1990

An Investigation of Variables Which Predict Social Skills Functioning in Children With Attention Deficit Hyperactivity Disorder.

Kelly Lynn Raymond

Louisiana State University and Agricultural & Mechanical College

Follow this and additional works at: https://digitalcommons.lsu.edu/gradschool_disstheses

Recommended Citation

https://digitalcommons.lsu.edu/gradschool_disstheses/5088

This Dissertation is brought to you for free and open access by the Graduate School at LSU Digital Commons. It has been accepted for inclusion in LSU Historical Dissertations and Theses by an authorized administrator of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.
INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
An investigation of variables which predict social skills functioning in children with Attention-deficit Hyperactivity Disorder

Raymond, Kelly Lynn, Ph.D.
The Louisiana State University and Agricultural and Mechanical Col., 1990
AN INVESTIGATION OF VARIABLES WHICH PREDICT SOCIAL SKILLS FUNCTIONING IN CHILDREN WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER

A Dissertation
Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy in
The Department of Psychology

by
Kelly Lynn Raymond
B.A., Vanderbilt University, 1985
M.A., Louisiana State University, 1987
December 1990
Acknowledgments

I would like to express many thanks to my dissertation advisor, Dr. Johnny L. Matson, for his support and guidance throughout this project. I would also like to thank Drs. Fredda Blanchard-Fields, Mary Lou Kelley, and Dirk Steiner for their expert advice and suggestions. In addition, I would like to express my deep appreciation to Esther Winters and Dr. Ann Goodrich for their moral support as well as their willingness to spend generous amounts of time collecting data for this endeavor. Finally, I would like to thank my husband, Jeff, for his tremendous encouragement through both the frustrations and successes emanating from this undertaking.
Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Acknowledgments</td>
<td>ii</td>
</tr>
<tr>
<td>II. List of Tables</td>
<td>iv</td>
</tr>
<tr>
<td>III. Abstract</td>
<td>vi</td>
</tr>
<tr>
<td>IV. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>V. Method</td>
<td>42</td>
</tr>
<tr>
<td>VI. Results</td>
<td>50</td>
</tr>
<tr>
<td>VII. Discussion</td>
<td>56</td>
</tr>
<tr>
<td>VIII. Tables</td>
<td>62</td>
</tr>
<tr>
<td>IX. References</td>
<td>74</td>
</tr>
<tr>
<td>X. Vita</td>
<td>93</td>
</tr>
</tbody>
</table>
List of Tables

I. Table 1  Means, Standard Deviations, Minimum Values and Maximum Values for WISC-R and K-TEA Scores ...................... 62
II. Table 2  Correlation Matrix: SSRS-T Subscales with IQ Scores, ADHD Symptoms, Aggression and Academic Achievement Scores .................................. 63
III. Table 3  Correlation Matrix: MESSY Subscales with IQ Scores, ADHD Symptoms, Aggression and Academic Achievement Scores .................................. 64
IV. Table 4  Correlation Matrix: IQ Scores, ADHD Symptoms, Aggression and Academic Achievement Scores .......................... 65
V. Table 5  Correlation Matrix: MESSY Subscales with SSRS-T Subscales ...................... 66
VI. Table 6  Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on MESSY Factor 1 .................................. 67
VII. Table 7  Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on MESSY Factor 2 .................................. 68
List of Tables (Continued)

VIII. Table 8  Regression of Full Scale IQ, ADHD
    Symptoms and Aggressiveness on Total MESSY Score............................... 69
IX. Table 9  Regression of Full Scale IQ, ADHD
    Symptoms and Aggressiveness on SSRS Cooperation Subscale..................... 70
X. Table 10 Regression of Full Scale IQ, ADHD
    Symptoms and Aggressiveness on SSRS Assertion Subscale....................... 71
XI. Table 11 Regression of Full Scale IQ, ADHD
    Symptoms and Aggressiveness on SSRS Self-Control............................... 72
XII. Table 12 Regression of Full Scale IQ, ADHD
    Symptoms and Aggressiveness on SSRS Total Score............................... 73
Abstract

The focus of this paper was on defining variables associated with social skills of children diagnosed with Attention-deficit Hyperactivity Disorder, as currently defined in the DSM-III-R. Sixty-six boys aged six through 10 participated in the study. Diagnosis of ADHD was made by a licensed psychologist in a private practice setting. Each student was administered the Wechsler Intelligence Scale for Children-Revised and the Kaufman Test of Educational Achievement. The primary teacher of each student completed the Matson Evaluation of Social Skills with Youngsters (MESSY), the Social Skills Rating System-Teacher Form (SSRS-T), the Revised Conner's Teacher Rating Scale (CTRS-R), the IOWA Conner's Teacher Rating Scale (IOWA), and the Swanson, Nolan, and Pelham (SNAP) Checklist. Correlational analyses supported hypotheses that scores on the social skills measures were related significantly to measures of inattention, impulsivity, inattention, aggression, and academic achievement. Regression analyses were performed in order to determine a parsimonious model which would account for the relationship between symptoms of ADHD, aggression, academic competence and social skills functioning. The results of these analyses are discussed along with the relevancy of the findings in relation to suggestions for future research.
The study of childhood psychopathology as a specialized branch of psychology has a relatively recent origin. Historically, children have been treated as miniature adults (Ollendick & Hersen, 1983). Only since World War II has there been any major attempt to differentially diagnose the etiology and composition of childhood pathology as discriminable from pathology in adults (Elkind & Weiner, 1978). Fortunately, the past 10 to 20 years have witnessed an increase in the number of books and articles devoted to the discussion of problems distinctive to children (Ollendick & Hersen, 1983). This growing interest in describing pathology prevalent in younger individuals has been accompanied by a comparative increase in the number of professionals and paraprofessionals dedicated to the study and remediation of childhood disorders (Matson & Ollendick, 1988). With this expansion has come both a broadening of the areas under investigation, as well as specialization within those areas. As researchers and clinicians gain knowledge concerning effective methods of treatment, application of these treatments across many different behavior problems becomes possible (Matson & Ollendick, 1988).

One of the most studied childhood disorders is Attention-deficit Hyperactivity Disorder (ADHD). This trend
reflects the fact that more children are referred for
treatment of this disorder than any other single problem
(Barkley, 1988). The importance of investigating ADHD
cannot be underestimated, as these children experience
difficulties in multiple areas of functioning. The primary
focus of this paper will be to examine the relationship
between ADHD and corresponding deficiencies in one
particular area of development, namely social competency.

First, a general description of this disorder will be
presented. The next section is devoted to a review of
factors which constitute a socially skilled individual, and
the relation of these social skills to the future
development and maturation of the individual. Finally,
research will be reviewed which focuses on the extent of
social skills deficiencies in children with
Attention-deficit Hyperactivity Disorder. We feel this is
important since identifying and remediating social
deficiencies may prove to be an important aspect of
treatment in hyperactive children. Please note that in this
section, the terms "hyperactivity," "ADD/H" and "ADHD" will
all refer to the heterogeneous group of children who have
been diagnosed with the disorder.

Attention-deficit Hyperactivity Disorder

General Description. The Diagnostic and
Statistical Manual of Mental Disorders, Third
Association, 1987) defines the essential features of Attention-deficit Hyperactivity Disorder (ADHD) as "developmentally inappropriate degrees of inattention, impulsiveness, and hyperactivity." These core symptoms are chronic in nature, but may be present in varying degrees. In addition, some children may exhibit problems across multiple environments, such as home, school, and social events, while others may demonstrate behavioral difficulties in only one or two specific situations. Many researchers have noted that due to the wide variety in expression of symptoms combined with the degree to which the symptoms are observed across situations, considerable heterogeneity exists among those children diagnosed with a common label of ADHD (Barkley, 1982).

Current prevalence estimates indicate that about three to five percent of school-age children may be diagnosed with ADHD (Bosco & Robin, 1980; Lambert, Sandoval, & Sassone, 1978; McGee & Silva, 1984). These estimates suggest that at least one child in every classroom across the country may possess the disorder. There is a disproportionate sex ratio in those children diagnosed with ADHD. Boys are more commonly labeled as ADHD, with rates three to six times that of girls (Ross & Ross, 1982; Trites, Dugas, Lynch, & Ferguson, 1979). Onset must occur before age seven. However, symptoms
are noted before age four in about 50% of the cases (DSM-III-R, APA, 1987).

Although developmental differences have been observed in how the symptoms of ADHD are manifested across age, these children continue to have problems throughout childhood and adolescence. Approximately 30% of ADHD children essentially outgrow their symptoms by the time they are young adults, with another 30% continuing to have mild to moderate impairment resulting from the disorder. The remaining 30% exhibit relatively severe disturbances in behavioral, social, and occupational adjustment (Pelham & Murphy, in press).

Diagnosis. The criteria for diagnosis and conceptualization of ADHD have a long and complex history. Over the years, many terms have been used to describe this disorder including "defects in moral control" (Still, 1902), "minimal brain damage" and "minimal brain dysfunction" (Clements & Peters, 1962), "hyperkinetic syndrome" and "hyperactivity." Changes in the terminology used to identify children with ADHD primarily have occurred as a result of shifts in researchers' theoretical conceptualization of the disorder. For instance, the DSM-II (American Psychiatric Association, 1968) included a diagnostic category of "Hyperkinetic Reaction of Childhood." Implicit in this label was the assumption that
hyperactivity was the core symptom of the disorder. Determination of this symptom was left to clinical judgment, however, as no operational criteria were defined in the DSM-II (APA, 1968) with which to differentially diagnose this disorder.

The work of Douglas (1972, 1974, 1976) inspired a major change in the way this syndrome was characterized. This researcher suggested that overactivity was not the primary symptom or even a necessary symptom of the disorder. Rather, Douglas (1972) posited that inability to sustain attention and to control impulses were the essential features of hyperactivity.

Hence, there followed a differentiation in the DSM-III (American Psychiatric Association, 1980) such that a child was diagnosed as either Attention-Deficit Disorder with Hyperactivity (ADD/H) or without Hyperactivity (ADD/WO). Using this system, an individual must exhibit a specified number of behaviors which can be subsumed under the core symptoms of hyperactivity, impulsiveness and inattentiveness. When the subject displayed the required number of items in each of these three dimensions, the diagnosis of ADD/H was made. A child failing only to demonstrate the specified number of hyperactive behaviors was classified as ADD/WO. This method of classification implies a monothetic definition. In other words, ADD is assumed
to be multidimensional in nature, such that only those children who meet the criteria on a number of symptoms are diagnosed.

With the advent of the DSM-III-R (American Psychiatric Association, 1987) came another change in the method used to categorize "hyperactivity." A shift to a polythetic definition took place mainly due to a lack of empirical evidence that ADD/H and ADD/WO were two separate diagnostic entities (Maurer & Stewart, 1980). Using this new diagnostic conceptualization, a child must exhibit at least eight out of 14 symptoms which describe problems previously listed in the DSM-III under the dimensions of inattention, impulsivity, and hyperactivity. However, the DSM-III-R does not require that a distinction be made concerning which items or combination of items must be present to fulfill diagnostic criteria.

In sum, a number of classification schemes have been applied to define the cluster of symptoms commonly known as "hyperactivity." These systems have included definitions based on presence of organicity, emphasis on a single behavior such as motor activity or attentiveness, and the application of either monothetic or polythetic concepts.

Subgrouping. Regardless of the diagnostic system used to make classifications, children who exhibit the
constellation of symptoms qualifying them to be labeled with Attention-deficit Hyperactivity Disorder constitute a very diverse and heterogeneous group. For this reason, many researchers have suggested the need to discriminate subgroups of ADHD children (Barkley, 1982; Langhorne, Loney, Paternite, & Bechtoldt, 1976; Pelham & Milich, 1984). The ability to delineate homogeneous subgroups has the potential of allowing researchers and clinicians to make more accurate predictions regarding prognosis and treatment outcomes. The determination of significant correlations between specific subtypes and other variables including etiology and degree of symptomatology would greatly improve the meaningfulness of this diagnostic classification.

Characteristics which have been investigated as possible ADHD subgroup variables include: presence and degree of aggressiveness (Loney, 1980; Loney & Milich, 1982; Milich & Loney, 1979), presence of learning disabilities (Slicek & Landau, 1984), various measures of organicity (Zametkin & Rapoport, 1986), drug responsiveness (Swanson & Kinsbourne, 1979), and situational (ADHD identified by either teachers or parents) versus pervasive (ADHD identified by both teachers and parents) ADHD (Schleifer, Weiss, Cohen, Elman, Cvejic, & Kruger, 1975).

While many of these variables have not proven
fruitful in accounting for significant differences between groups, a few have provided useful information. For example, Loney and her colleagues (Loney, Langhorne, & Paternite, 1978; Milich, Loney, & Landau, 1982) have presented data to support the presence of aggression as a valid and important subtype of ADHD. These findings have important implications. For instance, it should be noted that many researchers have recognized the frequent co-occurrence of the externalizing diagnoses ADHD and Conduct Disorder. Indeed, various studies have claimed co-occurrence rates ranging from 30% to 90% (Hinshaw, 1987). Because of the significant overlap between these disorders, some clinicians have concluded that they are actually two variants of the same disorder (Lahey, Green, & Forehand, 1980; Quay, 1979).

In response to this controversy, Loney et al.'s (1978) research is significant in that they have been able to distinguish through factor analysis specific behaviors that load on independent symptom dimensions labeled as Hyperactivity and Aggression. That is, the hyperactivity dimension was defined by behaviors such as overactivity, inattention, and judgment deficits/impulsivity, whereas behaviors associated with the Aggressive dimension included irritability, aggressive interpersonal behavior, and antisocial acts. Furthermore, Milich and Fitzgerald (1985) reported that
behaviors associated with the Aggressive factor tended to be more interpersonal in nature. That is, this factor was most highly correlated with inappropriate social interactions with teachers or peers. However, the Hyperactive factor was more highly correlated with task-specific behaviors such as failing to attend to classwork, minor motor activity, and playing with objects.

A number of family background variables also have been differentially correlated with the Aggressive versus Hyperactive factors (Loney et al., 1978; McGee, Williams, & Silva, 1985). Characteristics such as socioeconomic status, family hostility, and measures of parental psychopathology were significantly associated with aggression scores, but not with hyperactivity scores.

Subsequent research by Loney (Loney et al., 1978; Loney & Milich, 1982) and other investigators (Reeves, Werry, Elkind, & Zametkin, 1987) has shown that ADHD children who concurrently are rated as exhibiting aggressive symptomatology are demonstrably different on a number of social, behavioral and cognitive dimensions when compared to those ADHD children who are not rated as aggressive. For instance, Pelham and Bender (1982) found that ADHD boys with and without aggressive characteristics interact negatively with peers, and also
receive high numbers of negative peer nominations. However, boys rated as both hyperactive and aggressive have been found to be more impulsive, bossy, and aggressive in their interactions when compared to boys who are simply rated as hyperactive.

There is some research which suggests that children with both ADHD and aggressive characteristics exhibit poorer performance on intellectual and achievement tests (August & Stewart, 1982). However, these results are not consistently found, and much exiting data is conflicting (Werry, Reeves, & Elkind, 1987).

In regard to prognosis, ADHD boys with aggression are initially less responsive to stimulant medication, and much more likely to have significant problems into adulthood when compared to those boys with ADHD alone (Loney et al., 1978; Schachar, Rutter, & Smith, 1981).

Another characteristic which researchers have hypothesized to be a diagnostically relevant subgroup of ADHD is the presence of a learning disability. It is commonly accepted that children with ADHD are more likely as compared to non-ADHD peers to exhibit academically-related problems (Cantwell & Satterfield, 1978; Goldstein, 1987; Lambert & Sandoval, 1980) and perform more poorly on tests of intellectual ability (Loney, 1974). Recently, investigators have suggested that studies be conducted comparing ADHD children with
and without concomitant learning disabilities in order to determine whether significant differences between these two groups exist. Few studies of this type actually have been conducted, and those that have been undertaken contain serious methodological limitations.

However, a study by Halperin, Gittelman, Klein, and Rudel (1984) suggests that ADHD children who also have a reading disability may differ from children only presenting with ADHD in their performance patterns on the WISC-R. While those students with a reading disability exhibited a higher Performance IQ, students without a reading disability demonstrated a higher Verbal IQ. In that these results supply limited evidence for the validity of subgrouping ADHD children on the basis of a concomitant learning disability, further research is needed to resolve this issue.

In sum, recent trends toward finding subgroups within diagnostic categories of ADHD appear to be worthwhile. Because children diagnosed as ADHD constitute an extremely heterogeneous group, success in delineating contributing etiological variables, prescribing effective treatments, and making accurate predictions regarding prognosis ultimately depend on defining homogeneous groups. It is possible that much of the research on various aspects of ADHD either has supported the null hypothesis or has resulted in
conflicting results because of the heterogeneity inherent in the samples utilized.

As discussed above, the concomitant presence of aggressive characteristics with ADHD provides important information regarding the parameters of the individual's disorder. Interestingly, as Loney and Milich (1982) have noted, the vast majority of research on ADHD has been conducted without separating these two groups. Therefore, "we do not have a literature about childhood hyperactivity as such; instead, we have a literature about childhood externalizing behavior problems (hyperactivity and aggression) that we call a literature about childhood hyperactivity" (Loney & Milich, 1982, p. 143). Taken in this light, many of the current premises upon which clinicians and researchers base assessment and treatment practices may be uninformative.

Overview of Social Skills

Within the past decade, there has been a proliferation of studies with social skills functioning as the primary focus of investigation. The importance of adequate social competence has been increasingly recognized by a number of professionals across many fields of interest (Matson & Ollendick, 1988).

The prevalence of social skills problems is of considerable magnitude. For instance, Hymel and Asher (1977) noted that approximately 6% of children in normal
classrooms have no friends, whereas another 12% of children report having only one friend. Extensive investigation of variables related to the development of social skills and social competency, particularly in children, seems warranted due to the pervasiveness of social inadequacies and the negative long-term effects of such problems.

Social skills repeatedly have been demonstrated to play an integral role in the individual's reception of social, academic, and emotional rewards. Social skills have been implicated as an important medium through which the individual can initiate and maintain interpersonal relations (Phillips, 1978). The development of social skills has been directly related to overall adjustment and later functioning in society.

During childhood, prosocial behaviors are an essential means through which the individual can establish rewarding peer relations, and can assimilate social norms (Michelson, Sugai, Wood, & Kazdin, 1983). For this reason, an individual's social incompetency has profound negative effects across a number of behavioral dimensions, both in terms of present and future functioning (Gresham, Elliott, & Black, 1987; Michelson et al., 1983). In addition, in children who are unable to develop adequate social skills, these negative effects may compound themselves with age, as basic
skills may be lacking which prevent the development of more complex interaction patterns. These individuals may also be deprived of certain experiences due to poor social interaction skills, which may lead to further maladjustment (Bierman & Furman, 1984).

Persons who are unable to engage in prosocial behaviors have been shown to experience social isolation, social rejection, and overall diminished happiness (Michelson et al., 1983). In addition, deficits in socially appropriate behavior have been related to peer acceptance and popularity (Asher & Hymel, 1981), school maladjustment (Gronlund & Anderson, 1963), high rates of dropping out of school (Ullman, 1957), and juvenile delinquency (Roff, Sells, & Golden, 1972). Furthermore, bad conduct discharges from military service (Roff, 1961), and adult mental health difficulties (Cowen, Pederson, Babligian, Izzo, & Trost, 1973) have been related to poor social skills in later life.

The pervasive effects resulting from poor social interaction patterns as both a component in establishing interpersonal relationships, and in maintaining certain forms of psychopathology have been well documented. In several studies, Hersen and Bellack (1976) examined the effects of social skills training as a method of decreasing behavior problems resulting from chronic
schizophrenia. Results indicated that adjustment to the community could be enhanced in these persons through increasing adaptive social behaviors. In addition, poor social skills development has been associated with the social withdrawal and self-motivated isolation typically exhibited by persons with depression (Helsel & Matson, 1984; Lewinsohn, 1975).

In summary, social skills have been demonstrated as significant prognostic indicators for future development of the individual. They are related to numerous positive long-term outcomes for the individual, including the establishment of meaningful interpersonal relationships, and the incorporation of societal norms. Furthermore, those persons exhibiting "poor" social skills are at risk for developing emotional disturbances and psychopathology.

Theoretical Issues in the Definition of Social Skills. The study of social skills originally began through research with adults, with studies focusing on assertion training (McFall & Lillesand, 1971; McFall & Marston, 1970). Emphasis was placed on teaching the individual to display appropriate amounts of assertion, and to eliminate overly passive or overly aggressive behavior (MacDonald, 1982). Appropriate behavior was defined in terms of the person's sex and in regard to where the behavior was to be displayed.
With initial successes in training assertion skills, the field of social skills was inundated with researchers interested in expanding current knowledge in the area, with many different theoretical conceptions and definitions of social skills being presented (McFall, 1982). In efforts to define "social skills," the relationship between social skills and social competence has also been debated. Some researchers have not made a distinction between social competency and social skills, using the two terms interchangeably. However, most experts in the area would agree at least that a basic and more appropriate definition of "social competency" is a term to describe global judgments of the degree to which an individual exhibits socially skilled behaviors in appropriate settings. As McFall (1982) has stated "Competence is a general evaluative term that reflects somebody's judgment, on the basis of certain criteria, that a person's performance on some task is adequate" (p. 13). These evaluations may be made by the individual or by other persons with whom the individual has contact.

Conversely, the term "social skills" refers to those "specific abilities required to perform competently at a task" (McFall, 1982, p. 12). In general, three approaches to defining social skills have been presented. First, some researchers prefer to
define social skills in terms of peer acceptance (Asher & Hymel, 1981). This outcomes-oriented approach considers the best measure of social skills to be the extent to which the individual is accepted by his/her peers. Typically, peer nominations or peer ratings are employed, with those children receiving a relatively high number of positive nominations or ratings considered to be socially skilled. While these methods allow for discrimination between those children most likely to be accepted and rejected by their peers, they do not indicate which behaviors are problematic or in need of remediation (Gresham & Elliott, 1984).

A second, process-oriented conceptualization considers social skills to be specific behaviors exhibited in specific situations that increase the probability of positive reinforcement and decrease the probability of either punishment or extinction (Bellack & Hersen, 1979; Libet & Lewinsohn, 1973). Using this approach, behaviors posited to represent important social skills are operationalized and observed in naturalistic settings or behavioral role plays. Examples of such verbal and nonverbal behaviors include initiating conversations, giving praise, eye contact, smiling, and gesturing. A valid criticism of this approach is that while researchers may specify the social behaviors, their antecedents and their
consequences, the choice of behaviors is often idiosyncratic and not empirically based. In addition, they often fail to demonstrate that these behaviors are socially significant (Gresham & Elliott, 1984).

A third approach focuses on the social validity of behavior. This content-oriented approach defines social skills in terms of behavior expressed in particular situations that predicts important social outcomes for the individual (Trower, 1979). Examples of socially important outcomes include: peer acceptance, peer popularity, significant others' judgments of behavior, or other social behaviors which correlate with either peer acceptance or others' judgments (Gresham, 1986). This method essentially incorporates aspects of the other two definitions in that the behaviors considered "social skills" are specified, and they are linked to socially valid outcomes. Researchers employing this definitional approach advocate the use of observations of behavior, sociometric measures and ratings by others in assessing the individual's social skills (e.g., Green, Forehand, Beck, & Vosk, 1980).

In sum, with the increased interest in social behavior, numerous theoretical issues have developed concerning the definition and measurement of social skills. It is generally accepted that social skills constitute the specific behaviors upon which others base
judgments of the individual's social competency. Three general definitional approaches have been presented in the literature on which most research and assessment of social skills is based, including the outcomes-oriented, process-oriented, and content-oriented approaches.

**Correlates of social skills.** Many factors correlate with adequate social behavior and social status including physical attractiveness (Dion & Berscheid, 1974; Vaughn & Langlois, 1983), prosocial behaviors (Hartup, Glazer, & Charlesworth, 1967), aggressiveness (Dodge, 1983), motor skills (Hops & Finch, 1985), intelligence (Ollendick, Francis, & Hart, 1985), academic achievement (Green, Forehand, Beck, & Vosk, 1980) and sequences of entry strategies (Dodge, Schlundt, Schocken, & Delugach, 1983). A few of these factors will be discussed in more detail, since they have been suggested as possible influences in ADHD children's acquisition of social skills (Milich & Landau, 1982).

Numerous researchers have presented evidence that the exhibition of prosocial behaviors is significantly related to popularity among one's peers (Dodge, 1983; Dodge, Coie, & Brakke, 1982; Hartup, Glazer, & Charlesworth, 1967). Specifically, Hartup et al., (1967) found that popular children display high rates of both initiating and receiving positive social
interaction. Children more likely to be socially accepted also tend to play more cooperatively with peers, and display positively reinforcing behaviors.

Conversely, negative, disagreeable, and certain forms of aggressive behaviors have been associated with poor social skills and unpopularity. For example, Putallaz and Gottman (1981) conducted observations of preschool children as they attempted to join an unfamiliar peer group. Those children rated as unpopular were more disagreeable, more frequently stated their feelings and opinions, talked about themselves, and asked more informational questions than popular children. Similar results have been reported by others (Coie & Kupersmidt, 1983; Dodge et al., 1982; McGuire, 1973). Furthermore, Dodge (1983) observed boys rated as popular and unpopular by peers and found that the latter group more often violated classroom rules and disrupted ongoing peer activities. In addition, boys more likely to be rejected by peers spent a high proportion of time engaged in physical aggression and antisocial acts, including insults, threats, and contentious statements.

Academic achievement is another variable associated with judgments of social competence and peer acceptance (Bursuck & Asher, 1986; Butler, 1979; Green, et al., 1980). Indeed, Dubow and Cappas (1988) reported that children rejected by their peers were more likely to
exhibit academic difficulties when compared to children with a more favorable social status. The relationship between academic performance and social behavior is especially important in light of a study by French and Waas (1985). These researchers discovered that children who were rejected by their peers were more likely to be identified by their teachers as having social problems if they also exhibited poor academic achievement. While it is generally accepted that children with academic problems are more likely to experience concomitant social rejection, as yet the nature of the relationship between these variables is yet to be determined.

To summarize, children who display high rates of prosocial behavior have an increased likelihood of being accepted by their peers. Conversely, children exhibiting disproportionate amounts of negative and aggressive behaviors are at risk for being rejected by their peers. Additionally, academic competence has been associated with others' perceptions of social skills. That is, children who have academic difficulties are also likely to be rejected by their peers on sociometrics and to be judged as exhibiting poor social skills by their teachers.

Social Skills of ADHD Children

Many prominent researchers in the field of ADHD have recognized that individuals with ADHD are likely to
have significant social problems (Barkley, 1983; Campbell & Paulauskas, 1978; Carlson, Lahey, Frame, Walker, & Hynd, 1987; Cunningham, Siegel, & Offord, 1985; Klein & Young, 1979; Milich & Landau, 1982; Pelham & Bender, 1982; Whalen, Henker, Castro & Granger, 1987). Interestingly, social problems are rarely the primary reason for referral to a professional. However, it has been suggested that even when the core behavioral problems associated with ADHD (i.e., impulsivity, hyperactivity, and inattention) have decreased, long-range problems may still exist due to problematic social behaviors and skill deficits (Pelham & Bender, 1982).

The fact that ADHD children are likely to have social problems is not surprising given that they characteristically display many behaviors associated with increased risk for social skills deficits. For example, as discussed above, many ADHD children exhibit concurrent problems with aggressiveness. Also, due to their inattentiveness and impulsiveness, it would not be unexpected that they spend less time compared to normal peers engaged in prosocial behaviors. Furthermore, ADHD children are at greater risk than non-ADHD peers for academic deficiencies. All of these factors have been associated with judgments of social incompetency in normal children. While intuitively one would expect
these variables to correlate with social problems of ADHD children, only within the past decade have researchers begun the systematic investigation of social behaviors and peer relationships among those children diagnosed with ADHD.

**Peer Ratings.** Many studies have employed the use of peer nomination techniques to determine the ADHD children's status among their peers. For example, Pelham, Schnedler, Bologna, and Contreras (1980) developed sociograms for a number of classrooms in which there was at least one child diagnosed as either hyperkinetic reaction of childhood (according to DSM-II, APA, 1968) or ADD/H (according to DSM-III, APA, 1980). Each child in the classroom was asked to name "three children that he or she likes a lot in the class--who were his or her friends" and "three children that he or she did not like very much--who were not friends." Six out of seven children receiving a diagnosis were given negative nominations on the average of two standard deviations above their individual class means.

Pelham and Bender (1982) report another study in which the Pupil Evaluation Inventory (PEI) was administered to 587 children in grades one through six. Within this sample, 64 were subsequently diagnosed with ADD/H. The PEI is a 35-item peer nomination inventory on which each child is asked to nominate as many
classmates as they choose for each item. Results indicated that ADD/H children received a significantly greater number of nominations on immature, annoying, and aggressive behaviors. Examples of such items include "getting mad when they don't get their own way," "trying to get other people into trouble," "being mean and cruel to other children," "making fun of people," and "starting a fight over nothing."

Johnston, Pelham, and Murphy (1985) replicated the results above in a similar study. Using the same procedure, these researchers found that both male and female ADD/H children received fewer nominations on the "Likability" factor of the PEI, and a greater number of nominations on the "Aggression" factor. In addition, ADD/H males were noted to receive significantly higher scores on the "Withdrawal" factor when compared to non-ADD/H males. A developmental trend was noted in that older ADD/H children received lower scores on both the Aggression and Withdrawal factors. However, ADD/H children of all ages still were perceived as being substantially different from peers in their social behavior, suggesting that deficits in social competence do not improve simply by growing older.

Carlson et al. (1987) compared the sociometric nominations of children diagnosed Attention Deficit Disorder with Hyperactivity, without Hyperactivity, and
a normal control group. Classmates were instructed to write down the names of the three children they liked the most, the three children they liked the least, and the three who fought the most. Both diagnostic groups received a higher number of least liked nominations, a lower number of most liked nominations, and lower social preference scores (number of liked most minus the number of least liked nominations) when compared to the normal children. In addition, analyses indicated that the only difference between the ADD/H and the ADD/WO groups was the former group received a higher number of nominations for fighting. Similar results also were reported by King and Young (1982).

Peer perceptions were measured by deHaas (1986) using a sociometric technique called the Bower Class Play (Bower, 1969). This measure requires the target students' classmates to nominate class members for either positive or negative roles in a hypothetical play. Comparisons of ADD/H and normal students revealed the hyperactive group received a significantly higher number of nominations for negative roles.

Klein and Young (1979) also employed the Bower Class Play to investigate differences between hyperactive and active but normal boys. Similar to the results discussed above, the hyperactive boys were nominated more frequently for the negative class roles.
The hyperactive boys also were not chosen as often for the role of "true friend."

These findings were replicated and expanded in a later study by King and Young (1981). Again, using the Bower Class Play, hyperactive boys were nominated for more negative roles and fewer positive roles. Social preference was also computed for the hyperactive and active but normal groups, with the latter group receiving higher preference scores comparatively. Furthermore, the normal group had more reciprocal friends than the hyperactive group. That is, normal boys were more likely than hyperactive boys to be nominated for a positive role by an individual they themselves had nominated for a similar role.

Peer ratings of hyperactive boys were obtained by Grenell, Glass and Katz (1987). Each hyperactive child was paired with a normal comparison child, and required to interact during a variety of tasks emphasizing different types of social skills in order to succeed in task completion. Both groups of boys were then asked to rate on a scale of one to five how much they would like to work with their partners in school, how much they would like to play with their partners at home, and how good a friend their partners would make. Analyses indicated that hyperactive boys were rated as significantly less desirable only as a work partner.
**Teacher Ratings.** A number of studies have investigated teachers' perceptions regarding the social behavior of ADHD children. Paulauskas and Campbell (1979) had teachers of 16 hyperactive boys and 30 control boys complete the Peer Interaction Checklist. This instrument consists of 35 items rated on a 4-point scale, which include behaviors describing interpersonal and peer relations. Overall, teachers described the hyperactive students as exhibiting greater difficulty interacting with peers when compared to controls. In contrast to reports based on sociometric measures, teachers in the present study rated older hyperactive students as having significantly greater social skills deficits when compared to younger hyperactive boys.

In two separate studies, Klein and Young (1979) and King and Young (1981) compared teacher ratings of hyperactive and active but normal boys on the Conners Teacher Rating Scale. Specifically, these researchers were interested in the factor scores for the "Unsociability" dimension. Significant differences in both studies were found between the two groups on this factor.

**Observational Assessments.** Observational assessments have also been conducted in order to explore the social interactions of ADHD children in their natural environments. Klein and Young (1979) observed
pairs of boys consisting of one hyperactive child and one active but normal child. A total of 40 target child and peer behaviors were coded for two consecutive days. Correlations were calculated for all the targeted behaviors, and subsequently reduced to four major variables: 1) frequent positive peer interaction; 2) negative peer interaction; 3) on-task behavior; and 4) high activity and disruption. Comparisons between the hyperactive and control groups indicated that they exhibited significantly different patterns of behavior on the latter three variables described above. That is, the hyperactive boys demonstrated higher frequencies of negative peer interaction, more off-task behavior, and greater amounts of activity and disruption within the classroom.

A study undertaken by Grenell, Glass and Katz (1987) compared the peer interactions of hyperactive and normal control students in three different situations, namely a free play session, a cooperative puzzle task, and a persuasion task. During the free play period, subjects were rated on the frequency of the following behaviors: initiating friendship, telling the partner what to do, positive social behavior, rejecting an initiation from the partner, negative social behavior, becoming distracted by the video camera, activity changes, noncommunicative vocalizations, and total
speech. Multivariate analyses revealed no significant differences between the two groups on any of the nine dependent variables.

The cooperative puzzle task consisted of both partners taking turns helping each other put together two 50-piece puzzles. Subjects were assigned either to the role of worker or helper, and subsequently switched roles. The worker was required to put the puzzle together, while the helper was given a picture of the puzzle and instructed to help the worker without touching any of the pieces. Behaviors observed while in the worker role included: asking for help, rejecting help, cheating by trying to see the picture, being out of seat, off-task remarks, frustration, noncommunicative vocalizations, and total speech. The helper was rated on the following: giving help, refusing to help, praise, criticism, cheating by showing the picture or touching the puzzle, out of seat, off-task remarks, noncommunicative vocalizations, and total speech. Significant differences between hyperactive and control subjects were observed only for behaviors while in the helper role. That is, the diagnostic group was observed to demonstrate more cheating, and more uncommunicative speech.

For the persuasion task, subjects were instructed to persuade their partners to play a game of his own
choosing rather than a game the partner had chosen. Variables targeted during this task consisted of: types of strategies employed, the number of different strategies used, the strategies' effectiveness, and total speech. As in the free play situation, no significant differences were noted.

Cunningham and Siegel (1987) also observed dyads composed of hyperactive paired with normal boys (mixed dyads), and additionally monitored dyads composed of normal with normal boys (normal dyads). Developmental differences were also investigated, as pairs of younger and older mixed and normal dyads were included. Behaviors were observed during three different situations, including a free play period, a cooperative task, and a simulated classroom period. Behaviors recorded during each of the situations were: positive interactions, controls (e.g., giving commands), solitary activity, positive responses to peer behavior, compliance with peer instructions, controlling responses, ignoring others, observing others, activity level, and on-task behavior.

During both the free play and simulated classroom settings, the mixed dyads engaged in significantly more controlling behavior than normal dyads. In addition, boys in the mixed dyads were more likely to respond positively to a command from peers than were boys in the
normal dyads. Comparatively, boys in normal dyads were more likely to respond to a command by observing their peers as opposed to overtly responding to a peer's controlling behavior. Another difference noted in the simulated classroom setting only was that the mixed dyads were less compliant with peers' commands. Analyses on behaviors during the cooperative task revealed the only difference between the mixed and normal dyads in this setting was the amount of time spent on task, with the former group spending considerably less time working on assigned material.

When comparing the older and younger dyads, the older students were less controlling and more compliant with peer commands in both the cooperative task and the simulated classroom settings. Additionally, older boys in both types of dyads exhibited a higher percentage of independent work and were less active compared to their younger counterparts.

In summary, research studies employing various sociometric measures, teacher reports, and observational assessments have yielded findings suggesting children with Attention Deficit Hyperactivity Disorder may be expected to display significant problems when interacting with their peers. Results have indicated that hyperactive students tend to be more rejected by their peers, receiving a higher frequency of negative
peer nominations and a lower frequency of positive nominations on sociometric instruments. In general, teachers of these children perceive them to exhibit a significantly greater number of problems being accepted by their peers, and to display deficits in age appropriate social skills. Furthermore, observational methods have revealed that hyperactive children have a negative impact on their peers, with their presence appearing to increase the frequency of negative and controlling interactions among normal peers. Children with ADHD also have been observed to exhibit a higher activity level and disruption in the classroom, to engage in more uncommunicative speech, and to be less compliant with peer instructions.

Problems in Assessment of Social Behavior in ADHD. Although very little debate has been presented in the literature regarding the point that ADHD children are indeed at an increased risk for social problems, serious methodological problems are inherent in most of the studies which have examined such issues. The most prevalent problem in much of the research on various aspects of the ADHD population, including social problems, involves the selection of subjects included for study.

As was discussed previously, this diagnostic category subsumes an extremely heterogeneous group.
While the core symptoms of the disorder are inattention, impulsivity, and hyperactivity, all three characteristics are not necessary for the label ADHD to be assigned. In addition, those symptoms which are present may be observed to varying degrees. Interestingly, very few investigators take this factor into account when defining the parameters of the sample selected or when generating conclusions regarding their findings.

A common practice in selecting students for inclusion in studies on ADHD is to define this diagnostic group in terms of scores on a parent or teacher behavioral checklist. More specifically, a cut-off score of 15 on the Conners Teacher Rating Scale (CTRS, Goyette, Conners, & Ulrich, 1978) has been predominantly used as the criterion upon which the hyperactive sample is defined. The CTRS consists of 28 items which include behaviors tapping the core symptoms of ADHD. The student's teacher is asked to rate the occurrence of each behavior on a scale ranging from "Not at All," "Just a Little," "Pretty Much," to "Very Much." Each item is then scored with "Not at All" = 0 through "Very Much" = 3. Students who receive a total score of 15 or above are typically designated as the target group. However, very infrequently are any combination of symptoms required for the student to be included in
the ADHD sample. In addition, Pelham & Murphy (in press) point out that due to increases in expectations for behavior as the child ages, a cutoff score of 15 identifies different levels of disorder severity at various ages.

The Swanson, Nolan and Pelham (SNAP, Swanson, 1981) Checklist is another behavioral checklist frequently used to determine children who qualify for inclusion in the diagnostic group. The items on this instrument are composed of the criteria for ADD/H and ADD/WO as defined in the DSM-III (APA, 1980). As with the CTRS, the occurrence of each item is to be rated and scored on a scale from "Not at All" through "Very Much." Although the criteria for diagnosis as either ADD/H or ADD/WO are more explicit than the CTRS in reference to the minimum number of behaviors within each domain (i.e., hyperactivity, inattention, and impulsivity), a wide degree of variation still exists within the diagnostic groups.

One result of the practice of using questionnaires such as the CTRS and the SNAP is that a high degree of intra-sample and inter-sample heterogeneity is prevalent throughout the literature, leaving open to question the generalizability of research findings. In regard to the studies investigating social skills and peer relationships in ADHD children, a large number, in fact,
have employed the use of either the Conners scales or the SNAP to define the ADHD groups (Clark, Cheyne, Cunningham, & Siegel, 1988; Cunningham & Siegel, 1987; Cunningham, Siegel, & Offord, 1985; deHaas, 1986; Grenell, Glass, & Katz, 1987; Johnston, Pelham & Murphy, 1985; King & Young, 1981, 1982; Madan-Swain & Zentall, 1990; Paulauskas & Campbell, 1979; Pelham & Bender, 1982; Wallander, Schroeder, Michelli, & Gualtieri, 1987). Since much of the data available on the social development of ADHD children has been based on studies composed of heterogeneous samples, the degree to which these results are generalizable across all children diagnosed with this disorder remains open to question.

Furthermore, it has been noted that the use of a cut-off score or the requirement that the student receive a score two standard deviations above the mean on a scale has resulted in an inordinate number of students with more severe symptomatology being selected for study. That is, children with attentional problems who do not exhibit symptoms of hyperactivity will likely receive lower scores on behavioral inventories, and therefore are more likely to be excluded from ADHD groups. Indeed, Ullmann, Sleator, and Sprague (1985) presented evidence to suggest that with the use of a cutoff score of 15 on the CTRS, clinical samples of ADHD children tend not to be composed of children whose
primary symptom is inattention, but rather consist of individuals who mainly exhibit problems with hyperactivity and conduct problems.

The relationship between ADHD and aggression also should be taken into account when analyzing the methods of subject selection. As Loney and Milich (1982) have discussed, a large proportion of ADHD children may also be diagnosed with a concomitant Conduct Disorder. The vast majority of research investigating the social behavior of ADHD children has failed differentiate those ADHD children with and without co-occurring problems with aggression. For this reason, the possibility remains that what is currently understood about issues such as deficits in social skills and the social status of ADHD children is actually information about a population consisting of both ADHD and Conduct Disorder. While statements concerning the social problems of all ADHD children are commonly accepted as fact, the truth may be that only some children with this disorder may be at risk for such difficulties.

Another problem inherent in the selection of subjects for inclusion in studies of ADHD children's social behavior is the use of both clinical and non-clinical samples. Many researchers have debated whether data gathered on students referred to professionals is comparable to information obtained on
individuals in normal classrooms, who through research endeavors are determined to have behavior problems (Barkley, 1982; Kendall & Brophy, 1981; Lahey, Schaughency, Hynd, Carlson, & Nieves, 1987; Weithorn, Kagen, & Marcus, 1984). Children referred to a clinic may constitute a more disordered group. Hence, the conclusions reached from these students may not be generalizable to other populations, and vice versa (Carlson et al., 1987).

Along these lines, some researchers have defined the diagnostic group in terms of judgments by psychiatrists, physicians, and teachers. For example, Wallander et al. (1987) and Whalen, Henker, Collins, McAuliffe, and Vaux (1979) included subjects for study if they had been diagnosed as meeting DSM-III criteria by a pediatrician or psychiatrist. Contrastingly, King and Young (1981) defined as hyperactive those boys who teachers defined as "one who did not respond appropriately to requests that he monitor his behavior and who was unable to handle the expectations of a structured setting." In another study, Klein and Young (1979) included students in the clinical sample whose teachers had described them as "a child who was hyperactive enough so that they were concerned about him." Clearly, the use of such widely diverse determinants as inclusionary criteria for ADHD leaves
open the question as to whether such groups are truly comparable.

In summary, many problems exist in the state of current knowledge regarding the social behaviors and social skills of children diagnosed with ADHD. Most of these problems center around the heterogeneity of the disorder, as it is currently defined. Children with differing patterns of symptoms have been treated as though they constituted a homogeneous population. For this reason, much of the information pertaining to the social competency of these children may be misleading or inaccurate. Further research is needed to disentangle the many variables which may be influencing the social development of ADHD individuals. The following section proposes a study which will more clearly define the relationship between symptoms of ADHD, variables associated with the disorder, and social behavior within this diagnostic category.

**Purpose of the Present Study**

It is commonly accepted that individuals diagnosed as ADHD are likely to have problems in their social development. The ultimate purpose in researching the social problems that this population encounters is to remediate such difficulties. However, many of the studies designed to eliminate social skills deficiencies in ADHD children generally have failed to demonstrate
success in effecting long-term gains in positive social interactions and peer acceptance (Pelham & Murphy, in press). For this reason, it seems reasonable that future research efforts should be aimed at identifying specific variables which may be contributing to problematic peer relations, hence improving treatment interventions which can be applied to this population.

The present study was designed to more clearly define the relationship between each core symptom of ADHD, i.e., inattention, impulsivity, and hyperactivity, and the social skills abilities of ADHD students. Individuals diagnosed with ADHD constitute an extremely heterogeneous population. While it is assumed by definition that these persons will display some amount of inattention, impulsivity, and possibly hyperactivity, the degree to which these three symptoms are present in each individual greatly varies. Previous research has examined the social functioning of ADHD children as a heterogeneous whole, without regard to the possibility that children exhibiting differing patterns of symptoms may also be discriminable in relation to their level of social skills. The current study will eliminate the problems with heterogeneous samples by including as independent variables each of the core symptoms and by examining their individual relationship with social skills. The present study also will improve upon
earlier studies which have included students expressing a restricted range of symptoms by including students with a wide variety of all core behaviors. The first hypothesis thus stems from these goals.

HI: The core symptoms of Attention Deficit Disorder, namely inattention, impulsivity, and hyperactivity, each will be negatively and uniquely related to the expression of social skills.

Another goal of this study will be to investigate the relationship of concomitant aggression in children diagnosed with ADHD. Recent research has been directed toward defining subgroups within the larger population which would lead to more precise descriptions of the disorder along with more accurate predictions regarding etiology, prognosis, and treatment effectiveness. Pelham and Bender (1982) conducted a study which compared children with aggression alone, hyperactivity alone, and both aggression and hyperactivity. Results indicated that children with both aggressive and hyperactive characteristics tended to have more significant peer relationship problems. However, it should be noted that the hyperactive students were defined as those who were scored above the group mean on a "Hyperactive" factor derived from the Behavior Problem Checklist. It is therefore difficult to determine how the children included in this study would compare to
other samples of ADHD children. The current study will improve existing knowledge by expanding our understanding of the relationship between social skills, aggression, and ADHD. The second hypothesis is based on this line of reasoning.

H2: Aggressiveness in ADHD children will be negatively related to social skills.

A third purpose of the proposed study will be to examine a variable which has been found to correlate with social skills in normal populations, but which has thus far been excluded for study with ADHD children. As was previously discussed, ADHD children exhibit an increased risk for academic achievement problems. This factor has been related to concurrent problems in social acceptance, with children demonstrating poor academic performance also having difficulty being accepted by their peers. The third hypothesis follows from previous research.

H3: Academic competence will be positively related to the expression of social skills.
Method

Subjects

Sixty-six boys aged six through 10 (Mean age = 7.73) participated in the study. Fifty-nine of the boys in the study were white, while six were black, and one was oriental. Eighty-two percent of the boys' parents were married, 16% were divorced, and 2% were separated at the time of the evaluation. The average income of the families was between $31,000 and $41,000. Five of the boys who participated were on medication for behavioral difficulties at the time of the assessment. Students presenting with physical impairments such as seizure disorders, mental retardation, visual or hearing impairments were excluded from the study. This approach is consistent with the literature in the field and is a means of ruling out variables that might confound attempts to evaluate children with ADHD.

Students included in the study were diagnosed as having Attention Deficit Hyperactivity Disorder by a licensed psychologist in a private practice setting. In order to assess the reliability of diagnoses, the psychologist rated each student on the degree to which he demonstrated the 14 behaviors associated with ADHD listed in the DSM-III-R. In addition, a graduate student who participated in the evaluation process also rated 36 of the students on the same 14 behaviors. Each
behavior was rated on a scale from "Not at All," "Just a Little," "Pretty Much," to "Very Much." Only students who were rated as exhibiting at least 8 of the behaviors were included for study.

Interrater reliability was determined by scoring each item based on "Not at All" = 0 to "Very Much" = 3. The degree of interrater agreement was calculated by using Pearson product-moment correlations between the scored given by each rater. Results revealed an $r = .92$, indicating high agreement between the raters.

**Instrumentation**

**Matson Evaluation of Social Skills with Youngsters (Teacher Report Form) (MESSY).** The MESSY is a 64-item questionnaire in which behaviors are rated on a five-point scale (1=not at all, 5=very much). The measure consists of two factors: 1) Inappropriate Assertiveness, and 2) Appropriate Social Skills. The MESSY was developed both to identify children with social deficiencies and to aid in assessing the severity of those social skills problems. The scale assesses a broad domain of observable social behaviors, including a wide range of verbal and non-verbal behaviors emphasizing interpersonal effectiveness without harm to other, and consists of approximately equal numbers of positive and negative items. Examples of items from this measure include: "Hurts others feelings on
purpose," "Braggs about self," "Does nice things for others who are nice to him/her," and "Asks questions when talking with others." The scale was developed based on research with children ages 4-18 and has adequate internal and external reliability. Split-half internal reliability between odd and even items was $r = .81$ (Matson, Macklin, & Helsel, 1984). Test-retest reliability for the teacher report was $r = .5$ (Matson, Rotatori, & Helsel, 1983).

**Social Skills Rating System - Teacher Form (SSRS-T).**

The teacher form of the SSRS, Elementary Level measures three general domains of student behavior: 1) Social Skills, 2) Problem Behaviors, and 3) Academic Competence. The Social Skills domain is composed of three subscales, including Cooperation, Assertion and Self-Control. In addition, a Total Social Skills score may be obtained. Each of the items is rated on a three-point frequency scale indicating "how often" the behavior happens, with 0=Never, 1=Sometimes, and 2=Very Often. In addition to the frequency of behavior, teachers are asked to rate "how important" each behavior is for success in his/her classroom. The importance dimension is also based on a three-point scale, with 0=Not Important, 1=Important, and 2=Critical.

The SSRS-T is an empirically based social skills measure, with the purpose of serving as an aid in
screening, classification, intervention planning, and treatment evaluation. Reliability estimates were obtained during a national tryout of the Social Skills Rating System. The internal consistency of this measure using coefficient alpha was above .90 for the total social skills score across all forms (Gresham, 1988). Studies using an earlier version of the SSRS-T (the TROSS) have supported the validity of this instrument. Clark, Gresham and Elliott (1985) found evidence of concurrent validity in that moderate negative correlations were obtained between the Acting Out and Immaturity factors of the TROSS and the Walker Problem Behavior Identification Checklist (Walker, 1976), with \( r = -.46 \). In addition, the Academic Performance factor of the TROSS-C has been correlated with teacher-rated academic achievement in reading and mathematics, with \( r = .72 \) (Clark, Gresham, & Elliott, 1985).

Revised Conner's Teacher Rating Scale (CTRS-R). The CTRS-R (Goyette, et al., 1978) consists of 28 items which include behaviors tapping the core symptoms of ADHD. Principle component factor analyses of this instrument have yielded a three-factor structure, entitled Conduct Problem, Hyperactivity, and Inattentive-Passive. The student's teacher is asked to rate each behavior on a scale ranging from "Not at All," "Just a Little," "Pretty Much," to "Very Much." Each
item is then scored with "Not at All" = 0 through "Very Much" = 3. Test-retest reliability over a 1-week period has been reported at .97 for the total score and from .94 to .98 for the factors (Edelbrock & Reed, 1984). The factors from this measure also have been found to correlate highly with the corresponding factors of the Child Behavior Checklist-Teacher Report Form, with the mean correlation between factors equal to .76 (Edelbrock, Greenbaum, & Conover, 1985).

IOWA Conner's Teacher Rating Scale (IOWA). This scale was developed by Loney and Milich (1982) in order to operationally define the constructs aggression and hyperactive. This measure was derived from the CTRS, and consists of 10 items which have been demonstrated to differentiate children diagnosed as purely aggressive from children diagnosed as purely hyperactive. Items are rated and scored in the same manner as the CTRS, and yield scores for two factors named Inattention/Overactivity (I/O) and Aggression (A). Internal consistency was found to be .87 for the I/O subscale and .85 for the A subscale. Test-retest stability coefficients were .89 for the I/O subscale and .86 for the A subscale (Loney & Milich, 1982).

Swanson, Nolan, and Pelham (SNAP) Checklist. The SNAP (Swanson, 1981) items are composed of the operational criteria for Attention Deficit Disorder as defined in
the DSM-III (APA, 1980). These items are clustered such that they represent the three core symptoms of the disorder, namely inattention, impulsivity, and hyperactivity. Similar to the CTRS-R, each item is rated on a scale from "Not at All," "Just a Little," "Pretty Much," to "Very Much." Scores are assigned for each item from 0 through 3, respectively.

The authors have reported adequate reliability and validity for this instrument (Atkins, Pelham, & Licht, 1985). Interrater agreement for the SNAP items as assessed by Cohen's Kappa ranged from .70 to 1.00 (Lahey, et al., 1987). In addition, the SNAP has been demonstrated to reliably discriminate children with hyperactivity from normal children (Lahey, et al., 1987; Pelham & Bender, 1982).

**Kaufman Test of Educational Achievement (K-TEA).** The K-TEA (Kaufman & Kaufman, 1985) is an individually administered achievement test for children and adolescents. Scores can be based on either age norms (6 years 0 months to 18 years 11 months) or grade norms (grades 1 through 12). These norms have been based on two nationally representative samples. The test consists of five subtests, measuring the following domains: Reading Comprehension, Reading Decoding, Mathematics Applications, Mathematics Computation, and Spelling. These subtests are combined to produce
Reading Composite, Mathematics Composite, and Battery Composite scores.

Corrected split-half reliability coefficients for the subtests range from .90 to .95, and for the composite scores range from .94 to .98. Test-retest reliabilities for periods of one to 35 days ranged from .83 to .97. Evidence for the concurrent validity exists in that the instrument has been highly correlated with the Wide Range Achievement Test, the Peabody Individual Achievement Test, and the Kaufman Assessment Battery for Children (Kaufman & Kaufman, 1985).

Procedure

The purpose and procedure of the study were explained to the parents of each student. They were then asked to sign a consent form granting permission for their child to participate. Parents were also requested to supply demographic data, including parents' educational level and occupations as well as the family's income.

Each student then participated in a series of three testing sessions, with no more than one session occurring daily. The testing sessions were approximately 45 minutes to one hour in duration. During the first session, the first half of the Wechsler Intelligence Scale for Children-Revised (WISC-R) was administered. The second half of the WISC-R was given
during the second testing session. During the third session, the K-TEA were administered. The means, standard deviations, minimum and maximum values from both the intelligence and achievement testing are listed in Table 1.

Insert Table 1 About Here

Social skills were defined from a content-oriented approach, with children rated on specific socially relevant behaviors by their teachers. Thus, the primary teacher of each student was asked to complete two instruments assessing social skills, the MESSY and the SSRS-T. Teachers were also asked to complete several behavioral inventories including the CTRS-R, the IOWA and the SNAP. Teachers returned completed questionnaires within two weeks.

Results of all testing were reviewed with the parents following the evaluation.
Results

Correlation analyses were conducted in order to test each of the three hypotheses. Correlation matrices for variables included for study are listed in Tables 2 through 5. In support of the first hypothesis, scores on the CTRS-R

Hyperactivity, Inattention/Passive subscales, and the SNAP Impulsivity subscale were significantly correlated with subscales of both the SSRS-T and the MESSY. Similarly, analyses provided evidence for the second hypothesis in that scores on the IOWA Aggression subscale were significantly correlated with subscales of both the SSRS-T and the MESSY. Finally, results provided some support for the third hypothesis as Reading and Math Composite scores on the K-TEA were significantly, albeit minimally correlated with
subscales of both the SSRS-T and the MESSY.

After completion of the correlational analyses, regression analyses were undertaken in order to determine a parsimonious model which would account for the relationship between symptoms of ADHD, aggression, academic competence and social skills functioning. Stepwise regression techniques were chosen in order to assess the unique variance of each predictor. Separate stepwise regression analyses were run for each of the following dependent variables: the total score on the MESSY, the Appropriate Social Skills (Factor 1) and Inappropriate Assertiveness (Factor 2) subscales of the MESSY, the Total Social Skills Scale of the SSRS-T and the Cooperation, Assertion, and Self-Control subscales of the SSRS-T.

In each analysis, Full Scale IQ (FSIQ) scores were forced as the first predictor variable in order to control for the proportion of variance in social skills scores due to intelligence. Analyses included the following independent variables: the Inattentive/Passive and Hyperactivity subscales of the CTRS-R, the Impulsivity subscale of the SNAP, and the Aggressive factor of the IOWA. The Reading and Mathematics Composite scores were not included for study because they each had correlated significantly with FSIQ.

Analyses revealed the Inattentive/Passive CTRS-R subscale was the best and only significant predictor of the
MESSY Factor 1, $t(1,64) = -2.59, p < .01$. No other variables were significant predictors of the MESSY Factor 1. Results from this analysis are listed in Table 6.

Insert Table 6 About Here

Using the MESSY Factor 2 as the criterion variable, FSIQ was a significant predictor, $t(3,62) = 2.33, p < .02$. The IOWA Aggressive factor was the next significant predictor, $t(3,62) = 5.89, p < .001$. The next significant predictor was the CTRS-R Hyperactivity subscale, $t(3,62) = 4.08, p < .001$. No other variables were significant predictors of the MESSY Factor 2. Results from this analysis are listed in Table 7.

Insert Table 7 About Here

Analyses using the total MESSY score as the criterion variable indicated that the IOWA Aggression factor was the best significant predictor, $t(2,63) = 5.391, p < .001$. The CTRS-R Hyperactivity subscale second best significant predictor, $t(2,63) = 3.53, p < .001$. No other variables were significant predictors of total MESSY score. Results from this analysis are listed in Table 8.
Stepwise regression analyses conducted with the SSRS-T Cooperation subscale as the dependent variable revealed the SNAP Impulsivity subscale as the best significant predictor, $t(2,63) = -4.13, p < .001$. The second best significant predictor of the SSRS-T Cooperation subscale was the CTRS-R Inattentive/Passive subscale, $t(2,63) = -3.65, p < .001$. No other variables were significant predictors. Results from this analysis are listed in Table 9.

Using the SSRS-T Assertion subscale as the criterion variable, FSIQ was the only significant predictor, $t(1,64) = 3.12, p < .002$. Results from this analysis are listed in Table 10.

Analyses revealed the IOWA Aggressive factor was the best and only significant predictor of the SSRS-T Self-Control subscale, $t(1,64) = -7.23, p < .001$. Results from this analysis are listed in Table 11.
Finally, stepwise regression analyses using the SSRS-T Total Score indicated that the CTRS-R Inattentive/Passive subscale was the best significant predictor, \( t(2,63) = -3.30, p < .001 \). The next best significant predictor was the IOWA Aggressive factor, \( t(2,63) = -3.57, p < .001 \). No other variables were significant predictors. Results from this analysis are listed in Table 12.

The pervasiveness of social skills problems also was investigated for the sample by examining the individual scores for the MESSY subscales and the SSRS-T subscales and total score. Students' scores were compared to established age appropriate norms for both measures. The mean of the students' scores on the MESSY Factor 1 was 61.00 (SD = 13.53), on the MESSY Factor 2 was 94.83 (SD = 32.71), and on the total MESSY score was 137.97 (SD = 36.37). For the Appropriate Social Skills subscale, 19% of the sample scored outside the normal limits, 62% scored outside normal limits on the Inappropriate Assertiveness subscale, and 30% scored outside the normal limits on the total MESSY score.

The mean of the students' scores on the SSRS-T
Cooperation subscale was 8.35 (SD = 3.94), on the SSRS-T  
Assertion subscale was 8.80 (SD = 3.73), on the SSRS-T Self-Control subscale was 10.38 (SD = 4.26) and on the SSRS-T Total Score was 27.53 (SD = 8.67). For the Cooperation subscale 60% of the sample scored outside normal limits, 42% scored outside normal limits on the Assertion subscale, 28% scored outside normal limits on the Self-Control subscale, and 42% scored outside normal limits on the Total Score.

Furthermore, the extent to which children in this sample also displayed concurrent problems with aggression was also investigated. According to norms reported by Pelham, Milich, Murphy, and Murphy (1989), 30% of the students were rated outside the normal limits on the IOWA Aggressive factor.
Discussion

Previous research has demonstrated that ADHD children as a whole are at risk for problematic social relationships (Barkley, 1983; Milich & Landau, 1982; Pelham & Bender, 1982). However, earlier studies have failed to recognize the heterogeneity inherent within the ADHD population when selecting subjects (e.g., Clark, et al., 1988; deHaas, 1986; Johnston, Pelham, & Murphy, 1985; King & Young, 1981; Wallander, et al., 1987). Specifically, the techniques used to define diagnostic groups typically have relied on cutoff scores or ambiguously defined criteria. Numerous authors have pointed out that these methods are likely to include those children who possess the most severe symptomatology, particularly with regard to externalizing and aggressive behaviors (e.g., Ullmann, Sleator, & Sprague, 1985). Along these lines, children whose major difficulties center around their attentional problems without concomitant hyperactivity, are likely to be excluded from studies employing such selection techniques. In addition, failure to differentiate children with differing clusters of symptoms has impaired attempts to treat social skills deficits.

The present study was designed to determine the individual relationship between each of the symptoms of ADHD (i.e., inattention, impulsivity, and hyperactivity) and the social behavior of children diagnosed with this disorder.
This goal was important in order to help clarify which ADHD children may be at risk for the development of social problems.

In addition, most researchers have neglected to differentiate between those hyperactive children with and without co-occurring problems with aggression. Given the high overlap between children with ADHD and Conduct Disorder, the possibility exists that the literature to date on social behavior in ADHD children is in actuality based on children with multiple disorders (Loney & Milich, 1982). Thus, the presence of aggression also was examined in the present study to ascertain the unique contribution of this factor in the presentation of ADHD children's social behavior.

Furthermore, research has demonstrated that children with increased academic difficulties are at risk for social difficulties (Bursuch & Asher, 1986; Butler, 1979; Green, et al., 1980). Because children diagnosed with ADHD also are likely to display problems in academics, this variable was also analyzed.

With regard to specific patterns of relationships between variables, those symptoms of ADHD which comprise more passive and unpredictable types of behavior were related to decreases in exhibition of prosocial behaviors. Specifically, the CTRS-R Inattentive/Passive subscale was predictive of scores on the MESSY Appropriate Social Skills
subscale, the SSRS-T Cooperation subscale, and the SSRS-T Total Score. Additionally, the SNAP Impulsivity subscale was predictive of the SSRS-T Cooperation subscale. Given that children who do not display high activity levels typically have been excluded from studies investigating the social behavior of ADHD students, these results have significant ramifications. The results highlight the fact that children with predominantly attention and concentration difficulties are likely to have specific types of social skills deficits, particularly with regard to their ability to engage in prosocial behaviors (e.g., starting a conversation, attending to others while they are speaking, joining ongoing activities with others, cooperating with others, and helping others).

Externalizing behaviors such as aggression and hyperactivity were related to inappropriate assertiveness and poor self-control in social interactions. That is, the CTRS-R Hyperactivity subscale was predictive of the MESSY Inappropriate Assertiveness subscale and the MESSY Total Score. The IOWA Aggressive factor was predictive of the MESSY Inappropriate Assertiveness subscale, the MESSY Total Score, the SSRS-T Self-Control subscale, and the SSRS-T Total Score.

The results presented in the preceding paragraph are more clearly understood when one considers that both positive and negative social skills have been shown to be
important in terms of children's social acceptability within their peer group. Previous research with ADHD children has neglected to demonstrate relationships between children with specific behavioral symptoms of ADHD and particular types of social skills deficits. The results from the present study suggest that future research should take into account children's presenting symptoms, in that particular patterns of symptomatology appear to indicate a risk for specific types of social skills problems.

Because aggression proved to be a significant predictor across many of the social skills subscales, the necessity of assessing the concomitant presence of this variable when evaluating children's social functioning is emphasized. Results from the present study validate concerns expressed by Loney and Milich (1982) that research which fails to separate children with and without aggressive behaviors may confound results applying only to ADHD children.

Results of the present study provided some support for the relationship between academic and intellectual abilities and social skills functioning. Specifically, K-TEA Reading Composite scores were predictive of the SSRS-T Assertion subscale. The Mathematics Composite and Full Scale IQ scores were predictive of both the SSRS-T Assertion and MESSY Inappropriate Assertiveness subscales. Previous researchers have found that academic difficulties are more prominent in children labeled as "rejected" using
sociometric indices. The present results suggest that academic achievement may be more specifically associated with a child's ability to appropriately assert him/herself.

Future research should be aimed at delineating the relationship between specific cognitive abilities and social behavior across situations and environmental demands. Along these lines, investigation of the relation between individual subtests of the WISC-R and social skills may prove to be instructive. Similarly, the literature may benefit from extension of the study to include individuals within the adolescent age range, who are theoretically more capable of abstract reasoning abilities. In this manner, the influence of higher level cognitive strategies can be analyzed in relation to social behavior.

Consistent with previous research, a high percentage of students comprising the present sample demonstrated significant social skills deficits. Across all subscales of the MESSY and SSRS-T a high number of students scored outside normal limits. Additionally, a large number of students were identified as exhibiting significant problems with aggression. These results underscore the importance of assessing both positive and negative domains of social skills functioning in children diagnosed with ADHD. Furthermore, the data have significant implications for treatment. That is, these ADHD children demonstrated difficulties both in their ability to initiate appropriate
social interactions as well as to control unacceptable aggression and negative methods of associating with others. Treatment efforts therefore should not only be aimed at decreasing inappropriate social behavior, but also at increasing prosocial exchanges.

It should be noted that the generalizability of these findings is somewhat limited due to the recruitment of subjects who were evaluated through a private practice setting. The mean income and educational level of the present sample was significantly higher than the national average. Because socioeconomic status has been previously demonstrated to influence social functioning, future research should include children from lower socioeconomic strata to ensure that the results obtained in the present study are applicable to the ADHD population as a whole.

Another limitation of the present study rests in the use of teacher report to assess both social functioning and symptomatology indicative of ADHD. In order to evaluate the reliability of the present findings, other measures of these variables should be included, such as sociometric ratings and observation of social interactions.
Table 1

Means, Standard Deviations, Minimum Values and Maximum Values for WISC-R and K-TEA Scores

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>WISC-R Scales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal IQ</td>
<td>116.54</td>
<td>16.65</td>
</tr>
<tr>
<td>Performance IQ</td>
<td>111.93</td>
<td>17.58</td>
</tr>
<tr>
<td>Full Scale IQ</td>
<td>116.19</td>
<td>16.87</td>
</tr>
<tr>
<td>K-TEA Scales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decoding</td>
<td>56.20</td>
<td>29.42</td>
</tr>
<tr>
<td>Comprehension</td>
<td>57.28</td>
<td>30.32</td>
</tr>
<tr>
<td>Composite</td>
<td>57.08</td>
<td>30.92</td>
</tr>
<tr>
<td>Mathematics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applications</td>
<td>56.84</td>
<td>25.69</td>
</tr>
<tr>
<td>Computations</td>
<td>54.32</td>
<td>23.14</td>
</tr>
<tr>
<td>Composite</td>
<td>55.63</td>
<td>26.13</td>
</tr>
</tbody>
</table>

WISC-R scores are reported as standard scores and K-TEA scores are reported as percentile ranks.
Table 2

Correlation Matrix: SSRS-T Subscales with IQ Scores, ADHD Symptoms, Aggression and Academic Achievement Scores

<table>
<thead>
<tr>
<th>SSRS-T Subscales(^a)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSIQ</td>
<td>.02</td>
<td>.36</td>
<td>-.18</td>
<td>.07</td>
</tr>
<tr>
<td>IOWA Aggression</td>
<td>-.27</td>
<td>.05</td>
<td>-.71</td>
<td>-.45</td>
</tr>
<tr>
<td>CTRS-R Hyperactivity</td>
<td>-.49</td>
<td>.09</td>
<td>-.53</td>
<td>-.44</td>
</tr>
<tr>
<td>CTRS-R Inattentive/Passive</td>
<td>-.58</td>
<td>-.17</td>
<td>.16</td>
<td>-.42</td>
</tr>
<tr>
<td>SNAP Impulsivity</td>
<td>-.62</td>
<td>.09</td>
<td>-.47</td>
<td>-.47</td>
</tr>
<tr>
<td>Reading Composite</td>
<td>-.09</td>
<td>.34</td>
<td>-.05</td>
<td>.08</td>
</tr>
<tr>
<td>Math Composite</td>
<td>.03</td>
<td>.42</td>
<td>-.12</td>
<td>.13</td>
</tr>
</tbody>
</table>

Note.  \( p < .05 \) if \( r > |.25| \).

\( a \) 1=Cooperation, 2=Assertion, 3=Self-Control and 4=Total Score
Table 3

Correlation Matrix: MESSY Subscales with IQ Scores, ADHD Symptoms, Aggression and Academic Achievement Scores

<table>
<thead>
<tr>
<th>MESSY Subscales</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSIQ</td>
<td>.23</td>
<td>.29</td>
<td>.17</td>
</tr>
<tr>
<td>IOWA Aggression</td>
<td>-.15</td>
<td>.80</td>
<td>.78</td>
</tr>
<tr>
<td>CTRS-R Hyperactivity</td>
<td>-.13</td>
<td>.74</td>
<td>.72</td>
</tr>
<tr>
<td>CTRS-R Inattentive/Passive</td>
<td>-.31</td>
<td>.14</td>
<td>.26</td>
</tr>
<tr>
<td>SNAP Impulsivity</td>
<td>-.15</td>
<td>.68</td>
<td>.66</td>
</tr>
<tr>
<td>Reading Composite</td>
<td>.22</td>
<td>.29</td>
<td>.16</td>
</tr>
<tr>
<td>Math Composite</td>
<td>.33</td>
<td>.38</td>
<td>.20</td>
</tr>
</tbody>
</table>

Note. $p < .05$ if $r > |.25|$. 

64
<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. FSIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. IOWA Aggression</td>
<td>.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. CTRS-R Hyperactivity</td>
<td>.15</td>
<td>.67</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. CTRS-R Inattentive/Passive</td>
<td>-.16</td>
<td>.14</td>
<td>.40</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. SNAP Impulsivity</td>
<td>.13</td>
<td>.60</td>
<td>.81</td>
<td>.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Reading Composite</td>
<td>.67</td>
<td>.19</td>
<td>.15</td>
<td>-.21</td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>7. Math Composite</td>
<td>.60</td>
<td>.23</td>
<td>.19</td>
<td>-.20</td>
<td>.17</td>
<td>.62</td>
</tr>
</tbody>
</table>

**Note.** $p < .05$ if $r > |.25|$. 
Table 5

Correlation Matrix: MESSY Subscales with SSRS-T Subscales

<table>
<thead>
<tr>
<th>SSRS-T Subscales</th>
<th>MESSY Subscales</th>
<th>Factor 1</th>
<th>Factor 2</th>
<th>Total Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperation</td>
<td></td>
<td>.21</td>
<td>-.30</td>
<td>-.35</td>
</tr>
<tr>
<td>Assertion</td>
<td></td>
<td>.74</td>
<td>.12</td>
<td>-.18</td>
</tr>
<tr>
<td>Self-Control</td>
<td></td>
<td>.40</td>
<td>-.69</td>
<td>-.78</td>
</tr>
<tr>
<td>Total Score</td>
<td></td>
<td>.61</td>
<td>-.42</td>
<td>-.62</td>
</tr>
</tbody>
</table>

Note. $p < .05$ if $r > |.25|$. 

66
Table 6
Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on MESSY Factor 1

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>R^2</th>
<th>adj R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>1</td>
<td>1129.684</td>
<td>1129.684</td>
<td>6.706</td>
<td>.011</td>
<td>.094</td>
<td>.081</td>
</tr>
<tr>
<td>Residual</td>
<td>64</td>
<td>10780.315</td>
<td>168.442</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTRS-R Inattentive/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive</td>
<td>-0.778</td>
<td>0.301</td>
<td>-0.307</td>
<td>-2.590</td>
<td>0.011</td>
</tr>
<tr>
<td>(Constant)</td>
<td>70.356</td>
<td>3.950</td>
<td>17.810</td>
<td>0.001</td>
<td></td>
</tr>
</tbody>
</table>
Table 7
Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on MESSY Factor 2

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>R²</th>
<th>adj R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>3</td>
<td>50972.782</td>
<td>16990.927</td>
<td>56.714</td>
<td>.001</td>
<td>.733</td>
<td>.720</td>
</tr>
<tr>
<td>Residual</td>
<td>62</td>
<td>18574.384</td>
<td>299.586</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSIQ</td>
<td>.301</td>
<td>.129</td>
<td>.155</td>
<td>2.336</td>
<td>.022</td>
</tr>
<tr>
<td>IOWA Aggression</td>
<td>4.915</td>
<td>.834</td>
<td>.525</td>
<td>5.891</td>
<td>.001</td>
</tr>
<tr>
<td>CTRS-R Hyperactivity</td>
<td>1.918</td>
<td>.469</td>
<td>.362</td>
<td>4.083</td>
<td>.001</td>
</tr>
<tr>
<td>(Constant)</td>
<td>15.459</td>
<td>14.978</td>
<td>1.032</td>
<td>.306</td>
<td></td>
</tr>
</tbody>
</table>
Table 8
Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on Total MESSY Score

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>( R^2 )</th>
<th>adj ( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2</td>
<td>56884.332</td>
<td>28442.166</td>
<td>61.534</td>
<td>.001</td>
<td>.661</td>
<td>.650</td>
</tr>
<tr>
<td>Residual</td>
<td>63</td>
<td>29119.606</td>
<td>462.215</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOWA Aggression</td>
<td>5.564</td>
<td>1.032</td>
<td>.534</td>
<td>5.391</td>
<td>.001</td>
</tr>
<tr>
<td>CTRS-R Hyperactivity</td>
<td>2.061</td>
<td>.583</td>
<td>.350</td>
<td>3.536</td>
<td>.001</td>
</tr>
<tr>
<td>(Constant)</td>
<td>88.881</td>
<td>5.189</td>
<td></td>
<td>17.126</td>
<td>.001</td>
</tr>
</tbody>
</table>
Table 9

Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on SSRS Cooperation Subscale

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>R^2</th>
<th>adj R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2</td>
<td>459.355</td>
<td>229.677</td>
<td>27.020</td>
<td>.001</td>
<td>.461</td>
<td>.444</td>
</tr>
<tr>
<td>Residual</td>
<td>63</td>
<td>535.505</td>
<td>8.500</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNAP Impulsivity</td>
<td>-.323</td>
<td>.078</td>
<td>-.425</td>
<td>-4.133</td>
<td>.001</td>
</tr>
<tr>
<td>CTRS-R Inattentive/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive</td>
<td>-.274</td>
<td>.075</td>
<td>-.375</td>
<td>-3.650</td>
<td>.001</td>
</tr>
<tr>
<td>(Constant)</td>
<td>14.801</td>
<td>.959</td>
<td>15.418</td>
<td>.001</td>
<td></td>
</tr>
</tbody>
</table>
Table 10
Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on SSRS Assertion Subscale

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>R^2</th>
<th>adj R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>1</td>
<td>117.988</td>
<td>117.988</td>
<td>9.750</td>
<td>.002</td>
<td>.132</td>
<td>.118</td>
</tr>
<tr>
<td>Residual</td>
<td>64</td>
<td>774.411</td>
<td>12.100</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSIQ</td>
<td>.079</td>
<td>.025</td>
<td>.363</td>
<td>3.123</td>
<td>.002</td>
</tr>
<tr>
<td>(Constant)</td>
<td>-.475</td>
<td>3.001</td>
<td>-.159</td>
<td>.874</td>
<td></td>
</tr>
</tbody>
</table>
Table 11

Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on SSRS Self-Control

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>P</th>
<th>$R^2$</th>
<th>adj $R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>1</td>
<td>523.742</td>
<td>523.742</td>
<td>52.403</td>
<td>.001</td>
<td>.450</td>
<td>.441</td>
</tr>
<tr>
<td>Residual</td>
<td>64</td>
<td>639.642</td>
<td>9.994</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOWA Aggression</td>
<td>-.812</td>
<td>.112</td>
<td>-.670</td>
<td>-7.239</td>
<td>.001</td>
</tr>
<tr>
<td>(Constant)</td>
<td>14.648</td>
<td>.705</td>
<td></td>
<td>20.750</td>
<td>.001</td>
</tr>
</tbody>
</table>

72
Table 12

Regression of Full Scale IQ, ADHD Symptoms and Aggressiveness on SSRS Total Score

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>SS</th>
<th>MS</th>
<th>F</th>
<th>p</th>
<th>R^2</th>
<th>adj R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>2</td>
<td>1467.182</td>
<td>733.591</td>
<td>13.783</td>
<td>.001</td>
<td>.304</td>
<td>.282</td>
</tr>
<tr>
<td>Residual</td>
<td>63</td>
<td>3352.971</td>
<td>53.221</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE B</th>
<th>Beta</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTRS-R Inattentive/Passive</td>
<td>-0.563</td>
<td>0.170</td>
<td>-0.350</td>
<td>-3.302</td>
<td>.001</td>
</tr>
<tr>
<td>IOWA Aggression</td>
<td>-0.935</td>
<td>0.261</td>
<td>-0.379</td>
<td>-3.575</td>
<td>.001</td>
</tr>
<tr>
<td>(Constant)</td>
<td>39.220</td>
<td>2.470</td>
<td></td>
<td>15.874</td>
<td>.001</td>
</tr>
</tbody>
</table>
References


Advances in clinical child psychology (Vol. 5, pp. 137-180), New York: Plenum.


analysis of emerging social status in boys' groups.  
Child Development, 54, 1400-1416.

Cowen, E.L., Pederson, A., Babligian, H., Izzo, L.D., &  
detected vulnerable children. Journal of Consulting and  
Clinical Psychology, 41, 438-446.

of normal and attention-deficit disordered boys during  
free-play, cooperative task, and simulated classroom  
situations. Journal of Abnormal Child Psychology, 15,  
247-268.

developmental dose-response analysis of the effects of  
methylphenidate on the peer interactions of attention  
deficit disordered boys. Journal of Child Psychology  
and Psychiatry, 26, 955-971.

deHaas, P.A. (1986). Attention styles and peer relationships  
of hyperactive and normal boys and girls. Journal of  
Abnormal Child Psychology, 14, 457-467.

attractiveness and peer perception among children.  
Sociometry, 37, 1-12.


Behavior patterns of socially rejected and neglected


Reliability and concurrent relations between the teacher version of the child behavior profile and the Conners revised teacher rating scale. *Journal of Abnormal Child Psychology, 13,* 295-304.


Langhorne, J., Loney, J., Paternite, C. & Bechtoldt, H.


communication task: Comparisons of normal and hyperactive boys and of methylphenidate (ritalin) and placebo effects. Child Development, 50, 388-401.


Vita

Kelly Lynn Raymond
Florida Institute of Technology
University Psychological Services
150 West University Boulevard
Melbourne, FL 32901-6988
(407) 768-8000 ext. 8106

Education

B.A. : Vanderbilt University, May, 1985
   Major: Psychology

M.A. : Louisiana State University, August, 1987
   Major: Clinical Child Psychology
   Advisor: Johnny L. Matson, Ph.D.
   Thesis: Social Skills of Hearing-Impaired Adolescents

Ph.D. : Louisiana State University, August, 1990
   Major: Clinical Child Psychology
   Minor: Developmental Psychology
   Advisor: Johnny L. Matson, Ph.D.
   Dissertation: An Investigation of Variables which Predict Social Skills Functioning in Children with Attention-Deficit Hyperactivity Disorder

Honors and Awards

Elected as Chief Intern, Department of Clinical and Health Psychology, University of Florida, July, 1989
Graduated Cum Laude, Vanderbilt University, May, 1985
Graduated with Honors in Psychology, Vanderbilt University, May, 1985
Elected to Honors Program in Psychology, Vanderbilt University, August, 1983

Professional Experience

Duties: Assessment and treatment of childhood and adolescent psychological disorders.
   Supervisor: J. Donald Smith, Psy.D.
July 1989- June 1990. Position: Clinical Psychology Internship, Specialty in Child/Pediatric Psychology, Department of Clinical and Health Psychology, University of Florida, Gainesville, FL Duties: Assessment and treatment of child inpatient and outpatient populations. Supervisors: Stephen Boggs, Ph.D., Hugh Davis, Ph.D., Sheila Eyberg, Ph.D., Eileen Fennell, Ph.D., Gary Geffken, Ph.D., Jacquelin Goldman, Ph.D., James Johnson, Ph.D., Suzanne B. Johnson, Ph.D., James Rodrigue, Ph.D., Marika Spevack, Ph.D.


June 1986- May 1988. Position: Practicum and Teaching Assistant, Pediatric Psychology Department of Earl K. Long Memorial Hospital, Baton Rouge, LA Duties: Assessment and treatment of variety of childhood and adolescent inpatient and outpatient disorders; psychological and developmental testing; responsible for team management of inpatients, coordination of outpatients, and supervision of psychology graduate students; responsible for coordination of ongoing research projects and data collection. Supervisor: Mary Lou Kelley, Ph.D.

Aug. 1985- May 1986. Position: Practicum, Psychological Services Center of Louisiana State University, Baton Rouge, LA
Duties: Assessment and treatment of childhood and adolescent disorders; co-instructor of parent training class
Supervisor: Mary Lou Kelley, Ph.D.

Duties: Implementation of treatment programs for children with developmental delays and behavior problems
Supervisor: Lynn Folger, MCSW

Duties: Implementation of token economy system in shelter for abused and run-away adolescents; supervision of adolescents in performance of daily activities
Supervisor: Pat Hobson, MSW

Publications


Symposia

Poster Presentations


Abstracts


Professional Affiliations

1988-present American Psychological Association
1988-present American Psychological Association, Division 12
1987-present Association for the Advancement of Behavior Therapy
1987-present Society of Pediatric Psychology
1984-1985 Psy Chi, Vanderbilt University Chapter
Candidate: Kelly Lynn Raymond

Major Field: Psychology

Title of Dissertation: An Investigation of Variables Which Predict Social Skills Functioning in Children with Attention-Deficit Hyperactivity Disorder

Approved:

[Signature]
Major Professor and Chairman

[Signature]
Dean of the Graduate School

EXAMINING COMMITTEE:

[Signature]
L. Bluckard-Fields

[Signature]
Mary H. Kelley

[Signature]
Ann S. total

[Signature]
Joe W. Koehler

Date of Examination:

August 30, 1990