as the Connors questionnaire because it is a checklist but the symptoms can be caused by other disorders such as anxiety and it does not provide the full picture of the child; observation with child interacting with parents and in the class is an effective way to see what is going on with
the child; depends on the understanding of the clinician; some tests are more effective such as the TOVA computerized test; depends on the person completing the tools and their understanding of the diagnosis and making sure child meets the full DSM-IV TR criterion. There were 24% (n=6) of the therapists that did not give a response to the question (refer to Table 5).

Table 5. *Accuracy of Assessment*

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple Factors</td>
<td>5</td>
<td>20.0</td>
<td>26.3</td>
<td>26.3</td>
</tr>
<tr>
<td>Consider the entire</td>
<td>2</td>
<td>8.0</td>
<td>10.5</td>
<td>36.8</td>
</tr>
<tr>
<td>spectrum of behavior</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>48.0</td>
<td>63.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>76.0</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing System</td>
<td>8</td>
<td>34.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>25</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The mean average of the years in practice for the therapists (n=20) who stated misdiagnosis exists is \( M = 18.28 \) with a standard deviation from the mean of \( SE = 11.32 \). The large range in the standard deviation from the therapists in practice might be due to the difference in years of experience that the therapists reported (fluctuating from 4 to 48 years depending on the respondent). The mean average of the therapists (n=4) who stated misdiagnosis does not exist is \( M = 28.50 \) years in practice with a standard deviation of
SE=5.74. The independent samples T-test showed no statistical significance (p=.096) between the average years in practice of the therapists in the groups that perceived misdiagnosis and those who did not (refer to Table 6, 7).

Table 6.  
*Misdiagnosis and Years in Practice (Group Statistics)*

<table>
<thead>
<tr>
<th>Presence of Misdiagnosis</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in Practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20</td>
<td>18.28</td>
<td>11.32</td>
<td>2.53</td>
</tr>
<tr>
<td>No</td>
<td>4</td>
<td>28.50</td>
<td>5.74</td>
<td>2.87</td>
</tr>
</tbody>
</table>

Table 7.  
*Misdiagnosis and Years in Practice (Independent t-test)*

<table>
<thead>
<tr>
<th>F</th>
<th>Sig.</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
<th>Mean Difference</th>
<th>Std. Error Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in Practice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equal variances assumed</td>
<td>1.933</td>
<td>.178</td>
<td>-1.740</td>
<td>22</td>
<td>-.096</td>
<td>-10.22500</td>
</tr>
<tr>
<td>Equal variances not assumed</td>
<td>-2.671</td>
<td>8.646</td>
<td>.026</td>
<td>-10.22500</td>
<td>3.82847</td>
<td></td>
</tr>
</tbody>
</table>
Table 8.  
*Reliability of Measurements in the Diagnosis of ADHD and Type of Licensure*

<table>
<thead>
<tr>
<th>Reliability of Measurements</th>
<th>Type of Licensure</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PhD</td>
<td>PsyD</td>
</tr>
<tr>
<td>Very reliable Count</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>% within Type of Licensure</td>
<td>25.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Reliable Count</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>% within Type of Licensure</td>
<td>0.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Cannot respond Count</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>% within Type of Licensure</td>
<td>50.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Not reliable Count</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>% within Type of Licensure</td>
<td>25.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total Count</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>% within Type of Licensure</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Reliability of measurements/Type of licensure

There was a strong association between the participants’ professional qualifications and their perception on reliability of measurements (Cramer’s V=.698). The therapists with PhD’s \(n=4\) and the therapists with LCSW’s \(n=9\) found the reliability for measurements of ADHD as not reliable. Therapists with an MFT \(n=9\) and the therapist with a PsyD \(n=1\) found the reliability of measurements for ADHD was accurate. There was a moderate association between PhD’s \(n=4\) and LCSW’s \(n=9\) responses and MFT’s \(n=9\) and PsyD \(n=1\) responses regarding the reliability of measurements used to diagnose ADHD, the Cramer’s V displayed a strong association (Cramers V= .698) and the findings were statistically significant (p=.01) (refer to Table 8, 9).

Table 9.
Reliability of Measurements and Type of Licensure (Symmetric Measures)

<table>
<thead>
<tr>
<th>Value</th>
<th>Approx. Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phi</td>
<td>.698</td>
</tr>
<tr>
<td>Cramer’s V</td>
<td>.698</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>23</td>
</tr>
</tbody>
</table>
Table 10.
Accuracy of Assessments and Type of Licensure (Cross Tabulation)

<table>
<thead>
<tr>
<th>Accuracy of assessment</th>
<th>Type of Licensure</th>
<th></th>
<th></th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PhD</td>
<td>PsyD</td>
<td>MFT</td>
<td>LCS W</td>
<td>Other</td>
</tr>
<tr>
<td>Multiple factors</td>
<td>Count</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>% within Type of Licensure</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>62.5 %</td>
</tr>
<tr>
<td>Consider entire spectrum</td>
<td>Count</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>% within Type of Licensure</td>
<td>0.0%</td>
<td>0.0%</td>
<td>33.3 %</td>
<td>0.0%</td>
</tr>
<tr>
<td>Other</td>
<td>Count</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>% within Type of Licensure</td>
<td>100.0 %</td>
<td>100.0 %</td>
<td>66.7 %</td>
<td>37.5 %</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>3</td>
<td>1</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>(% within Type of Licenses)</td>
<td>100.0 %</td>
<td>100.0 %</td>
<td>100.0 %</td>
<td>100.0 %</td>
</tr>
</tbody>
</table>
There was a moderate correlation between the therapists with PhD’s and the therapists with LCSW’s in their responses on the reliability of the measurements of ADHD. The therapists with PhD’s and the therapists with LCSW’s found that the reliability for measurements of ADHD was not reliable. Therapists with an MFT and the therapist with a PsyD found the reliability of measurements for ADHD to be accurate. Although there was a moderate association between PhD’s and LCSW’s responses and MFT’s and PsyD responses regarding the reliability of measurements used to diagnose ADHD (Cramer’s V= .588), the association was not statistically significant (refer to Table 10, 11).

Table 11.
Association Between Accuracy of Assessment and Type of Licensure

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Approximate significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phi</td>
<td>.831</td>
<td>.108</td>
</tr>
<tr>
<td>Cramer’s V</td>
<td>.588</td>
<td>.108</td>
</tr>
<tr>
<td>N of Valid Cases</td>
<td>19</td>
<td></td>
</tr>
</tbody>
</table>

When respondents were asked for recommendations and suggestions to prevent misdiagnosis of ADHD they gave several detailed responses and the researcher organized responses by themes. Participants were asked open ended questions on their suggestions for what graduate programs should include in their curriculum to be able to properly
assess and differentiate ADHD symptoms from other disorders and recommendations about the study. The responses were organized according to the themes that emerged from their responses. The themes that emerged were: child development and psychosocial testing, assess the process of prescription medications and eliminate unnecessary use of prescription medications, additional training for professionals and specific knowledge of ADHD, proper assessment tools to differentiate between learning disabilities and ADHD, clinical interviewing with the inclusion of innovative methods such as motivational interviewing. These themes will be discussed in further detail with specific responses given by the therapists.

**Child Development and Psychosocial Testing**

Therapists stated that there is a need for graduate programs to improve their education in terms of child development, child neurological development and child assessment, specifically with using clinical assessments. Respondents stated that “graduate programs in general are weak in talking about psychological testing”, that there needs to be training with a multidisciplinary team once a student graduates, and that it is necessary to advocate for graduate programs to include education of the different tests available to assess children in a variety of situations. The findings support the literature review regarding the need for graduate students to be able to differentiate symptoms that are associated with ADHD and symptoms that masquerade as ADHD but are associated with another disorder (Hartnett, Nelson & Rinn, 2004; Rinn & Nelson, 2009).
The therapists further stated that psychosocial assessments are important for clinicians to better understand and differentiate features between ADHD and other diagnosis. As stated in the literature review there needs to be an overall assessment of a child by obtaining information from the family and the school, using objective/subjective tests, understanding the ADHD criteria on the DSM IV-TR, and using clinicians years of experience and practice (American Academy of Pediatrics, 2000).

**Process of Prescription Medications and Eliminate Unnecessary use of Prescription Medications**

Therapists recommended that graduate programs need to include good assessment methods in order to understand the symptoms of ADHD and the process of prescription medications. As indicated in the literature review there is a need to properly diagnose children and provide them with the adequate medication in order to see a difference in the behavior the child displays (Connor, 2011). Similarly, therapists’ responses were that in order to help a child with prescription medications the appropriate diagnosis has to be given first. If a child is prescribed with medication such as Ritalin the medication will not eradicate the behavioral symptoms because in reality the child does not have ADHD. The children’s behavior problems have to be properly dealt with from the beginning because medication will not make a difference if the behavior that the child has is not being assessed properly.
Additional Training for Professionals and Specific Knowledge of ADHD

The literature review discussed the importance in including multiple factors in the child’s life such as their behavior in the home setting, in the school setting, and outside of the home and school (American Academy of Pediatrics, 2000). Therapists recommended that there are multiple factors that need to be included to appropriately assess and diagnose a child. There are a variety of factors that have to be included in the diagnosis of ADHD, because, in general children do not only have one problem but a variety of problems which therapists should take into consideration. Therapists need to be aware that latching on to the first thing that they observe will keep them from viewing and understanding the rest of the information that is available about the child. The respondents stated that therapists have to understand the symptomology of ADHD, understand the DSM IV-TR criterion, understand the nuances, and be aware of the hallmarks of ADHD. Therapists further concluded that there are a variety of factors that are not included in the DSM IV-TR which graduate students and clinicians should be aware of and better understand, such as the need for children with ADHD to be stimulated, children failing to complete their homework, and children not following teachers’ instructions. The participants stated that ADHD is a difficult disorder to understand and there are limited tools for pediatricians to use which does not allow for a complete assessment.

As the literature review found there are limited tools that have high accuracy and reliability to appropriately assess and diagnose children, and that many times therapists
are not aware of the most effective tests that need to be used to evaluate a child (Delavarian, M., Towhidkhah, F., Dibajnia, P., & Gharibzadeh, S., 2010; Hartnett, Nelson, & Rinn, 2004). Therapists stated that students and social workers need to reach out on their own and attend meetings and research based colloquiums where they are able to become more educated on ADHD and its diagnosis. Therapists need to be aware of the available resources and the treatment that is available to provide to clients.

**Proper Assessment Tools to Differentiate Between Learning Disabilities and ADHD**

Therapists stated that graduate programs should include internship programs that provide the skills to properly assess and diagnose children. Therapists stated that graduate programs should include discussions regarding the diagnosis of ADHD and other disorders as well as the critique of professionals so that real life situations are presented and the learning becomes more real and is internalized by students for when they are practicing clinicians. As discussed in the literature review this theme is also supported by the responses given by professionals in this study regarding the graduate training that students receive and the need for more extensive training on effectively distinguishing ADHD from other disorders. The therapists responded that graduate programs can include a specific class that educates students on assessments and diagnosis and have longer time and courses allocated to assessments and differential diagnosis. Therapists recommended that students should have training on understanding ADHD from other diagnosis, reviewing usage of questionnaires, understanding the value of the TOVA test, understanding behavioral theory and how to apply it, teaching organizational skills,
focusing on training parents as well as the client on the organizational skills, and learning how to educate parents and teachers and/or day care providers on the diagnosis of ADHD and children’s behavioral symptoms.

It was further stated by participants that reviewing the most common assessment tools, discussing biases, and reviewing commonly confused diagnoses will help graduate students in developing themselves as professionals. Teaching students that the process of assessment takes a lot of experience with working with children and families and including a repertoire of assessment tools before a diagnosis is given such as observations of the child in various settings, classroom visits, training in clinical interviewing, tests and measurements, normal child development, child psychopathology, child assessment and diagnosis, child psychopharmacology, and ADHD in educational settings are important to be more effective as clinicians diagnosing children..

**Clinical Interviewing with the Inclusion of Innovative Methods such as Motivational Interviewing**

Therapists recommended that graduate programs should include strength based assessments, interviewing, and assessment skills. Therapists stated that by improving the assessments and interviewing taught in graduate school will help future therapists to be better trained at distinguishing co-morbid disorders, have more knowledge on cultural competence, and knowledge on “look alike” diagnosis. As stated in the literature review, there are a variety of disorders which can masquerade as ADHD which therapists have to be well trained to differentiate from to give the correct diagnosis and treatment. The
therapists in the study further stated that graduate programs need to be able to teach students how to interview without biases and get experience in the interviewing process through internship experience and good supervision.

**Interpretation of Findings**

The literature review and the study findings answered the researcher’s study question pertaining to the diagnosis/misdiagnosis of children with ADHD and the dynamics and implications of the same. Some of the common factors stated by therapists that contribute to the misdiagnosis/over-diagnosis of ADHD were inadequate use of assessment tools, pressure from pharmaceutical and licensing companies to obtain a diagnosis, and lack of training provided to future professionals. As previously stated in the literature review there are many factors that contribute to properly assessing children and differentiating ADHD from other disorders. The participants from the study stated that the contributing factors to over-diagnosis/misdiagnosis are the inability of clinicians to appropriately differentiate ADHD from other disorders and/or co-morbid disorders and the need to provide a quick diagnosis without a complete evaluation of a child.

The participants stated that various disorders overlap with the symptoms of ADHD which makes it harder to diagnose a child appropriately. As previous literature has suggested, learning disabilities, anxiety, and oppositional defiant disorder have similar symptomology as ADHD which makes it highly important to use a variety of assessment tools to make the proper distinctions between the symptoms that overlap between disorders. The analysis of the findings supported the previous literature in that
therapists suggested clinicians need to use as many assessments tools as possible in order to get the best evaluation possible and provide the correct diagnosis. The participants recommended future professionals should receive extensive clinical practice in a one-to-one setting with children to increase the understanding of the current assessment tools that are available and expand the current curriculum provided on distinguishing ADHD from other mental health disorders to properly assess, diagnose, and provide treatment to children.

Summary

In this chapter, the findings from the data collected from the twenty-four participants who completed the questionnaire were presented. The research was designed to explore therapists’ perspectives on the diagnosis of ADHD in children and its implications and the potential for misdiagnosis and over-diagnosis to occur. The study collected demographic information, as well as perceptions of therapists regarding the diagnosis of ADHD, the assessments tools used to diagnose children, whether misdiagnosis/over-diagnosis exists, training that future professionals receive, and recommendations to improve the training future professionals receive in order to accurately assess, diagnose, and provide proper treatment to children. A discussion of these findings is further presented in Chapter 5.
Chapter 5

CONCLUSION, SUMMARY, AND RECOMMENDATIONS

In recent decades, the diagnosis of ADHD in children has continued to be a controversial topic due to the rising number of children who are diagnosed with ADHD and are oftentimes subsequently medicated. A lack of consensus persists among therapists regarding the etiology of ADHD, diagnosis of ADHD, assessment instruments and procedures, and the training necessary to adequately assess and diagnose children. Although there has been extensive research concerning these topics, little research has been conducted on the perspectives of therapists who have worked with children on these issues. The present study builds on previous literature by researching a relatively novel population regarding its perspective.

The study used an exploratory research design which generated quantitative and qualitative data analyzed by the researcher through descriptive statistics and thematic analysis. Twenty five therapists completed the surveys analyzed by the researcher, and the significant findings were determined and are reported on in this section.

Summary of the Study

Demographic Data. In examining therapists’ perspectives on the diagnosis of ADHD in children and its implications for children, it was hypothesized that the participants would believe misdiagnosis/over-diagnosis of ADHD does exist (80%) due to a variety of factors, such as inappropriate assessments tools, inadequate training, and/or inability to differentiate ADHD from other disorders. ADHD has been an extensively
studied and controversial topic, and, due to the difficulty of its etiology, there is insufficient consensus regarding whether ADHD is over diagnosed or misdiagnosed. It was noted that participants had all worked with children at one point and had knowledge of ADHD in their clinical careers, even if they had not yet diagnosed a child. This was a prerequisite for participation in the survey. Literature has shown that therapists have to be knowledgeable regarding the symptoms of ADHD, because children, depending on their developmental age level, can display similar symptoms even though they do not suffer from ADHD (Seiter, 2007). The researcher sought participants who had worked with children at different developmental age levels and with different licensures to get diverse perspectives on the topic. Interviewing participants with different licensures, such as PsyD, PhD, LCSW, and MFT, allowed the researcher to get perspectives from therapists with different theoretical frameworks and educational backgrounds. As established in the literature, theoretical frameworks can affect the way a child is assessed, diagnosed, and treated. Therefore, including therapists with different licensures and theoretical frameworks allowed for diverse views concerning the diagnosis of ADHD.

Furthermore, participants were allowed to give their own opinion of the current assessments used to diagnose children and the effectiveness of therapists in differentiating ADHD from other diagnoses. The majority of participants stated that therapists do confuse symptoms associated with other disorders with ADHD. Generally, findings echoed those of previous studies which stated that certain symptoms children
display can masquerade as ADHD when, in reality, the symptoms are the result of another disorder, a co-morbid disorder, or characteristics of gifted children.

Findings also reinforced previous literature which indicated that the rising numbers in the diagnosis of ADHD is due to pharmaceutical incentives, or financial incentives by the government distributed to schools with higher percentages of ADHD (Kristjansson, 2009). The majority of participants in the current study perceived incentives as contributing to the diagnosis of ADHD (36%). There were 28% of therapists that perceived financial incentives as contributing to the diagnosis of ADHD, and 32% perceived other factors as contributing to the diagnosis of ADHD.

**Misdiagnosis of ADHD and Contributing Factors**

Regarding participants perspectives on the misdiagnosis of ADHD in children, the majority stated that misdiagnosis/over-diagnosis does exist (80%), while was a smaller percent (16%) of participants stated misdiagnosis/over-diagnosis does not exist. As the researcher expected there is a high percentage of therapists that believe ADHD is misdiagnosed/over-diagnosed in children. The findings indicate that there is high consensus regarding therapists’ perspectives on misdiagnosis/over-diagnosis of ADHD in children.

When participants were asked about the contributing factors for misdiagnosis/over-diagnosis of ADHD they gave a variety of different answer to the question, as the researcher expected. The answers that therapists gave were: lack of training from parents to adequately deal with their children’s manifesting behaviors
which may not be acceptable to society; quick fix to establish compliance as the therapist feeling pressured to give a diagnosis by the first meetings due to insurance reimbursement and/or having pressure from the parents to diagnose their child; lack of treatment for pre-existing condition such as trauma which can manifest itself in symptomology that is similar to ADHD; and confusion between co-existing and or misdiagnosed illness and ADHD. As research has shown, and as expected by the researcher, there were a variety of disorders therapists perceived as potentially masquerading or being co-morbid with ADHD which contribute to the misdiagnosis/over-diagnosis of ADHD. When therapists were asked about the disorders that can overlap with ADHD or masquerade as ADHD the responses they gave were that there are disorders that overlap with ADHD and or have similar symptomology that has to be properly distinguished from ADHD in order to give the correct diagnosis and treatment.

**Therapists’ Perceptions of the Diagnosis of ADHD**

Literature has shown that the diagnosis of ADHD can be a relief for many parents and children (Hartnett, Nelson, and Rinn, 2004; Rinn & Nelson, 2009). Therapists who were asked for their perception on the diagnosis of ADHD stated that the appropriate diagnosis of ADHD can be a solution for uncertainty. There were therapists who perceived that labeling a child with an ADHD diagnosis potentially affected self-esteem and self-efficacy, and also potentially lowered teachers’ expectations. One interesting finding was that the effects of an appropriate diagnosis of ADHD was seen by some as
beneficial to a child’s overall functioning and well-being, whereas other therapists viewed the diagnosis as detrimental to a child’s life and functioning. Some of the factors that therapists provided as potentially making a difference in the diagnosis of ADHD were the way a child, parents, and teachers perceive the disorder of ADHD, understand the disorder in its entirety, and the connotation that comes with a diagnosis of ADHD.

Perhaps most surprisingly, when therapists were asked how frequently other disorders are mistaken as ADHD, a large majority (84%) stated that therapists always mistake other disorders as ADHD. The therapists stated that this is due to the lack of knowledge therapists have to adequately distinguish ADHD symptomology from that of other disorders. Some therapists (8%) stated that sometimes therapists cannot differentiate ADHD symptoms from other disorders. All of the participants that responded to this question stated that therapists will at one point in their clinical career mistake other disorders for ADHD. This confirms research which has shown that therapists are not adequately trained to distinguish ADHD from other disorders and that this affects the diagnosis and treatment given to a child. The study further added to the existing literature that therapists are not trained adequately to distinguish other disorders from ADHD (Hartnett, Nelson, & Rinn, 2004; Rinn & Nelson, 2009).
Incentives for Misdiagnosis

The majority of participants confirmed the researcher’s expectation that incentives contribute to the misdiagnosis of ADHD, possibly due to the pharmaceutical companies and insurance companies that push for fast diagnosis and easy treatment through medication.

Accuracy and Relevance of Assessments used to Diagnose Children

Participants were asked about the reliability, accuracy, and relevance of assessments used to diagnose children. 20% of therapists stated that there are a variety of factors to consider in order to diagnose a child such as clinical judgment, therapists’ understanding of the DSM IV-TR criterion, using observations and obtaining parents history, assessments modified by current research, multiple sessions with the child and parents to understand their complete history and rule out other factors that may be perpetuating the symptoms the child is displaying, and conducting a combination of standardized tests and obtaining family information, child school interviews, and clinician observation to get a comprehensive view of the child’s life.

There were 8% of participants that stated the entire spectrum (family information, school information, tests/assessments, meeting the DSM-IV-TR criterion, and subjective/objective data) has to be considered when making an evaluation for ADHD. The majority of the participants (48%) found other factors are important to consider when assessing a child. Some of the factors that were thought to be important to the assessment of ADHD in children were: using brain scans to see what part of the brains are active
(though these do not assess for co-occurring disorders); tests used are too simplistic because they are checklists which do not provide the full spectrum of the child and do not differentiate the symptoms that can be caused by outcome of other disorders; observing the child interacting with parents and in the class is an effective way to see what is going on with the child; assessment depends on the understanding of the clinician regarding the symptoms displayed by the child and ADHD criterion; some tests are more effective to use when making a diagnosis such as the TOVA computerized test; and assessment depends on the person completing the tools and their understanding of the diagnosis and making sure child meets the full DSM-IV TR criterion.

**Reliability of Measurements/Type of Licensure**

The researcher conducted a cross tabulation analysis of the therapists’ type of licensure and their perspective on the reliability of measurements. Although the findings were interesting there was a weak association displayed by the Cramer’s V (p-62). The analysis showed a moderate correlation between the therapists that had PhD’s and the therapists that had LCSW’s in their perceptions regarding measurements of ADHD not being reliable. Interestingly, PsyD’s and MFT’s perceived the reliability of measurements used for ADHD diagnosis to be accurate.
Accuracy of Measurements/Type of Licensure

The researcher expected to find that participants perceive other factors as important for high accuracy on assessments that are used to diagnose children with ADHD across all level of licensures, when analyzing the correlations between accuracy and type of licensure of the participant. The findings showed that the majority of respondents with an LCSW (62.5%) perceived that multiple factors need to be considered as an accurate mode of assessment. Thirty-three percent of therapists with an MFT considered that the entire spectrum of behavior of a child has to be considered in order to have an accurate assessment. Interestingly, participants with PhD’s and PsyD’s considered that other factors need to be accounted for in order to have an accurate assessment. Sixty-eight percent of MFT’s considered that other factors need to be accounted for in the accuracy of assessments. Only 37% of LCSW’s considered other factors as contributing to the accuracy of assessment. As the researcher expected, all therapists considered that other factors contribute to an appropriate diagnosis of ADHD, with the majority of LCSW’s considering multiple factors as an accurate mode of assessment.

Implications for Social Work

It is highly important for social workers to advocate for social change and social justice in order to empower people in disadvantaged positions to succeed and to function to the best of their capacity. In order for social workers to make a difference, it is important that they are informed on the needs of their clients so as to provide the
appropriate services and enhance their well-being. Social workers need to be educated on the current laws that affect disadvantaged communities among the client populations they work with. It is essential for social workers to work with organizations and help expand the services that are currently being provided to children and families. As stated in the National Association of Social Workers code of Ethics, the mission of social workers is to enhance the well-being of people and meet their basic needs (NASW Code of Ethics, 2008). The main focus of social workers is to help those people with special needs and empower those who are vulnerable, oppressed, and living in poverty. As part of the ethics and values of social workers it is important to be involved at the macro, mezzo, and micro levels.

**Macro.** Based on the analysis of this study it is important that social workers are involved with the current laws and policies as well as research regarding the diagnosis of ADHD in order to advocate for changes to be made in the current assessments used to diagnose children, the practice of pharmaceutical companies promoting the use of medication, the licensing regulations in effect, and the training that therapists receive to adequately distinguish ADHD symptoms from other behaviors children display. Social workers need to be aware of the policies that exist in the places where they are employed and advocate for making changes if there are regulations that are unjust and do not promote the overall well-being of the children and families with whom they work with.

There are many agencies that have policies in place which do not promote the well-being and health of children but instead create additional burdens for them and for
their parents. As indicated by the therapists that were interviewed, additional training has to be provided to therapists such as social workers in order to give their clients the best services possible and properly diagnose and treat children. In order for additional training to be provided there has to be additional funding allocated to these agencies which the government has to provide. Through conducting empirical research, social workers can use the data and information gathered on ways to improve the diagnosis of ADHD in children to advocate for changes to be made and for additional funding to be provided which can enhance the training that therapists receive and the services that are provided to children being assessed. Social workers need to be aware that advocating at the macro level is important to ensure that their opinion is considered when laws and policies are established, and that regulations will not place their clients in further disadvantaged positions.

Mezzo. Social workers need to be involved in creating change at the community level to ensure that all children receive adequate services when being assessed and that parents are correctly informed regarding their child’s behavior and diagnosis. Social workers need to be informed about the most useful assessments, the newest evidenced based treatments, and ways to appropriately differentiate ADHD from other disorders in order for these agencies to give the appropriate services to each child and family. At the community level social workers need to be engaged with the organizations that exist in order to encourage the necessary change that has to be undertaken for children to be properly assessed, diagnosed, and treated. There are circumstances when agencies in
disadvantaged communities fail to give a child the appropriate assessment because of the lack of tools available to ensure the appropriate diagnosis and treatment. Social workers’ knowledge of the necessary tools to improve the diagnosis of ADHD and other disorders in children will help organizations include the various tools and techniques that have high validity and reliability. The majority of the respondents stated that organizations have to include various assessment tools and the most reliable testing methods in order to improve the diagnosis of ADHD in children. Social workers with knowledge on the topic of ADHD will be able to ensure that communities have programs in place with the adequate training for therapists, the most reliable and valid assessment tools, and the appropriate treatment.

Micro. Social workers need to have overall awareness of the current assessments that are most useful to appropriately assess, diagnose, and provide treatment for children with ADHD, as well as awareness of ways to prevent misdiagnosis of ADHD. Social workers working with children on a one-to-one basis and providing them with direct services have to be able to understand the differentiation between symptoms of ADHD and those associated with either their developmental age level or another disorder. Social workers have to be attuned to various factors that can be impacting a child’s life which should be considered before a child is referred to get assessed for ADHD.

As the participants stated there are many factors to consider when diagnosing a child, such as family factors and environmental factors which can be contributing to the behaviors that the child displays. There are circumstances, in which practicing therapists
are not aware of the environmental factors affecting a child’s behavior which need to be accounted for during the assessment of ADHD. Some of the participants’ responses regarding factors affecting therapists’ ability to obtain an appropriate assessment and evaluation of a child were the inclusion of family information, observation in the school setting and home, reliable testing, meeting the DSM IV-TR criterion, and subjective/objective data. Social workers need to be able to appropriately assess the child and consider the child’s concerns as well as the parents. Social workers need to empower children and parents through the correct diagnosis and treatment, as well as educating them on the disorder so the treatment plan can work more effectively. Therefore, therapists working at the micro level have to have the adequate training to appropriately distinguish ADHD from other disorders, understand the factors necessary to prevent misdiagnosis, and prescribe the correct treatment plan for the child.

**Recommendations**

Future research should expand on the diagnosis and impact of misdiagnosis of ADHD on the adult population. Using a qualitative approach and open ended question interview design would allow for richer information regarding the topic of ADHD, and allow for greater generalizability of the findings. This future research should provide additional information regarding the diagnosis of ADHD in adults and how it impacts not only children but the entire population at large regardless of age levels.

Additionally, as the participants of this study were solely therapists, future research should include the perspective of children and adults who have been diagnosed
with ADHD. Obtaining information such as children’s and adult’s diagnosis, treatment that they have been given, and how the diagnosis of ADHD has impacted their lives in a positive or negative manner would be beneficial to further ascertain whether misdiagnosis/over-diagnosis exists. Including this population in future research would also assist in understanding the methods that are used to diagnose children and adults and whether they are beneficial. Working with participants that have been diagnosed with ADHD and not just the therapists that have worked with this population would allow for more accurate information regarding ADHD and its diagnosis.

Furthermore, future research should focus on ways that graduate programs can enhance their curriculum in order to adequately train students to distinguish ADHD symptoms from other disorders. Obtaining information from graduate students in their last year of graduate school and professors from different universities about their understanding of ADHD and ways of improving the current curriculum would be beneficial in reducing the potential for misdiagnosis in children and adults.

**Limitations**

The current study focuses on an analysis of the misdiagnosis/over-diagnosis of ADHD from the perspective of therapists (psychologists, MFT’s, LCSW’s) who have treated or diagnosed children with ADHD. The sample size for this study was partially gained by using snowball sampling methods. This method of sampling allowed for participants to be identified, but it was not the preferred method as it created a sample
that may not include the most knowledgeable therapists on the diagnosis of ADHD (Dudley, 2011).

The current study used an interview questionnaire and self-report questions to gain the participants' perspectives, which varied based on each participant's research, practice experience, bias, and theoretical framework. It may be possible that participants neglected to include information relevant to the study, included evidence not based on their area of practice, or omitted information they did not want to share. Finally, in order to be able to generalize the findings to the statewide population, this subject requires further study. Subsequent studies should include a larger sample of therapists who have worked with children with ADHD, who are knowledgeable in the diagnosis of ADHD, and who have worked with children for many years.

**Conclusion**

The current study revealed that misdiagnosis/over-diagnosis of ADHD does occur and that there are ways that therapist can prevent this. Some of the ways that therapists can prevent misdiagnosis/over-diagnosis is by using a repertoire of assessment tools (school information, family information, observation of children in different settings, meeting the DSM IV-TR criterion, subjective/objective data, and computerized tests) to diagnose children. Using a variety of assessment tools is beneficial to differentiate ADHD from children’s typical developmental behaviors and/or other potential disorders. Participants stated that there are various contributing factors to misdiagnosis/over-diagnosis such as the theoretical lens of the therapist, the training they received, the
clinical years in practice, and their ability to differentiate ADHD from other disorders. Participants stated that appropriately diagnosing a child and providing them with the correct treatment plan can enhance the well-being and full potential a child has, while other participants felt that there can be detriments to labeling a child including lowered expectations from teachers and parents. As a result it is important that children, parents, and teachers are educated about the diagnosis of their child and are able to give their child a good perspective of who they are so the diagnosis does not affect their self-esteem.

For the most part, participants stated that ADHD is a neuro-biochemical disorder which can be exaggerated by environmental factors a child is exposed to in the home and school setting. Therapists stated that linguistic factors also have to be considered when a therapist is assessing a child because there are cultural factors that may be misinterpreted as symptoms of ADHD which can create the potential for misdiagnosis and incorrect treatment. Therefore, therapists have to be trained adequately on the factors that contribute to the diagnosis and misdiagnosis/over-diagnosis of ADHD to prevent an incorrect treatment being given to children.
APPENDIX
Human Subjects Approval Letter

CALIFORNIA STATE UNIVERSITY, SACRAMENTO
DIVISION OF SOCIAL WORK

To: Leidy Hernandez

Date: (corrected) 1/25/2013      (original)
10/24/2012

From: Committee for the Protection of Human Subjects

RE: YOUR RECENT HUMAN SUBJECTS APPLICATION

We are writing on behalf of the Committee for the Protection of Human Subjects from the Division of Social Work. Your proposed study, “The Diagnosis of ADHD and its Implications.”

___X___ approved as ___X___EXEMPT  ____ MINIMAL RISK.

Your human subjects approval number is: 12-13-065(corrected). Please use this number in all official correspondence and written materials relative to your study. Your approval expires one year from this date. Approval carries with it that you will inform the Committee promptly should an adverse reaction occur, and that you will make no modification in the protocol without prior approval of the Committee.

The committee wishes you the best in your research.
Professors: Maria Dinis, Jude Antonyappan, Teahasha Bankhead, Serge Lee, Kisun Nam, Maura O’Keefe, Dale Russell, Francis Yuen
Cc: Antonyappan
REFERENCES


