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A statewide survey of professionals' opinions and practices concerning the assessment of attention deficit/hyperactivity disorder in children

Roberta Waller Thompson
College of William & Mary - School of Education

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A STATEWIDE SURVEY OF PROFESSIONALS' OPINIONS AND PRACTICES CONCERNING THE ASSESSMENT OF ATTENTION DEFICIT/HYPERACTIVITY DISORDER IN CHILDREN

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Roberta Waller Thompson

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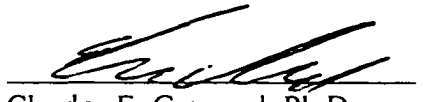
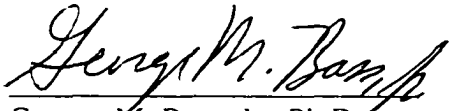


Charles F. Gressard, Ph.D.
Chairperson of Doctoral Committee



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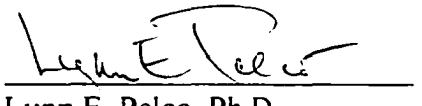

Lynn E. Pelco, Ph.D.

To Charlie, my husband,

for sustaining me with his love, faith and patience

and

Hunter, my son,

for teaching me that all things are possible

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A STATEWIDE SURVEY OF PROFESSIONALS' OPINIONS AND PRACTICES CONCERNING THE ASSESSMENT OF ATTENTION DEFICIT/ HYPERACTIVITY DISORDER IN CHILDREN

ABSTRACT

The purpose of this study was to investigate current practices used by clinicians when diagnosing children with AD/HD as well as to explore possible relationships between practices, professional disciplines, opinions, and theoretical leanings.

The study utilized a researcher designed questionnaire mailed to licensed Psychiatrists, Pediatricians, Clinical Psychologists, and Counselors in Virginia. The sample included 274 professionals.

Hypotheses examined relationships between professional discipline and use of assessment methodologies, consultation practices, and classification system preferences, as well as relationships between opinions about classification and assessment of AD/HD and practitioners' opinions about assessment practices.

It was found that physical examination was the only variable with any practical significance that was able to differentiate between the professional disciplines with regard to their preferences and utilization of specific methodologies for the assessment of AD/HD. Results revealed a negative relationship between one's confidence in assessing AD/HD and a practitioner's use of an interview in an assessment.

It was also found that practitioners were no more likely to engage in consultation with other professionals from their respective disciplines than from other disciplines, 2) those professionals who subscribed to a categorical system of classification were no more likely to utilize clinical techniques in assessment while those who subscribed to a dimensional model showed no preference for normative tools, and 3) physicians were no more likely than mental health professionals to subscribe to a categorical system of classification, while mental health professionals showed no preference towards a dimensional model of classification.

ROBERTA WALLER THOMPSON
SCHOOL OF EDUCATION
THE COLLEGE OF WILLIAM AND MARY IN VIRGINIA

A STATEWIDE SURVEY OF PROFESSIONALS' OPINIONS AND PRACTICES CONCERNING THE ASSESSMENT OF ATTENTION DEFICIT/HYPERACTIVITY DISORDER IN CHILDREN

CHAPTER ONE

Introduction

The Justification for the Study

Attention Deficit/Hyperactivity Disorder (AD/HD) affects a significant portion of the children in the United States in that prevalence of the disorder ranges anywhere from five to fifteen percent within community samples and upwards of fifty percent among clinical referrals (Barabasz & Barabasz, 1996). AD/HD is a developmental disorder of inattention that often has features of poor impulse control and hyperactivity (APA, 1994). Males are more likely to be diagnosed in ratios ranging from 2:1 to 6:1 (Guevremont, DuPaul & Barkley, 1990). However, as prevalence rates continue to rise, the frequency of diagnosis in females is increasing (Barabasz & Barabasz, 1996).

The conceptualization of AD/HD has shifted considerably since it was first officially recognized by the medical community. First, there has been a shift from viewing the disorder as unitary in nature to one that is heterogeneous, and in which there are subcategories. AD/HD is now described by the psychiatric community as a disruptive or externalizing disorder that consists of a heterogeneous group of children who have developmentally inappropriate levels of inattention, impulsivity and/or hyperactivity.

The use of stimulant medications has shown promising results in reducing the symptoms of AD/HD which has led to their widespread use in the treatment of this disorder. Studies reveal that in the 1980's there was a significant increase in the number of children being treated with methylphenidate (Ritalin), and in the early 1990's an estimated one million children were taking stimulant medication (Lavin, 1991) . Consequently, there has been growing concern in the scientific and lay communities as reported in the literature and media about the overdiagnosis and subsequent over medication of today's youth (Ruel & Hichkley, 1992; Weiss, 1981; Toufexis, 1989). Some of this concern has been spurred and perpetuated by radical organizations such as the Church of Scientology and their group, Citizens on Human Rights, who have gone so far as to wage an all out national campaign against the use of Ritalin, insisting the disorder of AD/HD does not exist, but rather was invented by "intolerant educators and parents and money-hungry psychiatrists" (Barkley, 1990a, p. 35). In the 1980s, they filed a major lawsuit against the American Psychiatric Association for fraud. This conspiracy theory aside, there are reports in the professional community of concerns about rising numbers of children identified with AD/HD (e.g. Ruel & Hickley, 1992; Weiss, 1981). Some issues that have arisen include insufficient diagnostic practices (Brown, Keene and Middleton, 1994; Moser & Kallail, 1995), intranasal abuse of Ritalin by adolescents (Jaffe, 1991), and lack of awareness of multicultural concerns (DeBoard, 1996).

It is likely that some of the criticisms and controversies surrounding the diagnosis and prevalence of AD/HD also center around the constantly changing

diagnostic label and criteria. In the last decade alone experts in the field harshly criticized the reconceptualization of attention deficit disorders in the revised third edition of the Diagnostic and Statistical Manual, DSM-IIIR (APA, 1987), from distinct and separate categories of attention deficit disorders with hyperactivity and those without hyperactivity (i.e. ADD/H and ADD) to a unitary disorder of Attention Deficit/Hyperactivity Disorder (e.g. Barkley, 1990a; Schaughency & Rothlind, 1991). The DSM-IV has since returned to the use of separate and distinct categories of the disorder.

Still others in the field suggest that the apparent increase in the numbers of children and youth with AD/HD is a result of "heroic efforts" and the increasingly sophisticated technologies used in today's neonatal units as more at-risk babies are surviving and/or being saved from more debilitating developmental disabilities. Barkley (1990b) further intimates that the actual occurrence of AD/HD may not be on the rise, but rather detection has increased as the public becomes more aware of the disorder.

These explanations, however, are premature in that little is still known about assessment and diagnostic practices of those professionals who work with these children. Questions remain as to how practitioners identify children with AD/HD and what influences their assessment and diagnostic decisions. These issues must be addressed before the controversy surrounding the prevalence of AD/HD can be fully answered.

Theoretical Rationale

The model of developmental psychopathology views psychopathology in relation to physical, cognitive, socioemotional and educational development throughout the lifespan (Achenbach, 1982, 1990). A focus on deviations from normal or typical developmental sequences creates a shift away from specific and discreet theories or paradigms to one that integrates several theoretical approaches. Achenbach (1990) refers to this approach as a "macroparadigm" which is not meant to take the place of specific theories, but rather is used to make sense out of particular methodologies, theories and/or explanations that may appear haphazard or unrelated. The macroparadigm aids in the integration of various approaches "around a common core of phenomena and questions" (p. 7). Achenbach is clear to point out the broad concept of developmental psychopathology cannot be explained by any one particular theory. Instead, each of the individual theories or "microparadigms" deals with a portion of the phenomena pertinent to developmental psychopathology.

Cicchetti (1993) points out that distinguishing the normal from the abnormal along a continuum is a key issue in developmental psychopathology. In psychiatry, discontinuity is assumed, with illness on one side and normality on the other. In contrast, developmental psychopathologists hypothesize that abnormal behavior represents the extreme of a continuum of normal variability in behavior. That is, the mechanisms responsible for abnormal behavior may be only quantitatively, not qualitatively, different from those that cause normal variability. This argument between the developmental psychopathologists (and others) who call for a dimensional diagnostic system and those mostly from the medical

community who adhere to a categorical system of diagnosis, is a debate that continues to rage on (e.g. Frances, Pincus, Widiger, Davis, & First, 1990; Heurman and Morey, 1990).

The dimensional model can be illustrated by describing how developmental psychopathologists suggest that most features of the undercontrolled disorders, of which AD/HD is one, can best be described as extreme versions of normal developmental characteristics exhibited by children at some point in their lives. It is postulated that those children with behaviors so extreme as to need professional help do not necessarily embody a specific disease so much as they do have extreme standing on so many variables that collectively they impair functioning and/or development (Steingard, Bierderman, Doyle, & Sprich-Buckminster, 1992).

Achenbach (1990) and other developmental psychopathologists (e.g. Routh, 1990; Cicchetti, 1993), suggest maladaptive behavior can be better understood by viewing it in the context of normative sequences and achievements of the different ages. Such a practice brings to light the notion that many emotional and behavioral problems do not differ qualitatively from those that are displayed to varying degrees by most individuals at some point in their lives. The problem can often be seen as a quantitative difference in characteristics that either are normally present during other developmental periods or are considered to be exaggerations of traits present in normal individuals (McConville & Steichen-Asch, 1990). The task, therefore, becomes one of having to tease apart those developmental variations that impair developmental progress from those that fall within the normal range of developmental expectations. It is espoused by developmental psychopathologists that no theory alone can answer

this question, because so many variables influence the course of development and its potential pathological outcomes.

Thus, assessment procedures are viewed by developmental psychopathologists as intrinsically multiaxial in nature. The aim of this assessment is the identification of a child's strengths and weaknesses in functioning in a variety of areas. Necessary information for diagnosis and treatment is derived by utilizing a mixture of assessment models (e.g. neurobiological, psychometric, psychodynamic and psychometric). In addition to multiple assessment procedures, the process also requires the utilization of multiple informants. This approach ultimately provides information regarding the child's strengths and weaknesses in functioning across different settings and with different people.

When AD/HD is viewed within the context of developmental psychopathology, it becomes clearer that an accurate assessment can take place despite the lack of understanding of a specific etiology. Indeed, theorists suggest the possibility of diverse and complex etiologies of this disorder. Such a multi-method and multi-informant conceptualization of assessment is described in the literature as the only approach that will lead to a valid and reliable diagnosis of AD/HD (Achenbach, 1990; Barkley, 1990a; Barkley, 1990b; Goldstein and Goldstein, 1990; Rapport, 1995). This approach is necessary not only from the viewpoint of making a differential diagnosis, but also for addressing issues of comorbidity.

Statement of the Problem

This study examined the assessment practices of professionals in the various disciplines of mental health, education and medicine to whom children are referred when AD/HD is suspected. It also investigated ways professionals' opinions about AD/HD, specifically, and biases about diagnostic classification, in general, are related to AD/HD assessment practices.

Definition of Terms

1. **Attention Deficit/Hyperactivity Disorder (AD/HD)**: Attention Deficit/Hyperactivity Disorder is defined in the Diagnostic and Statistical Manual (Fourth Edition) as a disorder whose essential feature is a "persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development" (p. 78, APA, 1994). Symptoms must be present before seven years of age, and impairment must be observed in two or more settings.
2. **Categorical model of classification**: This model uses a nominal scale of measurement, and thus is interested in straightforward naming of disease and psychiatric/psychological phenomena. The presence or absence of symptomatology is enough to connote the presence or absence of a disorder. This model assumes that qualitative differences exist between those who have and those who do not have a disorder. Use of this type of model is operationalized through the use of self reports and/or reports from caregivers about feelings,

thoughts and behaviors. This information is then used by the clinician who compares it to existing sets of criteria established by the classification system.

3. **Dimensional model of classification**: The dimensional model views disorders as quantifiably different which requires the use of ordinal, interval or ratio scales to determine relative positions of human behaviors along a continuum. It is concerned with attempts to identify interindividual differences as opposed to defining specific diseases which are identifiable by a specific set of criteria. This is in part operationalized through the use off cutoff scores on standardized scales.

Research Question and Hypotheses

Research question

What practices and opinions exist among practitioners with regard to assessment and diagnostic practices of AD/HD in children and adolescents?

Research Hypotheses

This question was answered through testing the following research hypotheses:

1. Each professional discipline (i.e. Psychiatrists, Clinical Psychologists, Pediatricians, and Professional Counselors) prefers and utilizes specific methodologies for the assessment of AD/HD.
2. There is a relationship between opinions about AD/HD (i.e. orientation to classification and practical concerns about assessment), and opinions about sufficient assessment practices.

3. When practitioners engage in consultation and/or collaboration with other professionals during the assessment process, they are most likely to consult with other professionals from their respective disciplines.
4. Those professionals who subscribe to a categorical system of classification are more likely to utilize assessment techniques that rely on clinical and qualitative descriptions of the client/patient than those professionals who subscribe to a dimensional model of classification.
5. Those professionals who subscribe to a dimensional system of classification are more likely to utilize assessment techniques that allow for normative comparisons than those professionals who subscribe to a categorical system of classification.
6. Physicians (i.e. Pediatricians and Psychiatrists) are more likely to subscribe to a categorical system of classification while mental health professionals (i.e. Professional Counselors and Clinical Psychologists) are more likely to subscribe to a dimensional system of classification.

Sample and Data Gathering Procedures

The sample for this study included 500 licensed practitioners from the disciplines of professional counseling, clinical psychology, psychiatry, and pediatrics who practice in the state of Virginia. Participants were surveyed with a researcher-designed mailed questionnaire about their assessment techniques and opinions regarding AD/HD specifically, and diagnostic classification, in general.

Limitations

This study utilized survey research methodology, specifically employing the use of a mailed questionnaire. Questionnaire research carries with it several limitations. First, the fact that questionnaires are self-report instruments raises the question as to whether the respondents are accurate in their reporting. This lack of accuracy, or response effect, may occur, for instance, in cases where the respondent might deliberately wish to appear differently to the researcher or may not accurately remember information that s/he is reporting. There is also the possibility that participants will interpret questions differently from one another which will negatively impact upon the standardization of the instrument (Borg and Gall, 1989).

Although a sample was initially chosen at random, completion of the questionnaire was purely voluntary. The issue of nonrespondents raises a question as to whether this group differs in some way from those who chose to respond. If so, it may have created a sampling bias and as a consequence the representativeness of the study may be suspect. Borg and Gall (1989) suggest checking a small sample of these nonrespondents and comparing them to respondents for possible bias; such a procedure was proposed as a part of the data collection process if the response rate fell below approximately fifty percent. Further, the sample was chosen from a sampling frame of licensed professionals. Use of sampling frames limited the generalizability of the results to the target population in that those who were licensed within their profession may have differed from those professionals who were not. Generalizability was also limited due to the demographics of the chosen population.

The sample consisted of practitioners from the state of Virginia, and therefore, results have limited generalizability to other states and/or regions.

CHAPTER TWO

SELECTED REVIEW OF THE LITERATURE

Introduction

This chapter reviews the literature with regard to several areas of study. First it addresses systems of classification which specifically include discussions of categorical and dimensional models of classifying psychological phenomena. Next, developmental psychopathology is presented as a dimensional model of classification. This is followed by a brief history of scientific thought and understanding of AD/HD and how we have come to understand the disorder at the present time. The model of developmental psychopathology is then specifically related to the diagnosis of AD/HD and other externalizing disorders of childhood. Next, diagnostic concerns specific to AD/HD are addressed. This includes an examination of literature relating to methodologies for assessment, differential diagnosis and comorbidity, as well as the problems that arise from inexact diagnostic practices. Finally, attention is given to those studies specifically aimed at measuring current diagnostic practices and techniques used by professionals in the field today.

Theoretical Overview

Models of Classification - An Overview

Kamphaus (1996) distinguishes between two levels of classification. One method involves the determination of whether psychological functioning is abnormal and what subsequent treatment is needed. The other level involves distinguishing between dimensions of functioning. Kamphaus (1996) further asserts that assessment and classification are closely linked in that at least a portion of assessment involves attempts at classification. Therefore, in order to understand clinical assessment, one must be aware of the issues surrounding classification. Achenbach (1982) states, "assessment and classification are two facets of what should be a single process: assessment aims to identify the distinguishing features of individual cases; taxonomy (classification) is the grouping of cases according to their distinguishing features" (p.1).

Classification involves the placement of psychological phenomena into categories which are determined based on a set of rules (Kamphaus, 1996). Models of classification are best at classifying those conditions that are clearly at the core of psychopathology rather than those that fall on the boundary with normality (Frances, et al., 1994). Frances, et al. (1994) state, "The many current and suggested categories for the less impaired outpatient population often raise the question of where psychopathology ends and the wear and tear of everyday life begins" (p. 213).

Any classification system of psychological functioning is not without its limitations in that psychological phenomena do not lend themselves to neat categorization of normality versus abnormality, nor do they exhibit distinctly separate types of dysfunction. This is particularly the case with children where typically there are no cut-offs of where it becomes apparent that a dimension of behavior becomes pathological. Frequently, a high degree of overlap exists between the different forms of pathology (Kamphaus, 1996). As with assessment, classification systems are evaluated based on their reliability and validity of the interpretations made as a result of classification (Quay, 1986).

Kamphaus (1996) distinguishes between two levels of classification. One method involves the determination of whether psychological functioning is abnormal and whether treatment is needed. The other level involves distinguishing between dimensions of functioning. The particular model of classification chosen will dictate what rules and procedures are utilized when classifying, and will consequently provide a structure in which assessment can take place (Mattaini and Kirk, 1991).

Dimensional and Categorical Models of Classification

The dimensional and categorical models are the two major models of classification.

The categorical model historically has its roots in the medical establishment. It uses a nominal scale of measurement, and thus is interested in straightforward naming. A disease state is assumed when psychopathology is viewed within the context of the medically oriented categorical model. This results in the identification of encapsulated

disorders which assume a pathognomonic nature (Achenbach, 1990). The presence or absence of symptomatology is enough to connote the presence or absence of a disorder. In other words, this model assumes that qualitative differences exist between those who have and those who do not have a disorder. Use of this type of model is operationalized through the use of self reports and/or reports from caregivers about feelings, thoughts and behaviors. This information is then used by the clinician who compares it to existing sets of criteria established by the classification system.

The categorical model works best when clear boundaries exist between the objects being named, and all members of the class have homogeneous traits with regard to defining features (Frances, et al. 1994). Conversely, it does not work as well when boundaries are unclear and heterogeneity exists within the class or category. As Frances, et al. (1994) point out, the majority of mental disorders "merge imperceptibly into near neighbors" (p. 215) where heterogeneity of categories and members is more the norm than the exception. Another practical drawback to the use of such a model is the loss of rich, descriptive information about clients. Because of this loss of information, implications for treatment are also often unavailable.

In contrast, many researchers (e.g. Frances, et al., 1994; Frances, Pincus and Widiger, 1990; Heumann and Morey, 1990; Zimmerman, Coryell and Bruce, 1985) claim advantages of the dimensional model of classification over the categorical model. The dimensional model views disorders as quantifiably different which requires the use of ordinal, interval or ratio scales to determine relative positions of human behaviors along a continuum (Mattaini and Kirk, 1991). It is concerned with attempts

to identify interindividual differences as opposed to defining specific diseases which are identifiable by a specific set of criteria. For instance, this way of conceptualizing psychopathology is in part operationalized through the use of cutoff scores on scales such as the Child Behavior Checklist (Achenbach & Edelbrock, 1983).

A dimensional approach is considered to be more reliable in identifying borderline cases and has specifically been found to be effective in classifying personality disorders where the majority of research in dimensional systems has taken place. Some major disadvantages of the dimensional model are that it is more cumbersome and less familiar to practitioners. Furthermore, it has not been widely accepted, and there are concerns that the use of a dimensional system may obscure what may truly be distinct categories (Frances, et al., 1994).

The current DSM (DSM - IV) system and its precursors (DSM - III and DSM - IIIR) have adhered to a categorical model of classification. It therefore conceptualizes mental disturbances as qualitatively different from normal psychological phenomena. Despite this continued reliance on the categorical model, the DSM - IV directly addresses the argument between the adherents to dimensional models and supporters of categorical models. It clearly point out that the APA makes no assumption that clear boundaries exist between any mental disorders or normality, nor that homogeneity exists within individual disorders. It also acknowledges the advantages of a dimensional system in describing phenomena that are distributed along a continuum and when boundaries are not clearly defined. Despite these concessions, the editors defend their decision to maintain the status quo by using a categorical

model of classification of mental disorders. This is justified by the following argument.

> Numerous dimensional systems are much less familiar and vivid than are the categorical names for mental disorders. Moreover, there is as yet no agreement on the choice of the optimal dimensions to be used for classification purposes (APA, 1994 p. xxii).

The authors do, however, add:

> Nonetheless, it is possible that the increasing research on, and familiarity with, dimensional systems may eventually result in their greater acceptance both as a method of conveying clinical information and as a research tool (APA, 1994 p. xxii).

Although the DSM-IV is not willing to go so far as to adopt a dimensional approach to classification, it clearly does not embrace a pure categorical system. In the strictest categorical system, only one disorder will usually be diagnosed, and thus, multiple diagnoses are rare (McConville and Steichen-Asch, 1990). For most disorders, the DSM-IV utilizes a polythetic system where only a certain proportion of symptoms must be present for a diagnosis to be made. Furthermore, the DSM-IV's suggested assessment practices for children notes the importance of viewing the child within a developmental context. These guidelines result in the identification of

individuals with a given diagnosis who are not likely to have identical defining features as would be the case in a truly categorical system (APA, 1994).

Proponents of the model of developmental psychopathology, do not support the "medically dominated diagnostic system" of the DSM (Steingard, Biederman, Doyle & Sprich-Buckminster, 1992; p. 449), but instead embrace the concept of a dimensional approach to classifying psychiatric disorders. They contend that when viewed within a developmental context, all individuals can possess some degree of every disorder. It is understood that differences in age and sex will commonly create variations in symptoms. Therefore, exaggerations in behaviors at different developmental stages can only be identified, in part, through the use of statistical techniques and empirically derived disorders that have distributed symptoms along a continuum (McConville and Steichen-Asch, 1990).

Shapiro (1993) addresses the importance of developmental considerations when assessing the significance of problematic behavior. Many troubling behaviors are displayed by children at some time in their development. Often these behaviors, while frustrating for parents and other caregivers, are quite common and do not result in psychological dysfunction later in life. Thus, the clinician must decide which behaviors will subside with the progression of normal development and which will require diagnosis and treatment.

Practitioners are also challenged by the fact that caregivers and not the children themselves are the ones who typically see the need for referral, evaluation and

treatment. Issues surrounding parent and family functioning and expectations of child behaviors certainly color the referral process.

Assessment practices and developmental psychopathology

Shapiro (1993) points out the nature and objectives of the various assessment paradigms, medical, psychodynamic, psychometric and behavioral, and describes how they can be incorporated into the macroparadigm of developmental psychopathology. First, medical assessment's goal is described as providing laboratory results that point to a specific disorder. This approach to limited in that the etiology of many psychological disorders remains unknown. Second, psychodynamic assessment is designed to provide information about underlying needs, desires and conflicts. Yet its inferential nature of discovery has opened it up to extreme criticism because of the difficulty in proving its validity. Next, the psychometric assessment paradigm attempts to measure psychological traits, such as intelligence. Thus, individual differences are of primary focus, and causation is not of concern. Finally, the behavioral paradigm focuses on measurable and observable behaviors and the environment that maintains these behaviors. Consequently, it shuns hypothetical constructs or inferences about underlying biological or mental variables. Patterns of behaviors are often overlooked as assessment typically focuses on discreet and individual behaviors.

It is argued that a melding of these various paradigms will lead to the most reliable and useful information in that accurate diagnosis will result and effective

interventions can be developed. Such an approach is operationalized through the use of various assessment techniques and multiple informants.

Within the context of developmental psychopathology, Achenbach (1990) describes five axes relevant to assessment of children: 1) parent reports of developmental history and behavioral characteristics; 2) teacher reports of academic and behavioral characteristics 3) cognitive evaluation; 4) medical assessment; and 5) direct assessment of the child. The relevance and importance of each of these axes varies depending on the developmental level of the child. It is clear, however, that an emphasis is placed on a diversity of data and the use of standardized normative-developmental procedures. This will allow the clinician to determine whether and to what degree a child under question deviates from the norm. However, the clinician must take into consideration interpersonal factors, situation-specificity, and differences in interpretations when interpreting assessment results and formulating intervention strategies (Shapiro, 1993).

Achenbach (1990) points out the likelihood that varying and sometimes contradictory information results when using different sources.

> Although many of the rating instruments showed high reliability, the modest correlations between informants indicate that no single informant can substitute for all the others. It is therefore necessary to obtain data from multiple informants who interact with children under different conditions... Because the child's functioning may really differ from one area to another, the goal is not to determine which assessment

> procedure yields a singular truth about the child but to use what each one reveals about needs for help in particular areas. In some cases, multiaxial assessment may reveal that certain interaction partners, such as parent or teacher, need changing more than the child does. In other cases, multiaxial assessment may show that one type of intervention is needed for one context but a different type is needed for another context. (p. 11)

As a child psychopathologist, Routh (1990) concurs that multiple sources are necessary and he addresses the need for more guidelines in the DSM about what types of sources of information are necessary when making diagnostic decisions. As when making a medical diagnosis, multiple sources of information are necessary. Each observer has a unique information about the child's behavior. While these reports should not be viewed as equivalent, they should be viewed as complimentary.

Routh (1990), however, criticizes the lack of guidance by Achenbach and others about how various sources of information should be integrated. He takes the use of a multitrait-multimethod system for identifying childhood psychopathology one step further by describing a variety of techniques and arguments found in the literature that center around the issue of multi-informant, multi-method assessment. Those first involved in the study of use of multiple sources in assessment (e.g. Campbell and Fiske's [1959] study of the multitrait-multimethod matrix cited in Routh 1990) attempted to derive a matrix of intercorrelations so that reliability and validity of each source could be assessed. Attention was paid especially to test-retest

reliability and concurrent validity. Examination of concurrent validity in particular would theoretically result in some criterion measure against which all procedures could be evaluated for their usefulness. However, recent thinking suggests that such an expectation of a single criterion is perhaps unrealistic. This has created a new focus on construct validity in attempts to move away from the focus on correlating information from various sources.

Routh also discusses the importance of considering the concept of "method variance" or "source variance" while using the multi-informant/multi-method assessment approach. Specifically, this is the high correlation seen among different traits reported by the same information source. This may be experienced, for example, as a "halo effect" by a teacher who rates a favored child highly in the areas of intelligence, achievement and socialization regardless of the child's actual performance in these areas. Routh (1990) cites an illustrative 1976 study conducted by Langhorne, Loney, Paternite, and Bechtoldt of hyperactive children. A factor analysis neglected to reveal factors specific to different forms of psychopathology (e.g. conduct disorder or hyperactivity). Rather it did find "source" factors, such as a teacher, parent or clinician factor. Routh (1990) further notes, however, that Campbell and Fiske dispel the concerns of source variance by suggesting that sufficient discriminant validity of the various traits under consideration will result in high enough intercorrelations so that source variance will be overridden. Still, Routh (1990) cautions, that in practice this is not always the case because traits are often not independent entities but rather are linked to each other and thus highly correlated. Furthermore, it is noted that the

method in which the information is gathered (e.g. direct observation vs. retrospective reports) cannot and should not be equally weighted as to their validity or reliability.

Several systematic methods have also been derived for interpreting data from multiple informants. One approach simply combines information using a type of weighted average which on occasion utilizes sophisticated mathematical formulas. Another approach selectively combines information by excluding those data not considered to be valid. Despite the difficulties with using multiple informants, Routh (1990) concludes it is crucial so as to avoid the inherent bias that results from the use of a single source.

AD/HD - A definition & brief history

AD/HD is a complex disorder of the brain, behavior, and development that accounts for approximately 30% to 60% clinical referrals of children in this country. Indeed, AD/HD is the most studied childhood psychiatric disorder, yet despite this fact its etiology remains unclear and to date there are no known cures. Some research addresses the likelihood of genetic-hereditary factors, while others link the disorder to pre- or perinatal factors, blood lead levels, or thyroid disease. It is considered chronic in nature with a significant number of cases (perhaps as high as 8% of identified children) continuing to show signs of the disorder into adulthood. The clinical features described by the DSM-IV include developmentally inappropriate degrees of inattention and/or impulsivity. The maladaptive behaviors must be present at least six months and must have been present prior to seven years of age. The DSM-IV also

now recognizes that problems must be pervasive, i.e. present in at least two settings, and there must be significant clinical impairment in social, academic, or occupational functioning.

Barkley (1990) further adds to the definition the inclusion of, "developmental deficiencies in the regulation and maintenance of behaviors by rules and consequences. These deficiencies give rise to problems with inhibiting, initiating or sustaining responses to tasks or stimuli, and adherence to rules or instructions, particularly in situations where consequences for such behavior are delayed, weak, or nonexistent" (p. 71). Problems seem to be most apparent when tasks are dull or repetitive. In contrast, attention of children with AD/HD can fluctuate considerably, and often problems seemingly vanish when they are placed in highly stimulating or novel situations

Shifts in conceptualization of the disorder have in turn led to a shift in diagnostic nomenclature. AD/HD was first recognized in the 1950s and 1960s as Minimal Brain Damage and later, Minimal Brain Dysfunction. Because of the inability to test for brain dysfunction, its name was changed to Hyperkinetic Reaction of Childhood for its first inclusion in the Diagnostic and Statistical Manual (DSM-II, APA, 1968). As the focus shifted in the research community to the study of hyperactive symptomatology and problems of inattention, The DSM-III (1980) again renamed the disorder, Attention Deficit Disorder and split it into two separate categories of Attention Deficit Disorder with Hyperactivity (ADD/H) and Attention Deficit Disorder without hyperactivity (ADD). This sparked controversy among

some researchers in the field who did not feel there was a sufficient scientific basis for the inclusion of ADD as a separate subtype. Consequently, the DSM-IIIR returned to the concept of one distinct disorder, naming it Attention Deficit Hyperactivity Disorder (ADHD), but including a secondary category of Undifferentiated Attention Deficit Disorder (UADD). Numerous studies (e.g. Goodyear & Hyng, 1992; Bauermeister, Alegria, Bird, Rubio-Stipec & Canino, 1992) examining the existence of separate disorders of ADD and ADHD have finally resulted in the latest revision of the DSM (DSM-IV; APA, 1994) including three distinct disorders, Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive Impulsive Type; Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type; and Attention-Deficit/Hyperactivity Disorder, Combined Type (Rapport, 1995). These three disorders are referred to collectively as AD/HD throughout this study.

These changes in diagnostic nomenclature must not be dismissed as mere semantical arguments among researchers, as the continually shifting labels and diagnostic criteria have had far reaching consequences. Garfinkel & Amrami (1992) explain that the more restrictive set of criteria in DSM-III resulted in the diagnosis of children with more severe and specific symptoms, while the more inclusive set of criteria in DSM-IIIR allowed for any mixture of symptoms to be present for diagnosis. This resulted in a more heterogeneous group being identified by the DSM-IIIR criteria. As a member of the DSM-IV child and adolescent group, Garfinkel and Amrami (1992) pointed out concerns about the DSM-IIIR low threshold. The revision committee, therefore, considered giving more weight to those symptoms that

had better predictive value through the use of separate major and minor criteria. While this was not the final outcome of the DSM-IV (APA, 1994), there is now the recognition of the three separate subtypes noted above. Other studies also speak to specific effects the changing criteria has had on identification. For example, Lahey, et al (1990) found over a 14% increase in diagnosis in a clinical sample of 177 boys when using the criteria from DSM-IIIR (APA, 1987) versus DSM-III (APA, 1980) criteria.

It is much too early to tell whether these newest diagnostic criteria and subtypes will be able to stand up to the scrutiny of research. Needless to say, many practitioners and researchers view the DSM-IV's revisions as a "work in progress", and assume that the definition will again be refined as we come to better understand this confusing and complicated disorder (Schaughency & Rothlind, 1991).

Best practices for the diagnosis of AD/HD

Various approaches have been used to diagnose AD/HD, but no single method has been found to be strong enough to stand alone. As a result, there is growing consensus among experts in the field that a multimethod and multidisciplinary approach must be undertaken for an accurate diagnosis. Although practitioners and researchers are still in pursuit of the "holy grail" for diagnosis, to date it has proven elusive which leaves us with no choice but to use a "best estimate" approach (Schaughancy & Rothhind, 1991). Research suggests that systematic, multimethod assessment leads to the most reliable diagnosis of AD/HD (e.g. Burnley, 1993; DuPaul, Anastopoulos, Shelton, Guevremont & Metevia, 1992; Goldstein &

Goldstein, 1990; Landau, Milich & Widiger, 1991; Schaughency & Rothlind, 1991). Although the use of multiple techniques and multiple informants is complex and time consuming, experts believe it is the approach that will lead to the highest rate of diagnostic accuracy, a goal particularly crucial for effective treatment. Utilization of such an approach is in keeping with the concept of developmental psychopathology and is in line with Achenbach's and others theorists' suggested assessment practices.

The DSM-III (APA, 1980) and its subsequent editions indicate a need for examining symptoms of AD/HD within a developmental context. For example, the DSM-IV emphasizes the importance of making a differential diagnosis between AD/HD and "age-appropriate behaviors in active children", especially when diagnosing young children. It also notes the need to view the child within the context of his/her mental age, particularly when diagnosing children who are either mentally retarded or gifted. This latter guideline at least indirectly supports the use of psychoeducational testing when making a differential diagnosis of these children. Further, the DSM-IV (APA, 1994) encourages the use of multiple informants, such as parents, grandparents or baby-sitters in that they will be able to provide information about the child's behaviors in various settings.

Barkley and his colleagues (e.g. Barkley, 1990a; Barkley, 1990b; Guevremont, DuPaul & Barkley, 1990; Shelton & Barkley, 1994) describe specific strategies for reliable and valid diagnosis of AD/HD. Barkley (1990a) emphasizes the necessity to view the child both within a "biopsychosocial" perspective and a developmental context. In doing so, several parameters for assessment are outlined. First,

developmental deviance should be established through measuring the child's primary symptoms and comparing them to adequate normative data. Second, is the need to address issues of possible comorbidity. Third, multiple sources are utilized because of the situational variations in problems. And finally, assessment techniques must cover a wide age range because of the persistence of symptoms across the developmental span.

Barkley further emphasizes that behavioral concerns must be viewed within the context of normal developmental sequences with special attention paid to whether symptoms can be better accounted for by delays in intellectual development.

Barkley advocates the use of the following assessment methods when AD/HD is suspected: clinical interviews of parents, teachers and child; a medical examination; behavior rating scales completed by parent and teacher; laboratory measures of attention, impulsivity and motor activity; and direct observation of the child in multiple settings.

Barkley's approach to AD/HD assessment closely mirrors both the theoretical components and assessment model outlined in the developmental psychopathology literature. Emphasis is not placed on one particular paradigm, but rather he suggests the need to attend to a variety of factors (i.e. biological, psychological and social) when diagnosing and treating a child. Further, four of the five axes for assessment as explicated by Achenbach are described in extensive detail in Barkley's and his colleagues' writings. One apparent criticism is the lack of emphasis placed on cognitive assessment, despite Barkley's stated parameter for the need to view

behavior within the context of cognitive developmental functioning. Instead, Barkley promotes the use of psychoeducational assessment only if a possible learning disability is suspected. Also, there is little evidence to date that laboratory measures, such as the Continuous Performance Test and Matching Familiar Figures Test provide useful diagnostic information or have adequate norms for use in the clinic (DuPaul, Anastopoulos, Shelton, Guevremont & Metevia, 1992).

Problems associated with assessment

Many researchers have addressed the potential hazards that arise when clinical diagnosis does not follow the above outlined prescription. Several studies are cited below to illustrate the pitfalls of inadequate assessment practices. This will include a review of literature that addresses the difficulties with differential diagnosis and possible comorbidity of AD/HD.

Cotugno (1993) conducted a study to examine how the use of comprehensive evaluations may influence the diagnoses of children presenting with AD/HD symptomatology. The study included 92 children referred to a community mental health over a three year period. Each subject had previously received a diagnosis of AD/HD from other mental health workers, pediatricians and other physicians. Previous assessment procedures included direct observations and/or behavior rating scales completed by parents and teachers, and no child had undergone an comprehensive assessment. Procedures for evaluation used in this study included an extensive history of educational, medical, developmental, educational, familial, and

social functioning; and a comprehensive assessment battery of intellectual, perceptual, personality, academic and behavioral testing. Team analysis (utilizing DSM-IIIR criteria) of the assessment data resulted in a primary diagnosis of ADHD in only 22% of the cases and a primary diagnosis of Undifferentiated Attention Deficit Disorder (UADD) in only 4%. Secondary diagnoses of ADHD and UADD were 37% and 20%, respectively. Although 83% of their sample clearly had symptoms associated with AD/HD, in 74% of these cases the symptoms could primarily be explained by another cause such as an anxiety, mood or other behavioral disturbance. Indeed, of the 26% who ended up with a primary diagnosis of Cyclothymia or Dysthymia, problems of attention and concentration were present in addition to somatic symptoms. Furthermore, 35% of the children presenting with attentional problems on referral were later found to have "significant and persistent anxiety" (p. 342) which in many cases could be traced to a traumatic event in their past. The researchers concluded that the referral sources had placed greater weight on the symptoms of inattention, distractibility, overactivity, and other AD/HD symptoms, while excluding those symptoms typically associated with other disorders. They related this conclusion to the limited developmental data collected and the almost exclusive use of observations and behavior rating scales. Cotugno (1993) suggests that the use of limited and briefer measures may unknowingly lead to misdiagnosis and mistreatment of AD/HD, because practitioners will be inclined to focus on behaviors *per se* and negate looking for other underlying sources for these symptoms.

Limitations to the study include the possibility that those children typically referred to a mental health clinic may constitute a more problematic subset of children with AD/HD, thus possibly compromising the population validity. Further, the researchers chose to use several projective tests to aid them in the differential diagnosis of anxiety and mood disorders. While these techniques are commonly used by many practitioners, this is not without controversy in that their validity is difficult to prove. Despite these limitations, Cotugno's study (1993) clearly illustrates the dangers associated with the use of limited diagnostic procedures. A comprehensive assessment battery will not only aid in the differential diagnosis of other disorders, it will also help to eliminate misdiagnosis of children who exhibit attentional problems and other symptoms suggestive of AD/HD. Finally, Cotugno calls for future studies to analyze referral source data, such as specialty or discipline, level of training, availability of alternatives to evaluation, and willingness to consider non-neurologically based disorders.

In a study of re-referred children with prior diagnoses of AD/HD, Sabatino and Vance (1994) found 58% had been inaccurately labeled after conducting a comprehensive multidisciplinary team assessment. The 75 children (55 male and 22 female) in the study were referred to a multidisciplinary clinic because prior interventions had proven ineffective. Each of these children had previously been diagnosed as AD/HD and were receiving treatment for the disorder. Multidisciplinary assessment included a minimum of the following: family and social histories, medical examination, teacher and parent responses on checklists, neurological examination,

behavioral observations, and psychoeducational testing. The team diagnoses often did not confirm the original diagnosis of AD/HD. In only 31 cases was the child diagnosed as having either undifferentiated AD/HD or AD/HD with hyperactivity. The remainder instead were found to have learning disabilities, central auditory processing deficits, language delays, conduct disorders, oppositional defiant disorders, anxiety disorders or separation anxiety disorders.

In Sabatino and Vance's (1994) discussion they reported "in a very large number of cases" (p. 194) the schools had originally initiated the first referral by encouraging parents to seek medical help from their child's physician. The authors suggest this immediately sets up parental expectations of a medical cure while negating the possibility of a learning or emotional problem. Such expectations proved to be extremely frustrating and confusing for parents when medication did not alleviate their child's problems.

The authors provide a compelling study that suggests the possibility of AD/HD commonly being overdiagnosed today. They conclude that many of the problems centered around the issue of diagnosing AD/HD have to do with imprecise criteria and the reliance on behavioral observation for diagnosis. One noteworthy limitation to the study was the authors' neglect of possible comorbid disorders when making their diagnoses. Although Sabatino and Vance acknowledge in their discussion the high comorbidity rate between AD/HD and emotional disturbances, their results suggest that they did not consider this possibility. This may have compromised the findings of this study and subsequently affected the external validity of the study.

Desranges, Desranges, and Karsky (1995) examined more closely those issues mentioned by Sabatino and Vance concerning parents' understanding of their children's problems and subsequent expectations for treatment and cure. They conducted a study to assess the accuracy of preconceived diagnoses of AD/HD. Of the 375 cases reviewed from a one year referral period, 119 parents had specifically requested an evaluation for AD/HD or specifically presented concerns about the primary symptoms of AD/HD. The other 256 cases had other concerns about their child upon initiation of services. The diagnosis was confirmed in 38% of the 119 cases requesting an evaluation for AD/HD or its symptoms (12% of the total sample). Of those cases which could not be confirmed, other factors such as the following arose: active abuse or neglect, grief issues, parental marital problems, substance abuse, medical problems, tic disorders, anxiety or mood disorders, pervasive developmental disorders, etc. There were significant implications found between the AD/HD confirmed and AD/HD not confirmed groups with regard to acceptance and compliance with treatment plans. Specifically, 56% of the confirmed cases were considered successful in meeting treatment goals while only 22% of these clients were unsuccessful. The remaining 22% of the clients were placed in an "other" category and were considered to be neither successful nor unsuccessful cases (e.g. family terminating treatment, child moving, family financial concerns, etc.). In contrast, in those cases where AD/HD was not confirmed, 42% were considered successful and 34% were considered unsuccessful. The authors hypothesize that the families where their preconceived diagnosis was not confirmed subsequently became frustrated and

either did not complete the evaluation process when they learned other factors were being considered or terminated treatment prematurely. It was first concluded by the researchers that preconceptions about AD/HD appear to impact significantly on the success of evaluation and treatment of children, many of whom do indeed have legitimate needs. The authors also expressed concerns about overinclusion of children under the AD/HD rubric when diagnosticians fail to provide a careful assessment and rely on the preconceptions of parents.

The authors present compelling information with regard to parents' preconceived diagnoses of AD/HD. However, no statistical analysis of their data was provided to assess significance of results. Such an analysis would have only added weight and legitimacy to their argument.

The statistical issues of specificity/sensitivity and positive predictive power (PPP)/negative predictive power (NPP) add more weight to the need for a multi-method, multi-informant diagnostic process and build on the articles reviewed above. While specific parental concerns about AD/HD or its symptoms of inattention, distractibility or hyperactivity are often a good indicator that some type of problem exists, the particular diagnosis of AD/HD must not be hastily concluded based on these concerns alone. As with all diagnostic procedures, the clinician must be aware of issues of predictive validity of symptoms. Sensitivity refers to the proportion of people with the symptom who also have the disorder (true positives), and specificity is the proportion of people without the disorder who do not have the symptom (true negatives). Perhaps of more value to the clinician who is engaged in the diagnostic

process is the concept of PPP and NPP. Positive predictive power reveals how useful a symptom is as an inclusion criterion by providing the probability of the person having the disorder when the symptom is present. Conversely, NPP provides the probability of not having the disorder when the symptom is absent, thus indicating the value of the particular symptom as an exclusion criterion. When a symptom or diagnostic tool has low specificity or PPP, it will lead to false positives, while false negatives can result if there is a low degree of sensitivity or NPP (Landau, Milich & Widiger, 1991).

Landau, Milich and Widiger (1991) investigated the predictive values of symptoms from a child interview in a follow-up study of 76 boys with presenting symptoms of AD/HD. Of the original sample of 100 boys, there was a heterogeneous mixture of AD/HD alone (24%), conduct disorder (20%), comorbid AD/HD and conduct disorder (10%) and a number of other common childhood disorders or no disorder at all (46%). Diagnosis was made by analysis of findings of a "multidisciplinary staff conference". Seventeen of the original 100 families refused to participate in the follow-up, and one other boy was in the custody of the state. Follow up evaluations were conducted approximately two years later and included the boys' responses to the standardized Diagnostic Interview for Children and Adolescents (DICA). Their mothers were also interviewed with the parent version of this instrument. The results from the parent interviews were used to derive a diagnosis that were then used as the criterion measure for this study. The children's self-reported symptoms were analyzed for base rates, PPP, NPP, sensitivity and

specificity rates to determine which diagnostic criteria were most effective for predicting AD/HD. Results indicated the most efficient inclusion indicators were "leaves meals/TV before finished", "teacher complains about out-of-seat". "pushes ahead in line", and "parents yell - don't know why". However, the first three symptoms had low sensitivity rates. None of the symptoms resulted in providing an efficient exclusion criterion for AD/HD. Furthermore, the boys only admitted to half the symptoms their mothers attributed to them.

The authors conclude, children and adolescents with AD/HD cannot be consistently relied upon to report difficulties, and thus should not be counted on to rule out the existence of this disorder. In contrast, mothers tended to overstated the presence of symptoms related to AD/HD.

This study underscores the importance of expanding one's assessment procedures to include data from multiple sources, such as both parents and children. Limitations to Landau, Milich and Widiger's (1991) research include the fact that mothers only were used in making the follow-up diagnoses. Consequently, the authors view their study as only preliminary in nature and make suggestions for follow-up studies that utilize other informants such as teachers.

The 245 children in Mulhern, Dworkin, and Bernstein's (1994) study were referred over an eleven year period to a university hospital-based pediatric practice for learning and behavior problems. They each received a comprehensive assessment which included a medical history and examination, parent and teacher questionnaires, neurodevelopmental examination, review of school records, and occasional

psychoeducational assessment. During information gathering, parents were asked to list those problems with which they wanted help. Their requests that suggested the possibility of AD/HD were grouped into categories of "inattention", "impulsivity" and "overactivity". Fifty percent of the parents expressed concerns of inattention, 25% had concerns about their child's impulsivity, and 19% were worried about overactivity. Also, 7% of the parents indicated concerns about AD/HD specifically by name. Mulhern, Dworkin, and Bernstein (1994) found that parents' concerns in almost all cases led to the diagnosis of some type of school-based problem. And the presence of one or more concerns categorized as relating to AD/HD had both a high sensitivity (.87) and negative predictive value (.84). However, their specificity and positive predictive value for predicting an attention deficit were only modest (.41 and .47, respectively) This resulted in a high degree of false positives for this disorder in that parental concerns about possible AD/HD were present, but the diagnosis was not warranted.

This study serves to underscore the importance of eliciting information from parents in that they are able to predict the existence of major problems in their children. However, their specific concerns, especially with regard to symptoms of AD/HD were not particularly accurate. This again suggests the need for a comprehensive assessment so as not to neglect other problems that may present with similar symptoms. Limitations to the study include possible threats to population validity in that a disproportionate number of children were white (92%) and male

(81%), and the vast majority of parents involved in the questionnaire process were mothers (65% mother alone and 25% both parents).

To further complicate the process of differential diagnosis, research reveals a high comorbidity rate, at least in part due to the symptom overlap of many childhood disorders. Approximately 49% of children diagnosed with AD/HD are considered pure cases, and the remainder present with a comorbid disorder (Desgranges, Desgranges and Karsky, 1995). Barkley (1990) reports that 21% to 45% of children and 65% of adolescents with AD/HD also meet the criteria for conduct disorder, and approximately 40% of children and 65% of adolescents who have AD/HD also have an oppositional defiant disorder. Prevalence data suggest approximately 20% of children with AD/HD also have a learning disability. However, an undetected learning disability can masquerade as an attention deficit disorder and thus often needs to be ruled out. It is also often the case that young children with significant language delays will typically present with an increased activity level because of their difficulties with verbal communication and/or central auditory processing.

When making a differential diagnosis, anxiety and depression must also be ruled out. Although Barkley (1990) reports a low rate of comorbidity between AD/HD and anxiety or depressive disorders, Lahey and Carlson (1991) report that children with attention deficit disorders without hyperactivity often do show signs of anxiety and depression, and Desgranges, Desgranges and Karsky (1995) report comorbidity with a full blown anxiety disorder anywhere from 15 to 75%. These statistics, however, should not be viewed as a rare phenomena specific to AD/HD in

that approximately 50% of the children who meet the criteria for one psychiatric disorder also qualify for diagnosis of another condition, thus significantly complicating the diagnostic process (de Mesquita & Gilliam, 1994).

De Mesquita & Gilliam's (1994) literature review of the differential diagnosis and coexisting disorders of childhood depression lists common diagnostic pitfalls that influence and interfere with clinical judgment. They specifically address the phenomenon of confirmatory bias. This is defined as "the result of a tendency to seek and attend to information that confirms an initially adopted hypothesis [which results in a] premature truncation of information searching" (p.159). Other hypotheses may be denied and supporting data are given priority over negative findings. The authors express concerns about clinicians adopting a hypothesis prior to collecting all needed information. This is turn creates the likelihood of data serving only as cues to confirm the already existing hypothesis. As a solution to or a way of reducing the problem of confirmatory bias de Mesquita & Gilliam (1994) suggest the generation of multiple hypotheses.

Steingard, Biederman, Doyle, and Sprich-Buckminster (1992) examined the association between parent reports on the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) and interview-defined AD/HD, as well as the existence of comorbid disorders. Of the 114 boys in the sample, 67 met the criteria for AD/HD based on a standard psychiatric evaluation and structured interview using DSM-III criteria. Fifty-five of these children also were diagnosed with comorbid oppositional or conduct disorders, major depression or anxiety disorders. Twenty-

three non-ill children served as a comparison group and the remainder were considered high-risk for future psychopathology. Results revealed both groups of children with AD/HD (i.e. AD/HD only and AD/HD with comorbid disorders) were scored significantly more deviant on the CBCL than both high risk and comparison groups. When the AD/HD only group and the AD/HD comorbid groups were analyzed separately, the AD/HD only group differed solely on the Hyperactivity scale of the CBCL when compared to the control. Further, the AD/HD comorbid group scored significantly higher on the Hyperactivity scale than all other groups including the AD/HD only group. There was no significant difference between any of the CBCL scales of the high risk group and the AD/HD only group. Of extreme clinical importance was the finding that the AD/HD only group scores did not exceed a T-score of 70 which is considered to be the cutoff score for clinically significant psychopathology (T-score = 65 3), although the AD/HD comorbid group did (T-score = 74.1).

Limitations to this study include threats to ecological validity due to the lack of explicit descriptions about the methodology used in the psychiatric evaluation to diagnosis AD/HD, thus making replication difficult. Also, it is quite possible that a noncomprehensive assessment may have resulted in an inflated number of children diagnosed with AD/HD which in turn may have contributed to some the nonsignificant results found in the AD/HD only group. The authors also point out problems with generalizing results to other settings because of the sole focus on mothers as informants. Despite these limitations, the findings provide compelling

information about the utility of behavior rating scales in diagnosing childhood psychopathology, as well as aiding in the identification of comorbid disorders.

Current practices in assessment of AD/HD

Several studies have been conducted to assess directly current diagnostic practices of those in the field. Rosenberg and Beck (1986) surveyed clinical child and school psychologists about their preferred assessment methods and treatment modalities for children with hyperactivity. Of the 500 questionnaires sent to professionals, there were 308 returned (30.8% response rate). It was found that clinical psychologists used neuropsychological tests and vigilance and impulsivity tests more often than school psychologists, while rating scales were used less frequently than interviews, standardized tests, and drawing tasks by either group. Both groups found behavioral observations to be the single best predictor of hyperactivity. The most preferred treatment modality for school psychologists was a combination of medication and behavior therapy, while clinical psychologists preferred a combination of medication, behavior therapy and cognitive behavior therapy. Concerns were raised by the authors that interviews and behavioral observations were the most preferred methods of assessment overall despite the fact that they lack normative information and standardized procedures.

Limitations to this study include a low response rate to the questionnaire which has implications for the generalizability of the results. While the authors did address this concern, they did not report doing any follow up mailings in attempt to

increase the response rate, nor did they try to ascertain whether the nonrespondents differed significantly from those who chose to respond.

The Brown, Keene and Middleton (1994) study of professional's assessment and intervention practices for AD/HD served as an expansion of Rosenberg and Beck's (1986) work. They surveyed clinical child psychologists, school psychologists, family physicians and pediatricians with a mailed questionnaire about their current use of particular assessment instruments and methods of intervention. The initial survey included 250 professionals, but 200 additional physicians were later included in the sample because of a low response rate. Of the 450 professionals surveyed, 197 responded (93 school psychologists, 56 clinical child psychologists, 24 family physicians and 25 pediatricians). It was found that although these professionals spent a significant percentage of professional time with children with AD/HD, school psychologists had attended three classes or workshops on the subject, and the other three groups had attended approximately one each. All groups reported a heavy reliance on interviews and behavioral observations. While both groups of psychologists preferred the use of standardized tests to rating scales, the opposite was true of the physician groups. Most of the 42 assessment techniques listed in the questionnaire were used by less than 15% of the respondents, and few techniques were widely used. Stimulant medication was the intervention of choice by physicians. School psychologists tended to modify the school environment and use cognitive behavioral strategies.

There was a low response rate to the questionnaire used in this study, especially with regard to the two groups of physicians which has implications for the generalizability of the results. The authors did not directly address this concern, nor appear to assess the representativeness of their sample. The authors also neglected to report their chosen sampling frame. This article served only as a straightforward reporting of current assessment trends of four professional groups as there was no attempt at interpretation of the data.

Another study was conducted by Moser and Kallail (1995) of family and general practitioners. Through a 20 item mailed questionnaire, Moser and Kallail (1995) conducted a study of Kansas' family and general physicians' assessment and diagnostic practices for AD/HD. Of the 940 physicians surveyed, 471 responded (50.1%). Forty-three percent of the respondents indicated they referred out to other professionals when AD/HD was suspected; typically this included referrals to other physicians, such as pediatric psychiatrists, pediatric neurologists or pediatricians. Thirty percent reported evaluating and treating themselves and 27% referred out for the evaluation, but conducted the follow-up treatment themselves. Of those physicians who diagnosed and treated themselves, 97% of them indicated some type of "routine evaluation in the office" before starting treatment. This assessment included the routine ordering of laboratory tests by 31%, the use of teacher questionnaires by 28% and parent questionnaires by 20%. It was also noted 55% routinely interviewed teachers and 92% routinely interviewed parents. In conclusion, it became evident to the researchers that those physicians who chose to assess for

AD/HD themselves infrequently used special tests or standardized questionnaires in their evaluation, but instead relied heavily on clinical evaluation.

Despite three mailings, only 50% of the 940 physicians surveyed actually responded. This severely calls into question the issue of generalizability of results. The authors address this concern hypothesizing that those who did not respond may have made up a disproportionate share of physicians who chose to treat their patients suspected of AD/HD rather than refer them out. However, no follow up techniques, such as telephone calls were made to confirm these theories. Furthermore, it is uncertain whether these results from a mainly rural midwestern state can be generalized to other localities in the country. Even so, this study revealed that at least 22% of the family and general physicians in Kansas do treat for AD/HD. The researchers point out several interesting questions that were raised by the survey. For instance, why do these physicians choose to refer their patients? They speculate about the possible lack of interest in the disorder, lack of expertise, lack of time for the diagnostic process and reimbursement concerns. It is also noted briefly that there is a disparity between clinical practice and recommendations in the literature, especially with regard to the use of standardized questionnaires for diagnosis.

Conclusions

The literature describes the most efficacious method for diagnosing Attention Deficit Hyperactivity Disorder as multifaceted in nature. The practitioner's goal is to gather information from a variety of informants about a variety of situations across a

variety of settings. Such an approach has a strong theoretical basis in the developmental psychopathology paradigm which espouses the use of multiple theories and methodologies to diagnose and treat childhood disorders. Problems are viewed within a developmental context and are considered to be extremes on a continuum of typical behaviors which is in keeping with the dimensional classification model.

The clinician's diagnostic task is to gather data through interviews, behavior rating scales, behavioral observation, medical examination and psychoeducational testing. Use of normative instruments will in part help provide information regarding developmental appropriateness of observed behaviors. While this approach can unfortunately prove to be a laborious and time consuming chore, it is essential if proper identification and subsequent effective treatment is the final goal. The issue of careful diagnosis is especially crucial for AD/HD, because the primary treatment of choice to date includes a combination of stimulant medication and behavioral programming. To avoid the unnecessary frustrations that can accompany inaccurate diagnosis, it is in the best interests of practitioners to begin with a thorough evaluation that specifically addresses issues of differential diagnosis and comorbidity of other childhood disorders.

Despite criticisms in the literature about inaccurate diagnostic procedures and subsequent overdiagnosis, few studies have attempted to address the issue by directly examining the diagnostic practices of professionals in the field. This study will attempt to fill at least part of this gap by examining diagnostic practices of several

disciplines of practitioners who routinely are called upon to make a diagnosis of AD/HD.

CHAPTER THREE

METHODOLOGY

This study investigated information about the current practices used by clinicians when diagnosing children with AD/HD as well as explored possible relationships between these practices, professional disciplines, opinions about AD/HD, and theoretical leanings. Specifically, a mailed questionnaire was used to collect data. Chapter three will present in detail the design and research methodology of the study.

Population and Sample

This study was designed to generalize to a target population of Professional Counselors, Clinical Psychologists, Psychiatrists, and Pediatricians who are currently licensed and currently practice their professions in Virginia. A survey of the literature (January, 1997) in the fields of psychiatry, pediatrics, counseling, psychology, neurology and social work revealed the disciplines of counseling, psychology, psychiatry and pediatrics had the most interest in the phenomenon of AD/HD as indicated by the number of publications cited in the databases psycFirst, MEDLINE, and SocioAbs. Results of this search are presented in Table 3.1 below.

Table 3.1

Data Base Citations for Disciplines

Data base	Search terms	Citations
psycFIRST	attention deficit disorder	1231
	attention deficit disorder and counseling	18
	attention deficit disorder and counselors	14
	attention deficit disorder and psychology	20
	attention deficit disorder and psychologists	15
MEDLINE	attention deficit disorder	2625
	attention deficit disorder and pediatricians	14
	attention deficit disorder and pediatrics	22
	attention deficit disorder and psychiatry	80
	attention deficit disorder and psychiatrists	15
	attention deficit disorder and neurology	9
	attention deficit disorder and neurologists	4
SocioAbs	attention deficit disorder	4
	attention deficit disorder and social work	0
	attention deficit disorder and social workers	1

The population of Pediatricians, Psychiatrists, Professional Counselors, and Clinical Psychologists who were licensed by the Commonwealth of Virginia equaled

approximately 4500 in January 1997. The accessible population came from two sources. The sample of Counselors and Clinical Psychologists came from a January 1997 mailing list provided by the state Board of Health Professions. The samples of Pediatricians and Psychiatrists came from the American Board of Specialties who provided the researcher with lists of all board certified psychiatrists and pediatricians in the state of Virginia as of January 1997. A systematic sampling method was utilized to select names from each of these sampling frames. Participants were randomly selected from alphabetical lists of names which were numbered and then selected using a table of random numbers. One hundred twenty-five participants were chosen to represent each of the four disciplines noted above to equal a total of 500 potential participants.

It was anticipated that approximately 50% of those surveyed would respond to the questionnaire (see Moser & Kallail, 1995 for comparison). This number (250) would exceed the recommended sample size for the largest regression run. A minimum of 10 subjects is recommended for each variable being included in a regression analysis (Tatsuoka, 1971). With 12 variables for the largest analysis (i.e. Hypothesis #1, p. 41), this required a sample size of 120. Furthermore, after completion of a follow-up survey of nonrespondents (see below for specific description of follow-up procedures), the total number of participants would approximate 75%. This number (n = 375) exceeds the recommended sample size of 354 which was determined by Krejcie and Morgan (1970; cited in Gay, 1996) to be appropriate for a population of

4,500. The population of pediatricians, psychologists, clinical psychologists and counselors who are licensed and/or board certified in Virginia equals roughly 4,500.

Data collection

Questionnaires and cover letters were mailed to all selected participants. The cover letter explained the nature of the study and provided information for completion of the questionnaire. Statements concerning the voluntary nature of the survey and an assurance of anonymity were also provided. The researcher enclosed a self-addressed prepaid envelope for ease of return. In addition to the questionnaire and a stamped return envelop, the selected participants received a cover letter that explained the purpose of the study, the confidentiality and anonymity of the responses, and the importance of responding in a timely manner (see Appendix A).

A coded cover sheet was attached to each questionnaire where the respondent was instructed to write his/her name and address if s/he desired a copy of the test results. To ensure the anonymity of the respondents, the coded sheets were removed by the researcher upon receipt of the returned questionnaires and numbers were matched to a master mailing list to facilitate follow-up mailings.

Follow-up procedures

Approximately three weeks after the initial mailing in March 1997, the researcher had received 202 (40%) completed surveys and 24 (5%) surveys returned by the postal service as undeliverable. Reminder postcards were sent to the 274 who

had not yet responded to the survey. The next follow up procedure took place in approximately another three weeks after 24 (45% total) additional questionnaires were returned. The researcher mailed the questionnaire and a new cover letter to the 250 who had not yet responded. Borg and Gall (1989) suggest varying the tone of the follow-up letter from that of the original letter as a method to increase the likelihood of return. A copy of this cover letter can be found in Appendix A.

After a four week period following the mailing of the third follow up, another 48 participants had responded. This yielded a total of 274 participants (55%) which fell below Borg and Gall's (1989) recommended response rate of 80% for survey research. When response rates are low, there may be important differences between those participants who chose to complete the instrument and those who did not which would thus create a sampling bias. As suggested by Borg and Gall (1989), nonrespondents should be surveyed to determine if any important differences exist. It was deemed most appropriate to use an abbreviated mailed questionnaire for this step (See Appendix A for abbreviated questionnaire and corresponding cover letter). The comparison sample included the 202 participants (excluding the 24 surveys that were returned as undeliverable) who had not responded to the first three mailings. From this sample 69 (34%) abbreviated questionnaires were returned. The two groups were compared on the following items: profession, current status of practice, caseload of children, referral and assessment practices, and opinions about classification systems.

Instrumentation

A cross-sectional survey provided data for analysis of current diagnostic practices. Specifically, a standardized questionnaire was developed by the researcher and distributed to a sample of the predetermined population. The questionnaire was three pages and was comprised of 19 items, the majority of which were closed questions. Some questions asked for a written response, which could provide another level of information for analysis. Opinion questions utilized a Likert-type scale. A copy of the questionnaire can be found in Appendix B.

Research Design

Rationale for Design

In general, a major advantage of the mailed questionnaire as a method of data collection is that it allows for the survey of a relatively large group of individuals. This particular questionnaire addressed specific issues of techniques and procedures, as well as explored pertinent information about opinions concerning assessment procedures and AD/HD.

Research Question

What practices and opinions exist among practitioners with regard to assessment and diagnostic practices of AD/HD in children and adolescents?

Research Hypotheses

The research question was answered through testing the following research hypotheses:

1. Each professional discipline (i.e. Psychiatrists, Clinical Psychologists, Pediatricians, and Professional Counselors) prefers and utilizes specific methodologies for the assessment of AD/HD.
2. There is a relationship between opinions about AD/HD (i.e. orientation to classification and practical concerns about assessment), and opinions about sufficient assessment practices.
3. When practitioners engage in consultation and/or collaboration with other professionals during the assessment process, they are most likely to consult with other professionals from their respective disciplines.
4. Those professionals who subscribe to a categorical system of classification are more likely to utilize assessment techniques that rely on clinical and qualitative descriptions of the client/patient than those professionals who subscribe to a dimensional model of classification.
5. Those professionals who subscribe to a dimensional system of classification are more likely to utilize assessment techniques that allow for normative comparisons than those professionals who subscribe to a categorical system of classification.
6. Physicians (i.e. pediatricians and psychiatrists) are more likely to subscribe to a categorical system of classification while mental health professionals (i.e. counselors and psychologists) are more likely to subscribe to a dimensional system of classification.

Specific Null Hypotheses

1. There will be no relationship found between professional discipline and use of each of the methodologies investigated in the questionnaire.
2. There will be no relationship found between opinions about AD/HD (i.e. classification and practical issues concerning assessment), and opinions about sufficient assessment practices.
3. There will be no relationship between professional discipline of respondents and the disciplines of those with whom these practitioners consult.
4. Those professionals who subscribe to a categorical system of classification are no more likely to utilize assessment techniques that rely on clinical and qualitative descriptions of the client/patient than those professionals who subscribe to a dimensional model of classification.
5. Those professionals who subscribe to a dimensional system of classification are no more likely to utilize assessment techniques that allow for normative comparisons than those professionals who subscribe to a categorical system of classification.
6. There will be no relationship between physicians' (i.e. pediatricians and psychiatrists) preference for a categorical system of classification and mental health professionals' (i.e. counselors and psychologists) preference for a dimensional system of classification.

Data Analysis

These hypotheses were analyzed as follows:

1. There will be no relationship found between professional discipline and use of each of the methodologies investigated in the questionnaire.

This hypothesis was tested by using multivariate correlational statistics, specifically, a discriminant analysis. In general, a major advantage of using a multivariate statistic as compared to univariates is the reduction of Type I errors (Morrison, 1990).

This particular statistical test is most appropriate because it is used to identify relationships between categorical criterion variables and quantitative predictor variables. In other words, discriminant analysis can be viewed as a way of identifying boundaries between groups where those boundaries are defined in terms of variable characteristics that best discriminate objects into their respective criterion groups (Kachigan, 1982). This technique is thus utilized in this study to determine how well the predictor variables of referral and assessment practices (i.e. responses to item #10 and chosen assessment methodologies from column 1 of item #12) discriminate between the criterion groups: Psychiatrists, Pediatricians, Clinical Psychologists, and Counselors.

Through a multivariate analysis of the data, the procedure identifies a linear combination of variables that best discriminates between the criterion groups, and in the case of a multiple-group discriminant analysis, also identifies the number of discriminant functions necessary to best represent differences among the groups. The

task of the discriminant function is to maximize the difference between the groups in order to minimize the number of classification errors. Generally, when discriminating between more than two groups, one fewer discriminant function is needed than the number of criterion groups. The discriminant function utilizes a weighted combination of values of various predictor variables to arrive at a derived variable, which in turn, is used to classify each object into a criterion group (Kachigan, 1982).

A stepwise procedure was used in this study when entering predictor variables into the equation. This approach is most useful when there is a number of potential predictor variables, but it is unclear as to which provide the best set (Sharma, 1996). The researcher is able to determine a smaller set of variables that discriminate best between the criterion groups because of intercorrelations and redundancies among the predictor variables. The procedure continues to add or remove any variable at each step until no other variable significantly contributes to the function.

When using the stepwise approach, the researcher must be concerned with the possibility of multicollinearity when two or more variables may be highly correlated among themselves (Kachigan, 1982). In such as instance, it is not necessary to include each of the highly correlated variables in the discriminant function for further discrimination between groups. This does not imply, however, that the excluded variable is not important and does not discriminate between groups; rather it only means redundancy is present, and thus the variable does not add additional information to the equation (Sharma, 1996). Therefore, the order in which the

predictor variables are entered into the equation affects the resulting function (Kachigan, 1982). Sharma (1996) points out that the tolerance level of the analysis can help control for the amount of accuracy or the degree of multicollinearity the researcher is willing to tolerate. This analysis used a tolerance level of .001 which is the default value selected by the SPSS program.

A chi square that was approximated from the Wilks' Lambda statistic was used in this analysis to determine significance of the discriminant functions. The Wilks' Lambda equation is concerned with between-groups separation and within-group homogeneity. At each step the variable with the smallest Wilks' Lambda is included next in the function (Sharma, 1996).

2. There was no relationship found between opinions about AD/HD (i.e. classification and practical issues concerning assessment), and opinions about sufficient assessment practices.

This hypothesis was tested by using multivariate correlational statistics, specifically, a canonical correlation. This is an appropriate statistic to use to determine the relationship between two sets of variables. In this procedure, a derived criterion variable is correlated with a derived predictor variable to arrive at a canonical correlation (Kachigan, 1982). Each of the derived variables is formed from a linear composite of each set of variables; these composites are referred to as canonical variates. Thus, the correlation between the canonical variates results in the canonical correlation. This technique attempts to arrive at a maximum correlation between each set of variables which in turn implies that there is a likelihood that only a few

canonical variates are needed to sufficiently represent the association between the two variable sets. This procedure, therefore, helps to reduce data to the minimum number of canonical correlations necessary to represent adequately the relationship between the criterion and predictor variables (Sharma, 1996).

When any of the canonical correlations are found to be significant, it is next necessary to interpret the canonical variates. This is accomplished through examining the standardized coefficients or their loadings which indicate the extent to which its corresponding variable contributes to the canonical correlation.

In the case of this study, a canonical correlation was used to explore the relationship between the criterion variables of Sufficient Practices chosen by respondents in Question #12 (column 3) and the predictor variables of Opinions about AD/HD (Questions #13 - 18).

3. There will be no relationship between professional discipline of respondents and the disciplines of those with whom these practitioners consult.

This hypothesis required the use of a contingency coefficient C for analysis because of its appropriateness of use with categorical data. Chi square and C are closely related statistics. A chi square can be computed from C, and is often done as this is the simplest way to determine the statistical significance of the contingency coefficient.

Each professional discipline was tested separately by comparing it to information from Question #12 (column 2) which was divided into the broad discipline categories of Physician, Mental Health Practitioner/Educator, and a

Combination group, thus yielding three contingency coefficients for each of the four participant groups. Significance of *C* was next determined through the use of a chi square.

4. There will be no relationship found between professionals who subscribe to a categorical system of classification and those professionals who favor assessment techniques that rely on clinical and qualitative descriptions of the client/patient.

5. There will be no relationship found between professionals who subscribe to a dimensional system of classification and those professionals who favor assessment techniques that allow for normative comparisons of the client/patient.

These two hypotheses were analyzed together with an one way analysis of variance (ANOVA). The three independent variables were subscribers to a dimensional model of classification, subscribers to a categorical model, and professionals who did not chose one model over the other. Those who adhered to each of these categories were determined as follows. Those who rated Question 13 with a 3 or 4 and Question 17 with a 1 or 2 were labeled as adhering to a categorical system of classification, and those who rated Question 13 with a 1 or 2 and Question 17 with a 3 or 4 were considered to adhere to a dimensional model of classification. A hybrid group included those who rated both Questions 13 and 17 with a 3, 4 or 5 **or** both Questions 13 and 17 with a 1, 2 or 5

The dependent variable was determined by assigning each practitioner a score

according to the number of clinical and qualitative measures (i.e. symptom list from diagnostic manual, behavioral observations, interviews, physical examination) or standardized, normative assessment techniques (i.e. behavioral checklists, clinical laboratory measures, medical laboratory measures, psychological, norm-referenced tests) each uses in their assessment practices. This score was determined as follows. Scores ranged from -4 to +4 where one point was assigned for each technique utilized. Scoring began at zero and each clinical measure used received a negative point and each normative technique utilized received a positive point. The use of such a scale therefore allowed for greater variability among practitioners in that there was the possibility of nine different scores for each practitioner.

6. There will be no relationship between physicians' (i.e. pediatricians and psychiatrists) preference for a categorical system of classification and mental health professionals (i.e. counselors and psychologists) preference for a dimensional system of classification.

This hypothesis utilized data from Questions 1, 13 and 17. A contingency coefficient C was used to determine of degree of relatedness.

Pilot Study

A small pilot study was conducted with practitioners in the fields of counseling, psychology, pediatrics, and psychiatry from the Peninsula and Tidewater regions of Virginia. Three persons from each discipline were chosen to complete the

questionnaire and provide written and/or verbal feedback to the researcher about the survey design, its ease of use, attractiveness and time to complete.

Borg and Gall (1989) suggest that a pilot can serve as a means for finding ambiguities, and of field testing the proposed questions for methodological problems and survey flaws. Analysis of the preliminary data helped finalize the selection of statistical procedures to be used in the full scale study. The rate of return (50%) also served as a rough estimate of the percentage of replies to expect from the final study. While the number returned (N = 6) did not allow for formal statistical analysis of data, the researcher was reassured about her estimated time for completion of the instrument and the clarity of questions.

Ethical Considerations

This proposal was reviewed and approved by the Human Subjects Research Committee of the College of William and Mary before any data collection was begun. All participants in both the pilot study and research project were informed of the voluntary nature of the questionnaire. They were assured of their confidentiality in that their names would never be used. Anonymity was provided through removal of all identifying information, such as return envelopes and coded cover sheets.

Chapter Four

Analysis of Results

The purpose of this study was to investigate methodologies utilized by various professional groups in the assessment of Attention Deficit/Hyperactivity Disorder in children. The findings will be discussed in this chapter. It is organized into three sections: descriptive statistics, data analysis specific to research hypotheses, and additional analyses.

Descriptive Statistics

The sample for this study included 274 professionals from the fields of Psychiatry, Pediatrics, Clinical Psychology, and Counseling. Each participant completed a researcher-designed questionnaire which they received by mail in March 1997. The sample was comprised of 46 Psychiatrists (17%), 65 Pediatricians (24%), 74 Clinical Psychologists (27%), and 89 Counselors (33%). Of these 274 responses, 126 (25%) contained complete sets of data which could be used to analyze research hypotheses. The breakdown of the complete data sets is as follows: 18 Psychiatrists (14%), 37 Pediatricians (29%), 38 Clinical Psychologists (30%), and 33 Counselors (26%). The remaining 148 questionnaires, were from participants who indicated that they either did not currently practice in their field, never were involved in the

diagnosis of children and/or AD/HD, or referred to another professional to complete the entire evaluation. The sample group of professionals was compared with a group of 69 professionals who did not respond to the original mailing or two follow ups, but did complete and return an abbreviated version of the questionnaire. The participant and nonrespondent groups were compared on the following characteristics: profession, nature of current practice, number of children seen weekly, general referral and assessment practices, and opinions about classification of AD/HD in order to determine whether a sampling bias existed.

To test for discrepancies in professional group membership, a chi square indicated a significant difference between the participant (N = 274) and non-respondent groups (N= 69), χ^2 (3, N=343) = 14.11, $p<.05$. As can be seen in Table 4.1, Psychiatrists were substantially underrepresented in the respondent group while they were overrepresented in the nonrespondent group. The converse was true of Professional Counselors who were overrepresented in the respondent group and underrepresented in the nonrespondent follow up group.

Table 4.1

Respondent vs. Non-Respondent Group

	Respondents	Follow up
Psychiatrists	46 (16.8%)	25 (36.2%)
Pediatricians	65 (23 .7%)	16 (23.2%)
Clinical Psychologists	74 (27.0%)	15 (21.7%)
Professional Counselors	89 (32.5%)	13 (18.8%)

A chi square showed no significant difference between the two comparison groups on the variable concerning status of current practice, χ^2 (1, N=343) = .00965, p>.05. There was also no difference between the comparison groups and whether they were never involved in diagnosing children, χ^2 (1, N=343) = 4.40, p>.05. However, there were different trends between the professional groups of these two comparison groups.

An independent t-test was used to test for a differences between groups for the number of children professionals see in a week. There was no significant difference between the two groups, t(175) = 343, p>.05, where the participant group (N= 148) saw on average 42 children, and the nonrespondent group saw a mean of 32 children per week. So that trends could be compared across the two groups, the respondent and non-respondent groups were also examined individually for differences between professions and the number of children seen in a week. A one-way analysis of variance and follow-up testing (Tukey's HSD) revealed similar trends within both the respondent and nonrespondent groups where Pediatricians saw a significantly greater number of children than Psychiatrists, Clinical Psychologists, and Counselors. (Table 4.2) in both groups.

Table 4.2

Numbers of Children Seen by Practitioner Groups

	Psychiatrists	Pediatricians	Clinical Psychologists	Counselors
Participants	22.3	106.8	11.7	10.2
Nonrespondents	11.7	100.7	10.1	2.0

An independent t-test was used to test for differences between the groups with regard to overall referral and assessment practices. No significant difference was found between the mean of the participant group (N=160, M=2.36) and the mean of the nonrespondent group (N=53, M=2.06), where $t(211) = .052$, $p>.05$.

While there was also no significant difference between the respondent group (N=121, M=2.47) and the nonrespondent group (N=50, M=2.32) with regard to whether AD/HD constitutes an extreme of a behavioral continuum, $t(169) = .346$, $p>.05$, when the respondent and nonrespondent groups were examined individually for differences between professional groups with regard to this question, different patterns were found. Specifically, there was no difference between professional groups in the nonrespondent group, but there were differences in the respondent group where Psychiatrists (3.6667) differed from both Counselors (2.8286) and Clinical Psychologists (M=2.900), $F(3, 114) = .0291$, $p<.05$.

Finally, for the question concerning opinions about the disease model and AD/HD, there was no significant difference between the mean for the participant

group (N=118, M=3.07) and the mean for the nonrespondent group (N=53, M=2.87), t(169) = .232, p>.05.

Data Analysis for Research Hypotheses

HYPOTHESIS 1

There will be no relationship found between professional discipline and use of each of the methodologies investigated in the questionnaire.

This hypothesis was tested by using a discriminant analysis of the 126 complete data sets. The criterion variable was professional discipline, and the predictor variables were preferred referral practices from item #10 and the use of each of the methodologies from item #12 (column 1).

The results of the discriminant analysis for professional group membership are presented in Tables 4.3 below. Table 4.3 includes four statistics: the eigenvalue, a value that corresponds to the equivalent number of variables represented by the function, the Wilks' Lambda, a measure of group discrimination, a chi-square derived from the Wilks' Lambda, the significance level of the chi-square, and the canonical correlation. The stepwise method was used to select variables to be included in the analysis. The functions derived from the entered variables are significant at the <.0001 level. As indicated in Table 4.4, the assessment practices of Medical Laboratory Tests, Physical Examination, Psychological Tests, Referral Practices, and Diagnostic

Manual List were the strongest and only statistically significant contributors to the functions.

Table 4.3

Canonical Discriminant Functions

Function	Eigenvalue	Wilks' Lambda	Chi Square	df	Significance	Canonical Correlation	CR^2
1	5.2242	.098802	276.599	15	<.0001	.9162	.8394
2	.3460	.614966	58.100	8	<.0001	.5070	.2570
3	.2081	.827768	22.588	3	<.0001	.4150	.1722

Table 4.4

Stepwise Selection Using Assessment Practice Variables as Predictors

Step	Variable Added	Wilks Lambda	Significance
1	Physical examination	.17832	<.0001
2	Medical lab tests	.14527	<.0001
3	Psychological tests	.12000	<.0001
4	Referral practice	.10870	<.0001
5	Diagnostic manual list	.09880	<.0001

Table 4.5 provides the standardized weights for these variables in each of the discriminant functions after completion of the stepwise procedure. Inspection of these weights suggests that Physical Examination contributed most significantly to the first function, while Medical Laboratory Testing was the strongest contributor to the second, and Psychological Testing was the most potent contributor to the third function. However, examination of the univariate Wilks' Lambda statistics (Table 4.6)

reveals that in addition to the four variables selected in the stepwise approach, Neurological Testing should also provide the best discrimination of the groups. As noted earlier, Kachigan (1991) and others (e.g. Tabachnick & Fidell, 1989; Sharma, 1996; Tatsuoka, 1971) indicate that caution must be taken when there is a high degree of correlation among the variables. Correlation coefficients are presented in Table 4.7. As can be seen, Neurological Testing is significantly correlated with Physical Exam, Psychological Testing, and Diagnostic Symptom List. Although this suggests a degree of intercorrelation of these variables, multicollinearity is not considered problematic unless there is a bivariate correlation of greater than 0.70 (Tabachnick & Fidell, 1989).

Table 4.5

Standardized canonical discriminant function coefficients

	Func 1	Func 2	Func 3
Medical Lab Tests	-.11631	.89536	.07264
Physical Exams	.96536	-.06262	.23537
Psychological Tests	-.15905	-.23388	.91454
Referral Practices	-.21031	.45202	.40573
Diagnostic Manual	-.26980	.34426	.10876

Table 4.6

Wilks' Lambda and univariate F-ratio with 3 and 121 degrees of freedom

Variable	Wilks' Lambda	F	Significance
Background Information	.98781	.4978	.6845
Behavioral Checklists	.98724	.5214	.6684
Behavioral Observations	.95416	1.9379	.1271
Interview	.98503	.6129	.6079
Clinical Lab Measures	.95021	2.1135	.1020
Medical Lab Measures	.74947	13.4824	<.0001
Neurological Tests	.57095	30.3097	<.0001
Other Practices	.98217	.7321	.5348
Physical Examinations	.17832	185.8525	<.0001
Psychological Tests	.72267	15.4782	<.0001
Referral Practices	.93401	2.8497	.0403
Diagnostic Manual	.73175	14.7860	<.0001

Table 4.7

Correlation Coefficients which reach significance at the .05 level

	Back-ground	Beh Checklist	Behavioral Obser	Interview	Clinical Lab Meas	Medical Lab Tests	Neuro Tests	Other	Physical exam	Psychol Tests	Referral Practice	Diagnostic Manual
Back-ground	(1.000)	.1769 p=.048	.3235 p=.000									.2789 p=.002
Beh Checklist	.1769 p=.048	(1.000)										
Behavioral Observ	.3235 p=.000	.1813 p=.042	(1.000)	.2052 p=.021						.2038 p=.022		.3590 p=.000
Interview			.2052 p=.021	(1.000)								
Clinical Lab Meas					(1.000)							
Medical Lab						(1.000)	.3316 p=.000	.1880 p=.035	.3632 p=.000			
Neuro Tests						.3316 p=.000	(1.000)		.6614 p=.000	-.2576 p.004		-.2480 p=.005
Other						.1880 p=.035		(1.000)				
Physical exams						.3632 p=.000	.6614 p=.000		(1.000)			
Psych tests			.2038 p=.022				-.2576 p.004			(1.000)		
Referral practice											(1.000)	
Diagnostic Manual	.2789 p=.002		.3590 p=.000				-.2480 p=.005					(1.000)

The squared canonical correlation (CR^2), equivalent to the R^2 of a multiple regression, gives a measure of practical significance of the discriminant functions by providing an indication of the amount of variance between the groups that is accounted for by the variables in the function. In other words, CR^2 provides an estimate of the strength of each of the discriminant functions. As can be seen from Table 4.3, the first function accounted for 84% of the variance, the second function accounts for 26%, the third accounted for 17%.

The eigenvalues for each function can also be used as a measure of practical significance. This value is associated with the derived factors which directly corresponds to the equivalent number of variables that the function represents. The eigenvalue, therefore, is useful in helping to determine how many variables should be retained from the analysis (Kachigan, 1982). An eigenvalue of 5.2242 (See Table 4.3) indicates that this first function accounts for as much variance as would approximately 5.2 variables, the second accounts for less than one variable, and the third function accounts for less than one variable.

In order to account for specific differences among the four professional groups with regard to the five significant contributors to the function, Medical Laboratory Tests, Physical Examination, Psychological Tests, Referral Practices, and Diagnostic Manual List were examined utilizing univariate statistics. Neurological Testing was also included in the analysis because of its significant univariate correlations with several of these variables.

Table 4.8

Professional Group Differences for Assessment Procedures

Assessment Technique	χ^2	DF	Significance
Medical Laboratory	31.72	3	<.0001
Physical Examination	103.62	3	<.0001
Diagnostic Manual	33.98	3	<.0001
Psychological Testing	33.30	3	<.0001
Neurological Testing	54.20	3	<.0001

With regard to Medical Laboratory Tests, a chi square revealed a significant difference between the four groups, $\chi^2(3, N=126) = 31.72$, $p<.05$ (Table 4.8). Pair-wise comparisons of these groups indicated a significant difference between both Psychiatrists and Pediatricians when compared separately with Clinical Psychologists and Professional Counselors (Table 4.9) where both Psychiatrists (56%) and Pediatricians (30%) are more likely to use Medical Laboratory Tests than either Clinical Psychologists (5%) or Professional Counselors (0%).

TABLE 4.9

Pairwise Comparisons of Professional Groups vs. Medical Laboratory Tests

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	3.42	1	.06434
Psychiatrists vs. Clinical Psychologists	18.35	1	<.00012
Psychiatrists vs. Professional Counselors	22.80	1	<.0001
Pediatricians vs. Clinical Psychologists	7.83	1	.00513
Pediatricians vs. Professional Counselors	11.64	1	.00065
Clinical Psychologists vs. Counselors	1.79	1	.18127

There was also a significant difference between the four groups with regard to Physical Examinations, χ^2 (3, N=126) = 103.62, p<.05 (Table 4.8), and pairwise comparisons found significance between all groups with the exception of Clinical Psychologists and Professional Counselors. Neither of these two groups reported using Physical Examination which precluded a χ^2 analysis. (Table 4.10). Pediatricians (97%) were more apt to use Physical Exams than Psychiatrists (33%), Clinical Psychologists (0%), and Counselors (0%).

TABLE 4.10

Pairwise Comparisons of Professional Groups vs. Physical Examinations

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	27.45	1	<.0001
Psychiatrists vs. Clinical Psychologists	14.19	1	.00017
Psychiatrists vs. Professional Counselors	12.47	1	.00041
Pediatricians vs. Clinical Psychologists	71.11	1	<.0001
Pediatricians vs. Professional Counselors	66.10	1	<.0001
Clinical Psychologists vs. Counselors	N/A	N/A	N/A

Significance between the four groups concerning Neurological Testing, χ^2 (3, N=126) = 54.20, p<.05 (Table 4.8), resulted in the following pairwise comparisons (Table 4.11).

TABLE 4.11

Pairwise Comparisons of Professional Groups vs. Neurological Testing

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	8.94	1	.00278
Psychiatrists vs. Clinical Psychologists	6.69	1	.00969
Psychiatrists vs. Professional Counselors	5.84	1	.01563
Pediatricians vs. Clinical Psychologists	31.97	1	<.0001
Pediatricians vs. Professional Counselors	28.61	1	<.0001
Clinical Psychologists vs. Counselors	N/A	N/A	N/A

Again, all comparisons were significant with the exception of Clinical Psychologists and Professional Counselors who both report that they do not do neurological testing. Sixty percent of the pediatricians reported the use of Neurological Testing while only 17% of psychiatrists used it.

There was significance between the four groups on the variable, Psychological Testing, $\chi^2(3, N=126) = <33.30, p<.05$ (Table 4.8). Pairwise comparisons showed significance between Psychiatrists (11%) and Clinical Psychologists (60%), Pediatricians (5%) and Clinical Psychologists, Pediatricians and Professional Counselors (21%), and Clinical Psychologists and Counselors (Table 4.12).

TABLE 4.12

Pairwise Comparisons of Professional Groups vs. Psychological Testing

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	.5846	1	.44453
Psychiatrists vs. Clinical Psychologists	12.07	1	.00051
Psychiatrists vs. Professional Counselors	.81770	1	.36585
Pediatricians vs. Clinical Psychologists	25.63	1	<.0001
Pediatricians vs. Professional Counselors	3.89	1	.04858
Clinical Psychologists vs. Counselors	11.19	1	.00082

Univariate analysis of the Diagnostic Manual variable revealed significance between the four professional groups, χ^2 (N= 126) = 33.98, $p<.05$ (Table 4.8), and pairwise comparisons found specific differences between the following: Psychiatrists vs. Pediatricians, Pediatricians vs. Clinical Psychologists, and Pediatricians vs. Professional Counselors (Table 4.13) where 94% of Psychiatrists reported use of Diagnostic Manuals, 43% of Pediatricians, 92% of Clinical Psychologists, and 88% of Counselors.

TABLE 4.13

Pairwise Comparisons of Professional Groups vs. Diagnostic Manual Use

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	13.23	1	.00028
Psychiatrists vs. Clinical Psychologists	.1008	1	.75091
Psychiatrists vs. Professional Counselors	.5678	1	.45114
Pediatricians vs. Clinical Psychologists	20.57	1	<.00011
Pediatricians vs. Professional Counselors	15.14	1	<.0001
Clinical Psychologists vs. Counselors	.3550	1	.55129

With regard to Referral Practices, an one way analysis of variance revealed significance between the four professional groups, $F(3, 122) = .0473$, $p < .05$. A Tukey's HSD test was employed for follow-up testing; no significance was reported between pairwise comparisons because a difference of .5385 was needed for significance at the .05 level (Table 4.14). A breakdown of referral practices of the 124 respondents whose data were analyzed in the discriminant analysis and this ANOVA is presented in Table 4.15. (This breakdown can be compared with the total sample of respondents, N=160, who answered question #10, presented in Table 1 in Appendix C.)

Table 4.14

Group Means and Standard Deviations for Referral Practices

Professional Group	Mean	SD
Psychiatrists	2.2222	.5483
Pediatricians	2.6757	.7092
Clinical Psychologists	2.3158	.7391
Counselors	2.6667	.9242

Table 4.15

Percentages of Referral Practices by Professional Groups

	Psychiatrists	Pediatricians	Psychologists	Counselors	Total
Refer out	5.6	5.4	7.9	12.1	7.9
Personally complete	66.7	27.0	57.9	21.2	40.5
Mixed*	27.8	64.9	31.6	60.6	48.4
No AD/HD **	0	0	0	0	0
Other	0	2.7	2.6	6.1	3.2

* Conduct a portion of the assessment themselves and refer part of it out
** Has never seen a child suspected of having AD/HD.

To further examine differences between the four professional groups and chosen assessment practices, a supplemental analysis was carried out by combining professionals' personal use of an assessment modality with professionals' use of a consultant for each procedure to create another variable for comparison. The combining of these two variables into one single variable eliminated the possibility that certain procedures were only being utilized by certain professional groups by virtue of their area of expertise. That is, it would be unlikely that a Counselor or Psychologist would personally conduct a physical examination of a client/patient; however, the likelihood of whether they would refer a client/patient to an appropriate professional for such an evaluation is less clear. The new variable was determined by scoring participants in the affirmative if they either personally used a particular assessment procedure or consulted with another professional who utilized the modality.

Another discriminant analysis was used to examine the linear combination of variables which best differentiated between the four professional groups. The results of this analysis are presented in Tables 4.16 and 4.17. Table 4.16 gives the standardized weights for the variables in the discriminant function after completion of the stepwise procedure. The strongest variables when assessment procedures were combined with consultation practices included: Physical Examination, Neurological Testing, Diagnostic Manual List, Medical Laboratory Tests, and Referral Practices. These five variables were the only significant contributors to the functions (Table 4.17).

Table 4.16

Canonical Discriminant Functions

Function	Eigenvalue	Wilks' Lambda	Chi Square	df	Significance	Canonical Correlation	CR^2
1	.6321	.475101	88.935	15	<.0001	.6223	.3873
2	.2384	.775417	30.395	8	.0002	.4387	..1925
3	.0414	.960238	4.849	3	.1832	.1994	.0398

Table 4.17

Stepwise Selection Using Assessment Practice Variables as Predictors

Step	Variable Added	Wilks Lambda	Significance
1	Phys exam + consult	.76771	<.0001
2	Neuro tests + consult	.66687	<.0001
3	Dx manual list + consult	.59238	<.0001
4	Med lab tests + consult	.52432	<.0001
5	Referral practice	.47510	<.0001

Examination of the standardized weights (Table 4.18) for these variables shows that Neurological Testing with Consultation was the most significant contributor to the first function, Medical Laboratory Testing with Consultation most influenced the second, and Physical Examination with Consultation contributed the most to the third function. As with the earlier analysis, some multicollinearity was evident as revealed by the discrepancy between the univariate Wilks' Lambda statistics (Table 4.19) and the variables chosen in the stepwise procedure. In this analysis, Psychological Testing was significantly correlated with three of the five significant variables: Neurological Testing, Physical Exam, and Medical Laboratory Testing (Table 4.20). However, all correlations were well below the suggested problem level of 0.70 (Tabachnick & Fidell, 1989).

Table 4.18

Standardized canonical discriminant function coefficients

	Func 1	Func 2	Func 3
Med Lab Test + Consult	-.23204	.73738	-.62951
Neuro Test + Consult	.66570	-.11062	-.36681
Physical Exam + Consult	.49195	.38535	.66156
Dx Manual List + Consult	-.54929	.37267	-.00420
Referral Practices	-.24445	-.57794	.53157

Table 4.19

Wilks' Lambda and univariate F-ratio with 3 and 121 degrees of freedom

Variable	Wilks' Lambda	F	Significance
Background + Consult	.98360	.6723	.5706
Behavior Checklist + Consult	.96720	1.3680	.2559
Observations + Consult	.97990	.8275	.4812
Interview + Consult	.98188	.7442	.5278
Lab Measures + Consult	.98370	.6683	.5731
Med Lab + Consult	.87279	5.8786	.0009
Neuro + Consult	.7760	11.6417	< 0001
Other + Consult	.98387	.6613	.5774
Physical Exam + Consult	.76771	12.2037	<.0001
Psych Tests + Consult	.91331	3.8282	.0116
Referral Practices	.93401	2.8497	.0403
Dx Manual List + Consult	.87815	5.5967	.0013

Table 4.20

Correlation Coefficients which reach significance at the .05 level

	Behavior Checklist	Behavior Observ	Interview	Clinical Lab Meas	Medical Lab	Neuro Tests	Other	Physical Exam	Psych Tests	Back-ground	Referral Practice	Diagnostic Manual
Behavior Checklist	(1.000)	.2399 p=.007						.1902 p=.033	.2290 p=.010	.1763 p=.048		
Behavior Observ	.2399 p=.007	(1.000)	.2505 p=.005						.2629 p=.003	.2505 p=.005		.3269 p=.000
Interview		.2505 p=.005	(1.000)									.1917 p=.032
Clinical Lab Meas				(1.000)					.1766 p=.048			
Medical Lab					(1.000)	.2761 p=.002		.2899 p=.001	.1803 p=.043			
Neuro Tests					.2761 p=.002	(1.000)		.3946 p=.000	.2095 p=.019			
Other							(1.000)			(1.000)		
Physical Exam	.1902 p=.033				.2899 p=.001	.3946 p=.000		(1.000)	.2033 p=.022	.3946 p=.000		
Psych Tests	.2290 p=.010	.2629 p=.003		.1766 p=048	.1803 p=.043	.2095 p=.019			(1.000)			
Back-ground	.1763 p=.048	.2505 p=005										.3880 p=.000
Referral Practice											(1.000)	
Diagnostic Manual		.3269 p=.000	.1917 p=.032							.3880 p=.000		(1.000)

The three identified functions provided varying levels of practical significance as can be seen from the squared canonical correlations and eigenvalues in Table 4.16. The CR^2 indicates that the first function accounted for 39% of the variance, the second function accounts for 19%, the third accounted for 4%.

In order to determine specific differences among the four professional groups with regard to the significant contributors to the function, Diagnostic Manual List with Consultation, Referral Practices, Medical Laboratory Tests with Consultation, Physical Examination with Consultation, and Neurological Testing with Consultation were examined utilizing univariate statistics. Psychological Testing was also included in the analysis because of its significant univariate correlations with two of these variables (Table 4.21).

Table 4.21

Professional Group Differences for Assessment Procedures Plus Consultation

Assessment Technique	χ^2	DF	Significance
Medical Laboratory + Consultation	16.16	3	.00105
Diagnostic Manual + Consultation	15.50	3	.00144
Neurological Testing + Consultation	26.78	3	<.00011
Physical Examination + Consultation	28.89	3	<.0001
Psychological Testing + Consultation	11.18	3	.01078

With regard to Medical Laboratory Tests with Consultation, a chi square revealed a significant difference between the four professional groups, $\chi^2(3, N=126) = 16.16$, $p<.05$ (Table 4.21). Pairwise comparisons (Table 4.22) of these groups

indicated a significant difference between Psychiatrists (61%) when compared with Pediatricians (30%), Clinical Psychologists (18%), and Counselors (12%).

TABLE 4.22

Pairwise Comparisons of Professional Groups vs.

Medical Lab Tests with Consultation

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	4.97	1	.02581
Psychiatrists vs. Clinical Psychologists	10.21	1	.00140
Psychiatrists vs. Professional Counselors	13.46	1	.00024
Pediatricians vs. Clinical Psychologists	1.31	1	.25160
Pediatricians vs. Professional Counselors	3.21	1	.07309
Clinical Psychologists vs. Counselors	.5354	1	.46435

There was also a significant difference between the four groups with regard to usage of a Diagnostic Manual and Consultation, $\chi^2(3, N= 126) = 15.50$, $p<.05$ (Table 4.21), and pairwise comparisons found significance between the following groups: Psychiatrists vs. Pediatricians, Pediatricians vs. Clinical Psychologists, and Pediatricians vs. Professional Counselors (Table 4.23) where Psychiatrists (94%) were the most likely to use it. Ninety-two percent of Clinical Psychologists reported using one, while 88% of the Professional Counselors and 62% of the Pediatricians did.

TABLE 4.23

Pairwise Comparisons of Professional Groups vs.

Diagnostic Manual with Consultation

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	6.36	1	.01166
Psychiatrists vs. Clinical Psychologists	.10076	1	.75091
Psychiatrists vs. Professional Counselors	.5678	1	.45114
Pediatricians vs. Clinical Psychologists	9.59	1	.00196
Pediatricians vs. Professional Counselors	6.04	1	.01399
Clinical Psychologists vs. Counselors	.3550	1	.55129

There was a significant difference between the four groups concerning Neurological Testing, $\chi^2(3, N=126) = 26.78$, $p<.05$ (Table 4.21). Pairwise comparisons (Table 4.24) found specific differences between the following groups: Psychiatrists (44%) and Counselors (18%), Pediatricians (70%) and Clinical Psychologists (21%), and Pediatricians (70%) and Professional Counselors (18%).

TABLE 4.24

Pairwise Comparisons of Professional Groups vs.

Neurological Testing with Consultation

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	3.42	1	.06434
Psychiatrists vs. Clinical Psychologists	3.275	1	.07035
Psychiatrists vs. Professional Counselors	4.034	1	.04460
Pediatricians vs. Clinical Psychologists	18.324	1	<.00012
Pediatricians vs. Professional Counselors	19.07	1	<.00011
Clinical Psychologists vs. Counselors	09195	1	.76171

Significance was also found between the four professional groups on the factor, Physical Examination with Consultation, χ^2 (3, N=126) = 28.89, p<.05 (Table 4.21). Pairwise comparisons (Table 4.25) showed significance between Psychiatrists (78%) vs. Pediatricians (97%), Psychiatrists vs. Professional Counselors (40%), Pediatricians vs. Clinical Psychologists (61%), and Pediatricians vs. Professional Counselors.

TABLE 4.25

Pairwise Comparisons of Professional Groups vs.

Physical Exam with Consultation

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	5.58	1	.01814
Psychiatrists vs. Clinical Psychologists	1.622	1	.20287
Psychiatrists vs. Professional Counselors	6.887	1	.00868
Pediatricians vs. Clinical Psychologists	15.104	1	<.0001
Pediatricians vs. Professional Counselors	27.849	1	<.0001
Clinical Psychologists vs. Counselors	3.1556	1	.07567

There was also a significant difference between the groups with regard to Psychological Testing, χ^2 (3, N=126) = 11.18, p<.05 (Table 4.21). Both Pediatricians (76%) and Clinical Psychologists (76%) were more apt to use Psychological Testing + Consultation than Psychiatrists (50%) and Counselors (46%) (Table 4.26).

Table 4.26

Pairwise comparison of professional groups vs. psychological testing plus consultation

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	3.63	1	.05689
Psychiatrists vs. Clinical Psychologists	3.88	1	.04892
Psychiatrists vs. Professional Counselors	.097	1	.75596
Pediatricians vs. Clinical Psychologists	.004	1	.94826
Pediatricians vs. Professional Counselors	6.72	1	.00951
Clinical Psychologists vs. Counselors	7.14	1	.00755

In summary, with regard to the first hypothesis the above analysis found differences between the four professional groups and their use of assessment modalities. Specifically, physicians preferred the use of both Physical Examinations and Medical Laboratory Tests when compared to mental health professionals. Clinical Psychologists reported using Psychological Tests more than any other group, and Professional Counselors also utilized Psychological Tests more than Pediatricians. Finally, Pediatricians used Neurological Tests more than any other group, but utilized a Diagnostic Manual less frequently in their assessment than the other three groups. As a result of these findings, the null hypothesis for this hypothesis can be rejected.

HYPOTHESIS 2

There was no relationship found between opinions about AD/HD (i.e. classification and practical issues concerning assessment) and opinions about sufficient assessment practices.

This hypothesis was tested with a canonical correlation. The criterion variables were opinions about AD/HD (Questions 13 through 18), and the predictor variables were sufficient practices selected by practitioners in Question #12 Column #3 ("If given unlimited time and resources, which of the following techniques do you feel would be necessary to provide sufficient information to warrant a diagnosis of AD/HD?").

In order to derive the canonical correlation statistic from the SPSS data set, it was necessary to first run a factor analysis of each set of variables and next determine the bivarate correlations between the resulting factors. The resultant correlation coefficients can be viewed as equivalent to the results obtained as if a canonical correlation had been directly run.

Results revealed one significant correlation between the first factors of both sets of variables ($r = .2919$, $p < .010$). Those criterion variables that resulted in the highest loadings for the first factor (above .50) included the Sufficient Use of Behavioral Checklist, Behavioral Observation, Interview, Diagnostic Manual, Physical Examination, and Background Information (Table 4.27). Those with the highest loadings in the predictor variables set included Confidence in Assessment (Question #18 " How confident do you feel in your ability to engage in a reliable assessment of AD/HD?), Dimensional Concept of AD/HD (Question #17 "AD/HD constitutes the extreme end of a continuum of normal behaviors found in children"), and Concerns about Time Constraints (Question #14 "How much do time constraints affect your assessment practices with regard to AD/HD?") (Table 4.28). Correlations between

these variables revealed a moderate relationship between Confidence in Assessment and Interview ($r = -.3256$, $p < .003$). Tables 1, 2, and 3 in Appendix C contain results of the factor analyses, loadings and correlations of relevant variables. As a result of significant findings, the null hypothesis was rejected for this hypothesis.

Table 4.27

Loadings for Relevant Sufficient Use Practices

Procedure	Factor 1 Loadings*
Behavioral Checklists	.67601
Behavioral Observations	.53354
Interviews	.57350
Medical Lab Tests	.62453
Diagnostic Manual	.62453
Background Information	.77696

* Loadings >0.50

Table 4.28

Loadings for Relevant Opinions

Procedure	Factor 1 Loadings*
Time constraints (#14)	.80884
AD/HD as dimensional (#17)	.50089
Confidence in assessment (# 18)	-.67281

* Loadings >0.50

HYPOTHESIS 3

There will be no relationship between professional discipline of respondents and the disciplines of those with whom these practitioners consult.

Each professional group was tested separately with a contingency coefficient *C* by comparing it to information from Question #12 Column 2 (". . . indicate whether you typically consult with another professional who will engage in the indicated procedure"). The written responses supplied by practitioners who consult

with other professionals for the various assessment categories were divided into the three broad categories of Physician, Mental Health Practitioner/Educator, or a Combination group, consisting of the two aforementioned groups. Cross tabulations were run for each of the 11 assessment practices in a 3 x 4 format (consultant category x professional group). A chi square test was used to test for the significance of *C* for each of the assessment methodologies; with an alpha equal to .05, there was no significance for any of the comparisons (Table 4.29). The null hypothesis, therefore, was retained for this hypothesis and, consequently, the directional research hypothesis could not be confirmed.

Table 4.29

Contingency Coefficients for Professional Groups vs. Consultant Types

Assessment Procedure	Contingency Coefficient	Chi Square (Pearson)	df	Significance
Behavioral Checklist	.23915	1.27390	3	.73534
Behavioral Observations	.34462	4.71680	6	.58061
Interview	.30650	1.76266	3	.62309
Med Lab Tests	.39736	2.43750	2	.29560
Neurological Exam	.53612	8.47059	6	.20561
Other Procedures	---- *	----	--	-----
Psychological Tests	.26380	3.44046	6	.75187
Physical Exam	---- *	----	--	----
Background Information	.42417	3.94898	3	.26703
Clinical Lab Measures	.43355	4.86111	6	.56175
Diagnostic Manual	.32087	2.75455	6	.83896

* Contingency coefficients could not be determined because there were cells containing zero observations.

Other trends were noted with regard to consultation practices among the four professional groups and the various methods of assessment. For each of the eleven assessment practices trends indicated that overall, professionals were more likely not to consult than consult with other professionals (Table 4.30).

Table 4.30

General Consultation Practices of Professionals

Assessment Procedure	% Consulting	% Not consulting
Background Information	18.3	81.7
Behavioral Checklist	22.2	77.8
Behavioral Observations	31.7	68.3
Clinical Lab Measures	19.0	81.0
Diagnostic Manual	20.6	79.4
Interview	16.7	83.3
Med Lab Tests	11.1	88.9
Neurological Exam	19.8	80.2
Physical Exam	38.1	61.9
Psychological Tests	42.9	57.1
Other Procedures	4.0	96.0

The data were further examined for differences among the four professional groups and general usage of consultation for each of the assessment methodologies which resulted in the following. There was a significant difference between groups for Behavioral Checklist, Diagnostic Manual, Physical Examination, and Psychological Testing (Table 4.31).

Table 4.31

Comparison of Professional Groups' Use of Consultants

Assessment Procedure	Contingency Coefficient	Chi Square (Pearson)	df	Significance
Behavioral Checklist	.24930	8.34974	3	.03931
Behavioral Observations	.21117	5.88095	3	.11755
Interview	.19254	4.85085	3	.18305
Med Lab Tests	.23368	7.27751	3	.06356
Neurological Exam	.09348	1.11078	3	.77447
Other Procedures	.24174	4.18920	3	.24174
Psychological Tests	37980	21.23956	3	< 00019
Physical Exam	39520	23.32124	3	<.00013
Background Information	.13729	2.42057	3	.48982
Clinical Lab Measures	.11392	1.65660	3	.64661
Diagnostic Manual	.25308	8.62251	3	.03475

Pairwise comparisons (Table 4.32) of professional groups with regard to utilization of a consultant with Behavioral Checklists found a significant difference between Pediatricians (35.1%) and Clinical Psychologists (10.5%), while 27.3% of the Counselors and 11.1% of the Psychiatrists used a consultant.

Table 4.32

Consultant Use and Behavioral Checklist

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	3.52	1	.06050
Psychiatrists vs. Clinical Psychologists	.004	1	.94731
Psychiatrists vs. Professional Counselors	1.80	1	17991
Pediatricians vs. Clinical Psychologists	6.48	1	.01093
Pediatricians vs. Professional Counselors	.500	1	.47935
Clinical Psychologists vs. Counselors	3.31	1	.06880

When using a consultant with Diagnostic Manual the following significant results were found (Table 4.33). Pediatricians and Professional Counselors used consultants at the same rate (30%) while Clinical Psychologists (11%) and Psychiatrists (6%) utilized consultants comparably to each other.

Table 4.33

Consultant Use and Diagnostic Manual

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	4.15	1	.04167
Psychiatrists vs. Clinical Psychologists	.371	1	.54238
Psychiatrists vs. Professional Counselors	4.22	1	.04003
Pediatricians vs. Clinical Psychologists	4.32	1	.03765
Pediatricians vs. Professional Counselors	.002	1	.95833
Clinical Psychologists vs. Counselors	4.36	1	.03671

With regard to the use of a consultant for Physical Examination results are reported in Table 4.34. Clinical Psychologists (61%) were the most likely to use a consultant followed by Psychiatrists (50%) and then Counselors (39%). Pediatricians utilized a consultant only 8% of the time.

Table 4.34

Consultant Use and Physical Examination

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	12.46	1	.00042
Psychiatrists vs. Clinical Psychologists	.553	1	.45724
Psychiatrists vs. Professional Counselors	.534	1	.46488
Pediatricians vs. Clinical Psychologists	22.74	1	<.0001
Pediatricians vs. Professional Counselors	9.68	1	.00186
Clinical Psychologists vs. Counselors	3.16	1	.07567

Significant results were found between the following pairs with regard to the use of a consultant with Psychological Testing (Table 4.35). Pediatricians (73%) were more likely to use one than Clinical Psychologists (26%) Counselors (27%) and Psychiatrists (44%).

Table 4.35

Consultant Use and Psychological Testing

Professional Groups	χ^2	DF	Significance
Psychiatrists vs. Pediatricians	4.26	1	.03905
Psychiatrists vs. Clinical Psychologists	1.84	1	.17490
Psychiatrists vs. Professional Counselors	1.55	1	.21381
Pediatricians vs. Clinical Psychologists	16.32	1	<.00015
Pediatricians vs. Professional Counselors	14.58	1	.00013
Clinical Psychologists vs. Counselors	.008	1	.92762

HYPOTHESES 4 & 5

Those professionals who subscribe to a categorical system of classification are no more likely to utilize assessment techniques that rely on clinical and qualitative descriptions of the client/patient than those professionals who subscribe to a dimensional model of classification.

and

Those professionals who subscribe to a dimensional system of classification are no more likely to utilize assessment techniques that allow for normative

comparisons than those professionals who subscribe to a categorical system of classification.

A one way analysis of variance was used to examine the relationship between chosen model of classification (i.e. dimensional, categorical and no preference) and preferred types of assessment (i.e. clinical/qualitative measures versus standardized/normative techniques). With a range of -4 to +4 where each clinical technique (i.e. Diagnostic Manual, Behavioral Observations, Interviews, Physical Examination) utilized received a negative point and each normative technique utilized received a positive point (Behavioral Checklists, Clinical Laboratory Measures, Medical Laboratory Tests, Psychological Tests), the mean score for preferred assessment types was -1.5111 (SD = .9200) for the Categorical group, -1.4211 (SD = .9016) for the Dimensional group, and -1.6531 (SD = .9906) for the No Preference group. With alpha equal to .05, a one-factor between subjects analysis of variance indicated a nonsignificant effect for classification model category: $F(2, 120) = .3304$, $p > .05$. The null hypotheses were retained for these two hypotheses, and consequently, the directional research hypotheses could not be confirmed.

Table 4.36

Group Means and Standard Deviations by Classification Model for Preferred Assessment Type

Group	Count	Minimum	Maximum	Mean	SD
Categorical	45	-3	1	-1.5111	.9200
Dimensional	19	-3	0	-1.4211	.9016
No preference	59	-3	0	-1.6102	.9829
Total	123	-3	1	-1.5447	.9431

Table 4.37

Oneway Analysis of Variance

Source	df	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	2	.5941	.2971	.3304	.7193
Within Groups	120	107.9099	.8992		
Total	122	108.5041			

Supplemental analysis included a comparison of each assessment practice with the chosen model of classification (Table 4.38). This analysis revealed no significant results with the exception of Physical Examination where $\chi^2(2, N=125) = 8.61679$, $p>.05$. Trends indicated that very few of the respondents who use Physical Exam showed theoretical leanings towards the dimensional model; however, the greatest number did not show a preference for either model of classification (Table 4.39).

Table 4.38

Comparison of Models of Classification and Assessment Procedures

Assessment Procedure	Chi Square (Pearson)	df	Significance
Behavioral Checklist	1.16696	2	.55795
Behavioral Observations	0.12039	2	.94158
Interview	0.11887	2	.94230
Med Lab Tests	1.12629	2	.56941
Neurological Exam	4.44127	2	.10854
Other Procedures	0.37184	2	.83034
Psychological Tests	1.37124	2	.50378
Physical Exam	8.61679	2	.01346
Background Information	2.11152	2	.34793
Clinical Lab Measures	4.14688	2	.12575
Diagnostic Manual	2.96888	2	.22663

Table 4.39

Classification Model Preferences for Physical Examination

	Categorical	Dimensional	No Preference
Use Physical Exam	31.0%	4.8%	64.3%
Don't Use Physical Exam	39.8%	20.5%	39.8%

HYPOTHESIS 6

There will be no relationship between physicians' (i.e. Pediatricians and Psychiatrists) preference for a categorical system of classification and mental health professionals' (i.e. Counselors and Psychologists) preference for a dimensional system of classification.

The two groups were tested with a contingency coefficient *C*. A chi square approximated from *C* was not significant, $\chi^2(2, N=124) = 4.28$, $p>.05$. The null hypothesis was retained for this hypothesis (Table 4.40), and the directional research hypothesis subsequently could not be confirmed.

Table 4.40

Relationship between Professional Category and Models of Classification

Contingency Coefficient	Approximate Significance	Chi Square (Pearson)	df	Significance
.18268	.11760	4.28093	2	.11760

CHAPTER FIVE

Summary and Conclusions

The purpose of this study was to investigate current practices used by clinicians when diagnosing children with AD/HD as well as to explore possible relationships between these practices, professional disciplines, opinions about AD/HD, and theoretical leanings. This chapter will review the results of the study which were presented in the previous chapter. A discussion of the findings and their implications for an enhanced understanding of assessment practices of professionals will be presented. In addition to the major findings of the study, other trends and results will be discussed. Little research to date has been done which investigates assessment practices with regard to AD/HD, and thus, this study was mostly exploratory in nature. There are, however, several studies that document AD/HD assessment practices among various professional groups. Those studies will be contrasted with this investigation. Limitations of this research, including threats to generalizability of the findings, will be presented. This chapter concludes with recommendations for future research and practice.

Summary of Results

The present study was conducted in the Spring of 1997, through a randomized mailing to 500 licensed professionals in Psychiatry, Pediatrics, Clinical Psychology, and Counseling, who practiced in the state of Virginia. There were twenty-two

surveys that could not be delivered to addressees and 274 that were completed and returned. The respondent group was compared to a group of 69 subjects who had not responded to the original mailing and two subsequent follow-up mailings. The participant and nonrespondent groups were compared on the following characteristics: professional group, nature of current practice, number of children seen weekly, general referral and assessment practices, and opinions about classification of AD/HD. A significant differences was found with regard to professional group membership. Nonsignificant differences were found for the variables of status of current practice, involvement in diagnosing children, number of children seen in a week, general referral and assessment practices, and the two opinion questions.

The specific research hypotheses examined relationships between professional discipline and the use of assessment methodologies, consultation practices, and classification system preferences, as well as the relationship between opinions about classification and assessment of AD/HD and practitioners' opinions about assessment practices.

The first hypothesis found differences between the professional disciplines with regard to their preferences and utilization of specific methodologies for the assessment of AD/HD. A discriminant analysis revealed that the assessment practices of Medical Laboratory Tests, Physical Examination, Psychological Tests, Referral Practices, and Diagnostic Manual List contributed significantly to the functions predictive of professional discipline. However, Physical Examination is the only variable that offered any practical significance. When professionals' personal use of an

assessment modality was combined with professionals' use of a consultant for each procedure as a criterion for utilization of each methodology, Physical Examination, Neurological Testing, Diagnostic Manual List, Medical Laboratory Tests, and Referral Practices were found to be significant contributors. Neurological Testing with Consultation and, to a lessor degree, Medical Laboratory Testing with Consultation were found to have practical significance for this analysis.

For the second hypothesis, a relationship was found between opinions about AD/HD and opinions about sufficient assessment practices, thus supporting the research hypothesis. Specifically, the researcher found a negative relationship between one's confidence in assessing AD/HD ("How confident do you feel in your ability to engage in a reliable assessment of AD/HD?) and his/her use of an interview in an assessment.

Practitioners were no more likely to engage in consultation with other professionals from their respective disciplines than from other disciplines which fails to support the third directional research hypothesis. When the null hypothesis was tested no relationship was found between professional discipline of respondents and the disciplines of those with whom practitioners consult. It was found that in general Pediatricians utilized consultants more frequently than the others; however, overall professionals were less likely to consult than consult on any assessment modalities.

The data did not support the directional hypotheses that predicted that those professionals who subscribe to a categorical system of classification were more likely to utilize clinical techniques in assessment and those who subscribed to a dimensional

model preferred normative assessment tools. Consequently, when the fourth and fifth null hypotheses were tested, there was no relationship found between professionals' adherence to a particular model of classification and the types of assessment techniques used.

Finally, for the sixth hypothesis, physicians were no more likely than mental health professionals to subscribe to a categorical system of classification, and mental health professionals showed no preference towards a dimensional model of classification.

Discussion of Findings

Descriptive Data

The study under discussion was conducted in the Spring of 1997 through a randomized mailing to 500 licensed mental health and medical professionals in Virginia. There were 274 professionals who returned surveys. To establish the representativeness of the sample, comparisons were made between characteristics of the respondent group and characteristics of a group of subjects who had not responded to the original mailing or two follow ups.

Respondents to the study included 46 Psychiatrists (17%), 65 Pediatricians (24%), 74 Clinical Psychologists (27%), and 89 Counselors (33%). Of these 274 respondents, 148 were not currently practicing in their field or never were involved in the diagnosis of children and/or AD/HD, and therefore provided inadequate information for analysis. The 126 completed questionnaires came from 18

Psychiatrists (14%), 37 Pediatricians (29%), 38 Clinical Psychologists (30%), and 33 Counselors (26%). Counselors were over represented in this study while Psychiatrists were underrepresented. In contrast, the breakdown by profession of the nonrespondent follow-up group was as follows: 25 Psychiatrists (36%), 16 Pediatricians (23%), 15 Clinical Psychologists (22%), and 13 Counselors (19%) which revealed an opposite trend of representation when compared to those who did answer the three page questionnaire. Differences were found between the participant and nonrespondent groups with regard to profession.

Examination of frequency tables of each technique revealed the majority of practitioners were personally using five of the eleven tools when assessing children for AD/HD (See Appendix C Table 4). When consultative practices were considered in combination with personal use, the majority of practitioners were using or consulting on seven of the procedures (See Appendix C Table 5). At least 50% of the Psychiatrists and Pediatricians reported typically using (either personally or in consultation) eight techniques, while the majority of Clinical Psychologists used seven and Professional Counselors used five (See Appendix C Tables 6 and 7).

The Rosenberg and Beck (1986) survey was the earliest study in the literature that examined assessment practices and AD/HD. The authors found that both clinical child psychologists and school psychologists reported behavioral observations as the single best predictor of an accurate diagnosis of hyperactivity with 97% of the clinical psychologists and 98% of the school psychologists using them. This can be roughly compared to this study's less frequent typical use of behavioral observations (Range

70% - 94%). There was also a very high rate of use of interviews by psychologists (M = 99%) while in the present study, there was a mean use by 94% of the participants.

The Brown, Keene and Middleton (1994) survey of child clinical psychologists, school psychologists, pediatricians and family physicians most closely resembled the current investigation's sample. Their study served as a replication of Rosenberg and Beck's (1986) earlier research. Although Brown, Keene and Middleton only reported descriptive information about what assessment methods professionals were using which was not the major focus of this study, some general comparisons can be made. Brown, Keene and Middleton (1994) found that all groups reported a heavy reliance on interviews (95%) and behavioral observations (93%), compared to this study's 94% who used interviews and 81% who used behavioral observations. While both groups of psychologists (83%) preferred the use of standardized tests to rating scales in the Brown, Keene and Middleton (1994) study, the opposite was true of the physician groups (56%). The findings in this study, however, found that these two groups (clinical psychologists and physicians) had much more similar usage patterns with regard to behavioral checklists (74% and 71%, respectively). The Moser and Kallail (1995) survey of family and general practitioners also had similarities to the study under discussion. Differences in the target populations of the two studies precluded direct comparisons; however, general trends could be assessed. The overall 55% response rate of the participants in this study is comparable to the 50% response rate of Moser and Kallail's (1995) survey. Forty-three percent of Moser

and Kallail's respondents indicated they referred out to other professionals while 31% of the current survey's participants reported completing the entire assessment themselves while the largest percentage (38%) conducted part of the evaluation themselves and referred out for a portion of it.

The Moser and Kallail study found that 31% of the physicians surveyed routinely ordered laboratory tests compared to 38% of the physician groups of this study. Moser and Kallail reported the use of teacher questionnaires by 28% and parent questionnaires by 20%. The current research found an overall usage of behavioral checklists by 75% of the total participants and 75 % of the physician groups. It was also noted 55% routinely interviewed teachers and 92% routinely interviewed parents in the Moser and Kallail study while the current study found that 94% of the total sample and 95% of the physicians used interviews in their assessments.

In summary, the studies to date that have investigated assessment practices and AD/HD have found a general trend toward a heavy reliance on the use of clinical tools such as interviews and behavioral observations. Although the existing research reveals that many professionals also appear to be using some normative techniques (e.g. standardized psychological tests and behavior rating scales) at an increasing rate, it is to a lessor extent than clinical techniques and is inconsistent across professional groups.

Conclusions

This study examined current assessment practices for AD/HD with particular attention paid to how various professional groups differed in their approaches. A major goal was to attempt to determine whether opinions about AD/HD and/or theoretical orientation with regard to classification models influenced assessment practices. While the study failed to establish such a link, other notable trends did emerge. First, it is interesting to note that the largest percentage of the survey's respondents (48%) scored in the No Preference category with regard to chosen model of classification (compared to 37% Categorical and 15% Dimensional). Secondly, no one group or individual scored higher than +1 on the scale from the fourth and fifth hypotheses that measured preferences for clinical vs. normative assessment tools. This indicated a strong preference towards clinical tools by all those surveyed.

Speculations could also be made about the impact the DSM system of classification has had on professionals' assessment and diagnostic practices. The DSM system upholds an atheoretical stance with regard to etiology and the developmental nature of psychopathology. Consequently, the DSM emphasizes the descriptions of shared phenomenology where diagnoses are made based in an individual meeting a certain number of diagnostic criteria. Organization of categories appears to have mostly to do with pragmatism and facilitation of differential diagnosis. Clarke, Watson & Reynolds (1993) state, ". . . it is apparent that this is not a unified scientific taxonomy; the organization is eclectically pragmatic and serves more as a heuristic system for filing diagnoses than as an integrated scientific

classification of psychological disorders" (p. 125). It is possible that the DSM's espousal of an atheoretical framework for psychopathology has influenced professionals' understanding of disorders and has created such a straightforward categorical system for classification that it affords practitioners the luxury of being able to assess and label people with no regard to etiology, biological precursors, family relations and genetics, or response to treatment.

Next, examination of univariate statistics found that significant differences showed up in those techniques that were most unique to a particular discipline. That is, all the medical techniques were used by significantly more physicians than non-physicians (Medical Laboratory Tests, Neurological Testing and Physical Exam). Perhaps more noteworthy, this trend towards reliance on medical procedures by the physician group was maintained when personal assessment practices were considered in combination with consultative practices, although the differentiation between the groups is slightly reduced for two of the procedures. Furthermore, the other two techniques for which there were significant differences between groups were the use of Psychological Tests and Diagnostic Manual. Clinical Psychologists were much more likely to utilize Psychological Tests than any other group, and all mental health professionals (i.e. Psychiatrists, Clinical Psychologists and Counselors) utilized a Diagnostic Manual while Pediatricians did not except when consulting with another professional. There was also a curious finding in that a relatively substantial number of professionals (38%) reported that their assessment and referral practices consisted of a combination of completing a portion of an assessment personally and referring

out for part of it; however, consulting practices for each of the individual techniques showed that professionals typically did not consult with others.

Consequently, there are questions as to why these trends arose. Although it was beyond the scope of this exploratory study to answer these questions, several speculations can be made. It may be hypothesized that preferences for assessment techniques have less to do with theoretical leanings or professional opinions and more to do with the simple utilization of the tools of one's trade. It is also possible that professionals tend to remain reliant on those techniques learned while in their training programs.

Rabinowitz's (1993) review of the literature on diagnostic reasoning offers yet another explanation. He reports that research had found that clinicians tend to generate few hypotheses while data collecting, and will even go so far as to add newly collected information to already existing hypotheses as opposed to generating new hypotheses. It is possible, therefore, that practitioners' limited use of assessment procedures could be directly related to the notion that if AD/HD is suspected, the practitioner does not see the need to attempt to gather information outside of that needed to confirm the existing hypothesis.

Perhaps the use of clinical methods by physicians is not surprising given the fact that several of the most recent articles in prominent medical journals suggest assessment protocols that include mostly clinical procedures. For example, Searight, Nahlik and Campbell (1995) in the Journal of Family Practice advocate the sole use of Nahlik's five step Office Screening Test and review of the DSM-IV criteria,

procedures they say will take only five minutes to complete, and Zametkin (1995) states in the Journal of the American Medical Association, "The diagnosis is made strictly by history from parents with input from teachers or day care providers" (p. 1872). Rosenberg and Beck (1986) also point out that practitioners in psychology tend to prefer the reliance on clinical judgments despite the growing number of objective measurements available. Furthermore, Rabinowitz (1993) notes that a typical shortcoming in the diagnostic reasoning of mental health practitioners is their preference for processing information through anecdotal means as opposed to systemic and statistical information. Clinicians also tend to choose techniques that are conceptually appealing but not necessarily valid based on empirical research (Rabinowitz, 1993).

The literature suggests the utilization of a wide variety of assessment tools in order to make an accurate diagnosis; however, it is unclear as to what constitutes a "good enough" assessment. Most likely, Counselors' routine utilization of only five techniques is not sufficient; however, the seven or eight techniques routinely utilized by the other groups might be more reasonable. Again, one could speculate that practitioners rely mostly on those procedures that were introduced to them in their training programs as opposed to what the current literature is suggesting as best practices. This possibility could explain the disparity between Counselors, who receive comparably fewer assessment and appraisal courses from the other groups. However, there is an overall concern that despite a higher number of techniques used by the three other groups, there still is a heavy reliance on clinical techniques at the

exclusion of objective, normative tools. These findings are in keeping with those of past studies (Keene and Middleton, 1994; Moser and Kallail, 1995; Rosenberg & Beck, 1986; Brown) who each reported a heavy reliance on clinical evaluation and infrequent use of special tests or standardized questionnaires in psychologists' and physicians' evaluation of AD/HD.

Limitations

There are a number of methodological and practical concerns that have a direct bearing on the generalizability and conclusions that can be made about this study. These must be examined in order to facilitate an accurate interpretation of the findings. A discussion follows regarding each of the major limiting factors of the study.

Perhaps the greatest limitation of the study is in the area of generalizability. According to Borg and Gall (1979), if more than twenty percent of the surveys are not completed, "It is very likely that most of the findings of the study could have been altered considerably if the nonresponding group had returned the questionnaire and had answered in a markedly different manner than the responding group" (p. 308).

Limitations to Generalizability: An abbreviated postcard survey was sent to nonrespondents in order to address issues of generalizability. The results from this abbreviated questionnaire found significant differences between those participants who answered the original survey and those who did not with regard to professional membership. It is important to note that other important differences may exist between groups, for instance, with regard to demographic variables that were not

compared. Furthermore, there may also be significant differences between both of these groups and those professionals who chose not to respond to any of the mailings. Comparisons of participant and nonrespondent groups, therefore, suggests a possible sampling bias especially with regard to profession.

Generalizability was further affected by the low response rate (55%). Of the 274 respondents, only 126 surveys (25% overall) were answered in their entirety which further limited the number of questionnaires that could be used for data analysis. Counselors were also over represented in this study while psychiatrists were underrepresented.

Questions should arise to the generalizability of a sample taken only from the state of Virginia. It is quite possible that professionals from Virginia differ significantly from professionals practicing in other states and regions of the country. Other limitations: When using a research-designed questionnaire, there is a general concern about validity of the instrument. Although a pretest was conducted that should have helped clarify flaws with questions, it became clear to the researcher that problems arose with Column 3 of Question 12 where an apparent lack of clarity in the instructions created confusion among some respondents. There was a substantial number of respondents who left this column blank or who wrote comments that indicated possible confusion about the instructions.

There was also some concern as to the validity of the opinion questions that were used to assess respondents' theoretical orientation with regard to classification of AD/HD (i.e. Questions 13 and 17). Results of Hypotheses 4, 5 and 6, therefore,

should be accepted with some caution in that appropriate measures for determining construct validity were not conducted to determine whether these questions could truly measure an individual's preference for a categorical or dimensional model of classification.

Implications

The literature clearly suggests that best practices in the assessment of AD/HD have their basis in developmental psychopathology theory which relies on a dimensional model of classification (e.g. Barkley, 1990a, 1990b). However, as with any clinical issue that has generated a considerable amount of research, there are questions as to whether research developments have trickled down into clinical practice (Rosenberg and Beck, 1986). Results of this study reveal that in practice there is a disregard for the theoretical approach of developmental psychopathology. Instead, the vast majority of professionals in this study place a heavy reliance on clinical, non-normative assessment tools performed by themselves which would suggest theoretical leanings towards a categorical system of classification. However, most practitioners do not hold opinions about AD/HD that indicate any preference for a particular classification system. These results, therefore, suggest a lack of awareness and/or acceptance of what the research has taught us about AD/HD and its assessment. It remains unclear as to whether this is a result of a lack of knowledge (i.e. inadequate training programs or professional development), lack of resources (i.e. time, money, accessible colleagues), simply a reliance on tradition and the subsequent

use of those techniques that have been found to be tried and true over the years, or some other factor or combination thereof. Over-reliance on such a classification system as the DSM can perhaps create more harm than good. The manual stresses the importance of using criteria as guidelines that are informed by clinical judgment; criteria, ". . . are not meant to be used in a cookbook fashion" (APA, 1994, p. xxiii), yet no specific guidelines are provided for assessment and subsequent diagnostic decisions.

This diagnostic system has had a significant impact on the mental health field with its most obvious use relating to the facilitation of clinical practice and professional communication. However, when a DSM diagnosis is made there is the assumption that the individual differs qualitatively from someone who does not meet the criteria. Without a common approach to assessment for a particular diagnosis such as AD/HD, professional communication becomes meaningless in that the reliability of the diagnosis is called into question.

The lack of consultation and collaboration among professionals is of concern in that proper adherence to the developmental psychopathology model with regard to assessment goes beyond cataloging specific capacities within various domains of functioning, but rather requires the development of a more holistic picture of the child. Such an approach defies boundaries between domains of functioning and focuses instead on the integration of cognitive, motor, perceptual and emotional processes (Santostefano, 1995). However, such a sophisticated and complex approach cannot be

adequately accomplished within the boundaries of one profession, but rather will require cooperation and communication between disciplines.

Results from this study, therefore, have significant implications for practice if professionals are to begin to conduct assessments of children suspected to have AD/HD that are in keeping with what is recommended in the literature. First, it appears crucial that training programs offer coursework in assessment, appraisal and pathology that has a basis in theory so that new practitioners can have a solid foundation on which to formulate opinions about classes of disorders and approaches to assessment and diagnosis. From the results of the present study it is likely that counselor education programs are most deficient in their coursework with regard to assessment and diagnosis. While traditionally the professional counselor has not always played a crucial role in assessment, it is clear that there is a significant number of practitioners today who find themselves making diagnostic decisions about the children that they serve. (This may be a result of insurance companies' reliance on a medical model and subsequent emphasis on diagnosis.) It would, therefore, behoove such programs to consider augmenting their course of studies. Without proper preservice training and continuing education, it will be difficult to assure accurate and appropriate assessment, diagnosis and treatment of children and their families.

Suggestions for future research

Future researchers need to address those questions outlined above as to why practitioners rely more heavily on clinical tools. Are training programs sufficiently

preparing graduates, and if not, are professionals availing themselves of appropriate continuing education? Do professionals tend to rely on procedures learned in their training programs as opposed to what the current literature recommends? Also, it will be important to investigate the possible influences the DSM system has on assessment and diagnostic labeling, in general and in particular, for AD/HD.

So that professionals can learn to balance accuracy with timeliness and cost effectiveness, it must become more clear as to whether those professionals who do utilize a variety of techniques are indeed providing an adequate and accurate assessment although their approach might not follow specifically what is outlined as best practices for the assessment of AD/HD.

There is a need to clarify further through a detailed investigation the influence theoretical orientation of classification has on assessment. It will be important to ascertain whether practitioners are coming from an atheoretical perspective in general or only with regard to AD/HD.

While differences between professional groups were found with regard to general assessment methods, it will be important to investigate whether this is also true with regard to specific procedures and instruments.

The issue of consultation and collaboration needs to be addressed by the research community to ascertain why this practice is overlooked and whether professionals' reluctance is specific to AD/HD.

It will also be important to survey other professional groups who are likely to assess children for AD/HD to provide additional information to the general and

professional public as to who is engaging in what practices. Other groups might include school psychologists, family physicians and primary care physicians. Finally, this study could be further refined by narrowing the chosen professional groups to those who specialize in working with children.

APPENDICES

APPENDIX A

The College of William and Mary
School of Education
Williamsburg, Virginia 23187

March 23, 1997

Dear Colleague:

The attached questionnaire is part of a statewide survey of practitioners in the fields of medicine, psychology and counseling. We are investigating the current practices used by professionals in the assessment and diagnosis of children with Attention Deficit/Hyperactivity Disorder (AD/HD).

Your responses are of particular interest because of the invaluable experience you have had in the field. Completion of the questionnaire will help professionals who serve children and families by providing much needed information about how children with attention deficit disorders are identified by professionals of various disciplines.

The attached questionnaire will take approximately 10 minutes to complete. Please return the questionnaire by April 10 in the enclosed, stamped and addressed envelope. Feel free to attach any further comments, as well. All of your responses and comments will be held in strictest confidence.

If you are interested, we will be more than happy to send you a summary of results of the survey. Please indicate this wish on the attached cover sheet that will be removed upon receipt of your completed questionnaire to assure anonymity. The number found on this cover sheet is for bookkeeping purposes only, so that I can maintain an accurate record of returns. Thank you for taking time from your busy day to complete this questionnaire. It is much appreciated.

Sincerely Yours,

Charles F. Gressard, Ph.D.
Associate Professor
The College of William & Mary

Sincerely Yours,

R. Waller Thompson, Ed.S.
Doctoral Candidate
The College of William & Mary

THE COLLEGE OF WILLIAM & MARY
School of Education
Williamsburg, Virginia 23187

May 19, 1997

Dear Colleague:

Approximately six weeks ago I mailed you a questionnaire that concerned current practices used by professionals in the assessment and diagnosis of children with Attention Deficit/Hyperactivity Disorder (AD/HD). I understand that it may have been lost in the mail or misplaced. Therefore, I have enclosed another copy for your completion because your response is of specific interest to me. Please take the next ten minutes to complete the questionnaire and return in the prepaid envelope. Also, kindly note that even **if you do not diagnose children with AD/HD** you may indicate this fact in the first question of the survey.

In addition to assisting me with data collection for my dissertation, your completion of the questionnaire will help add to the limited research that has been done on this topic. Ultimately, this will aid those who serve children and their families by providing them with accurate information about how children with attention deficit disorders are being identified by professionals such as yourself.

Please return the questionnaire by June 2 in the enclosed, stamped and addressed envelope. Feel free to attach any further comments, as well. All of your responses and comments will be held in strictest confidence.

If you are interested, I will be more than happy to send you a summary of results of the survey. Please indicate this wish on the attached cover sheet that will be removed upon receipt of your completed questionnaire to assure anonymity. The number found on this cover sheet is for bookkeeping purposes only, so that I can maintain an accurate record of returns. Thank you for taking time from your busy day to complete this questionnaire. It is much appreciated.

Sincerely Yours,

R. Waller Thompson, Ed.S.
Doctoral Candidate
The College of William & Mary

THE COLLEGE OF WILLIAM & MARY
School of Education
Williamsburg, Virginia 23187

June 29, 1997

Dear Colleague:

By now you should have received two copies of my questionnaire concerning assessment practices of children with Attention Deficit/Hyperactivity Disorder. I realize that your time is extremely valuable; however, I am asking you to take the next minute to fill out the **abbreviated questionnaire** found on the enclosed postcard. Although completion of the full length questionnaire would be most beneficial to my research, it is necessary that I at least receive the completed postcard so that I may ascertain the representativeness of my sample. I thank you in advance for making a contribution to this important study. All information shared is confidential and anonymous.

Sincerely Yours,

R. Waller Thompson, Ed.S.
Doctoral Candidate
The College of William & Mary

Nonrespondent Postcard

1. Please check if applicable:
☐ I am not currently a practitioner
☐ I never make diagnostic decisions about children.
☐ I am in a subspecialty that is not involved in the diagnosis of AD/HD

2. In an average week, I see ____ children (≤17 yrs) in my practice.

3. If I suspect AD/HD, I do the following:
☐ Refer to another professional for assessment
☐ Complete assessment myself
☐ Complete part of an assessment myself and refer to another professional for other aspects of the evaluation
☐ I've never seen a child in my practice I suspected of having AD/HD

4. Please rate the following statements:

a) ***AD/HD constitutes a specific disease state*** **(circle one)**

strongly disagree	somewhat disagree	somewhat agree	strongly agree	no opinion

b) ***AD/HD constitutes the extreme end of a continuum of normal behaviors found in children*** **(circle one)**

strongly disagree	somewhat disagree	somewhat agree	strongly agree	no opinion

APPENDIX B

AD/HD ASSESSMENT PRACTICES QUESTIONNAIRE

Directions: Below you will find questions pertaining to your most typical assessment practices concerning Attention Deficit/Hyperactivity Disorder (AD/HD) in children. The term AD/HD will be used throughout this questionnaire to connote any type of attention deficit disorder whether or not hyperactivity is present.

If you are **not a practitioner** and/or **never provide professional services to children or adolescents**, this questionnaire is not appropriate for you. If this is the case, PLEASE TAKE A MOMENT to mark ONE or BOTH of the following statements and return the unanswered questionnaire in the envelope provided. Thank you for your time.

☐ I am not currently a practitioner and/or,
☐ I never make diagnostic decisions about children.

1. Professional title: _____
2. Current board licensure/certifications: _____
3. Gender: ☐ Male ☐ Female
4. How many years have you practiced since you completed your training? ___
5. Please indicate current setting(s) in which you practice (check all that apply):

☐ Private practice - Solo
☐ Private practice - Group
☐ Private Practice - Multispeciality group
☐ Hospital (general care)
☐ Psychiatric hospital (free standing)
☐ Other (please name) _____

6. Please indicate the type of community in which you practice:

☐ rural ☐ semi-rural ☐ suburb ☐ city

7. In an average week, how many children (≤17 yrs of age) do you see in your practice? ___
8. Of your entire caseload, what percentage of it is children? ___
9. In the past year, how many children did you see in your practice who you suspected of having AD/HD? ____
10. When you see a child who you suspect may have AD/HD, which of the following do you do?
    ☐ Refer to another professional to complete an assessment (go to question 11)*
    ☐ Complete an assessment myself (skip to question 12)
    ☐ Complete part of an assessment myself and refer to another professional for other aspects of the evaluation (skip to question 12)
    ☐ I have never seen a child in my practice I suspected of having AD/HD*
    ☐ Other (please explain) _____
11. Please mark below ***all*** reasons you refer out when you suspect a child may have AD/HD.

☐ lack of time
☐ lack of expertise/training
☐ other (please describe) _____
☐ lack of interest in AD/HD
☐ poor insurance reimbursement for AD/HD

**** Please stop here and return questionnaire in envelope provided if you never engage in any aspect of an assessment for AD/HD.***

12. Please complete the chart below by describing with your **TYPICAL** assessment practices when you suspect AD/HD.

COLUMN 1: Place an X in the ☐ if this is a tool or procedure you PERSONALLY use during your assessment, and below the heading please supply the requested information.
COLUMN 2: Please circle YES or NO to indicate whether you typically consult with another professional who will engage in the indicated procedure. Next, indicate the professional discipline of the person with whom you are most likely to consult.
COLUMN 3: If given unlimited time and resources, which of the following techniques do you feel would be necessary to provide SUFFICIENT information to warrant a diagnosis of AD/HD? Place an X in the ☐ for all tools or procedures that apply.

COLUMN 1 Typical practices (read instructions above)	COLUMN 2 Use of consultant	COLUMN 3 Sufficient practices
☐ I typically use **a symptom list from a diagnostic manual** Mark all that apply: ☐ DSM - IV ☐ DSM- IIIR ☐ DSM - III ☐ ICD- 10 ☐ ICD - 9 ☐ other (specify)	YES NO Profession: _____ _____	☐
☐ I typically collect **background information** Mark all that apply: ☐ developmental history ☐ review of school records ☐ review of medical records ☐ other (specify)	YES NO Profession: _____ _____	☐
☐ I typically conduct **interviews** Specify who you interview _____ Indicate name(s) of any standardized/commercial interviews you use:	YES NO Profession: _____ _____	☐
☐ I typically use **behavioral checklists** Specify titles: _____ Indicate who completes checklist: _____	YES NO Profession: _____ _____	☐
☐ I typically conduct a **physical examination**	YES NO Profession: _____ _____	☐
☐ I typically do **behavioral observations** Mark all that apply and indicate length of observation in minutes ☐ office visit: ___ min. ☐ structured play situation: ___ min. ☐ school setting: ___ min. ☐ other: (describe) _____	YES NO Profession: _____ _____	☐
☐ I typically administer **laboratory measures** (e.g. Continuous Performance Test) Specify title(s) _____	YES NO Profession: _____ _____	☐

COLUMN 1	COLUMN 2	Column 3
☐ I typically order **medical laboratory tests** Specify type(s): _____	YES NO Profession: _____ _____	☐
☐ **I typically administer a psychological/psychoeducational evaluation** Specify tests: _____	YES NO Profession: _____ _____	☐
☐ I typically conduct a **detailed neurological exam**	YES NO Profession: _____ _____	☐
☐ **Other** Specify: _____	YES NO Profession: _____ _____	☐

13. On a scale of 1 to 5, rate the statement: AD/HD constitutes a specific disease state.	Strongly disagree 1	Somewhat disagree 2	Somewhat agree 3	Strongly agree 4	No opinion 5
14. How much do time constraints affect your assessment practices with regard to AD/HD?	Not at all 1	Slightly 2	A fair amount 3	Very much 4	Don't know 5
15. How much does the current climate of the third party insurance system influence how you make a diagnosis of AD/HD?	Not at all influential 1	Slightly influential 2	Fairly influential 3	Very influential 4	Don't know 5
16. In your opinion, do you feel the number of children diagnosed with AD/HD is:		Underestimated 1	Overestimated 2	Just about right 3	No opinion 4
17. On a scale of 1 to 5, rate the statement: AD/HD constitutes the extreme end of a continuum of normal behaviors found in all children.	Strongly disagree 1	Somewhat disagree 2	Somewhat agree 3	Strongly agree 4	No opinion 5
18. How confident do you feel in your ability to engage in a reliable assessment of AD/HD?		Not at all confident 1	Slightly confident 2	Fairly confident 3	Very confident 4

19. If you have other issues concerning the assessment of AD/HD that you would like to share, you may note them here or on the back.

APPENDIX C

Table 1

Percentages of Referral Practices by Professional Groups

	Psychiatrists	Pediatricians	Psychologists	Counselors	Total
Refer out	15.0	25.0	22.4	36.4	25.4
Personally complete	52.5	16.7	46.6	12.7	30.5
Mixed*	30.0	50.0	29.3	40.0	38.0
No AD/HD**	2.5	3.3	0	3.6	2.3
Other	0	5.0	1.7	7.3	3.8

Table 2

Loadings for Opinion Questions

Opinions	Factor 1	Factor 2	Factor 3
AD/HD as categorical (Ques # 13)	.13041	.13081	−.15609
Time constraints (#14)	.80884	−.06708	.18568
Influences by insurance (#15)	.30419	.67398	−.35132
Number diagnosed (#16)	.08214	.80567	.00921
AD/HD as dimensional (#17)	.50089	−.29325	−.51728
Confidence in assessment (# 18)	−.67281	.12946	−.15609

Table 3

Loadings for Assessment Techniques

Procedures	Factor 1	Factor 2	Factor 3	Factor 4
Behavioral Checklists	.67601	−.30765	.25069	.08041
Behavioral Observations	.53354	.01370	−.33093	−.25963
Interviews	.57350	.08603	−.46435	−.02377
Clinical Lab Tests	−.10568	.20353	.71293	−.06738
Diagnostic Manual	.62453	−.29410	.08686	.11944
Medical Lab Tests	.62453	.67455	−.31666	−.29411
Neurological Tests	.43032	.56807	.06174	.23740
Other Procedures	.16095	−.02175	−.11207	.85219
Physical Exams	.54343	.02498	.38181	−.43156
Psychological Tests	.27555	.64808	.28512	.25975
Background Information	.77696	−.24148	.06698	−.01529

Table 4

Correlation Coefficients for Relevant Variables

	Confidence	Dimensional	Time constants
Behavioral Checklists	−.0258 p = .820	.0773 p = .495	.1116 p = .324
Behavioral Observations	−.2121 p = .059	.1144 p = .312	.0693 p = .541
Interviews	−.3256 p = .003	−.0862 p = .447	.1843 p = .102
Diagnostic Manual	−.1603 p = .156	.00603 p = .595	.1306 p = .248
Physical Exams	−.0513 p = .651	−.0465 p = 682	.2050 p = .068
Background Information	−.1009 p = .370	.1229 p = .274	.1530 p = .173

Table 5

Overall Percentage of Personal Use of Assessment Techniques

Variable	Typically Use	Don't Use
Background Information	94.4	5.6
Behavioral Checklists	74.6	25.4
Behavioral Observations	81.0	19.0
Interview	93.7	6.3
Clinical Lab Measures	13.5	86.5
Medical Lab Measures	18.3	81.7
Neurological Tests	19.8	80.2
Other Practices	7.1	92.9
Physical Examinations	33.3	66.7
Psychological Tests	27.0	73.0
Diagnostic Manual	77.0	23.0

Table 6

Overall Percentage of Personal Use and/or Use of Consultant with Assessment Techniques

Variable	Use and/or Consult	Don't Use
Background Information	95.2	4.8
Behavioral Checklists	81.0	19.0
Behavioral Observations	87.3	12.7
Interview	95.2	4.8
Clinical Lab Measures	31.0	69.0
Medical Lab Measures	26.2	73.8
Neurological Tests	38.1	61.9
Other Practices	7.9	92.1
Physical Examinations	68.3	31.7
Psychological Tests	64.3	35.7
Diagnostic Manual	82.5	17.5

Table 7

Percentage of Use of Assessment Techniques by Profession

Variable	Psychiatrists	Pediatricians	Psychologists	Counselors
Background Information	100	94.6	92.1	93.9
Behavioral Checklists	61.1	81.1	73.7	75.8
Behavioral Observations	94.4	70.3	84.2	81.8
Interview	100	91.9	94.7	90.9
Clinical Lab Measures	27.8	5.4	18.4	9.1
Medical Lab Measures	55.6	29.7	5.3	0
Neurological Tests	16.7	59.5	0	0
Other Practices	0	8.1	10.5	6.1
Physical Examinations	33.3	97.3	0	0
Psychological Tests	11.1	5.4	60.5	21.2
Diagnostic Manual	94.4	43.2	92.1	87.9

Table 8

Percentage of Personal Use and/or Use of Consultant with Assessment Techniques by Profession

Variable	Psychiatrists	Pediatricians	Psychologists	Counselors
Background Information	100	94.6	92.1	97.0
Behavioral Checklists	66.7	89.2	78.9	81.8
Behavioral Observations	94.4	86.5	89.5	81.8
Interview	100	91.9	97.4	93.9
Clinical Lab Measures	44.4	27.0	31.6	27.3
Medical Lab Measures	61.1	29.7	18.4	12.1
Neurological Tests	44.4	70.3	21.1	18.2
Other Practices	0	8.1	10.5	9.1
Physical Examinations	77.8	97.3	60.5	39.4
Psychological Tests	50.0	75.7	76.3	45.5
Diagnostic Manual	94.4	62.2	92.1	87.9

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VITA

Roberta Waller Thompson

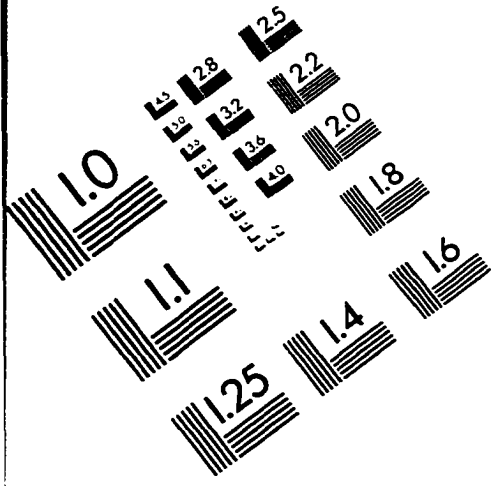
Birthdate: November 8, 1962

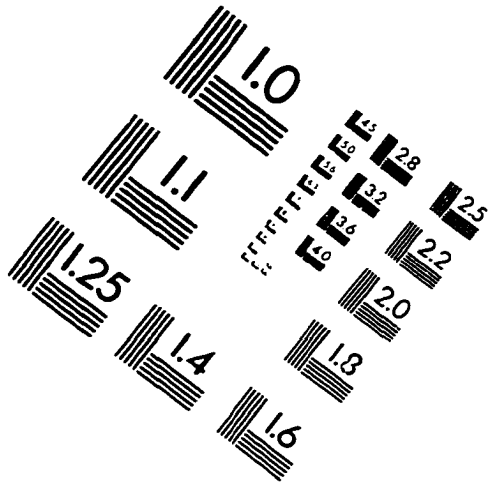
Birthplace: Richmond, Virginia

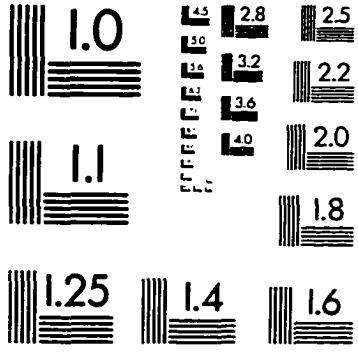
Education:

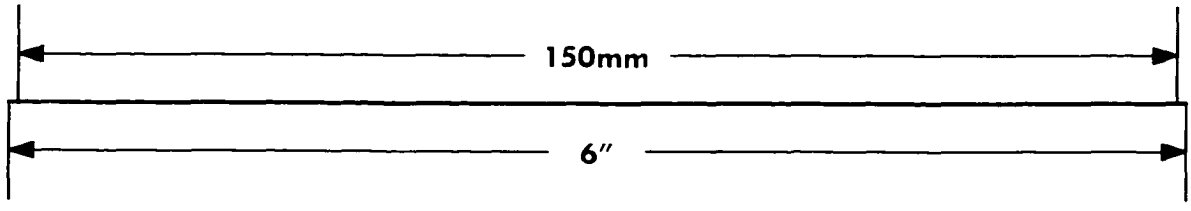
1994 - 1998	The College of William and Mary in Virginia Williamsburg, Virginia Doctor of Education
1988 - 1990	The College of William and Mary in Virginia Williamsburg, Virginia Educational Specialist
1987 - 1988	The College of William and Mary in Virginia Williamsburg, Virginia Master of Education
1981 - 1986	The College of William and Mary in Virginia Williamsburg, Virginia Bachelor of Science

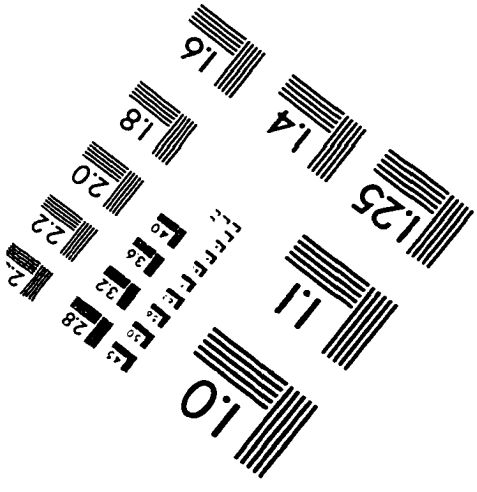
IMAGE EVALUATION TEST TARGET (QA-3)

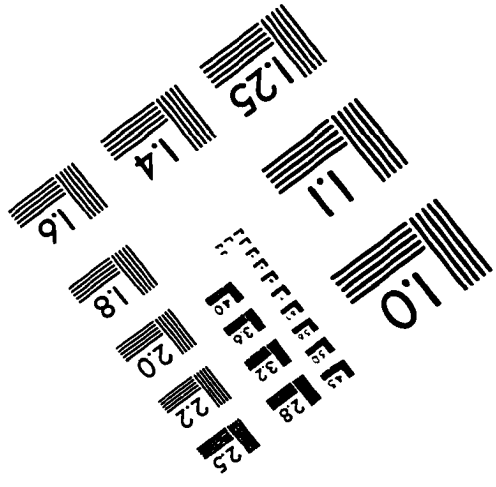












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