Differential Family Characteristics of High and Low Aggressive Children with Attention Deficit Hyperactivity Disorder

Cynthia Ann Lease

College of William & Mary - Arts & Sciences

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Differential Family Characteristics of High and Low Aggressive Children with Attention Deficit Hyperactivity Disorder

A Thesis
Presented to
The Faculty of the Department of Psychology
The College of William and Mary in Virginia

In Partial Fulfillment
Of the Requirements for the Degree of
Master of Arts

by
Cynthia A. Lease
1989
APPROVAL SHEET

This thesis is submitted in partial fulfillment of the requirements for the degree of

Master of Arts

Cynthia A. Lease
Author

Approved, May 1989

Glenn D. Shean, Ph.D.

W. Larry Ventis, Ph.D.

Ellen Rosen, Ph.D.
DEDICATION

To my parents and to all of the parents and children who participated in this study.
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Abstract

The present study examined the relationship between aggression among children with Attention Deficit Hyperactivity Disorder (ADHD) and characteristics of their parents and families. Parents of 64 clinic-referred ADHD boys and parents of 12 boys with no history of a behavioral disorder completed six self-report measures designed to assess alcohol-related characteristics, social maturity, family environment and perceptions of alcohol mediated changes in parent-child interactions; a social desirability scale was also completed. The parent version of the Child Behavior Checklist (CBCL: Achenbach & Edelbrock, 1983) was used to assess levels of aggression exhibited by the children. In the first analysis, scores on the aggression factor of the CBCL for the ADHD boys were divided into high and low groups on the basis of a median split. T-tests were then performed to analyze group differences on parents' responses to the six self-report measures. A second, similar set of analyses was performed to compare responses by parents of the low aggressive ADHD boys to those in the normal control group. Finally, 51 ADHD boys completed a self-report measure that corresponded to the questionnaire used to assess parent perceptions of alcohol-mediated changes in adult-child interactions; a t-test was performed to compare the perceptions of parents and children. Although fathers of the high aggressive ADHD boys exhibited more extensive drinking histories than those of the low aggressive ADHD boys, a post-hoc correlation revealed no significant relationship between fathers' drinking histories and aggression among their sons. As a group, parents did not report antisocial personality characteristics, or risk for alcoholism; nor did any of the groups differ on these factors. When compared to low aggressive ADHD boys, family environments of high aggressive ADHD boys were characterized by greater conflict, less cohesion, and less expressiveness; they also participated in fewer intellectual-cultural activities, fewer recreational activities, placed less emphasis on moral-religious values, and were less independent. No significant differences were found among family environments of the low aggressive ADHD boys and the normal control group. Finally, although some similarities were found between parents' and children's perceptions of alcohol related changes on their interactions, several important differences were also reported. In terms of both etiology and treatment, these results emphasize support for continuing the practice of subgrouping the ADHD population on aggression. Reciprocal determinism and modeling, premises of social learning theory, are highlighted in the discussion of the above results.
Differential Family Characteristics of High and Low Aggressive Children with Attention Deficit Hyperactivity Disorder
The childhood syndrome of hyperactivity was first defined as "hyperkinetic impulse disorder of childhood" (Laufer & Denhoff, 1957) and systematically described as consisting of primary (e.g., inattention, impulsivity, and hyperactivity) and secondary symptoms (e.g., aggression, control deficits, and negative affects). Subsequent research has suggested that the primary and secondary symptoms actually represent two distinct behavioral disorders (Loney, Langhorne & Paternite, 1978; Milich, Loney & Landau, 1982; Trites & Laprade, 1983; McGee, Williams & Silva, 1985). Consequently, the most recent revision of the Diagnostic and Statistical Manual (DSM-III-R: American Psychiatric Association, 1987) employs the label of "attention deficit hyperactivity disorder" (ADHD) to classify children who display developmentally inappropriate levels of inattention, impulsiveness, and hyperactivity. Childhood behavioral disorders characterized by aggression and social maladjustment are generally classified under the headings of Oppositional Defiant Disorder (ODD) or Conduct Disorder (CD).

ADHD is believed to constitute 3 to 5% of the school-age population in North America (Sandoval, Lambert & Sassone, 1980). Causes for the disorder are as of yet undetermined, and contrary to various popular opinions, diet and environment do not appear to be causal factors of ADHD (Milich, Wolraich & Lindgren, 1986). In addition to the primary symptoms, children with ADHD demonstrate severe deficits in peer relationships and academic performance. This childhood disorder is extremely resistant to
treatment, and the long-term prognosis is poor. It has been suggested that ADHD children are at risk for later alcohol abuse and delinquent behavior (Huessy & Howell, 1985).

There is considerable evidence supporting the connection between childhood behavior problems and adult psychopathology. Many investigators have found a high prevalence of antisocial personality, alcoholism, and hysteria among the parents of children with ADHD (Cantwell, 1972; Morrison & Stewart, 1971; Robins, 1966). Family studies have shown that not only is there a high rate of alcoholism among the male relatives of ADHD children, but fathers of ADHD children, when hyperactive themselves as children, tend to become alcoholic (Goodwin, Schulsinger, Hermansen, Guze & Winokur, 1975). In a recent study, Huessy & Howell (1985) found that while many young adults report high levels of alcohol consumption, ADHD subjects seem often to move toward alcoholism while normal subjects move toward controlled drinking.

Extensive studies have also shown a strong relationship between childhood CD and parental psychopathology. Robins (1966) found that children with severe CD were more likely to have fathers who were sociopathic and alcoholic than were children without these disorders. More recent studies have confirmed these findings indicating that biological fathers of children with CD were more likely to manifest alcoholism and Antisocial Personality Disorder than fathers of a clinical control group (Jary & Stewart, 1985; Stewart DeBlois & Cummings, 1980).
Although there is a large body of literature suggesting a link between alcohol abuse among parents of children with ADHD and those with CD, there are serious flaws in this corpus of research with regard to consistency of diagnoses given by various investigators (Lahey, Piacentini, McBurnett, Stone, Hartdagen & Hynd, 1988). Of even greater importance, is that many of the previous studies have not dealt with the fact that CD and ADHD frequently occur together. Consequently, parental disorders associated with CD could be attributed erroneously to ADHD if children presenting with both disorders were not distinguished.

Much of the classification research has focused on the reliability and validity of the differential diagnosis of ADHD and CD (Campbell, 1983). Although there seems to be general agreement that these are distinct disorders, research has also indicated the presence of substantial covariation and overlap of ADHD and CD (Milich, Widiger & Landau, 1987; Stewart, Cummings, Singer & DeBlois, 1981). Children who present with these disorders often display symptoms of both. In fact, there is much to suggest that children who are symptomatic of both CD and ADHD differ from those who meet criteria for only one disorder in many significant ways including social-status problems (Milich et al., 1987), response to treatment (Pelham & Bender, 1982), long-term outcome (August, Stewart & Holmes, 1983), and parental pathology (Lahey et al., 1988; Stewart et al., 1980).

Valid categorical diagnoses have been difficult to achieve. As is the case with clinical groups in general, ADHD populations
are not homogeneous with respect to etiology, symptomatology, or prognosis. In an attempt to overcome this dilemma, researchers have used subgrouping of the CD population on hyperactivity (Sandberg, Rutter, & Taylor, 1978) or conversely, subgrouping the ADHD population on aggression (Langhorne & Loney, 1979; August et al., 1983; Loney, Kramer & Milich, 1981). The later method has been validated and is currently widely accepted (Milich & Loney, 1979).

In their initial approach to scale construction and validation, Loney and her colleagues (Loney et al., 1978) based their work on the distinction between primary and secondary symptoms of externalizing behaviors. Principal factor analysis revealed two orthogonal factors, Aggression and Hyperactivity. Differential validity of these factors was assessed with respect to independent parent ratings; teacher ratings; measures of SES, cognitive functioning, family relationships, and response to stimulant treatment. Distinct patterns of association emerged. Further validational evidence was presented by Paternite and Loney (1980) and Loney et al. (1981). In brief, Aggression factor scores were consistently related to SES, negative family-interaction variables and adolescent symptomatology and delinquency. On the other hand, Hyperactivity was not consistently related to environmental variables; rather, it predicted only achievement problems at adolescent follow-up. This finding is of particular importance in light of the claims that "hyperactive children are at risk for subsequent conduct
disturbance, substance abuse, delinquency, and antisocial personality disorder (Hinshaw, 1987), and as Loney and colleagues have concluded, separate consideration of the two domains is critical, particularly with respect to prognosis.

In their review of the literature, Pelham & D. Murphy (1988) reported that heterogeneous groups of ADHD children were differentiated on a number of familial measures, suggesting that high levels of aggression were associated with low socioeconomic status (SES), hostile fathers and undercontrolling mothers—associations that were not found for the hyperactivity dimensions.

Similar findings were reported by August and Stewart (1983) who defined two groups of hyperactive children according to their parents' psychiatric disorders. On the basis of family history data, two subtypes of childhood hyperactivity were defined. Family-history positive indicated that at least one biological parent of the child had a diagnosis in the antisocial spectrum; and family-history negative indicated that neither parent had such a diagnosis. Family-history positive children, were far more likely to be conduct disordered and to come from broken homes, whereas the family-history negative children showed more achievement problems. This study revealed a specific link between parents' and children's antisocial behavior in apparent contradiction to earlier reports that tied parental antisocial behavior to children's hyperactivity in general (e.g. Cantwell, 1975). Earlier studies, however, tended to employ general,
undifferentiated diagnosis of "hyperactivity," clouding important relations within the narrow-band distinction under review (Hinshaw, 1987).

The above studies clearly reveal a strong relationship between parent and family pathology and aggression in childhood and adolescence. Furthermore, they emphasize the need for differentiated assessment of hyperactivity/attentional deficits and conduct problems/aggression in child psychopathology and suggest that failure to distinguish these dimensions may obscure important concurrent and predictive relations (Hinshaw, 1987).

It is compelling in terms of theory and etiology to consider how antisocial patterns may be transmitted. The literature reviewed above implies that the etiology of conduct problems and aggression is familial in some way (e.g., based on genetic, social learning, or some other family mechanism), but that the etiology of hyperactivity and attention problems is unrelated to family transmission of antisocial and aggressive conduct patterns. If there is a familial pattern of transmission of ADHD, it appears to be that it involves only the primary symptoms of ADHD in both parent and offspring generations (Lahey et al., 1988).

The extent to which deviant characteristics of parents and family environment are associated with aggression and/or hyperactivity in children will be re-examined in the current study. It is expected that parents of ADHD children exhibiting high levels of aggression will be at greater risk for alcohol abuse than those of ADHD children exhibiting low levels of
aggression. It is also expected that childhood aggression will be associated with the absence of a positive family climate, that is, a family environment low on cohesion and expressiveness and high on conflict (McGee et al., 1985), and containing parents who display antisocial characteristics.

A further inquiry will concern children's perceptions of how adult behavior toward them is changed as a function of adult alcohol consumption, and how children themselves react when confronted with an intoxicated adult. Most of the literature in this area has focused primarily on adverse effects of adult drinking on children with greater inconsistency and unpredictability of parental support and discipline cited frequently as reasons for children's maladjustment and increased risk of later problems when they are reared in alcoholic families (Jacob, Favorini, Meisel & Anderson, 1978; Chafetz, Blane & Hill, 1971; El-Guebaly & Offord, 1977). This downplays the role of children in general, and problem children in particular, as contributors to negative characteristics in dysfunctional families.

If a child's tendency to misbehave decreases in the presence of a drinking adult, alcohol consumption for a parent would certainly be reinforced. Likewise, if a frustrated parent desires distance from his/her problem child, and the child is more likely to avoid drinking adults, parental drinking is likely to increase. Examples such as these, if confirmed, would support the premises of social learning theory (Bandura, 1977) and
results will be discussed in terms of reciprocal family interactions.
Method

Subjects

Parents of Clinic-Referred Children. Subjects were parents (mothers=62; fathers=40) of 64 boys between the ages of 6 and 14 (M = 9.22) who were evaluated in the Attention Deficit Hyperactivity Disorder Clinic at Western Psychiatric Institute and Clinic in Pittsburgh, Pennsylvania, and who met DSM-III criteria for Attention Deficit Hyperactivity Disorder (ADHD). Clinical diagnoses were based on the child’s history, parent and teacher interviews, parent and teacher ratings, direct observations of the child in natural and clinical settings, and other commonly accepted criteria (Pelham, 1982), and were made by the director of the treatment program, William E. Pelham, Ph.D. and his staff, who specialize in treating children with attention deficit and conduct disorders. One of the rating scales used in the assessment process was the Child Behavior Checklist (CBCL: Achenbach & Edelbrock, 1983); the CBCL provides data on a number of different dimensions of deviant behavior including hyperactivity and aggression. The children whose parents participated in this study attended an outpatient day treatment program for ADHD from June 20th through August 12th, 1988 at Western Psychiatric Institute and Clinic.

Parents of Non-Referred Children. Parents of 12 boys between the ages of 6 and 12 (M = 9.00) who had never been diagnosed or treated for a behavior disorder or ADHD served as a normal control group. Members of this groups were recruited from two
private schools in Eastern Virginia: Walsingham Academy in Williamsburg; and Christ the King Catholic School in Norfolk.

Children. Fifty-one boys between the ages of 7 and 14 (M = 9.84) who attended the 1988 Summer Treatment Program for ADHD at Western Psychiatric Institute and Clinic also participated in this study. The parents of all clinic-referred and normal control subjects gave written informed consent and the children gave oral consent.

Almost all families in both groups were Caucasian (Clinic-referred: 95% Caucasian; Normal Control: 100%). Socioeconomic status (SES) was determined by the Hollingshead occupational scale (Hollingshead & Redlich, 1958). The seven levels of the scale include (a) executives and proprietors of large concerns and major professionals; (b) managers and proprietors of medium-sized businesses and lesser professionals; (c) administrative personnel of large concerns, owners of small independent businesses, and semiprofessionals; (d) owners of little businesses, clerical and sales workers, and technicians; (e) skilled workers; (f) semiskilled workers; and (g) unskilled workers. The subjects who had one or more breadwinner in the family at the level of (d) above, or higher, were classified as high SES, whereas other subjects were considered low SES. The majority of families in both the clinic-referred (92%) and normal-control group (100%) were of upper SES.

Materials

A battery of six self-report measures was completed by
parents to assess (a) their drinking history and behavior; (b) family environment; and (c) degree of social maturity. A social desirability scale was also included. In addition, parents completed a report on their child's behavior. The boys from the 1988 Summer Treatment Program completed a questionnaire designed to measure their perceptions of behavior changes by adults and by themselves as a function of alcohol consumption by adults.

**Drinking History** (DH: Lang, 1983a). In order to obtain information about drinking behavior, frequency of drinking, and amount of alcohol generally consumed, subjects completed an 11-item questionnaire. Responses were on a Likert scale with higher numbers indicating greater amounts of alcohol consumed at higher frequencies and over longer durations of time. The range of possible scores is 0 to 66.

**MacAndrew Alcoholism Scale** (MAC: MacAndrew, 1965). The MAC special scale of the MMPI was designed to detect individuals believed to be at risk for alcohol abuse. The MAC contains 49 MMPI items and is scored in such a way that higher scores are more indicative of alcohol abuse. In general, raw scores of 28 and above strongly suggest substance abuse; scores between 24 and 27 are somewhat suggestive of such abuse; and scores below 24 strongly contraindicate substance abuse (Graham, 1977). High test-retest reliability has been reported for this scale (Hoffman, Loper & Kammeier, 1974) on both normal and alcoholic populations.

MacAndrew (1965) reported cross-validation for his scale, and subsequent research has indicated that the MAC effectively
differentiated alcoholics from nonalcoholics in a variety of settings (Graham, 1977; Wolfsan & Erbaugh, 1984).

Alcohol Expectancy (AE: Lang, 1983b). The AE is a 27-item questionnaire based on the Children's Knowledge of Alcohol Questionnaire [described below] designed to examine subjects' beliefs about how alcohol might affect interactions with their children. The AE contains two sets of items: one querying parents on how their behavior toward their children changes when they have drunk alcoholic beverages, and a second tapping parents' perceptions of how their children change their behavior toward parents when parents have been drinking alcohol.

Questions regarding changes in adult's behavior toward their children as a function of drinking fall into four factors: Negative/Aversive Action, Active Affection, Attention/Altruism, Passive Neglect. Questions regarding changes in children's behavior as a function of drinking by their parents fall into three factors: Gross Misbehavior, Avoidance, Approval Seeking.

The format for the first set of items is: "When you drink alcoholic beverages, do you...a lot more, a little more, the same, a little less, a lot less?" The content of the items include, for example, "Forget things you told your children;" "Hug and kiss your children;" "Spank or hit your children;" etc. The format of the second set of questions is: "When you drink alcoholic beverages, do your children...a lot more, a little more, the same, a little less, a lot less." The content of these questions include for example, "Stay away from you;" "Obey you;"
"Act nice;" "Break rules;" etc.

The items are scored on a 0 to 4-point scale with 0 indicating a lot more and 4 indicating a lot less. The AE is a fairly new instrument, and psychometric properties have not yet been established.

**Family Environment Scale** (FES: Moos & Moos, 1986). The FES consists of 90 true-false items that make up ten subscales. The subscales assess three underlying domains: The Relationship dimensions, the Personal Growth dimensions, and the Systems Maintenance dimensions.

The Relationship dimensions are measured by the Cohesion, Expressiveness, and Conflict subscales. These subscales assess the degree of commitment, help, and support family members give to one another; the extent to which family members are encouraged to act openly and express feeling directly; and the amount of openly expressed anger, aggression, and conflict among family members (Moos & Moos, 1986).

The Personal Growth dimensions are measured by the Independence, Achievement Orientation, Intellectual-Cultural Orientation, Active-Recreational Orientation, and Moral-Religious Emphasis subscales. These subscales analyze the extent to which family members are assertive, are self-sufficient, and make their own decisions; the extent to which activities are cast into a goal-oriented or competitive framework; the degree of interest in political, social, intellectual, and cultural activities; the extent of participation in social and recreational activities;
and the degree of emphasis on ethical and religious issues and values (Moos & Moos, 1986).

The Systems Maintenance dimensions are measured by the Organization and Control subscales. These subscales assess the degree of importance of clear organization and structure in planning family activities and responsibilities and the extent to which set rules and procedures are used to run family life (Moos & Moos, 1986).

There are 9 true-false questions on each of the ten subscales, and a score for each subscale is obtained. The FES has been shown to have adequate test-retest reliability for all ten subscales. Intercorrelations of subscales indicate that they measure distinct though somewhat related aspects of family social environments. Cohesion and Organization are positively correlated, as are Intellectually-Cultural Orientation and Active-Recreational Orientation. There are negative correlations between Cohesion and Conflict and between Independence and Control (Moos & Moos, 1986).

The FES has successfully discriminated between families (a) with normal children and those with delinquent or disturbed children; and (b) families with and without substance abusers. Families with disturbed children generally score lower on cohesion, expressiveness, and independence and higher on conflict (Tyerman & Humphrey, 1981; Moos & Moos, 1986). Families of substance abusers tend to report less cohesion, expressiveness, and organization, and more conflict than the normative sample.
(Moos & Moos, 1986).

**Socialization (So) Scale of the California Psychological Inventory** (CPI: Gough, 1969). The So is the most thoroughly studied scale in the CPI. It was empirically developed to identify individuals of asocial, delinquent disposition, and is highly valid in this function (Gough, 1965). The scale consists of 54 true-false questions and attempts to classify people along a continuum of socialization, proceeding from highly asocial and criminal dispositions at one end to highly socialized and rule-respecting inclinations at the other. Low scorers tend to be unperceptive concerning the inner needs and feelings of others, little guided by interpersonal nuances, and given to rash and precipitate behavior. High scorers, on the other hand, tend to be responsive to the feelings and thoughts of others, prudent, circumspect, and habitually in accord with the obligations of interpersonal life (Gough, 1968).

**Marlow-Crowne Social Desirability Scale** (Crowne & Marlow, 1964). The Marlow-Crowne is a 33-item self-report measure that was used as a control variable to determine the degree to which subjects' responses may reflect their tendency to describe themselves and their families in a favorable light. Higher scores indicate higher levels of social desirability.

**Child Behavior Checklist** (CBCL: Achenbach & Edelbrock, 1983). On the CBCL, the parent rates the child on a 3-point scale on each of 113 Behavior Problem items, and on a 4-point scale for 11 Academic and Social Competency items. The CBCL
provides data on a number of different dimensions of deviant behavior including hyperactivity and aggression. The scales were derived empirically using factor analysis and the norms were based on nonclinical (normal) samples. Normative data for inpatient and outpatient clinical populations have also been established by subsequent research (Jones, Latkowski, Kircher, & McMahon, 1988). The CBCL is a widely researched instrument and has been shown to have adequate psychometric properties (Achenbach & Edelbrock, 1983).

Children's Knowledge of Alcohol Questionnaire (CAQ: Lang, 1983c). The CAQ contains items to test the child's familiarity with various forms of alcoholic beverages, persons who use them, and the quantities of each that would be required for intoxication. Personal experience with consumption of alcohol and contact with persons who have had "too much to drink" or are "drunk" are probed also. The major part of the CAQ however, is in two sets of items: one tapping children's perceptions of how adults' behavior changes when those adults have drunk a lot of alcohol, and a second querying the children about how they change their own behavior when around an adult who has had a lot to drink. Questions regarding changes in adults' behavior toward children as a function of drinking fall into four factors: Negative/Aversive Action, Active Affection, Attention/Altruism, Passive Neglect. Questions regarding changes in children's behavior as a function of drinking by their parents fall into three factors: Gross Misbehavior, Avoidance, and Approval
Seeking.

The CAQ is designed for individual or group administration where questions are read aloud and the children respond on an answer sheet. The format for the first set of items is: "When people drink a lot of alcohol do they...a lot more, a little more, the same, a little less, a lot less?" The content of the items include, for example, "Forget things they told you;" "Hug and kiss you;" "Spank or hit you;" etc. The format of the second set of questions is: "When you are around someone who is drunk, do you...a lot more, a little more, the same, a little less, a lot less." The content of these questions include for example, "Stay away from them;" "Obey them;" "Act nice;" "Break rules;" etc.

The items are scored on a 1 to 5-point scale with 1 indicating a lot less and 5 indicating a lot more. The second set of items also contains a blank to indicate that the child has never been around someone who was drunk. Like the AE, the CAQ is a new instrument, and psychometric properties have not yet been established.

Procedure

A letter written by the director of the ADHD summer treatment program explaining the study and requesting participation was enclosed with a consent form and the battery of self-report measures to be completed by parents. This questionnaire packet was handed to parents at group therapy sessions. In addition, parental consent was obtained to administer the Children's
Alcohol Questionnaire to their children.

It was requested that the parents complete the questionnaires within a week to ten days and return them to the primary therapist of their son's treatment group. Because they had contact with the program director and treatment team on a daily basis, they were instructed to bring any questions regarding the questionnaire or the study to the director or to the principal investigator. Parents who were not interested in participating, were asked to simply return the questionnaires unanswered. As the parents returned the packets, they were collected from primary therapists by the principal investigator.

The Children's Knowledge of Alcohol Questionnaire was administered to the children in groups by their treatment teams. Treatment groups were formed on the basis of age and each included approximately 10 to 12 children. Each treatment team consisted of a primary therapist and four assistants. The therapists scheduled a period of one hour to administer the CAQ; the questionnaire was read aloud by the primary therapist and the children responded on individual answer sheets. The therapist and his or her assistants were available to provide assistance to the children to insure proper interpretation of questions and correct completion of the answer form.

In order to recruit the normal control group, a letter containing a brief summary of the study was attached to a monthly newsletter sent to parents by the two participating schools. A form was provided for parents to indicate whether or not they
were interested in participating; a stamped envelope addressed to the investigator was included for return of the form. Parents who agreed to participate were then telephoned and given a full explanation of the study. During the conversation, one child from each family was targeted for the study on the basis of age and absence of any past or current behavioral disorder. Parents were asked to complete the CBCL as well as a battery of six self-report measures identical to those given to the parents of ADHD children. The packet was mailed, and a stamped envelope for returning completed forms was enclosed. The investigator provided a telephone number and requested that parents contact her if they had any questions regarding the questionnaires or the study.

Data Analysis

In the first analysis, parent and family characteristics of ADHD children considered to be high on aggression were compared to those of ADHD children considered to be low on aggression. Two parent groups were formed according to children's scores on the CBCL. The scores on the aggression factor of the CBCL (median=21.5) were divided into high and low groups on the basis of a median split. The two parent groups were compared on their responses to the six self-report measures. Scores on the AE were transformed to match the scale on the CAQ, and mean ratings for the seven subscales were calculated. Summary scores for the remaining five measures were calculated and t-tests were performed to assess differences. Separate analyses were carried
out for mothers and fathers, and Pearson's correlation coefficients were calculated on mother and father reports of the FES.

A second set of similar analyses was performed to compare responses of parents of the low aggressive ADHD children to responses of parents in the normal control group. In addition, a oneway analysis variance was carried out to assess differences between the three groups of children's aggression scores.

Mean ratings on the seven subscales of the CAQ were calculated. The relationship between children's and parents' perceptions about how alcohol consumption affects their interactions was analyzed by comparing mean scores on the CAQ subscales with mean scores on the corresponding AE subscales using paired t-tests. Additional t-tests were performed to assess differences on CAQ scores of high and low aggressive ADHD children to compare their perceptions of alcohol related changes in adult-child interactions.
Results

**Parent Self-Report Measures**

Data from the ten subscales of the FES reported by mothers of ADHD children are presented in Table 1. Father's scores on all but one subscale (Active/Recreational) were directly and significantly correlated with mother's scores, therefore, only mother data is reported. An examination of the table indicated that families of high aggressive ADHD children demonstrate significantly less cohesion, less expressiveness, and more conflict on the Relationship Dimensions. On the Personal Growth Dimensions, family members of high aggressives were less independent, and lower on intellectual-cultural orientation, active-recreational orientation and moral religious emphasis. The groups did not differ significantly on achievement orientation or on the Systems Maintenance Dimensions.

Drinking histories reported by fathers of the high aggressive boys were significantly greater ($M = 23.23$) than those reported by fathers of the low aggressive boys ($M = 17.29$), $t(36) = 1.93$, $p<.05$. Although the mean score on the DH was slightly higher for mothers of high aggressive boys, the difference between the two groups was not significant.

Data from the Socialization scale of the CPI revealed no significant difference between the two groups of parents. As a group, fathers tended to score in the moderately high range (raw score means for high and low aggressive groups were 41.83 and 40.76 respectively); and mothers scored in the moderately low
### Table 1

Mean Ratings of Mother’s Reports on the Family Environment Scale

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>ADHD Low Aggression (n=29)</th>
<th>ADHD High Aggression (n=30)</th>
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<td><strong>Relationship Dimensions:</strong></td>
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<tr>
<td>Subscale Scores:</td>
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<td>5.43</td>
<td>1.76</td>
<td>.05</td>
</tr>
<tr>
<td>Achievement Orientation</td>
<td>5.70</td>
<td>5.71</td>
<td>.02</td>
<td>ns</td>
</tr>
<tr>
<td>Intellectual-Cultural Orientation</td>
<td>6.57</td>
<td>4.83</td>
<td>2.80</td>
<td>.05</td>
</tr>
<tr>
<td>Active-Recreational Orientation</td>
<td>6.38</td>
<td>5.17</td>
<td>2.00</td>
<td>.05</td>
</tr>
<tr>
<td>Moral-Religious Emphasis</td>
<td>6.24</td>
<td>5.17</td>
<td>1.80</td>
<td>.05</td>
</tr>
<tr>
<td><strong>Systems Maintenance Dimensions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscale Scores:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organization</td>
<td>5.65</td>
<td>5.07</td>
<td>1.02</td>
<td>ns</td>
</tr>
<tr>
<td>Control</td>
<td>5.83</td>
<td>5.67</td>
<td>.41</td>
<td>ns</td>
</tr>
</tbody>
</table>
range (raw score means were 34.90 and 33.37 for high and low aggressive groups respectively).

Both groups of parents scored within the normal range on the MacAndrews scale (i.e. raw scores were less than 24) and although fathers of the high aggressive boys scores somewhat higher (M = 23.20) than fathers of low aggressive boys (M = 21.39), there was no significant difference between the two groups on this measure.

Table 2 contains coefficients of correlations between aggression among ADHD children as reported by parents on the CBCL and parent self-reports on the DH, MAC, So scale of the CPI, and the subscales of the FES. The correlations reveal no significant relationships between childhood aggression and parents' drinking histories, risk for alcoholism, or social maturity. Significant relationships were, however, found on seven of the ten FES subscales.

Data from the AE revealed no significant differences between the two groups of mothers and fathers. Mean scores for both groups of parents indicated that they did not perceive subjective behavior toward their children to become any more or less negative or aversive toward their children as a function of alcohol consumption. Mean scores for mothers in both groups suggested that when drinking, they became a little less affectionate, a little more neglectful, and gave a little less attention to their children than when they were not drinking. Data from the fathers' reports showed that they perceived no changes in their behavior toward children along any of the above
Table 2
Correlations Between Aggression Among ADHD Children and Parent Self-Report Data

<table>
<thead>
<tr>
<th>Self-Report Measure</th>
<th>r</th>
<th>df</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drinking History</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>.04</td>
<td>54</td>
<td>ns</td>
</tr>
<tr>
<td>Father</td>
<td>.05</td>
<td>38</td>
<td>ns</td>
</tr>
<tr>
<td><strong>MacAndrews Scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>.13</td>
<td>59</td>
<td>ns</td>
</tr>
<tr>
<td>Father</td>
<td>-.04</td>
<td>38</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Socialization Scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>-.18</td>
<td>60</td>
<td>.08</td>
</tr>
<tr>
<td>Father</td>
<td>-.12</td>
<td>40</td>
<td>ns</td>
</tr>
<tr>
<td><strong>Family Environment Scale</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subscales:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohesion</td>
<td>-.44</td>
<td>59</td>
<td>.001</td>
</tr>
<tr>
<td>Expressiveness</td>
<td>-.30</td>
<td>59</td>
<td>.01</td>
</tr>
<tr>
<td>Conflict</td>
<td>.40</td>
<td>59</td>
<td>.001</td>
</tr>
<tr>
<td>Independence</td>
<td>-.37</td>
<td>58</td>
<td>.01</td>
</tr>
<tr>
<td>Achievement Orientation</td>
<td>.01</td>
<td>55</td>
<td>ns</td>
</tr>
<tr>
<td>Intellectual/Cultural Orientation</td>
<td>-.45</td>
<td>58</td>
<td>.001</td>
</tr>
<tr>
<td>Active/Recreational Orientation</td>
<td>-.38</td>
<td>59</td>
<td>.001</td>
</tr>
<tr>
<td>Moral/Religious Emphasis</td>
<td>-.28</td>
<td>58</td>
<td>.02</td>
</tr>
<tr>
<td>Organization</td>
<td>-.14</td>
<td>58</td>
<td>ns</td>
</tr>
<tr>
<td>Control</td>
<td>.01</td>
<td>59</td>
<td>ns</td>
</tr>
</tbody>
</table>

*Data from reports by mothers.
dimensions as a function of alcohol consumption.

The data on questions regarding changes in children's behavior as a function of parental drinking revealed no significant differences in the perceptions of the two groups. Both mothers and fathers reported that children did not misbehave, avoid their parents, or seek approval any more or less when parents were drinking alcohol than when they were not.

The oneway analysis of variance revealed significant differences between the aggression scores of the three groups of children (F = 122.84, p<.001). A Scheffe's test also indicated that each of the three sets of scores were significantly different from one another (t= 3.11, p<.05). When data from reports of parents in the normal control group were compared to those from parents of low aggressive ADHD children, a significant difference was found in the drinking histories reported by mothers. Scores on the DH were lower for mothers in the normal control group (M = 9.00) than for mothers in the ADHD group (M = 13.57); t(38) = 1.76, p<.05. No significant differences emerged between the two groups of mothers or fathers on the AE, MAC or CPI. The group difference on the Control subscale of the FES approached significance; means for the normal and low aggressive ADHD groups were 5.00 and 5.83 respectively; t(39) = 1.60, p<.06. There was also a tendency for the ADHD group (M = 3.48) to report more conflict in their families than the normal control group (M = 2.67); t(39) = 1.29, p<.10. There were, however, no significant group differences on the FES.
In general, significant group differences were not found for scores on the social desirability measure.

**Children's Self-Report Measure**

Data from the CAQ showed that 27 of the 51 children reported that they had not personally been in the company of a drunk adult, and that they learned about alcohol-related behavior from parents or other family members, teachers, friends, books, movies, television or from watching people. Of the 24 children who reported having been in the company of an intoxicated adult, 13 were from the low aggressive ADHD group and 11 were from the high aggressive ADHD group. When high and low aggressive ADHD children were compared on their responses to the CAQ, no significant differences emerged. There was, however, a tendency for high aggressive children to score higher ($M = 2.44$) than their low aggressive counterparts ($M = 1.74$) on the gross misbehavior factor, $t(22) = 1.47$, $p<.07$.

As can be seen from Tables 3 differences did exist between the parent reports on the AE and child reports on the CAQ. Regarding alcohol-related changes in adult behavior, mean scores for children relative to their parents were significantly higher on the passive/neglect factor and significantly lower on the active affection and attention/altruism factors. Expectations of parents and children did not differ along the negative/aversive factor. With respect to changes in children's behavior when around an intoxicated adult, perceptions of parents and children tended to be similar. The one exception to this was that
Table 3
Mean Ratings for Parents’ and Children’s Reports on the Alcohol Expectancy and the Children’s Knowledge of Alcohol Questionnaire

<table>
<thead>
<tr>
<th>AE and CAQ Factors</th>
<th>Mothers (n=38)</th>
<th>Children (n=38)</th>
<th>t-value</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parent Behavior:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative/Aversive</td>
<td>2.96</td>
<td>3.25</td>
<td>1.47</td>
<td>ns</td>
</tr>
<tr>
<td>Active Affection</td>
<td>2.82</td>
<td>2.12</td>
<td>4.35</td>
<td>.001</td>
</tr>
<tr>
<td>Attention/Altruism</td>
<td>2.60</td>
<td>2.04</td>
<td>3.27</td>
<td>.01</td>
</tr>
<tr>
<td>Passive Neglect</td>
<td>3.08</td>
<td>4.03</td>
<td>4.69</td>
<td>.001</td>
</tr>
<tr>
<td><strong>Child Behavior:</strong></td>
<td>(n=18)</td>
<td>(n=18)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Misbehavior</td>
<td>3.28</td>
<td>2.02</td>
<td>4.91</td>
<td>.001</td>
</tr>
<tr>
<td>Avoidance</td>
<td>2.91</td>
<td>3.09</td>
<td>.86</td>
<td>ns</td>
</tr>
<tr>
<td>Approval Seeking</td>
<td>2.72</td>
<td>2.72</td>
<td>0.00</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>**Fathers (n=28)</th>
<th>Children (n=28)</th>
<th>t-value</th>
<th>p&lt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parent Behavior:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative/Aversive</td>
<td>2.96</td>
<td>3.01</td>
<td>.23</td>
</tr>
<tr>
<td>Active Affection</td>
<td>3.08</td>
<td>2.18</td>
<td>5.03</td>
</tr>
<tr>
<td>Attention/Altruism</td>
<td>2.87</td>
<td>2.18</td>
<td>3.64</td>
</tr>
<tr>
<td>Passive Neglect</td>
<td>3.18</td>
<td>3.93</td>
<td>2.75</td>
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<tr>
<td><strong>Child Behavior:</strong></td>
<td>(n=15)</td>
<td>(n=15)</td>
<td></td>
</tr>
<tr>
<td>Gross Misbehavior</td>
<td>3.04</td>
<td>2.31</td>
<td>2.00</td>
</tr>
<tr>
<td>Avoidance</td>
<td>3.00</td>
<td>3.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Approval Seeking</td>
<td>3.03</td>
<td>2.57</td>
<td>1.47</td>
</tr>
</tbody>
</table>
children expected to misbehave less, whereas their mothers expected degrees of misbehavior to be relatively unchanged.
Discussion

Group differences were found among fathers and family environments of clinic-referred boys with ADHD who were distinguished on levels of aggressive behavior. Family characteristics of high and low aggressive boys were dissimilar in relationship qualities and personal growth experiences. More specifically, relationships in families with high aggressive ADHD boys were characterized by less cohesion and expressiveness and more conflict. These families also demonstrated less independence and moral-religious emphasis, showed less interest in intellectual and cultural activities, and participated in fewer social and recreational activities. When compared to fathers of low aggressive boys, fathers of high aggressive boys reported more extensive drinking histories; that is, they either drank more frequently and/or generally consumed more alcohol.

Although many important differences were demonstrated in families of high and low aggressive ADHD boys, notable similarities emerged for the two groups. Neither mothers nor fathers in the two groups differed on self-reported risk for alcohol abuse, social maturity, or expectations of alcohol-mediated changes in their parent-child interactions.

Although the levels of aggression reported for the boys in the normal control group was significantly lower than aggression reported for boys in the low aggressive ADHD group, it is of particular interest that the family environments of these two groups did not differ. The mothers in these two groups, however,
did differ on self-reported drinking histories. Contrary to the expected hypothesis, mothers of low aggressive ADHD boys reported more extensive drinking histories than mothers in the normal control group.

Some initial comments on these findings are pertinent. First, no conclusions can be made regarding the presence or absence of alcoholism among participants in this study. Although some subjects scored in the "at-risk range" on the MacAndrews scale and reported pathological drinking histories, the primary objective of this research was to examine group differences. Furthermore, the results do not confirm a significantly positive relationship between aggression in children and parental alcohol use.

There may be an interaction between sociability and alcohol abuse. Lahey et al. (1988) found that although fathers of children with CD were more likely to abuse substances, every father who abused substances also exhibited antisocial personality disorder. This suggests that alcohol abuse may be entirely secondary to antisocial personality characteristics. The absence of a group difference on the MAC scores, and of a significant relationship between MAC and DH scores and childhood aggression in the present study may be related to the fact that as a group, parents did not report antisocial characteristics on the Sociability scale.

The group similarity on the Sociability scale of the CPI may be partly due to the fact that the research sample was over-
represented by upper SES. Loney and her associates have consistently found a negative relationship between SES and aggression (Loney et al., 1978; Paternite, Loney & Langhorne, 1976; Milich et al., 1982). In the present study, only 8% of the sample was of lower SES, however, a significant correlation was found between SES and childhood aggression ($r(63) = -0.28$, $p<0.01$). It may be that there is an interaction between SES and parental level of sociability in predicting aggression in children.

There are several interpretations of the findings that drinking histories among mothers of low aggressive ADHD boys were more extensive than among mothers in the normal control group. First, the two samples were drawn from different areas of the country, and social practices in eastern Virginia may differ from those in western Pennsylvania. On the other hand, because there were no differences between mothers in the high and low aggressive groups, it is plausible that mothers of children with disruptive behavioral disorders in general drink more frequently or consume more alcohol. Although mothers scores on the DH did not suggest abusive drinking, it is relevant to point out that Lahey et al. (1988) found that mothers of children with pure ADHD, pure CD, and ADHD with concurrent CD all exhibited a greater incidence of alcohol abuse than did mothers in a clinic control sample.

Among the sample populations used in this study, the most exhaustive differences were found in the family environments of
high and low aggressive ADHD boys. The finding that aggressive behavior is related to family variables concurs with many previous reports (Loney et al., 1978; Milich & Loney, 1979; Loney, 1980; McGee, Williams, Bradshaw, Chapel, Robins & Silva, 1985b). The intention of such investigations has been to detect factors contributing to the transmission of psychopathology from one generation to the next. Recently, however, the focus of study has shifted from individual pathology of parents and specific parenting styles to include variables reflecting the nature of general interaction patterns among members of families with ADHD children (McGee et al., 1985, 1985b). This shift in the focus of study reflects the importance of social learning theory (Bandura, 1977), which has been the guiding model for the present investigation.

According to social learning theory, the origin of human behavior is primarily imitation. The individual is exposed to a plethora of models during a lifetime, and although learning is mediated by various factors (e.g., attention, past experiences, etc.), the essential process remains imitation (Robinson & Jacobson, 1987). In addition to concretely modeled events, such as one individual hitting another, abstract modeling also takes place. Abstract modeling occurs when people generate rules from the behavior of others as in language or in moral development (Robinson & Jacobson, 1987). During abstract modeling, people can "create generative and innovative behavior...when observers derive the principles underlying specific performances for
generating behavior that goes beyond what they have seen or heard" (Bandura, 1977, p.41). Relevant to the present research, questions derived from these modeling constructs include: What typical behavioral interactions occur among members of a family with an ADHD boy? Are there common structural patterns within a family system that lead to certain rule-generating beliefs among its members? What generalizations are drawn by children in a family?

The extensive research conducted by Bandura and his associates has identified parental models as playing a central role in the development of children’s behavioral patterns. Children have numerous opportunities to imitate their parents in many interpersonal interactions and day-to-day activities. Although other characters emerging from various sources may also serve as models for imitations, the parents are probably the most influential models for young children (Gelfand, 1975).

Research has consistently demonstrated that after children observe aggressive behavior performed by adult models, the children themselves are more likely to exhibit similar aggressive acts. The concept of abstract modeling would predict that when children are exposed to particular interaction patterns among adults, they would in turn, develop similar rules or patterns of interpersonal behavior.

In this study, parents were asked to report on their children's behavior. Aggressiveness was judged by the extent to which the child, for instance, argued, screamed, got into
fights, disobeying at home, physically attacked people, was stubborn, lost his/her temper, and threatened others. Parents were also asked to report on their family environments. Family conflict was evaluated by whether or not families: (a) had a lot of fights, (b) believed that favorable results were produced by raising voices, (c) tried to smooth over disagreements and keep the peace; whether or not family members: (d) threw things when they got angry, (e) frequently lost their tempers, (f) criticized each other, (g) hit each other; (h) tried to out-do each other, and (i) frequently became openly angry. Due to the design of this study, no causal effects can be concluded, however, as social learning theory would predict, families whose interactions are characterized by conflict and aggression were likely to have aggressive children.

Families of high aggressive ADHD boys were also characterized as lower on cohesion. That is they reported less support and togetherness, less group spirit, and less time and energy spent on home activities. These families were less likely to get along with each other, less likely to back each other up, and less likely to provide enough attention for each other than were families of low aggressive ADHD boys. The fact that ADHD children who are aggressive have serious disturbance in peer relations (Pelham & Milich, 1984) may be due, in part, to the absence of relevant modeling in their families.

Group differences on the personal growth dimensions of the FES are difficult to interpret theoretically. Past research has
indicated that highly aggressive children often become delinquent and antisocial as they grow older. It may therefore, be speculated that the fewer socially accepted activities children are exposed to (e.g. intellectual, cultural and recreational), the more likely they will be to engage in socially unacceptable ones (e.g. delinquent or criminal). Additionally, if the family does not focus on what types of behavior are right and wrong, or fails to emphasize values and morals, it can be assumed that children's behavior will fail to be characterized by such principles.

The families of high aggressive ADHD boys were less independent than families of the low aggressive ADHD boys. That is, they were less assertive, less self-sufficient, and less able to make individual decisions. It may be the case that without the skills for appropriate assertiveness individuals behave aggressively instead; and without the ability to make decisions, the family as a group is chaotic and frustrated, and these qualities may also precipitate aggressive behavior.

Family environment appears to be a critical factor in determining the magnitude of aggressive behavior exhibited by children. In this study, the family environments of the normal control group and of the low aggressive ADHD group were similar, whereas family environments on the high aggressive ADHD boys were significantly more negative. These results suggest that although ADHD boys are generally more aggressive than boys without ADHD, aggression can be exacerbated by a negative family
Group differences among parents or children on perceptions of alcohol-mediated changes in parent-child interactions were not observed, but when compared to their parents, children's reports were significantly different on several factors. Relative to both their mothers and fathers, the children expected less affection, less attention, and more neglect from their parents when parents were drinking alcohol. Children also expected to misbehave less when in the company of an intoxicated adult.

Although no assumptions about actual behavioral changes can be assumed from these data, when integrated with the above results on family and parent variables, they provide several interesting theoretical implications.

The interpretation of these results begins with the assumption that the individual's perception, or interpretation, of environmental events, and not just the mere occurrence of those events, is the essential ingredient in determining a behavioral response (Bandura, 1977). Social learning theory, unlike earlier behavioral models, places cognitions in a central role. This theory is also different from traditional behavioral models in its notion of bidirectional interaction and reciprocal determinism (Bandura, 1983). The interplay of the environment, the behavior of the individual, and factors associated with the person are said to dynamically interact to determine psychological functioning. By reciprocal interaction, Bandura meant that not only does the environment influence behavior, but
behavior also influences the environment.

In light of the above premises, consider for instance, the children's perceived decrease in their tendency to misbehave when they are around intoxicated adults. Theoretically, this implies that this change on the part of the children would reinforce drinking behavior on the part of their parents. This in turn creates a perceived decrease in the degree of affection and attention, and an increase in neglect received by children from their parents. These circumstances have the potential for creating a negative learning environment for the children. That is, they may not be receiving reinforcement (e.g. attention and affection) for positive behavior (negative punishment) and on the other hand, their aversive behaviors may be receiving negative reinforcement (e.g. passive neglect).

The findings resulting from this study emphasize several important issues relevant to research and clinical practice. First, it is useful to continue the practice of subgrouping the ADHD population on the dimension of aggression. It is suggested that the etiology and prognosis of ADHD is different for hyperactive children who are also highly aggressive than for those who are not. These findings have important clinical implications; a different kind of treatment appears to be necessary for ADHD children who present a clear picture of aggression and who have negative family environments, and for ADHD children who show little aggression, but whose primary complications are cognitive and attentional, and whose families
are relatively less dysfunctional.

Second, the mechanisms by which behavior shapes the environment have been ignored in empirical investigations, and the role of individual perception in both behavior and the impact on the environment has been left to paradigms other than social learning theory (Robinson & Jacobson, 1987). It would be informative for future investigations of families, to examine how both parents and their children interpret events within the family structure. As was found in the current study, the perceptions of parents and children are frequently dissimilar. Finally, it would be particularly enlightening to perform observations of families and compare actual events to their perceived interpretations.
References


VITA

Cynthia Ann Lease