Assessing Pediatricians’ Diagnostic Practices: An Analogue Study of Responses to ADHD-Like Presentations in Preschoolers

Helle Augustesen
Western Michigan University

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ASSESSING PEDIATRICIANS' DIAGNOSTIC PRACTICES:
AN ANALOGUE STUDY OF RESPONSES TO ADHD-LIKE
PRESENTATIONS IN PRESCHOOLERS

by

Helle Augustesen

A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
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Attention Deficit Hyperactivity Disorder (ADHD) has been considered one of the most chronic behavior disorders observed in the preadolescent population and is one of the most frequently diagnosed childhood disorders in North America. Currently, however, there is little consistency in terms of identifying specific criteria which need to be present in a child's behavior to make a diagnosis of ADHD. This difficulty is even more pronounced in very young children of preschool age. This study utilized a three year old male child shown to 80 subjects on a videotape engaging in either a high or a low level of activity. Subjects were also exposed to either a high or low level of home stress, and a high or low level of parental motivation for treatment. All subjects were given an identical history concerning the child. Once having seen the videotape and having read the background information, all subjects were asked to fill out a 12-item questionnaire which included questions pertaining to demographics, diagnosis, treatment, and psychostimulants. Results indicated that, in general, home stress and parental motivation were important when considering diagnosis. In addition, most subjects were not entirely certain of the diagnosis they had made and wanted more information. As far as treatment was concerned, most subjects chose some form of therapy for either the child, the family, the parents, or a combination of these. Only a few subjects indicated that a change in diet or psychostimulant medication would be the treatment of choice, yet many subjects indicated few concerns about prescribing...
medications, even to young children. Unfortunately, most subjects believed that it would be very or fairly difficult for the child and family to obtain treatment. One can speculate that although the subjects chose therapy as the more appetitive mode of treatment, they may, when in a clinical setting, choose medication due to the ease with which the family can obtain it and because it is easier to comply with than is therapy.
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Helle Augustesen
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INTRODUCTION

History and Prevalence

Attention Deficit Hyperactivity Disorder (ADHD) has been considered one of the most chronic behavior disorders observed in the preadolescent population (McGee, Partridge, Williams, & Silva, 1991), and is one of the most frequently diagnosed childhood disorders in North America (Barkley, 1981). Most research on ADHD has focused on school-aged children despite the fact that ADHD typically occurs before age four (Campbell, Breaux, Ewing & Szumowski, 1984; Megee, et al., 1991), and despite a general trend in child psychopathology toward early detection and intervention (Zigler & Berman, 1983, Short, Simeonsson, & Huntington, 1990). Until recently very little research has been conducted with preschoolers who display the symptomatology associated with ADHD (Pisterman, McGrath, Firestone, Goodman, Webster, & Mallory, 1989). One reason for this lack of attention to early detection (and intervention) has been a long history of controversy regarding the symptomatology, etiology, and procedures for diagnosing ADHD, which has resulted in much confusion about the prevalence rates of this disorder. Prior to the DSM-III-R classification of ADHD, this group of symptoms was referred to by many different labels. These include minimal brain damage (Gessell & Amatruda, 1949), minimal brain dysfunction (Clements, 1966; Wender, 1971), hyperactive child syndrome (Stewart, Pitts, Craig, & Dieruf, 1966), hyperkinetic reaction of childhood (DSM-II) (American Psychiatric Association, 1968) and attention deficit disorder with or without hyperactivity (DSM-III) (American Psychiatric Association, 1980). Given the diversity of these labels, it is no surprise that there is little consensus concerning the actual
prevalence of ADHD. Some studies suggest that it occurs in 3% to 5% of the school-
age population (DuPaul, Guerremont, & Barkley, 1991); other studies suggest that it
may occur in as much as 20% of this same population (Barkley, 1988). Although
ADHD is frequently diagnosed and represents a large percentage of all cases that are
seen in clinics and pediatricians offices, there is little agreement among professionals
about the key characteristics, etiology, or developmental course of this disorder
(Barkley, 1988). The current movement toward earlier intervention and detection of
psychopathology in general, presents another problem to the clinician (Constantino,
1992). Clearly, and examination of the characteristic presentation of ADHD in young
children and consideration of the special diagnostic and developmental issues related to
young children is called for (Lavigne, et al., 1993). Additionally, there is a need to
investigate the role of pediatricians when dealing with children who show symptoms of
ADHD since the pediatricians are often the first, and sometimes the only, professional
that the child will see before entering school (Copeland, Wolraich, Lindgren, Milich, &
Woolson, 1987).

Traditionally, ADHD has been diagnosed at the time a child starts school
suggest that the peak onset of the behavioral characteristics (e.g., overactivity) of
ADHD may occur between the ages of 3 and 4, and it has been suggested that ADHD
can be identified during the preschool years (Ross & Ross, 1982). Children displaying
these early behavioral characteristics may also develop secondary problems that persist
through childhood, and maybe even into adulthood. These secondary problems may
include poor academic performance, cognitive impairment, low self-esteem, and
difficulty with peer relationships (McGee, et al., 1991). According to Campbell,
Breaux, Ewing, Pierce, and Szumowski (1986), diagnosis in the preschool years can
be reliable and predicts difficulties that may be experienced at the point of entry into
school. Since ADHD is chronic in nature, and is associated with significant secondary problems, early diagnosis and early intervention are clearly indicated. Although research with preschool ADHD children is limited, there is reason to believe that early detection and intervention can be effective in reducing the primary symptoms of this disorder, and more importantly, may reduce sequelae of this disorder, such as poor academic performance and low self-esteem (Pisterman, et al., 1989).

Etiological and Diagnostic Issues

Controversy over etiological models for ADHD emerged as early as the 1960's and continues today. Beginning in the 1940's, it was recognized that there were some similarities (in terms of attentional problems and impulsivity) in children who would now be identified as ADHD and in people with known brain damage (Strauss & Lehtinen, 1947). Consequently, it was believed that brain damage was responsible for the symptomatology of ADHD, and terms such as minimal brain damage and later minimal brain dysfunction were used to label children displaying those symptoms (Clements, 1966; Wender, 1971). The practice of looking for an underlying structural cause for the disorder continues even today. Studies looking at heart rate, skin conductance, and electroencephalograms comparing ADHD children and normal controls have been carried out, but the results have been inconsistent, usually showing no significant differences between these groups (Jacobvitz, Sroufe, Stewart, & Leffert, 1992). Computerized tomography scan techniques have failed to detect significant structural abnormalities in ADHD children (Shaywitz, Shaywitz, Byrne, Cohen, & Rothman, 1983). Stewart and Olds (1973) estimate that less than 10% of the referrals for hyperactivity have histories suggesting brain damage, per se. Moreover, with structural causes used as explanations for ADHD, there continues to be a lack of clinical
utility and no immediate implications for intervention focusing directly at these structures.

Another major avenue for determining possible structural causes for ADHD has been to attempt to document the genetic transmission of this disorder (Wender, 1971). Some investigations suggest that there is a higher correlation between findings of hyperactivity in identical twins versus fraternal twins (Buss & Plomin, 1975; Matheny & Dolan, 1980). There is also some suggestion that there is an increased incidence of ADHD among siblings and parents of ADHD children (Deutsch, 1984). Nevertheless, there is sparse evidence that documents structural differences (or biochemical differences) that may be genetically transmitted. The findings from family and twin studies are far from consistent and it is still very difficult, if not impossible, to separate genetic contributions from environmental contributions (see Whalen, 1982 for a review of studies which have looked at genetics in association with ADHD).

Explanations for ADHD other than biological or neurological have been sought. These include toxins, specifically lead (Rutter, 1980) and diet, specifically additives, dyes, and sugars (Feingold, 1976). There is conflicting evidence concerning whether elevated blood lead levels or any number of additives, dyes or sugars may cause the behavioral symptomatology of ADHD, and currently the results of interventions based on these hypotheses are weak (Gittelman & Eskenazi, 1983; Ross & Ross, 1982; Conners, 1980; Milich, Wolraich, & Lindgren, 1986).

Other approaches have focused on psychosocial factors that may contribute to or cause the symptomatology of ADHD. Misguided parenting, social disadvantage, or chaotic home environments have all been implicated in the development of ADHD symptoms. For example, Patterson (1982) posits that poor contingency management in the home may influence some of the behavioral symptoms found in children with ADHD. Willis and Lovaas (1977) postulated that ADHD may be due to parental
commands having poor stimulus control over the child's behavior, i.e., poor child management. Some investigators (Bhatia, Nigam, Bohra, & Malik, 1991) report that there is a higher incidence of ADHD children in homes where persistent parental discord is present. However, at the present time, the evidence is not sufficient to support the notion that psychosocial stressors in the home cause ADHD symptomatology (Barkley, 1990; Braswell & Bloomquist, 1991).

Despite the long historical emphasis on structural (brain) abnormalities, since the 1970's there has been a call for a focus on observable, behavioral characteristics in making an ADHD diagnosis. For example, Douglas (1972) emphasized the need to regard inattention and impulsivity as the major symptoms defining ADHD rather than searching for organic factors in order to justify the diagnosis. In recent years there has been a trend toward behavioralizing and operationalizing the diagnostic criteria and definitions in American psychology and psychiatry. Thus, this practice has also been seen in the diagnosis of ADHD (Spitzer, Davies, & Barkley, 1990).

This reliance on impulsivity and inattention for making the ADHD diagnosis has been validated by a number of researchers (Weiss & Hechtman, 1986; Douglas, 1980, 1983; Douglas & Peters, 1979). However, it has only been in the last decade or so that these and a set of additional behaviors have been agreed upon as defining ADHD. (August & Garfinkel, 1993; APA, 1980; APA, 1987). It is generally accepted that the essential features of ADHD include inattention, impulsivity, and excessive motor activity (Whalen, 1982; APA, 1987), however, DSM-III-R contains no specification for the amount or severity of attentional problems or amount of activity necessary to meet these diagnostic criteria. Overall, the diagnostic criteria continue to be limited, i.e. the diagnostic criteria has still not been operationalized to a satisfactory level (Munoz-Millan & Casteel, 1989). For example, a behavioral characteristic such as "has difficulty playing quietly" is not defined in terms of what degree this behavior must be
present at a particular age, or the degree of severity for the behavior to be considered deviant. Furthermore, criteria for behaviors such as overactivity may commonly be applied to children of all ages despite well documented evidence that there are age-related declines in some behaviors, such as motor activity and inattention during normal development (Barkley, 1990; Campbell, 1990; DuPaul, et al., 1991). For example, a preschool child is not expected to be able to sit still in a group of children attending to a story for 20 minutes, whereas this would be expected of a 10-year-old child.

As in the diagnosis of most childhood disorders, clinicians must typically rely heavily on parent report to determine the absence or presence of symptoms and their levels. Of course, verbal report (and parent report in particular) can present serious problems in terms of inaccuracies such as exaggeration or minimization of symptoms and historical information (Lavigne & Reisinger, 1984), and this clearly emphasizes the need for multiple observation sources when attempting to make a diagnosis (Sleator & Ullman, 1981). Moreover, checklists (which have become the standard method of gaining teacher and parent report) produce data with poor interobserver agreement and reliability (Jellinek & Murphy, 1990). For example, in studies using DSM-III criteria interexaminer agreement for ADHD diagnoses has ranged from .50 to .69 (Kappa Coefficient) (APA, 1980; Taylor, 1983). The problem of interobserver agreement may go beyond the lack of specificity of DSM-III criteria. For example, when parents or teachers are asked to rate school-aged males on different behavioral dimensions, they rate as many as 30% to 50% of a normal sample as overactive, restless, distractible, or inattentive (Whalen, 1982). Thus, the problem may not just lie with the DSM-III-R and the associated criteria, but also with parent and teacher perceptions of what constitutes deviant behavior (Schlessler, Armstrong, & Allen, 1990).

Finally, the differential diagnosis of ADHD presents its own set of problems, since the primary characteristics of this disorder cut across many alternate diagnostic
categories. For example, differential diagnoses may include an Adjustment Disorder in which the child is reacting to a stressful, disorganized, or chaotic environment; Mental Retardation and Pervasive Developmental Disorders in which the child may exhibit such behaviors as aggressiveness, poor impulse control, and low frustration tolerance; and Mood Disorders in which depression or anxiety may manifest themselves in overactivity particularly in children (Jensen, Burke, & Garfinkel, 1988). Additionally, conduct disorder and oppositional defiant disorder have many overlapping symptoms with ADHD, and there has been much controversy in the literature concerning this differential diagnosis (APA, 1989; O'Brien, Halperin, Newcorn, Sharma, Wolf, & Morganstein, 1992). If one disorder is difficult to diagnose due to lack of specificity in criteria, then attempting to differentially diagnose a child displaying symptomatology consistent with one or both disorders is going to be extremely troublesome.

As described above, there are many issues concerning the diagnosis of ADHD, but the issue of how to diagnose accurately with the current diagnostic criteria available should be of primary interest to researchers and clinicians alike.

Early Diagnosis

According to some researchers (Carey, 1972; McInerny & Chamberlin, 1978; Terestman, 1980), development of ADHD may begin as early as in infancy. Infants who display excessive activity, have poor sleeping and eating patterns, and have negative moods may be at greater risk for later ADHD than children who do not display these qualities (Ross & Ross, 1982; Lambert, 1982). However, it should be stressed that the presence of these characteristics in an individual child do not necessarily predict that that child will develop diagnosable ADHD, nor does the absence predict a non-ADHD child. Ross and Ross (1982) suggest that when a difficult temperament is combined with poor parenting, the probability is increased that more severe problems
will result. This suggests that early diagnosis and intervention is important when symptomatology is present.

On the other hand, however, if clinicians are to diagnose early, the criteria established for diagnoses must account for the developmental changes that occur as the child grows older. As noted previously, the DSM-III-R diagnostic criteria for ADHD do not specify the number, types, or severity of symptoms that are required at different developmental levels (Barkley, 1988). The diagnostic system does state that the "essential features of this disorder are developmentally inappropriate degrees of inattention, impulsiveness, and hyperactivity (APA, 1987, p. 50), but there is no explicit relation to "normals" or to behavior at different ages in the developing child. When a professional is faced with the task of diagnosing a toddler or a preschool child, it would appear necessary to be able to utilize the criteria as set forth in the DSM-III-R. However, in its present state, this is really not possible due to the limitations discussed above.

As far as early identification is concerned, the majority of children who will be identified as having ADHD will have begun to manifest significant overactivity, noncompliance, and short attention span by 3 years of age (DuPaul, et al., 1991). These problems are usually brought to the attention of the parents by others, such as teachers, day-care workers, or relatives and at that point, the child is most likely taken to a pediatrician or family physician for diagnosis and treatment (Copeland, et al., 1987).

Practices of Pediatricians

Pediatricians are usually the first, and often the only professional to have contact with a hyperactive child (Copeland, et al., 1987). As such, the pediatricians are at a disadvantage. Despite the need for multiple observation sources for accurate
diagnosis of ADHD (Sleator & Ullman, 1982), pediatricians often only have access to parental information, and thus, many diagnoses are based on a single source of information (Copeland, et al., 1987).

Only a three studies have been undertaken in an attempt to learn about the decision-making processes used by practicing pediatricians when diagnosing and managing children who show symptoms consistent with hyperactivity. Sandoval, Lambert, and Yandell (1976) used an extensive questionnaire in order to survey 48 physicians about their diagnostic procedures. They found that diagnoses were made primarily on the basis of parent report of key behaviors, and information gathered from the child's medical history, rather than from data collected during the physical examination.

In a study by Copeland, et al. (1987), 290 pediatricians were surveyed via questionnaires. Most pediatricians did not utilize specific DSM-III criteria for ADHD, but they did rely on symptoms of distractibility, overactivity, and impulsivity. Parents were cited as the most common source of information about the child's behavior, and histories provided by teachers were also utilized frequently. Furthermore, many pediatricians reported reliance on practices such as attempting to document the presence of soft neurological signs and observing differential response to stimulant medication.

One final study also involves the reported practices of pediatricians (Stancin, Christopher, & Coury, 1990). In this investigation, 124 pediatric residents were subjects. The residents reported that they based their diagnosis on DSM-III-R criteria and used multiple sources of information (e.g. parent and teacher reports). Information gained from parents was used "frequently" or "always" by 98% of the sample. Seventy-one percent reported considering family functioning when they make their diagnosis, and 52% responded that they used "response to medication" as part of their diagnostic procedures. Another interesting response was that the subjects reported that
30% of children that they evaluate for ADHD are not given the diagnosis of ADHD but are considered to have behavior problems due to family dysfunction.

The following data are especially relevant to the present review. In the study by Sandoval, et. al., (1976), the preferred treatment recommendation was by far stimulants (Ritalin was reported to be prescribed by 70% of the physicians on a frequent basis). Only 50% of the physicians reported that they frequently made referrals for psychotherapy or counseling for the children and/or the parents. In Copeland, et. al.'s (1987) investigation, methylphenidate and behavior modification were the most frequent therapies employed, and the more recently trained pediatricians tended to rely more on behavioral treatments than did earlier trained pediatricians. Finally, Stancin, et al. (1990) found that most physicians reported that they referred ADHD children to other professionals for evaluation, consultation or treatment, with psychologists and behavioral pediatricians the most common referral sources. Eighty-eight percent reported that they rely most heavily on parent guidance interventions, 75% on behavior modification, and 47% on stimulant medication.

Although the information gathered in these studies is suggestive, there are several limitations. First, all of these investigations used surveys. It is well known that a survey can only assess what pediatricians (and others) report about their diagnostic and treatment procedures, and as Ultman and Doherty (1984) have noted, clinicians may not always be cognizant of what factors they actually employ in making a diagnosis of hyperactivity. Second, some of the information gathered is several years old, and this limits the applicability to current pediatric practice. Furthermore, there has been some suggestion in the literature that physicians may be influenced by the parent motivation for treatment (Lavigne & Reisinger, 1984) and this should be investigated in a study of diagnostic issues concerned with ADHD children. More direct assessments
of pediatricians' diagnostic practices are needed in order to determine actual practices, for example, a direct study of pediatricians in contact with the patient.

Purpose of the Present Study

The purpose of the present study was to examine the assessment methods used by pediatricians who deal with very young children showing some symptomatology consistent with ADHD. The primary questions addressed in this study were whether physicians rely on information gleaned from parent report or on observational data in order to diagnose a child as having ADHD. That is, were physicians more influenced by what the parents and/or teachers reported about the child or were they more affected by how the child actually behaved during an office visit.

This study adds to previous research by considering the influence of reported psychosocial stress, other specific features of parent report, and observed activity levels. It was an attempt to identify the factors which influence pediatricians most when diagnosing a very young child with ADHD-like symptoms. In order to identify such factors, it was necessary to have an analogue study so that the effect of extraneous variables could be reduced to a minimum. Furthermore, this study extends previous research (Copeland, et al. 1987; Stancin, et al., 1990; Sleator, 1981; Sandoval, et al., 1976) by manipulating specific sources of information (e.g. a tape showing a child with different levels of activity) and noting the effects on physicians' reports of how they would assign a diagnosis.

It was hypothesized that pediatricians' diagnoses of hyperactivity would be most influenced by parent report of activity and attentional difficulties regardless of the levels of psychosocial stress reportedly present in the child's family. It was also hypothesized that the source or motivation for seeking treatment (e.g. the parents being
pushed to seek treatment by the daycare staff) would strongly influence the pediatricians' diagnoses, again overriding some important sources of information.
METHOD

Subjects

Eighty subjects were recruited for participation in this study. Subjects were either pediatric faculty, pediatric residents, or pediatric interns at an Eastern teaching hospital. Forty-six subjects were pediatric residents, 36 were pediatric interns, three were pediatric post-residents, and two were faculty. Subjects were surveyed immediately after a colloquium had been presented by a member of the faculty. Of the subjects who were asked to participate in the study, 100% agreed to do so.

Independent Variables

This study involved three independent variables, each presented in two levels. The first independent variable was the level of activity displayed by a three-year old boy who had been videotaped playing with blocks. This age was chosen due to suggestions in the literature that ADHD symptoms may be detected at that age (Palfrey, et al., 1985) and that behaviors of children at this age are highly influenced by stressors such as marital discord (Emery, 1982; Emery & O'Leary, 1982). The child, engaged in different levels of activity, was presented on a 3 minute video tape. Two activity levels were displayed, "high" or "low". The "low" level of activity was displayed by the boy playing with toys at a table. The "high" level of activity was the same videotape but with the speed increased times two. Thus, the "high" level of activity was simply the "low" activity tape but speeded up so that twice as many movements were seen in the "high" activity video in the same amount of time. Due to the poor sound quality of the speeded up version of the tape, both video, the "low" activity and
the "high" activity, were presented with the sound off. This investigator also made the following statement to all subjects, regardless of the level of activity to which they were exposed: "I apologize for the poor quality of the tape, but it is a copy of another tape."

The second independent variable was the level of home stress reported in the written vignette (please see Appendix A for sample vignettes). The levels of psychosocial stress were "high" as indicated by marital discord in the form of divorce, or "low" as indicated by the absence of marital discord. Marital discord was selected due to the known influences that it has on children in terms of behavioral characteristics (Emery, 1982; Emery & O'Leary, 1982; Hodges, Tierney, & Buchsbaum, 1984). The third independent variable was parent motivation (also reported in the written vignette) for obtaining some type of treatment. "High" parent motivation was indicated by the preschool asking the parents to obtain treatment for the child; "low" parent motivation was indicated by the preschool mentioning to the parents that the child is very active, but that he is doing well. Each subject was randomly assigned to one of eight conditions (see Appendix B) which consisted of the above variables in different combinations.

Dependent Variables

After viewing the videotape, the subjects were asked to complete a 12-item questionnaire pertaining to diagnostic and treatment issues (see Appendix C). Demographic items on the questionnaire included whether the subject is currently in training, and if so what year in training. Additionally, the subjects were asked to indicate approximately how many patients they have seen who have displayed ADHD symptoms. Five items dealt with diagnostic issues ranging from asking the subjects to indicate a provisional diagnosis based on the information presented, the level of certainty with which they made the diagnosis, what, if any, additional information they
might seek in order to make a diagnosis, what they found frustrating when making the
diagnosis, and what they would want to rule out. Three items dealt with treatment
issues including what treatment or referral they would make, how available that type of
treatment or referral source is, and what barriers might exist that would keep the family
from utilizing the treatment or referral source. The remaining questions asked the
subjects to indicate what aspect of the information presented influenced them most in
making the diagnosis, and to indicate if they had any concerns regarding prescribing
psychostimulants to young children.

This investigator presented the videotape and the vignettes to psychology
interns and psychology faculty at an Eastern internship site. This was done in order to
obtain feedback regarding the appearance of the speeded up version of the videotape
and in order to obtain feedback on the questionnaire with respect to any difficulties
answeering questions or any ambiguities within the questions themselves. The
feedback did not warrant any changes in the videotape nor in the questionnaire.

Design and Procedures

Subjects were surveyed in groups rather than on an individual basis. The
groups varied in subject size, from seven to 15. Each group viewed only one videotape
sample, i.e., each group saw only one level of activity. The remaining independent
variables were distributed randomly. The groups of subjects, containing a mixture of
pediatric interns, pediatric residents, post residents in pediatrics, and faculty
pediatricians, were surveyed until 10 subjects in each of the eight conditions had been
obtained. The investigator was always present at each of the presentations. All
subjects were advised that participation was completely voluntary and that all
information would be anonymous.
Immediately prior to presenting the videotape, each subject was given a packet of materials. The packet included a written vignette and a questionnaire. Subjects were asked to read the vignette (see Appendix A), which contained some combination of information about a three-year old boy. The vignette included fictional background information about the child, current psychosocial stressors, current behaviors, and parent motivation for seeking treatment. The subjects were then asked to view a three-minute videotape sample of the child. Subsequent to viewing the videotape, the subjects were asked to complete the questionnaire and turn it in to the investigator. The subjects were asked to not supply any identifying information on the questionnaire other than the demographics explained above. Debriefing consisted of telling the subjects that the information that they had provided by participating in the study would be used to try to determine how pediatricians go about diagnosing a child who presents with certain behaviors and with certain backgrounds.
RESULTS

Data Analysis

Although the design of this study lends itself better to using log linear regression analysis, due to the nature of the categorical data I have chosen to report results using analyses of variance. There are three reasons behind this decision. One, there is no theoretical rationale for expecting interactions with log linear regression analyses (Knoke & Burke, 1980). When a log linear regression was applied initially in this study, many of the logistic regressions that included interaction terms failed to converge adequately (using the maximum likelihood criteria). Two, the parameter estimates in log linear regression analyses are reported as odds ratios which can be difficult to understand (Knoke & Burke, 1980). Three, after actually performing the log linear regression analyses, and comparing them to the results of the analyses of variance, i.e., the main effects, there was very little discrepancy between the two methods of analysis.

An alternative method of analyzing the data was to use a nonparametric approach (i.e. Chi Square). However, when this was performed, it was found that the cell means were too small for valid interpretation. Therefore, ANOVAs became the analysis of choice, even though this method of analysis did not fit the data as well as

---

1 An "odds" is the ratio between the frequency of being in one category and the frequency of not being in that category. Its interpretation is the chance that an individual selected at random will be observed to fall into the category of interest rather than into another category. An odds ratio is a single summary statistic which is formed by dividing one conditional odds by a second conditional odds. Thus odds ratios larger than 1.00 indicate direct covariation between variables, while odds ratios smaller than 1.00 indicate an inverse relationship (Knoke & Burke, 1980)
log linear regression analysis, i.e. the data was categorical in nature rather than continuous.

When considering using the $2 \times 2 \times 2$ analyses of variance which were used, one could consider all subjects available in each cell as the number of subjects available to respond to each variable. As such when subjects were exposed to one of eight conditions, there were 10 subjects available in each condition. When these 10 subjects were then asked to respond, theoretically speaking, 50% of the subjects should respond with a "yes" and 50% with a "no" on the variables which required such a response. On the diagnosis question, 33.3% were expected to respond with an Adjustment Disorder diagnosis, 33.3% to respond with an ADHD diagnosis, and 33.3% with an "other" diagnosis.

Due to the presence of several variables, a separate table indicating the variables and the levels of each variable has been created (see Table 1).

<table>
<thead>
<tr>
<th>Table 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variables and Levels of Variables Used in the Analyses of Variance</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variables</th>
<th>Levels of Each Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video</td>
<td>High/Low</td>
</tr>
<tr>
<td>Home Stress</td>
<td>High/Low</td>
</tr>
<tr>
<td>Parental Motivation</td>
<td>High/Low</td>
</tr>
</tbody>
</table>

In addition, due to the number of graphs associated with significant interactions, the graphs have been placed in Appendix D.
Demographics

The following demographic information was obtained from the 80 subjects. Fifty-eight percent (n = 46) indicated pediatric residency status, 36% (n = 29) were pediatric interns, 4% (N = 3) were post residents, and 3% (n = 2) were faculty. To the question "Have you seen, or are you seeing children in a clinical context who show symptomatology suggesting Attention Deficit Hyperactivity Disorder", 86% (n = 69) responded "yes". When posed the question, "How many such children have you seen" the following results were obtained: Thirty-six percent (n = 29) of the subjects indicated that they had seen between one and three such children, 31% (n = 25) had seen between four and 10, 10% (n = 8) had seen between 11 and 20, and 9% (n = 7) had seen 20 or more.

Diagnosis

Table 2 shows the distribution of diagnoses made with respect to the various experimental groups. A total of 11% of the subjects (n = 9) chose diagnoses other than Attention Deficit Hyperactivity Disorder and Adjustment Disorder, and thus, post hoc, these were collapsed into one category labeled "other". Eight percent (n = 6) chose Oppositional Defiant Disorder, and 3% of the subjects (n = 3) chose Conduct Disorder. No subjects chose Affective Disorder.

As shown in Table 3, a 2 x 2 x 2 ANOVA was conducted in order to assess the influence of home stress and parental motivation on the diagnosis chosen. When subjects were given information indicating high levels of stress in the home and high levels of motivation for seeking treatment, they were more likely to make a diagnosis of Adjustment Disorder. In contrast, the interaction of the level of activity seen in the
video tape and the level of stress reported in the home did not affect the diagnosis chosen ($F (1, 72) = 3.47, p < .07$).

To the question, "How certain are you about making this diagnosis given the information provided?" The following percentages were obtained: Eleven percent ($n = 9$) indicated that they were very certain, 45% ($n = 36$) indicated that they were fairly certain, and 44% ($n = 35$) indicated that they were not very certain.

<table>
<thead>
<tr>
<th>Group</th>
<th>Adjustment Disorder</th>
<th>ADHD</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>HiV/LoHS/HiPM</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>HiV/LoHS/LoPM</td>
<td>0</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>HiV/HiHS/HiPM</td>
<td>7</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>HiV/HiHS/LoPM</td>
<td>7</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>LoV/HiHS/LoPM</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>LoV/LoHS/LoPM</td>
<td>1</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>LoV/LoHS/HiPM</td>
<td>6</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>LoV/HiHS/HiPM</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: HiV = High Video, LoHS = Low Home Stress, HiPM = High Parental Motivation, LoPM = Low Parental Motivation, HiHS = High Home Stress, LoV = Low Video

The subjects who were "not very certain" when choosing a diagnosis were asked to indicate an alternative diagnosis and 71% of these subjects ($n = 25$) complied. The alternative diagnoses included "normal child" ($n = 7$); "hearing deficit" ($n = 1$); "inappropriate parent/child interactions" ($n = 1$); "organicity" ($n = 2$); "adjustment
disorder" (n = 5); "attention deficit hyperactivity disorder" (n = 6); and "conduct disorder" (n = 3).

Table 3
Proportion of Subjects Choosing Each Diagnosis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Low Stress</th>
<th>High Stress</th>
<th>Low Stress</th>
<th>High Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjustment Disorder</td>
<td>.05</td>
<td>.85</td>
<td>.40</td>
<td>.75</td>
</tr>
<tr>
<td>ADHD</td>
<td>.60</td>
<td>.15</td>
<td>.50</td>
<td>.25</td>
</tr>
<tr>
<td>Other</td>
<td>.35</td>
<td>.00</td>
<td>.10</td>
<td>.00</td>
</tr>
</tbody>
</table>

\( F (1, 72) = 10.63, \ p < .005 \) (See Figure 1 in Appendix D)

Responses to the question "what if anything did you find frustrating when diagnosing this child" primarily fell in one of three categories. Twenty percent of the subjects (n = 16) indicated no frustration or left the answer space blank, 19% (n = 15) indicated that on some level the lack of sound or the quality or positioning of the video was frustrating, and 53% of the subjects (n = 42) responded that they were frustrated by too little or discordant information. Of the remaining subjects, one wrote that the pacifier in the child's mouth hindered making a diagnosis, two indicated that a lack of personal interaction was missing, two subjects were frustrated by the sudden onset of symptoms and the progression of symptoms, one subject indicated that observations of the child in other environments were needed in order to make a diagnosis, and finally one subject felt that it was frustrating to have to make a diagnosis at all.
When subjects were asked what information, tests, etc. and what professional, if any, they would refer the child to if they were to continue an evaluation of the child, many different answers were obtained. (Twenty-three percent (n = 18) indicated more than one possibility, thus, the numbers do not add up to n = 80. In addition, 23% of the subjects (n = 18) indicated that no additional information was needed by leaving that portion of the answer space blank.) Most of these involved gathering more information from teachers and parents directly (n = 26) or through parent/teacher questionnaires (n = 14), and through various medical (n = 28) and psychological tests (n = 5). Some subjects (n = 4) indicated that it would be important to get an intelligence test done, as well as language, vision, and hearing screenings (n = 10). Additionally, some subjects felt that a toxin screen (n = 2) and a neurological evaluation (n = 9) should be performed. Five subjects indicated a need to observe the child and his parents directly, and one subject wanted more information on discipline techniques.

With respect to referrals to professionals, 44% of the subjects did indicate a referral source (n = 35) and 3% (n = 2) referred the child to two professionals, thus the total number of referrals is actually n = 37. Those subjects who did respond that they would make a referral, named sources such as psychologists, child psychologists, or counselors, 54% (n = 22), developmental specialists, 10% (n = 4), family therapists, 8% (n = 3), education personnel for testing, 15% (n = 6) and psychiatrists, 5% (n = 2). Finally, when asked what they "would want to rule out in this case" 69 subjects responded with at least one diagnosis or problem. In order to simplify the analysis only the first diagnosis or problem mentioned was utilized when the subjects' responses included more than one. These included attention deficit hyperactivity disorder (n = 19), adjustment disorder (n = 13), mental retardation or developmental delay (n = 5), medical problems or neurological disorder (n = 7), affective disorder (n = 5), family problems (n = 4), learning disability (n = 3), hearing loss (n = 3),
organicity (n = 3), abuse (n = 2), conduct disorder (n = 1), oppositional defiant disorder (n = 1), toxins (n = 1), problematic history (n = 1), and parents seeking Ritalin (n = 1).

Treatment

In order to gain a perspective on the overall distribution of treatment options by experimental group, please see Table 4. Recommendations for treatment were varied, and since each subject was allowed to make more than one treatment recommendation, the analyses that were carried out were done via 2 x 2 x 2 ANOVAs, i.e. each subject was scored as if they had indicated "yes" or "no" to each of the five treatment options. As such, the following results were obtained. A 2 x 2 x 2 ANOVA was conducted in order to assess the influence of video and home stress on the subjects' recommendation of change in diet as a mode of treatment (see Table 5).

Table 4

Treatment Options for Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Change Diet</th>
<th>Behavior Therapy</th>
<th>Therapy for the Child</th>
<th>Therapy for the Family</th>
<th>Parent Training</th>
<th>Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>HiV/LoHS/</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>HiPM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HiV/LoHS/</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>6</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>LoPM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HiV/HiHS/</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>HiPM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HiV/HiHS/</td>
<td>0</td>
<td>3</td>
<td>8</td>
<td>9</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>LoPM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LoV/HiHS/</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>10</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>LoPM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 4—Continued

<table>
<thead>
<tr>
<th>Group</th>
<th>Change Diet</th>
<th>Behavior Therapy</th>
<th>Therapy for the Child</th>
<th>Therapy for the Family</th>
<th>Parent Training</th>
<th>Medication</th>
</tr>
</thead>
<tbody>
<tr>
<td>LoV/LoHS/LoPM</td>
<td>3</td>
<td>7</td>
<td>5</td>
<td>10</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>LoV/LoHS/HiPM</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>LoV/HiHS/HiPM</td>
<td>0</td>
<td>9</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: HiV = High Video, LoHS = Low Home Stress, HiPM = High Parental Motivation, LoPM = Low Parental Motivation, HiHS = High Home Stress, LoV = Low Video

Table 5

Proportion of Subjects Recommending Change in Diet by Experimental Group

<table>
<thead>
<tr>
<th>Low Video</th>
<th>High Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Stress</td>
<td>.35</td>
</tr>
<tr>
<td>High Stress</td>
<td>.00</td>
</tr>
</tbody>
</table>

Note: F (1, 72) = 10.67, p < .005 (see Figure 2 in Appendix D)

This indicates that only when subjects were exposed to low levels of home stress and low levels of activity in the video were they choosing diet as a mode of treatment.

In order to determine the combined influence of video and parental motivation on the choice of child behavior therapy as treatment, a 2 x 2 x 2 ANOVA was performed, (see Table 6). In addition, a 2 x 2 x 2 ANOVA was performed in order to
assess the combined influence of home stress by parental motivation for child behavior therapy (see Table 7).

Table 6
Proportion of Subjects Recommending Child Behavior When Focusing on Video and Parental Motivation

<table>
<thead>
<tr>
<th></th>
<th>Low Video</th>
<th>High Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Motivation</td>
<td>.35</td>
<td>.50</td>
</tr>
<tr>
<td>High Motivation</td>
<td>.85</td>
<td>.20</td>
</tr>
</tbody>
</table>

Note: $F(1, 72) = 19.53, p < .0001$ (see Figure 3 in Appendix D)

Table 7
Proportion of Subjects Recommending Child Behavior Therapy When Focusing on Home Stress and Parental Motivation

<table>
<thead>
<tr>
<th></th>
<th>Low Stress</th>
<th>High Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Motivation</td>
<td>.70</td>
<td>.15</td>
</tr>
<tr>
<td>High Motivation</td>
<td>.45</td>
<td>.60</td>
</tr>
</tbody>
</table>

Note: $F(1, 72) = 14.95, p < .001$ (see Figure 4 in Appendix D)

Thus, when subjects were exposed to low levels of activity on the videotape and were given information indicating high parental motivation for seeking treatment, they were more likely to choose child behavior therapy as a treatment option. Furthermore, when
subjects were given information combining low levels of stress in the home and low levels of parental motivation to seek treatment, and when they were given information combining high levels of stress in the home and high levels of parental motivation to seek treatment, they were more likely to recommend child behavior therapy.

Two separate 2 x 2 x 2 ANOVAs were also performed in order to assess the influence of level of activity on the videotape and level of home stress, and level of home stress and parental motivation to seek treatment when considering counseling for the child as a form of treatment (see Tables 8 and 9).

Table 8

<table>
<thead>
<tr>
<th></th>
<th>Low Video</th>
<th>High Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Stress</td>
<td>.55</td>
<td>.10</td>
</tr>
<tr>
<td>High Stress</td>
<td>.35</td>
<td>.45</td>
</tr>
</tbody>
</table>

Note: $\text{F}(1, 72) = 8.07$, $p < .01$ (see Figure 5 in Appendix D)

These results indicate that when subjects were exposed to low levels of activity on the videotape and were given information suggesting low levels of home stress in the child's environment, subjects tended to recommend counseling for the child. In addition, when subjects were given information indicating a high level of stressors and low levels of parental motivation to seek treatment, they also tended to recommend counseling for the child. A significant parental motivation main effect was obtained for family counseling, $\text{F}(1, 72) = 7.26$, $p < .01$. 

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Table 9

Proportion of Subjects Recommending Counseling for the Child When Focusing on Home Stress and Parental Motivation

<table>
<thead>
<tr>
<th></th>
<th>Low Stress</th>
<th>High Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Motivation</td>
<td>.25</td>
<td>.60</td>
</tr>
<tr>
<td>High Motivation</td>
<td>.40</td>
<td>.20</td>
</tr>
</tbody>
</table>

Note: $F(1, 72) = 14.95, p < .001$ (see Figure 4 in Appendix D)

In order to assess the combined influence of all three independent variables, video, home stress, and parental motivation, a $2 \times 2 \times 2$ ANOVA was performed (see Table 10). Hence, subjects who were given information indicating low parental motivation for treatment, low levels of home stress, and were exposed to low levels of activity on the videotape, were more likely to suggest parent training as a treatment option.

When looking at whether medication, i.e., a psychostimulant, would be a viable treatment option, a significant home stress main effect was found, $F(1, 72) = 5.05, p < .05$.

When referring to the various treatment options that each subject had chosen, and asking how easy it would be for the family to obtain that treatment, the subjects responded as follows: Five percent ($n = 4$) indicated that it would be very easy, 53% ($n = 42$) indicated that it would be fairly easy, and 41% ($n = 33$) indicated that it would not be very easy. One subject did not respond to this question, and therefore, the percentages do not add up to 100%.
Table 10
Proportion of Subjects Recommending Parent Training When Looking at the Influence of All Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>Low Video</th>
<th>High Video</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Stress</td>
<td>High Stress</td>
</tr>
<tr>
<td>Low Motivation</td>
<td>.90</td>
<td>.20</td>
</tr>
<tr>
<td>High Motivation</td>
<td>.40</td>
<td>.40</td>
</tr>
</tbody>
</table>

$\chi^2 (1, 72) = 6.52, p < .01$ (See Figures 7 and 8 in Appendix D)

As with type of treatment chosen, "barriers to treatment" were considered one at a time as if each subject had indicated "yes" or "no" to each choice. As such the following results were obtained, 69% of the subjects ($n = 55$) indicated that family motivation issues might be a barrier to treatment. Fifty-six percent ($n = 45$) believed that cost or insurance issues might be a barrier, 49% ($n = 39$) thought that transportation, child care and other practical issues might prevent treatment, and 70% ($n = 56$) indicated that general stress and chaos in family functioning would prevent the pursuit of treatment options.

Influential Factors

When subjects were asked what factor most influenced their decision about the diagnosis that they had made, the following results were obtained. See Table 11 for a summary of numbers of subjects choosing each factor as most influential).
Table 11
Factors That Influenced Decisions in Diagnosing for Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>History</th>
<th>Observed Activity</th>
<th>Reported Activity</th>
<th>Home Stressors</th>
</tr>
</thead>
<tbody>
<tr>
<td>HiV/LoHS/HiPM</td>
<td>0</td>
<td>5</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>HiV/LoHS/LoPM</td>
<td>0</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>HiV/HiHS/HiPM</td>
<td>0</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>HiV/HiHS/LoPM</td>
<td>0</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>LoV/HiHS/LoPM</td>
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<td>2</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>LoV/LoHS/LoPM</td>
<td>0</td>
<td>3</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>LoV/LoHS/HiPM</td>
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<td>2</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>LoV/HiHS/HiPM</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: HiV = High Video, LoHS = Low Home Stress, HiPM = High Parental Motivation, LoPM = Low Parental Motivation, HiHS = High Home Stress, LoV = Low Video

In order to assess the combined influence of video and parental motivation for seeking treatment when looking at early history of the child as the most influential factor, a 2 x 2 x 2 ANOVA was carried out (see Table 12). These results indicate that only when subjects were exposed to low activity on the videotape combined with high levels of stressors in the home did they find history of early infant temperament as the most influential factor when making a diagnosis. Additionally, a significant video main
effect was found for current activity level of the child as observed in the video tape, $F(1, 72) = 10.76, p < .005$. Also, a significant home stress main effect was found for current activity level of the child as reported by the parents, $F(1, 72) = 12.37, p < .001$.

<table>
<thead>
<tr>
<th>Table 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proportion of Subjects Indicating That History Was the Most Influential Factor</td>
</tr>
<tr>
<td>Low Video</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Low Motivation</td>
</tr>
<tr>
<td>High Stress</td>
</tr>
</tbody>
</table>

Note: $F(1, 72) = 8.19, p < .01$ (see Figure 9 in Appendix D)

A 2 x 2 x 2 ANOVA was conducted in order to assess the effect of activity level, home stress and parental motivation in seeking treatment on the subjects indicating that reported stressors in the home was the most influential factor when making a diagnosis (see Table 13). This suggests that when subjects were exposed to low levels of activity in the videotape and had information indicating high levels of home stressors and low levels of parental motivation they indicated that reported stressors in the home was the most influential factor when making a diagnosis.

The last question that was posed to the subjects asked them to indicate any concerns that they had about prescribing Ritalin or other psychostimulants to young children. Many subjects, 29% ($n = 23$), indicated that they were concerned about side effects, 36% of the subjects ($n = 29$) indicated that they did not have any concerns about prescribing medications; nine percent ($n = 7$) were concerned about labelling the
child; and eight percent (n = 6) worried that a psychostimulant might not be necessary. Other concerns included that medications were used to control behavior (n = 2), that the child's behavior was normal and no medications were needed (n = 4), that the child might be too young (n = 2), that other treatments should be tried first (n = 2), that medications were a quick fix (n = 1), that medications might be toxic (n = 1), lack of parental compliance (n = 1), that it might not work (n = 1), and finally, that the child would be medicated (n = 1).

Table 13
Proportion of Subjects Indicating That Reported Stressors in the Home Was the Most Influential Factor

<table>
<thead>
<tr>
<th>Low Video</th>
<th>High Video</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Stress</td>
<td>High Stress</td>
</tr>
<tr>
<td>Low Motivation</td>
<td>0.00</td>
</tr>
<tr>
<td>High Motivation</td>
<td>0.00</td>
</tr>
</tbody>
</table>

E (1, 72) = 9.29, p < .005 (See Figures 10 and 11 in Appendix D)

In summary, a significant home stress by parental motivation interaction was found for diagnosis. In addition, when looking at treatment, the following significant interactions were found: A video by home stress interaction for diet; a video by parent motivation interaction and a home stress by parental motivation interaction for child behavior therapy; a video by home stress interaction and a home stress by parental motivation interaction for child counseling. A significant three way interaction (video by home stress by parental motivation) was found for parent training. A significant
home stress main effect was found for medication as treatment. When looking at influential factors, a significant video by parental motivation for history of early infancy temperament was found. Also, a significant video main effect was found for observed activity, and a significant home stress main effect was found for reported activity. Lastly, a significant three way interaction (video by home stress by parental motivation) was found for reported stressors in the child's home environment.
DISCUSSION

As noted previously, the primary purpose of this study was to examine the assessment methods used by pediatricians when dealing with very young children who show some symptomatology consistent with ADHD. As was shown in the results, subjects who had information which indicated high levels of home stress and either low or high levels of parental motivation were more likely to diagnose the child with an Adjustment Disorder. When asked about how certain the subjects felt about making a diagnosis, the majority of the subjects indicated either that they were fairly certain or not very certain. This suggests that most of the pediatricians were not entirely comfortable making a diagnosis based on the limited information provided and can be viewed as a positive outcome in terms of the subjects being wary of diagnosing false positives or not diagnosing true positives. Indeed most subjects wanted more information, and many subjects indicated that they would make a referral to another professional. As far as ruling out a diagnosis, the majority of the subjects indicated at least one diagnosis to rule out. Most of these rule outs were the other diagnoses mentioned in the questionnaire such as ADHD, Adjustment Disorder, and Affective Disorder. Other diagnoses mentioned were medical or neurological problems.

Several significant results were obtained when looking at treatment options. First, although change in diet was not a very popular treatment option, of the eight subjects who chose it, seven were exposed to the low activity video group. This may indicate that these subjects perhaps did not view the child's problem as very severe and thus may have chosen the least intrusive treatment option. In addition, as reported parental motivation went from low to high, and when home stress went from high to low, subjects tended to recommend child behavior therapy more frequently. Also as
parental motivation increased and video decreased more subjects chose child behavior therapy. Subjects chose child counseling as a treatment modality when video decreased and home stress increased, and when parental motivation was low and home stress was high. Thus, it was clear that many subjects saw that the child needed help in some fashion, especially when there was high home stress. In addition, as speculated prior to completing the study, it did appear that parental motivation was an important factor when that motivation was high, even when the video, or observed activity, was low.

Also of significance was the fact that as parental motivation increased, more subjects tended to choose family counseling as a treatment option. A caveat concerning the variable "parent motivation" is in order before continuing the discussion. After the completion of the study it became apparent that the supposed levels of parental motivation could have been differently than had been intended. What was labeled as "low parental motivation" could actually be interpreted as a high level of motivation due to the parents seeking treatment on their own accord. Thus, when parents were asked to obtain treatment by daycare staff, this could be interpreted as low parental motivation to seek treatment because an external source was demanding the treatment. As a consequence, the results concerning parental motivation should be interpreted with caution and with the above caveat in mind.

When focusing on the treatment modalities, it appeared that parent training was chosen more frequently when there was low parental motivation, low stress, and low video. Consequently, there was more of a focus on the parent needing treatment than on the child when all of the conditions were "low" in nature. Finally, when looking at medication, i.e. psychostimulants, as a viable option for treatment, subjects tended to not recommend medication as home stress increased. This could indicate that subjects were focused on the home situation and recognized that the stressors in the home could be causing the acting out behaviors. Thus, the subjects did not view medication as a
good solution for the problem behaviors. Unfortunately, only five percent of subjects believed that the treatment options were easy to obtain for the families. One can therefore postulate that pediatricians and other professionals may inadvertently lead to prescribe a treatment such as medication because it is more easily complied with than are the more typical therapies, and medication is much less expensive.

When looking at the factors which influenced the subjects the most in terms of diagnostic assessment, the following results were obtained. History was not considered very important as a factor when making a diagnosis. Observed activity was very important to the subjects when making a diagnosis, at least when exposed to the high level of activity on the videotape. On the other hand, Subjects who were exposed to low levels of home stress were more likely to indicate that reported activity was the most influential factor. Conversely, only 12% of the subjects exposed to high levels of home stress indicated that reported activity was the most influential factor. Finally, when considering reported stressors in the child's home environment as an influential factor, it was found that when parental motivation and video were low and when home stress was high, then subjects tended to view reported stress in the child's home as very important in making a diagnosis. When looking at concerns about prescribing stimulants to young children, a little more than one third of the subjects indicated that they had no concerns about prescribing medication.

As with any study, there are strengths and weaknesses. In this analogue study, there were several of both. First, due to the analogue nature, this investigation was able to control various extraneous variables, and thus was more controlled than previous studies (Sandoval, Lambert, & Yandell, 1976; Copeland et. al., 1987; Stancin, Christopher, & Coury, 1990). Specifically home stress, parental motivation to seek treatment, and activity levels of a child were variables which were manipulated rather than just accounted for. As such more direct information was obtained. For
example, it was found that pediatric residents at various stages in their training, tended to rely on observed activity, especially if they were exposed to high activity. However, when exposed to low activity that was not the case. A much larger percentage reported that parent report of activity was the most important factor, especially when they were exposed to a low level of home stress. Previous investigations, using surveys (Sandoval, Lambert, & Yandell, 1976; Copeland et al., 1987), also found that parent report is often considered the most important source of information when making a diagnosis of ADHD.

The present investigation did not find evidence that parental motivation was a significant factor when making a diagnosis as had been hypothesized. However, as noted above the reason for this could be misinterpretations of low and high levels of parental motivation. Reported stressors in the child's environment was considered the most important factor by a majority of subjects in the low video, high home stress, low parental motivation group, however, that group was the only group which considered reported stressors as most important by a majority of the subjects. Thus, seven of the eight groups, did indeed consider reported stressors as unimportant, or at least not the most important factor, when making a diagnosis as had been hypothesized at the beginning of this investigation.

Contrary to previous investigations, only 20% of the subjects in this study indicated that medication (i.e. psychostimulants) would be a viable treatment option. This was a surprising result due to other studies (Copeland, et al, 1976). Instead, they tended to view some sort of therapy or training as more practical solutions to the behavior difficulties. This finding should perhaps be viewed with caution due to the subjects knowing that this investigator is in the mental health field. Additionally, the subjects at this particular training site are all exposed to a variety of psychiatric resources, and thus, may be more willing to view such routes as possible treatments.
Unlike the study performed by Stancin, Christopher, and Coury (1990), only 5% of subjects in the present study indicated that it would be very easy to obtain treatment. Another 53% indicated that it would be fairly easy to obtain treatment. Consequently, it is obvious that pediatricians, at least in the geographic area studied, believe that access to treatment is relatively difficult even when exposed quite liberally to psychiatric resources while in training.

As with the previous studies, there is a limitation in terms of investigators not knowing whether the pediatricians actually follow through the way they report they do. This limitation cannot be addressed unless a study is actually done on site, with real patients, and with follow-up information accessible to the investigators. In addition, future related studies should concentrate on a study of diagnostic practices, types of treatments recommended, and referrals made in order to find out if there are real differences among practicing pediatricians and those who are still in training. In addition, with issues of managed care in the nation's health system, it would be relevant to study the contingencies that are operating when physicians refer patients to other professionals. Finally, an important issue that was raised in this study warrants further attention, specifically most subjects in this particular study believed that therapy and other such treatments were very difficult or relatively difficult for the family to obtain. This is a serious issue when faced with children who need to have psychological treatment because there may be a tendency for the pediatricians to do what they can, which is to prescribe medication.
Appendix A

Levels of the Independent Variables and Examples of Vignettes
The following descriptive phrases and sentences correspond to each of the variables, i.e. psychosocial stress and parent motivation.

Home stress

**High.** The parents report that they have recently filed for divorce and Johnny is aware of this.

**Low.** The parents report that they have a good marital relationship.

Parent motivation

**High.** The preschool has mentioned to the parents that Johnny can be quite active at times, but does not appear to have any problems with hearing or ability to learn. However, the preschool insists that the parents have Johnny evaluated before returning to preschool.

**Low.** The preschool has mentioned to the parents that Johnny can be quite active at times, but does not appear to have any problems with hearing or ability to learn. The parents have initiated this visit with you in order to get your opinion about Johnny's behavior.
The parents report that as an infant, Johnny was moderately fussy but had no problems reaching developmental milestones. For the past few months he has been showing increasing problems including noncompliance, i.e. not following directions and not doing what he has been told. Recently, he can't even sit still long enough to watch his favorite cartoon for one minute. When playing with toys, for example a simple puzzle, he doesn't pay attention long enough to put more than a couple of pieces in the puzzle.

The parents also report that they have recently filed for a divorce, and Johnny is aware of this. The preschool has mentioned to the parents that Johnny can be quite active at times, but does not appear to have any problems with hearing or ability to learn. However, the preschool insists that the parents have Johnny evaluated before returning to preschool.
The parents report that as an infant, Johnny was moderately fussy but had no problems reaching developmental milestones. For the past few months he has been showing increasing problems including noncompliance, i.e. not following directions and not doing what he has been told. Recently, he can't even sit still long enough to watch his favorite cartoon for one minute. When playing with toys, for example a simple puzzle, he doesn't pay attention long enough to put more than a couple of pieces in the puzzle.

The parents report that they have a good marital relationship. The preschool has mentioned to the parents that Johnny can be quite active at times but does not appear to have any problems with hearing or ability to learn. The parents have initiated this visit with you in order to get your opinion about Johnny's behavior.
The parents report that as an infant, Johnny was moderately fussy but had no problems reaching developmental milestones. For the past few months he has been showing increasing problems including noncompliance, i.e. not following directions and not doing what he has been told. Recently, he can't even sit still long enough to watch his favorite cartoon for one minute. When playing with toys, for example a simple puzzle, he doesn't pay attention long enough to put more than a couple of pieces in the puzzle.

The parents also report that they have recently filed for a divorce, and Johnny is aware of this. The preschool has mentioned to the parents that Johnny can be quite active at times but does not appear to have any problems with hearing or ability to learn. The parents have initiated this visit with you in order to get your opinion about Johnny's behavior.
The parents report that as an infant, Johnny was moderately fussy but had no problems reaching developmental milestones. For the past few months he has been showing increasing problems including noncompliance, i.e. not following directions and not doing what he has been told. Recently, he can't even sit still long enough to watch his favorite cartoon for one minute. When playing with toys, for example a simple puzzle, he doesn't pay attention long enough to put more than a couple of pieces in the puzzle.

The parents report that they have a good marital relationship. The preschool has mentioned to the parents that Johnny can be quite active at times, but does not appear to have any problems with hearing or ability to learn. However, the preschool insists that the parents have Johnny evaluated before returning to preschool.
Appendix B

Experimental Conditions
1. high activity video
   high home stress
   high parent motivation

2. high activity video
   low home stress
   high parent motivation

3. high activity video
   high home stress
   low parent motivation

4. high activity video
   low home stress
   low parent motivation

5. low activity video
   high home stress
   high parent motivation

6. low activity video
   high home stress
   low parent motivation
7. low activity video
   low home stress
   high parent motivation

8. low activity video
   low home stress
   low parent motivation
Appendix C

Questionnaire
Questionnaire

1. Please indicate your current professional status:
   a. Medical School, (please specify what year____________)
   b. Internship
   c. Residency, (please specify what year____________)
   d. Post residency, (please specify what year___________)
   e. Faculty
   f. Private practice
   g. Other__________________________________________

2. Have you seen, or are you seeing, children in a clinical context who show symptomatology suggesting Attention Deficit Hyperactivity Disorder?
   Yes      No
   If yes, how many have you seen to date?
   1-3   4-10   11-20   more than 20

3. Given the information that you do have available to you, what provisional diagnosis would you make?
   a. Adjustment Disorder (Adjustment Reaction)
   b. Affective Disorder
   c. Attention Deficit Hyperactivity Disorder (Hyperkinetic syndrome of childhood)
   d. Conduct Disorder (Disturbance of Conduct)
   e. Oppositional Defiant Disorder.
4. How certain are you about making this diagnosis given the information provided?
   a. Very certain
   b. Fairly certain
   c. Not very certain
   If you indicated "not very certain" please note an alternative diagnosis that you would consider, if there is one.

5. What did you find frustrating when making a diagnosis of the child?

6. If you were to continue an evaluation of this child, please indicate what other kinds of tests, data, and information you would want to obtain, and what, if any, type of professional you would refer to.

7. What would you want to Rule Out (R/O) in this case?

8. What treatment recommendations and/or referral would you make?
   Please check any that apply
   a. Change in diet (e.g. vitamins, sugar restriction, food allergies)
   b. Child behavior therapy
   c. Counseling/psychotherapy for the child
   d. Counseling/psychotherapy for the family
   e. Parent training (behavior modification)
   f. Psychostimulants (e.g. Ritalin, Cylert)
   g. Other psychotropic medication (please specify_________________)

9. In your opinion and/or experience how easy is it to provide the option that you selected? (i.e. in number 8, how easy is it for the parents to obtain that treatment option?)
   a. Very easy
   b. Fairly easy
   c. Not very easy

10. In your opinion and/or experience, what other barriers might keep the family from pursuing this treatment option?
    a. Family motivation issues (parents not really seeing the problem as severe enough to warrant this service)
    b. Cost/insurance reimbursement issues
    c. Transportation/child care/practical issues
    d. General stress and chaos in family functioning
    e. Other_____________________________
11. What aspect of the information presented today seemed to most influence your decision about your diagnosis? (please rank order from highest to lowest)
   a. History of early infancy temperament
   b. Current activity level of the child as observed in the video tape
   c. Current activity level of the child as reported by the parents
   d. Parents' interest in solving the child's problem
   e. Reported stressors in the child's home environment
   f. Other

12. Please indicate any concerns that you might have about prescribing Ritalin and other psychostimulants to young children?
Appendix D

Figures Depicting Results of ANOVAs
Figure 1. Diagnosis Under Experimental Conditions.
Figure 2. Change in Diet Recommended as Treatment.
Figure 3. Child Behavior Therapy Recommended as Treatment Stress by Parental Motivation.
Figure 4. Child Behavior Therapy Recommended as Treatment Video by Parental Motivation.
Figure 5. Child Counseling Recommended as Treatment.
Figure 6. Child Counseling Recommended as Treatment.
Figure 7. Parent Training Recommended as Treatment for Low Video.
Figure 8. Parent Training Recommended as Treatment for High Video.
Figure 9. Importance of History in Diagnostic Decision.

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Figure 10. Importance of Reported Stress in Diagnostic Decision (Low Video Condition).

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Figure 11. Importance of Reported Stress in Diagnostic Decision (High Video Condition).
Appendix E

Human Subjects Institutional Review Board Approval Form
Date: May 7, 1993

To: Helle Augustesen

From: M. Michele Burnette, Chair

Re: HSIRB Project Number 93-04-23

This letter will serve as confirmation that your research project entitled "Assessing pediatricians diagnostic practices: An analogue study of responses to ADHD-like presentations in preschoolers" has been approved under the exempt category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application.

You must seek reapproval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: May 7, 1994

xc: Meinhold, PSY
REFERENCES


