

2003

Toward validation of the Sports Behavior Checklist: a comparison of Attention-Deficit/Hyperactivity Disorder and control group children in a sports environment

Aaron Clendenin

Louisiana State University and Agricultural and Mechanical College

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



Part of the [Psychology Commons](#)

Recommended Citation

Clendenin, Aaron, "Toward validation of the Sports Behavior Checklist: a comparison of Attention-Deficit/Hyperactivity Disorder and control group children in a sports environment" (2003). *LSU Master's Theses*. 2461.

https://digitalcommons.lsu.edu/gradschool_theses/2461

This Thesis 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 Master's Theses by an authorized graduate school editor of LSU Digital Commons. For more information, please contact gradetd@lsu.edu.

TOWARD VALIDATION OF THE SPORTS BEHAVIOR CHECKLIST: A COMPARISON
OF ATTENTION-DEFICIT/HYPERACTIVITY DISORDER AND CONTROL GROUP
CHILDREN IN A SPORTS ENVIRONMENT

A Thesis

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
Aaron Allen Clendenin
B.S., University of Central Florida, 2000
May 2003

Table of Contents

Abstract	iii
Introduction	1
Attention-Deficit/Hyperactivity Disorder	1
Review of Literature	3
Social Skills	3
Definitions and Components	3
Common Training Targets and Procedures	4
Relationship to ADHD	6
Sports	7
Sports Participation and Environment	7
Peer Acceptance and Self-Efficacy	8
Relationship to Social Skills	9
Sports and ADHD	9
Groups and Status	9
Sports Skills and Sportsmanship	10
Sports Behavior Checklist	12
Hypotheses	14
Methods	16
Participants	16
Examination of Sample Differences	17
Instruments	18
Demographics Questionnaire	18
Sports Behavior Checklist	18
Conners' Rating Scales-Revised	18
Social Skills Rating System	19
Procedure	19
Results	21
Internal Consistency	21
Principal Components Analysis	21
Subscale Correlations	22
SBC Subscale Differences	23
Discussion	25
References	28
Appendix: Consent Form	33
Vita	36

Abstract

Data from participants ($N = 124$) was entered into a principal components analysis to test the factor structure of the Sports Behavior Checklist ([SBC] Johnson & Rosen, 2000). The subscales of the SBC were correlated with relevant subscales of the Conners' - Revised Parent Form (Conners, 1997) and Social Skills Rating System (Gresham & Elliott, 1990). Both of these analyses were conducted to determine the construct validity of the instrument. Additionally, a subsample ($N = 92$) of low socioeconomic status individuals was used to compare groups of Attention-Deficit/Hyperactivity Disorder ($n = 49$) and non-clinical ($n = 43$) children on the subscales of the SBC. It was found that a six-factor solution as proposed by the original authors did, in fact, hold up and accounted for 71.5 % of the variance. As hypothesized, subscales on the SBC were low to moderately related to subscales on the anchor measures. Finally, significant group differences were found on the Aggression, Emotional Reactivity, and Injury subscales. Implications and limitations are discussed.

Introduction

Attention-Deficit/Hyperactivity Disorder

Accounts of Attention-Deficit/Hyperactivity Disorder (ADHD) in the scientific literature have been traced to the early 1900's (Anastopolous, 1997). It was noted that these children tended to be aggressive, defiant, and resistant to discipline (Barkley, 1990). The exact etiology of ADHD is currently unknown. Genetics have been implicated (Barkley, 2000), although not without opposition (Joseph, 2000), as have environmental factors (Barkley, 1990) and select neurotransmitters (Zametkin & Rapoport, 1986). This uncertainty notwithstanding, much is known about ADHD.

Prevalence estimates range from 3% to 7% of the school-aged population, depending on several factors including the definition of ADHD that is used, sample studied, geographic location, and extent of agreement between parents, teachers, and professionals (American Psychiatric Association [APA], 2000; Anastopolous, 1997; Barkley, 1990; Cantwell, 1996; Lambert, Sandoval, & Sassone, 1978). Moreover, children with ADHD comprise as much as 50% of certain child psychiatric populations (Cantwell, 1996). Boys are overrepresented relative to girls at a ratio of approximately 3:1 in community samples and 6:1 in clinical samples (Barkley, 1990). It is commonly believed that this phenomenon is related to the overreferral of boys due to a greater manifestation of hyperactive-impulsive symptomatology among them and the perceived greater social impropriety of behaviors of this type. Hyperactivity-Impulsivity is, however, only one of two key dimensions of ADHD; the other is Inattention (APA, 2000).

Barkley (2000) recently defined ADHD as “a developmental disorder with the cardinal features of difficulties with sustained attention, distractibility, hyperactivity, and impulse control.” As such, the overarching theme is a deficit in behavioral response inhibition (Barkley, 1997). This inability to inhibit undesirable, maladaptive responses has important ramifications for the person diagnosed with ADHD. Children with ADHD have consistently been found to be inattentive to details and forgetful, get distracted easily, fidget, get out of their seats, talk without permission, blurt out answers, and interrupt others. Indeed, these are several of the criteria required for making the diagnosis. According to the DSM-IV-R

(APA, 2000), one is classified as having ADHD if they exhibit at least 6 of 9 symptoms of Inattention or 6 of 9 symptoms of Hyperactivity-Impulsivity, some of which must occur before age 7. Symptoms must also be present for a minimum of 6 months, exist in at least 2 settings, cause significant impairment in social, academic, or occupational functioning, and not occur in the course of or be better accounted for by other specified mental disorders.

Furthermore, It has been found that individuals with this disorder are vulnerable to numerous associated problems including learning disabilities, low academic achievement, temper outbursts, lying, stealing, difficulties with relationships, low self-esteem, and symptoms of depression and anxiety (Barkley, Anastopolous, Guevremont, & Fletcher, 1991; Barkley, DuPaul, & McMurray, 1990; Loney & Milich, 1982; Margalit & Arieli, 1984). Another important domain of functioning that is typically affected in persons with ADHD is social skills (Milich & Landau, 1982; Pelham & Bender, 1982).

Research on assessment and intervention of social skills has burgeoned in the past 30 years, with a significant portion focusing on children and adolescents (Hansen, 1993). The importance of social skills on a variety of outcomes has been thoroughly demonstrated (Elliott & Gresham, 1990). ADHD children often show significant deficits in this area and, therefore, have been major recipients of remedial training (Guevremont & Dumas, 1994). In parallel, sports involvement also has been implicated in the healthy emotional and social development of youths (Smoll, Smith, Barnett, & Everett, 1993; Weiss & Duncan, 1992). Recently, investigators have been successful in using the sports environment to teach sports skills and prosocial behaviors to ADHD children (Hupp & Reitman, 1999; O'Callaghan, 2001). Data in this area has been collected mainly through observation and only recently has a standardized measure of sports behavior of ADHD children been developed (Johnson & Rosen, 2000). The authors' stated purpose for the Sports Behavior Checklist (SBC) is the assessment of typical ADHD behavioral difficulties as they manifest in a sports context. One aim of the present study is to further validate this instrument. The following review will discuss the nature of social skills and their association to ADHD children's functioning, as well as the importance of sports behavior in these individuals' lives.

Social Skills

Definitions and Components

McFall (1982) has laid an important groundwork in the conceptualization of social skills. First, a distinction is made between social competence and social skills where the former is a value-laden construct based upon judgments that task performance was adequate and the latter are specific behaviors used to competently perform a task. To say it another way, social skills are an essential component of social competence and one would have to be socially skilled (eg. choose the right behavior) in a given situation in order to be judged as socially competent.

Only fairly recently has much attention been paid to social skills specifically in reference to children (Michelson & Wood, 1980). Gresham (1986) has culled three broad definitions of children's social skills from the scientific literature: (1) peer acceptance, (2) behavioral, and (3) social validity. The peer acceptance definition is so called because of its reliance on indices of peer acceptance or popularity, such as child sociometric ratings where ratings of social status are taken from the child's peer group. The major drawback of this methodology and definition is the orientation to outcome and consequent failure to identify specific behavioral deficits and excesses that lead to that outcome. The behavioral approach, however, seeks to identify situation specific responses that elicit reinforcement based on social performance. This definition has the advantage of the identification and operationalization of antecedents and consequences of certain social behaviors. Conversely, it cannot guarantee that these behaviors are significant or important. The social validity definition is a hybrid of the previous two and holds that social skills are behaviors that predict important social outcomes. These outcomes may be peer acceptance or popularity, others' judgments about social skill, or behaviors that correlate with either of these.

Another key issue in the course of understanding social skills is the distinction between an acquisition versus a performance deficit (see Bandura, 1977a), where the question is whether the child has the skill and does not use it or lacks it altogether. Gresham (1986) offers a modification and extension of

this original concern as a heuristic framework for the assessment, classification, and remediation of social skills difficulties. He delineates social skills problems into four main categories: (a) skill deficits, (a) performance deficits, (c) self-control skill deficits, and (d) self-control performance deficits. Children with skill deficits do not have a necessary skill or lack knowledge of a critical step in the performance of a skill. Examples include not knowing how to carry on a conversation with peers, obtain appropriate recognition in class, or give a compliment. Alternately, a child with a performance deficit has adequate knowledge of the skill but lacks appropriate frequency or timing in performing the behavior. If a child has been seen in the past or in other contexts exhibiting the behavior in question, it is most likely a performance deficit. Finally, a self-control skill deficit arises when an emotional response interferes with learning a skill and a self-control performance deficit arises when an emotional response interferes with exhibiting proper responses.

Common Training Targets and Procedures

Social skill training has been very effective in treating many behavior problems in children and adolescents (Gilbert & Gilbert, 1991). Interventions have been addressed from operant, social learning, and cognitive-behavioral approaches with training tactics directed by therapist, peers, or a combination of the two. Social skills instruction usually incorporates skill identification, modeling, practice, social reinforcement, and programming for generalization (Rutherford, Chipman, DiGangi, & Anderson, 1992). Operant procedures focus on observable behaviors and corollary antecedents and consequences. Often, punishment or reinforcement is applied contingent on a target behavior. Antecedents also are a target of intervention as they may set the stage for positive social interactions. Cooperative learning is one such procedure that focuses on antecedents, whereby students complete an academic task as a group and are graded as such (Madden & Slavin, 1983; Slavin, 1990). Contingent social reinforcement is another operant device that involves public reinforcement for appropriate social behaviors by a teacher, parent, or other significant person. Differential reinforcement of other behavior (DRO) and differential reinforcement of low rate of responding (DRL) are two operant techniques that have been used to

decrease aggression (Pinkston, Reese, LeBlanc, & Baer, 1973) and reduce inappropriate talking (Dietz & Repp, 1973; Zwald & Gresham, 1982). Social learning theorists use modeling and peer-mediated interventions to teach children social skills. Live modeling, in which children observe models in naturalistic settings, and symbolic modeling, in which the target child observes modeled social behavior on film or videotape, have received broad empirical support (Elliott & Gresham, 1993). Peers have also been a valuable medium for improving social behaviors. Clinicians have had success in training confederate peers to initiate play organization, helping others, and sharing (Sacks & Gaylord-Ross, 1989; Sisson, Babeo, & Van Hasselt, 1988; Strain, 1984). Lastly, cognitive-behavioral interventions place primary emphasis on internal regulation of behavior. The two most common cognitive-behavioral interventions are “coaching” and social problem-solving. Coaching requires that a knowledgeable individual give verbal instruction regarding the target behavior(s). The behavior is then enacted and immediate feedback concerning performance is given. Oden and Asher (1977) successfully used this technique to teach participation, cooperation, communication, and peer reinforcement to students in third and fourth grade. Social problem-solving research has obtained mixed results with some authors interpreting comprehensive reviews of the area positively and others negatively (Elliott & Gresham, 1993). Although portions of this literature are somewhat dated, this survey demonstrates the many avenues that have been taken by researchers and clinicians.

More recently, in an attempt to provide an empirically based taxonomy of positive social behaviors in children and adolescents, Caldarella and Merrell (1997) synthesized two decades of factor analytic research. Five behavioral dimensions occurred consistently: Peer Relations, Self Management, Academic, Compliance, and Assertion. A total of 43 behavioral characteristics were derived from these dimensions. The two most frequent behaviors in each category were: a) Peer Relations: 1) Compliments/praises/applauds peers, 2) Offers help or assistance to peers when needed; b) Self Management: 1) Remains calm when problems arise, controls temper when angry, 2) Follows rules, accepts imposed limits; c) Academic: 1) Accomplishes tasks/assignments independently, displays

independent study skills, 2) Completes individual seatwork/assigned tasks; d) Compliance: 1) Follows instructions/directions, 2) Follows rules; and e) Assertion: 1) Initiates conversations with others, 2) Acknowledges compliments. Clearly, this is a wide array of behaviors. Given the copious behavioral repertoire that is needed to function well socially, one need not look far to find ADHD children in need of remediation.

Relationship to ADHD

Behaviors associated with ADHD are inextricably woven into many aspects of the social skills domain and, as Anastopolous (1997) points out, group settings are likely to be far more problematic for children diagnosed with ADHD than one to one situations due to the necessity of behavioral self-regulation. Milich and Landau (1982) assert that as many as 50% of children with ADHD will also experience problems with peer relationships including a high probability of peer rejection. Barkley (1990) also later estimated the rate of peer rejection to be approximately 50 – 60 % in this population. Using the Social Adjustment Inventory for Children and Adolescents (Orvaschel & Walsh, 1984), Greene, Biederman, Faraone, Ouellette, Penn, and Griffin (1996) found that 22 % of individuals in their sample that were diagnosed as having ADHD also were classifiable as having a social disability. A social disability was defined by a discrepancy between the observed and expected scores, where expected score was based on estimated Full Scale IQ. The relevant constructs assessed by this measure were school, spare-time activities, peer relationships, and home life. Although consensus does not exist among researchers concerning which domains are most problematic for these youngsters, some consistent themes have emerged. Guevremont & Dumas (1994) note at least four distinct problem areas for ADHD children: (a) high-rate intrusive overt behaviors; (b) deficient communication and reciprocity; (c) biased social-cognitive performance; and (d) poor emotional regulation. For example, it has been shown that ADHD children, compared to others without the disorder, exhibit higher rates of talking (Whalen, Henker, Collins, Finck, & Dotemoto, 1979) more aggressive behavior (Campbell & Paulauskas, 1979), express significantly more disagreement, request less feedback about their performance (Whalen, Henker, Collins,

McAuliffe, & Vaux, 1979), have less knowledge about appropriate social behaviors (Dodge & Newman, 1981), and show “greater degrees of explosive, unpredictable, and oppositional behavior” (Guevremont & Dumas, 1994). Given the likelihood of social skills problems occurring in children with ADHD and the social nature of much sport activity, Johnson & Rosen (2000) advocate the examination of sports involvement and sports behavior in ADHD children due to the unpopularity of these children with their peers, the effects of social rejection on later adjustment, and the known benefits of sports participation.

Sports

Sports Participation and Environment

Each year, more than 25 million children take part in organized sports activities (Browne & Francis, 1993). The sports environment is widely recognized as an important agent of socialization (Leonard, 1988) and, more recently, a vehicle for naturalistic research activity (eg. Smith & Smoll, 1991) and setting for teaching interpersonal skills (Sharpe, Brown, & Crider, 1995). There are several reasons why sports settings are especially conducive to research and treatment. Many of the behaviors that are studied in other realms and locations of psychological science are activated in and relevant to the sports setting. Smith & Smoll (1991) note that some of the most apparent behaviors are compliance, unselfishness, attitudes toward achievement, stress management skills, perseverance, risk-taking, and the abilities to tolerate frustration and delay gratification, to name a few. These authors found a significant interaction between coach supportiveness, which was defined as reinforcing desirable performance and an effort to respond to mistakes with encouragement rather than punitiveness, and athletes’ level of self-esteem (Smith & Smoll, 1990). Another valuable asset that the sporting domain presents is the opportunity for immediate, specific feedback concerning performance. A sports-based experience tends to be personal, concrete, time limited, and intense (Danish, Petitpas, & Hale, 1990) for the participant, thereby offering a more salient context in which learning can occur, variables can be studied, and treatments implemented. For example, an early study by Smith and colleagues developed a training module for increasing coaching effectiveness, during which coaches were taught techniques for

interacting with players. Children who played for these coaches liked them more, felt they were better teachers of the game, and felt that their teams were more cooperative (Smith, Smoll, & Curtis, 1979). This backdrop has led to many interesting and noteworthy findings.

Peer Acceptance and Self-efficacy

It is widely known that athletic ability is highly valued by youths (Evans & Roberts, 1987). There is a natural progression when it comes to the order of team sports selection and it is readily understood that "last one picked" usually means least athletic ability – at least with respect to the sport at issue. This is important because athletic ability and physical competence significantly correlate with social status and peer acceptance among boys, in both actual and perceived indices of these variables (Gross and Johnson, 1984; Weiss & Duncan, 1992). Browne and Francis (1993) lent some support to these findings when they discovered individuals' perceptions of social competence were related to degree of sports involvement and perceived skill. It is evident that there are many important variables and interrelationships taking place in the sports setting and, in fact, this is what another study showed.

Eighteen male coaches participated in a training module to increase their effectiveness. The core of this module is a series of behavioral guidelines derived from an empirical database. These guidelines emphasize the desirability of increasing four target behaviors: a) reinforcement, for effort as well as good performance, b) mistake- contingent encouragement, c) corrective instruction, given in an encouraging and supportive fashion, and d) technical instruction - spontaneous instruction in the techniques and strategies of the sport. Coaches were also urged to decrease nonreinforcement, punishment, and punitive instruction. Preseason and postseason data were collected in structured interview and questionnaire sessions. The authors discovered that children who were low in self-esteem that received instruction from coaches who underwent training in these methods of social support indicated having more fun, liked their coaches more and perceived their coaches as liking them more, and made significant increases on post-season measures of general self-esteem (Smoll et al., 1993). This was found in spite of controlling for win-loss records across groups. Unfortunately, no measure of individual athletic ability was included in

the study and, thus, it remains unknown if these gains in self-esteem were due to improved performance, increased positive attention, or other variables. This study does, however, point to the feasibility of the sports context for teaching and researching interpersonal skills.

Relationship to Social Skills

Physical education and sports activities provide valuable opportunities for teaching social skills, sportsmanship, and other prosocial behaviors. Giebink and McKenzie (1985), using softball and basketball settings, found that instruction and praise, modeling, and a point system had positive effects in decreasing unsportsmanlike behavior and increasing sportsmanship behaviors in non-clinical samples. Sportsmanship, in this context, was defined as one player offering another encouragement, support, assistance, feedback, or explanation, whereas, intimidation, provocation, animosity, and disapproval were considered unsportsmanlike behaviors. Unfortunately, treatment effects did not generalize across settings. Several other investigations found that social skills training that was incorporated into physical education curricula led to increases in positive social behaviors, such as leadership and conflict resolution, and corresponding decreases in social isolation (Anderson, Rush, Ayllon, & Kandel, 1987; Sharpe, Brown, & Crider, 1995; Sharpe, Crider, Vyhldal, & Brown, 1996). These behavioral improvements did generalize, albeit to a lesser degree, to the children's regular classroom situation suggesting greater external validity than was previously thought.

Sports and ADHD

Groups and Status

Surprisingly, only recently have investigators attempted to utilize the sports arena for increasing prosocial behavior in ADHD children and other clinical samples. Armstrong and Drabman (1994), in a case study recommending sports skills acquisition tutoring, hypothesized that tutoring should lead to greater self-confidence and acceptance from peers. Parents of grade-school boys, referred for behavior problems that mainly consisted of inappropriate attention-seeking behavior, were instructed to find an older male sports tutor to direct drill sessions for the sport of the upcoming season. For example, if

football began in one month, it was selected. Children proceeded through a hierarchy of pertinent skills, moving to the next level once relative mastery of the current level was acquired. No data were collected in this instance but anecdotal evidence was offered stating that participants enjoyed the increased attention and this seems to be associated with increased self-confidence and self-efficacy. Also, teachers reported that children were happier and more self-confident with increased persistence on schoolwork and less socially inappropriate attention-seeking behavior. Several limitations of this article are evident. It was not clear the exact nature of the behavior problems or if this included children with ADHD. No girls were included, presumably, because athletic ability is not weighted as heavily among females. Furthermore, as they admit, no controlled outcome measures were taken and therefore no empirical evidence exists yet to support these recommendations as a valid treatment option.

Another investigation was conducted with three preschoolers who were high in hyperactivity and aggression. Stormont, Zentall, Beyda, Javorsky & Belfiore, (2000), working from a behavioral analytic perspective, found two antecedents most predictive of aggression in a playground context were (a) a child was seeking entry into an activity and was denied and (b) a child interrupted an ongoing activity. These findings are significant because, as another study showed, young children who are hyperactive and continue to show aggression in elementary school are at increased risk for peer rejection (Melnick & Hinshaw, 1996).

Sports Skills and Sportsmanship

Another area of investigation that is relevant to the present study has been the effects of pharmacological and behavioral interventions on the ability of boys with ADHD to learn sports skills and sportsmanship. Pelham, McBurnett, Harper, Milich, Murphy, Clinton, and Thiele (1990) evaluated the effects of methylphenidate on 17 participants ages 7.8 to 9.9 years old. These children went through a rotation of three drills prior to a baseball game on each day - batting, grounders and throwing, and fly balls. During the game, dependent measures were taken on batting skill and judgment, "ready" position, and game awareness. Batting skill was defined as the percentage of times at bat the boy hit a ball in fair

territory, divided by his total number of times at bat; batting judgment referred to the degree to which appropriate pitches were swung at, such as swinging at pitches in the strike zone and not swinging at ones outside the strike zone. “Ready” position required that players have knees and hips bent, one or both hands on the knees, facial orientation toward the batter, and position maintained from pitch delivery until the ball reached the plate. Finally, the player’s knowledge of game awareness was assessed by asking them various questions regarding the status of the game. The data showed that the drug had no effect on skills but did show significant positive effects on attention, ready position, and game awareness measures.

Later, Hupp and Reitman (1999), using operant conditioning with three ADHD boys, ages 8-10 years old, in a summer treatment program (STP), were able to improve sports skills and sportsmanship. These children had been previously diagnosed ADHD and continued their normal medication regimen throughout the study. Pre-treatment measures consisted of basketball dribbling and shooting tests along with direct observation of game performance. A multiple baseline across-participants design was used to analyze the effects of basketball skills training on these variables. Training was comprised of verbal discussion of the rules, dribbling and shooting drills, and informal discussions of sports and basketball current events. The researchers were able to improve basketball-dribbling performance with skills tutoring and increase sportsmanship behaviors, such as verbal praise and encouragement directed toward another player or coach, nondirective positive statements, physical signs of encouragement, and neutral, positive coaching. It has been found, however, that social skills are unlikely to generalize spontaneously and need to be programmed (Giebink & McKenzie, 1985). O’Callaghan (2001, unpublished manuscript) conducted a follow-up study in the same summer treatment program with the intent of programming these skills to generalize to a non-training setting. Using a kickball-game format with rising levels of reinforcement for sportsmanship and attentive behaviors, an increase was found in these behaviors in and out of the training setting. The Multimodal Treatment Study of Children with ADHD (Pelham et al., 2000), using a similar STP format that incorporates sports skills training and activities for skills utilization, found that ADHD individuals who had a combination of behavioral and pharmacological interventions did significantly

better than others in rule-following, good sportsmanship, peer negative nominations, and teacher ratings of inattention and overactivity. From these results, it is evident that the interplay of sports and children's development, be they clinically diagnosed or otherwise, is an area of research that has proven relevant and fruitful.

Sports Behavior Checklist

Coleman (1991) has summarized the main components that have hindered youth sports research as: (a) poor methodological designs; (b) lack of an applied justification for conducting youth sports research; (c) overgeneralization of results across situations; (d) inappropriate focus on global personality traits that are poor predictors of specific behaviors; and (e) insufficient use of developmental theories in planning and conducting youth sport research studies. Johnson and Rosen (2000) attempted to ameliorate, at least in part, this situation by developing the Sports Behavior Checklist (SBC).

The SBC is a 29-item, six-factor informant report measure developed to address behavioral difficulties specifically relevant to ADHD children within a sports context. The subscales are Aggression, Emotional Reactivity, Injury, Fairness, Rule Adherence and Disqualification. Each subscale is comprised of statements that purport to examine the construct of interest in both individual and team settings. The child is given a rating by the caregiver regarding these dimensions on a 5-point, Likert-type scale. (My child is likely to be injured in *individual* sports, 1 to 5, rarely to often, respectively. My child is likely to be injured in *team* sports, 1 to 5, rarely to often, respectively.) The authors analyzed internal consistency at this level of individual and team subscale constituents. Cronbach's coefficient alpha analysis revealed that the subscales of Emotional Reactivity, Injury, and Disqualification had adequate to very good internal consistency reliability, ranging from .72 - .94. The Aggression subscale in the team setting was also adequate, yet in the individual setting was insufficient. The authors, however, retained this individual Aggression component for the purpose of analyzing the variables as repeated measures. Two subscales that were included in the initial design were discarded in the final analysis based on low internal consistency estimates. These subscales were Fairness and Rule Adherence. Using this measure, the

authors found that boys with ADHD displayed higher levels of aggression, emotional reactivity, and disqualification than did those not having ADHD. Furthermore, both clinical and non-clinical groups displayed higher levels of aggression, emotional reactivity, and injury in team sports compared to individual sports.

Although the SBC is a promising measure, the questionnaire has limited psychometric support. For example, the initial study suffered from a small sample size ($N = 75$) that was all male. Additionally, the authors report that participation was solicited from four cities in the Rocky Mountain region of the United States. As such, those recruited were predominately middle class, Caucasian and, therefore, low socioeconomic and ethnic minority groups were underrepresented. Furthermore, no attempt was made to address questions of validity. The present study will aim to address several of these critical issues.

Research in the sports environment has proven a worthwhile endeavor. Studies show that children with ADHD encounter significant difficulties in these settings compared to others without the disorder. A specialized measure of functioning in this area is necessary to advance our understanding concerning this topic. The present study intends to: 1) reanalyze internal consistency of the SBC in light of a different and larger sample; 2) analyze the factor structure of the SBC to determine if the six-factor structure that was rationally derived by the authors is empirically supported; 3) consistent with the multitrait-multimethod matrix described by Campbell and Fiske (1959), subscales of the SBC will be correlated with subscales of two well-known measures of ADHD and social functioning for the purpose of providing convergent and divergent validity; and 4) attempt to replicate the findings of Johnson and Rosen (2000) in a population that is more representative of minorities, specifically those of female gender, African–American ethnicity, and lower socioeconomic status. This comparison will be done by examining differences in the parental ratings of sport-environment behavior of ADHD and control group children as evidenced on the subscales of the SBC.

Hypotheses

1. Factor analysis should produce a six-factor solution that accounts for most of the variance in the Sports Behavior Checklist.
2. SBC Total and subscale scores should show low to moderate correlations or no relationship with select subscales of well-known measures of disruptive behavior and social functioning (i.e. Conners' Parent and Teacher Rating Scales [Conners, 1997] and the Social Skills Rating System- Parent and Teacher Versions [Gresham & Elliott, 1990]; see Table 1).

Specifically, it is hypothesized that 1) the Aggression subscale of the SBC will have a positive relationship with the Oppositional subscale of the CPRS and the Externalizing subscale of the SSRS- Parent Form; 2) the Rule Adherence subscale of the SBC will be negatively correlated with the Responsibility subscale of the SSRS; 3) the Emotional Reactivity subscale of the SBC will show a positive correlation with the Hyperactivity subscale of the SSRS but a negative relationship to the Self-Control subscale; 4) the Injury subscale of the SBC will be positively correlated with the Cognitive Problems/Inattention subscale of the CPRS; 5) Disqualification on the SBC will also be negatively correlated with Self-Control and positively correlated with Externalizing on the SSRS; and 6) the Fairness subscale will show a negative relationship with the Cooperation subscale of the SSRS. Finally, it is believed that the Internalizing subscale of the SSRS should not be significantly related to any of the SBC subscales as, presumably, they are orthogonal constructs.

3. Children with ADHD will have greater difficulty than control group members with impulsive behaviors such as aggression, rule-following, fairness, rule adherence, and emotional reactivity and more injury as evidenced by scores on the SBC.

Table 1

Proposed Relationships of SBC Subscales and SSRS/CPRS Subscales

	<u>Aggr.</u>	Emot Reactivity	Injury	Disqu	Rule Adherence	Fairness
SSRS						
Cooperation						-
Responsibility					-	
Self-Control		-		-		
Internalizing	Æ	Æ	Æ	Æ	Æ	Æ
Externalizing	+			+		
Hyperactivity		+				
CPRS						
Oppositional	+					
Cognitive Problems/ Inattention			+			

Methods

Participants

Participants ($N = 124$) of interest were children, ranging in age from 5 – 13 years and spanning kindergarten through seventh grade. The total group consisted of 52 African-American males (41.9%), 30 African-American females (24.2%), 27 Caucasian males (21.8%), 11 Caucasian females (8.9%), 1 Latino male (.8%), 1 Latino female (.8%), 1 Native American female (.8%), and 1 reported as “Other” male(.8%). The mean age for this sample was 8.37 years ($SD = 1.99$). The mean grade level was 2.95 ($SD = 1.86$). The mean SES score for the entire sample (Hollingshead, 1961) was 51.5 ($SD = 14.70$), which corresponds to the middle of the higher tier of the two lowest SES categories. One female participant was excluded from the total sample due to a primary diagnosis of a depressive disorder and one male and one female were excluded due to incomplete questionnaires. Participation was solicited at a publicly funded primary care hospital, 3 area schools, and an advocacy and support organization (Children and Adults with Attention-Deficit/Hyperactivity Disorder [CHADD]). All participants were selected on the basis of: 1) target age range, 2) a presence or absence of a previous diagnosis of ADHD, and 3) having been observed in sports activities by the caregiver that completed the questionnaires.

For the comparison of differences on the SBC subscales only, the total sample was filtered to include only those participants occurring in the bottom two SES brackets (Hollingshead, 1961). The addition of this criterion produced a refined sample ($N = 92$) from which clinical ($N = 49$) and control ($N = 43$) groups were extracted. These two sub-samples will now be described.

The ADHD group ($N = 49$) consisted of 26 African-American males (53.1%), 7 African-American females (14.3%), 12 Caucasian males (24.5%), and 4 Caucasian females (8.2%). The mean age was 8.82 years ($SD = 1.83$) and the mean grade level was 3.31 ($SD = 1.73$). The mean SES score was 57.57 ($SD = 7.80$).

The control group ($N = 43$) consisted of 16 African-American males (37.2%), 20 African-American females (46.5%), 3 Caucasian males (7.0%), 2 Caucasian females (2.3%), 1 Latino male

Table 2

Demographic Characteristics

	<u>Total sample</u>	<u>Low SES</u>	
		<u>ADHD</u>	<u>Control</u>
Sex			
Male	81	38	20
Female	43	11	23
Ethnicity			
African-American	82	33	36
Caucasian	38	16	5
Latino	2	--	1
Native American	1	--	1
Other	1	--	--
Mean Age	8.37 yrs. (<i>SD</i> =1.99)	8.82 yrs. (<i>SD</i> =1.83)	8.05 yrs. (<i>SD</i> =2.14)
Mean Grade	2.95 (<i>SD</i> =1.86)	3.31 (<i>SD</i> =1.73)	2.58 (<i>SD</i> =1.88)

(2.3%), and 1 Native American female (2.3%). The mean age was 8.05 years (*SD* = 2.14) and the mean grade level was 2.58 (*SD* = 1.88). The mean SES score was 59.84 (*SD* = 7.18).

Examination of Sample Differences

Group differences were analyzed for the purposes of matching samples and establishing differences in clinical profiles for the test of the third hypothesis. Regarding the matching of samples, no differences were found between groups on the variables of age, grade, ethnicity, and SES. There was, however, a significant difference on sex, $\chi^2 = (1, N = 92) 9.47, p < .01$, such that a greater number of males were diagnosed with ADHD. This is not unexpected given the higher prevalence rate among males (Barkley, 1997). Since there was a significant difference in sex between groups, sex was treated as a covariate in all relevant analyses.

The CPRS was administered as a selection measure as it has been shown to discriminate between ADHD and non-ADHD children (Conners, 1997). One-way analyses of covariance (ANCOVAs) were conducted to determine the effect of group status (ADHD v. non-ADHD) on the Inattentive, Hyperactivity, and ADHD Index subscales with sex as the covariate. Results indicated a statistically significant group effect ($F(1, 91) = 121.99, p < .001$) for ratings on the Inattentive subscale. The mean Inattentive score for the ADHD group was 72.35 (*SD* = 10.38); the mean Inattentive score for the non-

ADHD group was 50.95 ($SD = 10.61$). Results indicated a statistically significant group effect ($F(1, 92) = 95.88, p < .001$) for ratings on the Hyperactivity subscale. The mean Hyperactivity score for the ADHD group was 77.69 ($SD = 9.88$); the mean Hyperactivity score for the non-ADHD group was 55.00 ($SD = 11.27$). Results indicated a statistically significant group effect ($F(1, 91) = 172.60, p < .001$) for ratings on the ADHD Index subscale. The mean ADHD Index score for the ADHD group was 72.67 ($SD = 7.73$); the mean ADHD Index score for the non-ADHD group was 50.86 ($SD = 9.81$). As can be seen above, in each case, the means closely correspond to the recommended cutoff ($T = 70$) for adequate diagnostic utility of these scales and the mean of the T-distribution ($T = 50$).

Instruments

Demographics Questionnaire

A questionnaire was used to obtain information from participants regarding standard demographic variables. The variables were sex, age, grade, and ethnicity of the child, type of school, with whom the child lives, parental occupation, parental education, and child's diagnosis.

Sports Behavior Checklist

The SBC is a behavior rating scale designed to assess ADHD children within a sports context. It has shown adequate reliability on select subscales. No validation research has been conducted yet (Johnson & Rosen, 2000).

Conners' Rating Scales-Revised

The Conners' Rating Scales-Revised is a set of thoroughly researched behavior rating scales used with children and adolescents. They have extensive empirical support including a very large and heterogeneous normative sample. They are able to discriminate between groups of ADHD and non-ADHD children and detect broad psychopathology. The Conners' Parent Rating Scale: Revised – Short (CPRS:R-S) and Conners' Teacher Rating Scale: Revised - Short ([CTRS: R-S] see *Technical Manual*; Conners, 1997) are comprised of four subscales: a) Oppositional, b) Cognitive Problems, c) Hyperactivity, and d) ADHD Index with 27 and 28 items, respectively.

Social Skills Rating System

The Social Skills Rating System ([SSRS]; Gresham & Elliott, 1990) is intended as a screening and classifying instrument for children suspected as having social behavior problems. This may include children that are emotionally disturbed, behaviorally disordered, learning disabled, mildly mentally retarded, or handicapped in some other way. This measure samples the three domains of social skills, problem behaviors, and academic competence. The social skills domain on the Parent Form-Elementary Level is composed of Cooperation, Assertion, Responsibility, and Self-Control subscales. The Teacher Form-Elementary Level contains Cooperation, Assertion, and Self-Control subscales. Both versions have Externalizing, Internalizing, and Hyperactivity subscales that comprise the problem behaviors domain. The Teacher Form has representative items in the academic competence domain. The SSRS is a group of instruments that are psychometrically sound and well-established regarding the assessment of children's interpersonal functioning.

Procedure

Parents of ADHD and non-ADHD children were recruited 1) at a publicly funded hospital that predominately services low income persons, 2) through local schools, and 3) at an advocacy and support group for individuals with ADHD. The majority of the ADHD participants were obtained at a specialty clinic for behavior-disordered children which is offered through the Earl K. Long Hospital Pediatric Clinic on a weekly basis. This hospital is part of the Louisiana State University Health Sciences Center. Parents/guardians of children who are patients in this clinic were solicited for participation in the lobby or examination room during their routine visits. After the researcher or assistant checked the child's chart to verify an existing diagnosis of ADHD, the parent/guardian was approached and asked if they had observed the child in sports over the past year. If they met this criterion, the study was described and they were asked if they would like to participate. If interested, they were given a questionnaire packet containing the consent form, demographics questionnaire, SBC, CPRS, and SSRS to complete and return before they departed. Parents/ guardians were paid \$5 for completing the packet. Additionally, they were

asked if they could have a teacher or sports supervisor, such as a coach or sports camp counselor, complete a similar packet containing the SBC, CTRS, and SSRS and return it by mail. This procedure was attempted with the other collection methods. The return rate for these sports supervisor packets was extremely low (5.6%) and, given the small sample size ($N = 7$), they were excluded from analysis.

The collection methodology for the school participants primarily consisted of the author, upon obtaining permission from the appropriate administrator, visiting classes individually, typically one class per grade level per school. A letter describing the study and requesting participation was sent home with all children. This letter also determined if parents/guardians would return the questionnaires by mail or via the child. In the latter case, they were asked if they would like payment administered via the child as well. If they returned the packet by mail or preferred not to receive it via the child, the payment was mailed. The children were instructed to take this letter to their parent/guardian and return it completed as soon as possible. All parents/guardians that indicated interest were given a questionnaire packet.

Parents/guardians were paid \$5 for completion of the questionnaires.

In the case of the CHADD meeting, an assistant screened for participants, described the study, and requested participation in a similar fashion as the Pediatric Clinic. Similarly, parents/guardians were paid \$5 for completion of the questionnaires.

Results

Internal Consistency

All responses on the SBC were analyzed to review the internal reliability of the subscales. This analysis was done with the total sample as well as the low SES constituent alone. Overall results were quite similar to the original authors' (Johnson & Rosen, 2000) with respect to adequacy (see Table 3). Two noteworthy exceptions occurred. The first one is that, in the current study, Individual Aggression was found to be adequate in both total and low SES analyses ($\alpha = .73$ and $.70$, respectively) compared to previous work ($\alpha = .52$). Furthermore, the Team Rule Adherence subscale in the low SES sample was found to have a negative relationship ($\alpha = -.11$).

Table 3
SBC subscale reliability

<i>Subscale</i>	<i>Individual alpha</i>	<i>Team alpha</i>	<i>Total alpha</i>
Total sample			
Aggression	.73	.75	.84
Emotional Reactivity	.81	.85	.91
Injury	.83	.80	.88
Disqualification	.83	.75	.90
Fairness	.56	.23	.67
Rule Adherence	.13	.03	.47
Total SBC			.92

Principal Components Analysis

Data from all 124 participants were entered into a principal components analysis. Six factors emerged with eigenvalues greater than or equal to 1. Varimax rotation (Kaiser, 1963) was used to achieve simple structure. This procedure also produced six interpretable factors that accounted for 71.5% of the variance (see Table 4).

The item loadings roughly approximated the original authors' organization. The first factor contained the original six Emotional Reactivity items plus two items pertaining to verbal and physical arguments in the team setting that were originally from the Aggression subscale. The second factor was

Table 4

Factor Loadings

	<u>Component 1</u>	<u>Component 2</u>	<u>Component 3</u>	<u>Component 4</u>	<u>Component 5</u>	<u>Component 6</u>
Eigenvalue	10.01	2.79	1.91	1.62	1.27	.99
% of Variance	38.51	10.73	7.35	6.22	4.89	3.82
Cumulative %	38.51	49.25	56.60	62.82	67.71	71.53
Items						
T:Agitated	.852					
T:Overreact	.827					
I:Overreact	.763					
I:Agitated	.719					
T:Easily Upset	.696					
I:Easily Upset	.575					
T:Verbal Arguments	.552					
T:Physical Argument	.495					
I:Ejected		.763				
T:Disqualified		.735				
T:Ejected		.730				
I:Disqualified		.650				
T:Not Play Fair		.632				
I:Injured			.868			
T:Gets Hurt			.767			
T:Injured			.745			
I:Gets Hurt			.742			
I:Good Sportsman				.853		
T:Follow Rules				.817		
T:Good Sportsman				.781		
I:Follow Rules				.693		
I:Play Fair				.586		
I:Verbal Arguments					.663	
I:Physical Arguments					.601	
I:Not Understand Rules						.876
T:Not Understand Rules						.700

comprised of the original four Disqualification items as well as one item regarding playing fair in the team setting, originally from the Rule Adherence subscale. The third factor contained only the four original items from the Injury subscale. The fourth factor consisted of two items pertaining to good sportsmanship in the individual and team settings that originally were part of the Fairness subscale and two items regarding following rules in the team and individual settings that came from the Rule Adherence subscale. The fifth factor was composed of the two individual items pertaining to verbal and physical arguments, originally part of the Aggression subscale. Finally, the sixth factor contained two items concerning rule comprehension that were originally in the Rule Adherence subscale.

Subscale Correlations

Using the original sample ($N = 124$), correlations were calculated between the SBC subscales and CPRS and SSRS subscales (see Table 5). As hypothesized, the Aggression subscale was positively

correlated to the Oppositional subscale of the CPRS, $r(111) = .52, p < .001$, and the Externalizing subscale of the SSRS, $r(112) = .48, p < .001$. The Rule Adherence subscale was negatively correlated with the Responsibility subscale of the SSRS, $r(115) = -.39, p < .001$. The Emotional Reactivity subscale was negatively correlated with the Self-Control subscale of the SSRS, $r(112) = -.41, p < .001$, and positively related to the Hyperactivity subscale of the SSRS, $r(112) = .33, p < .001$. The Injury subscale was positively correlated with the Inattention subscale of the CPRS, $r(110) = .30, p < .001$. The Disqualification subscale was negatively correlated with the Self-Control subscale of the SSRS, $r(111) = -.38, p < .001$, and positively related to the Externalizing subscale of the SSRS, $r(111) = .25, p < .01$. The Fairness subscale was not negatively correlated with the Cooperation subscale of the SSRS, $r(115) = -.02, p = .85$ as expected.

Finally, it was believed that the Internalizing subscale of the SSRS would not be related to any SBC subscales. Unexpectedly, this subscale showed significant positive relationships to the Aggression subscale, $r(112) = .37, p < .001$, Emotional Reactivity subscale, $r(112) = .40, p < .001$, Injury subscale, $r(110) = .42, p < .001$, and Disqualification subscale, $r(111) = .25, p < .01$.

SBC Subscale Differences

It was hypothesized that ADHD children would show more difficulty than the control group on the SBC subscale scores. A multivariate analysis of covariance (MANCOVA) was performed to determine the effect of group status (ADHD v. non-ADHD) on SBC subscale scores (see Table 6). The SBC subscale ratings differed between the two groups, Wilks's $\lambda = .80, F(7,80) = 2.57, p = .005$. Main effects for ADHD status were found on three of the six SBC subscales. On the Aggression subscale, ADHD children had a mean score of 9.46 ($SD = 4.02$) and non-ADHD children had a mean score of 6.50 ($SD = 3.71$), $F(1, 87) = 13.05, p < .001$. On the Emotional Reactivity subscale, ADHD children had a mean score of 15.56 ($SD = 7.15$) and non-ADHD children had a mean score of 10.75 ($SD = 5.69$), $F(1, 87) =$

Table 5

Relationships of SBC Subscales and SSRS/CPRS Subscales

	Agg	Emot React	Injury	Disqu	Rule Adher	Fair	Coop	Resp	Self-Con	Int	Ext	Hyper	Opp	Inattn
Agg	1.00										*** <u>.48</u>		*** <u>.52</u>	
Emot React		1.00							*** <u>-.41</u>	*** .40		*** <u>.33</u>		
Injury			1.00							*** .42				*** <u>.30</u>
Disqu				1.00					*** <u>-.38</u>	** .25	** <u>.25</u>			
Rule Adher					1.00			*** <u>-.39</u>		.13				
Fair						1.00	-.02			.11				
Coop						-.02	1.00							
Resp					*** <u>-.39</u>			1.00						
Self-Con		*** <u>-.41</u>		*** <u>-.38</u>					1.00					
Int		*** .40	*** .42	** .25	.13	.11			*** .37	1.00				
Ext	*** <u>.48</u>			** <u>.25</u>							1.00			
Hyper		*** <u>.33</u>										1.00		
Opp	*** <u>.52</u>												1.00	
Inattn			*** <u>.30</u>											1.00

Note. ** indicates $p < .01$, *** indicates $p < .001$; underlined values are proposed relationships

14.15, $p < .001$. On the Injury subscale, ADHD children had a mean score of 8.25 ($SD = 4.09$) and non-ADHD children had a mean score of 6.53 ($SD = 3.63$), $F(1, 87) = 5.31$, $p < .01$.

Table 6

Significant Group Differences on SBC Scores

<u>Subscales</u>	<u>ADHD</u>	<u>Control</u>	<u>F, alpha</u>
Aggression	9.46 ($SD = 4.02$)	6.50 ($SD = 3.71$)	13.05, $< .001$
Emot. React.	15.56 ($SD = 7.15$)	10.75 ($SD = 5.69$)	14.15, $< .001$
Injury	8.25 ($SD = 4.09$)	6.53 ($SD = 3.63$)	5.31, $< .01$

Discussion

The goals of this study were to compare the differences of sport-environment behavior as rated on the SBC (Johnson & Rosen, 2000) between low SES ADHD and non-ADHD children, as well as validate the SBC by way of correlating it with select subscales of the CPRS and SSRS. The factor structure also was empirically analyzed to investigate the construct validity of the instrument.

The factor structure that was found by the principal components analysis was fairly close to the original authors' proposition. A six - factor solution accounted for 71.5% of the variance, adding considerable support for the entire measure although not in the exact configuration it was initially constructed. That the team verbal and physical argument items loaded with the emotional reactivity items suggests that they may be considered emotionally reactive behaviors. Similarly, not playing fair in a team situation may be frequent cause for disqualification and, therefore, explain the occurrence of this statistical relationship. The isolation of the two items pertaining to the failure to understand rules implies that this is a construct of its own, distinct from both the two items regarding following rules and from Rule Adherence as a whole. This could be an explanation of the poor internal consistency of this subscale.

As hypothesized, most of the correlations were in the proposed direction and of the expected magnitude. This finding lends support for the construct validity of this instrument (Campbell & Fiske, 1959) through convergent validity with other problem behavior scales and divergent validity with scales that measure prosocial behaviors. One noteworthy exception to this trend was the lack of concordance between the Fairness and Cooperation subscales. It was reasoned that an individual who is cooperative is probably more likely to be fair. Since the items on the Cooperation subscale deal primarily with compliance to adults' requests, they may not be related to the items on the Fairness subscale because these items reflect peer dynamics. Another intriguing finding was the unexpected positive relationships between the Internalizing subscale and the Aggression, Emotional Reactivity, Injury, and Disqualification subscales. It is known that ADHD individuals exhibit higher comorbid rates of internalizing problems (Barkley, 1990), but the reason for the relationship in this situation is currently unclear.

As hypothesized, we found that children with ADHD were rated by their parents as having significantly more difficulty with aggression, emotional reactivity, and injury while participating in sports activities. While these children were not rated as being disqualified more often than non-ADHD children, there was clearly a trend in this direction. It is likely that a larger sample would show greater sensitivity to this effect. It is not surprising that the subscales of Rule Adherence and Fairness failed to show differences given their inherent unreliability.

The group differences evidenced above are consistent with prior research (Campbell & Paulaskas, 1979; Johnson & Rosen, 2000) that shows children with ADHD are perceived as displaying higher levels of aggression and emotional reactivity than non-ADHD children. The inability of these individuals to delay responding to prepotent stimuli (Barkley, 1997) appears to be present in these contexts also. Loney and Milich (1982) found that 65% of clinic-referred ADHD children may show significant problems with temper tantrums, verbal hostility, stubbornness, and defiance. It is these differences in emotional response patterns that likely are contributory to the increased aggression and emotional reactivity exhibited by ADHD children in the sports environment (Johnson & Rosen, 2000). The greater ratings on the Injury subscale might be explained by the greater rates of the impulsive-type behaviors as captured in the Aggression and Emotional Reactivity subscales or the attentional deficits of ADHD individuals. For example, Lavarda (1976) discovered that the characteristics of impulsivity, aggression, and guilt were related to the incidence of injury among Italian national athletes, independent of the sports activity. Alternatively, Bergandi and Witting (1988) found that attentional style accounted for 10% to 60% of the variance in predicting injury. It is equally conceivable that externalizing behaviors could bring about higher rates of disqualification among these children. It is possible that the effect of disqualification was diminished because parents of ADHD children are selecting away from team sports in favor of individual ones (Johnson & Rosen, 2000) where disqualification is less likely.

A potential limitation of this study is a failure to control for comorbidity of other disorders. Since ADHD children are more likely than the general population to exhibit other psychological problems, it is

possible that these other difficulties may account for a small portion of the variance on their SBC scores. While this effect was not controlled for directly, data was available regarding parent-reported comorbid diagnoses. Of the low SES sample, 10.1% had a co-occurring diagnosis. Three children had a Learning Disorder, two children had Oppositional Defiant Disorder, two children had Mental Retardation/Developmental Disability, one child had an Anxiety disorder, and one child had Conduct Disorder. It is not believed that the presence of these additional diagnoses contributed significantly to the results given their low prevalence ($n = 9$) but systematic examination would be prudent. Another limitation of the current study is the overrepresentation of males in the ADHD sample. This is a challenge that plagues this area of research and an attempt should be made to exam these phenomena more thoroughly with a larger number of female participants.

In summary, children with ADHD exhibit numerous problem behaviors within sports contexts beyond their non-ADHD counterparts. This is unfortunate but not surprising given the pervasiveness and intractability of this disorder. The development of specialized measures should aid clinicians and researchers in explicating the nature of these problems and tailoring interventions to individual strengths and weaknesses. The Sports Behavior Checklist is one such measure. It has evidenced the ability to detect group differences and has shown low to moderate correlations with many subscales of two well-established measures of ADHD and social skills behaviors. Though factor loadings were not exactly as originally specified, a six-factor solution was obtained with item loadings that roughly approximated the rationally derived configuration. While additional refinement would be beneficial, the SBC has proven thus far to be an adequate instrument.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th edition-Text revision). Washington, DC: Author
- Anastopolous, A. D. (1997). Attention-Deficit/Hyperactivity Disorder. In R. T. Ammerman & M. Hersen (Eds.), *Handbook of prevention and treatment*. (pp. 551-571). New York: Wiley
- Anderson, C. G., Rush, D., Ayllon, T., & Kandel, H. (1987). Training and generalization of social skills with problem children. *Journal of Child and Adolescent Psychotherapy*, 4 (4) 294-298.
- Armstrong, K. J., & Drabman, R. (1994). The clinical use of sports skills tutoring with grade school boys referred for school behavioral problems. *Child & Family Behavior Therapy*, 16 (1), 43-48.
- Bandura, A. (1977a). *Social learning theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Barkley, R. A. (1990). *Attention-Deficit Hyperactivity Disorder: A handbook for diagnosis and treatment*. New York: Guilford Press.
- Barkley, R.A. (1997). Behavioral inhibition, sustained attention, and executive functions: Constructing a unifying theory of ADHD. *Psychological Bulletin*, 121 (1), 65-94.
- Barkley, R. A. (2000). Genetics of childhood disorders: xvii. ADHD, Part 1: The executive functions and ADHD. *Journal of the American Academy of Child and Adolescent Psychiatry*, 39 (8), 1064-1067.
- Barkley, R. A., Anastopolous, A. D., Guevremont, D. C., & Fletcher, K. E. (1992). Adolescents with Attention Deficit Hyperactivity Disorder: Mother-adolescent interactions, family beliefs and conflicts, and maternal psychopathology. *Journal of Abnormal Child Psychology*, 20, 263-288.
- Barkley, R. A., DuPaul, G. J., & McMurray, M. (1990). A comprehensive evaluation of attention deficit disorder with and without hyperactivity defined by research criteria. *Journal of Consulting in Clinical Psychology*, 58, 775-789.
- Browne, B. A., & Francis, S. K. (1993). Participants in school-sponsored and independent sports: Perceptions of self and family. *Adolescence*, 28 (110), 384-391.
- Caldarella, P., & Merrell, K. W. (1997). Common dimensions of social skills of children and adolescents: A taxonomy of positive behaviors. *School Psychology Review*, 26 (2), 264-278.
- Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56, 81-105.
- Campbell, S. B., & Paulauskas, S. (1979). Peer relations in hyperactive children. *Journal of Child Psychology and Psychiatry*, 20, 223-245.
- Cantwell, D. P. (1996). Attention Deficit Disorder: A review of the past 10 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35 (8), 978-987.

Coleman, M. (1991). Sports participation and social development. In L. Diamant (Ed.), *Mind-body maturity: Psychological approaches to sports, exercise, and fitness*. (pp. 105-126). Washington, DC: Hemisphere Publishing Corp.

Conners, C. K. (1997). *Conners' rating scales-revised*. North Tonawanda, New York: Multi-Health Systems, Inc.

Danish, S. J., Petitpas, A. J., & Hale, B. D. (1990). Sports as a context for developing competence. In T. P. Gullotta, G. R. Adams, & R. Montemayor (Eds.), *Advances in adolescent development* (Vol. 3, pp. 169-174). Thousand Oaks, CA: Sage Publications Inc.

Dietz, S., & Repp, A. (1973). Decreasing classroom misbehavior through the use of DRL schedules of reinforcement. *Journal of Applied Behavior Analysis*, 6, 457-463.

Dodge, K. A., & Newman, J. P. (1981). Biased decision-making processes in aggressive boys. *Journal of Abnormal Psychology*, 90, 375-379.

Elliott, S. N., & Gresham, F. M. (1993). Social skills interventions for children. *Behavior Modification*, 17 (30), 287-313.

Giebink, M. P., & McKenzie, T. L. (1985). Teaching sportsmanship in physical education and recreation: An analysis of interventions and generalization effects. *Journal of Teaching in Physical Education*, 4, 167-177.

Gilbert, B. O., & Gilbert, D. G. (1991). Personality, social skills, and disturbed behavior patterns: An introduction to the issues. In D. G. Gilbert & J. J. Connolly (Eds.), *Personality, social skills, and psychopathology: An individual difference approach*. (pp. 1-15). New York: Plenum.

Greene, R. W., Biederman, J., Faraone, S. V., Ouellette, C. A., Penn, C., & Griffin, S. A. (1996). Toward a new psychometric definition of social disability in children with Attention-Deficit Hyperactivity Disorder. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35 (5), 571-578.

Gresham, F. M. (1986). Conceptual and definitional issues in the assessment of children's social skills: Implications for classification and training. *Journal of Clinical Child Psychology*, 15 (1), 3-15.

Gresham, F. M., & Elliott, S. N. (1990). *Social Skills Rating System*. Circle Pines, MN: American Guidance Service.

Gross, A. M., & Johnson, T. C. (1984). Athletic skill and social status in children. *Journal of Social and Clinical Psychology*, 2 (1), 89-96.

Guevremont, D. C., & Dumas, M. C. (1994). Peer relationship problems and disruptive behavior disorders. *Journal of Emotional and Behavioral Disorders*, 2 (3), 164-172.

Hansen, D. J. (1993). Current issues and advances in social-skills assessment and intervention with children and adolescents. *Behavior Modification*, 17 (3), 227-228.

Hollingshead, A. B. (1961). Class and disordered speech in the mentally ill. *Journal of Health and Human Behavior*, 2, (3), 178-185.

Hupp, S. D. A., & Reitman, D. (1999). Improving sports skills and sportsmanship in children diagnosed with Attention-Deficit/Hyperactivity Disorder. *Child & Family Behavior Therapy*, 21 (3), 35-51.

Johnson, R. C., & Rosen, L. A. (2000). Sports behavior of ADHD children. *Journal of Attention Disorders*, 4 (3), 150-160.

Joseph, J. (2000). Not in their genes: A critical review of the genetics of Attention-Deficit Hyperactivity Disorder. *Developmental Review*, 20, 539-567.

Kaiser, H. F. (1963). Image analysis. In C. W. Harris (Ed.) *Problems in measuring change* (pp. 156 – 166). Madison: University of Wisconsin Press.

Lambert, N. M., Sandoval, J., & Sassone, D. (1978). Prevalence of hyperactivity in elementary school children as a function of social system definers. *American Journal of Orthopsychiatry*, 48, 446-463.

Leonard, W. M. (1988). *A sociological perspective of sport* (3rd ed.). New York: Macmillan.

Loney, J., & Milich, R. (1992). Hyperactivity, inattention, and aggression in clinical practice. In D. Routh & M. Wolraich (Eds.), *Advances in developmental and behavioral pediatrics* (Vol. 3, pp. 113-147). Greenwich, CT: JAI Press.

Madden, N. M., & Slavin, R. E. (1983). Mainstreaming students with mild handicaps: Academic and social outcomes. *Review of Educational Research*, 53, 519-569.

Margalit, M., & Arieli, N. (1984). Emotional and behavioral aspects of hyperactivity. *Journal of Learning Disabilities*, 17, 374-376.

Mayhew, G., Enyart, P., & Anderson, J. (1978). Social reinforcement and the naturally occurring social responses of severely and profoundly retarded adolescents. *American Journal of Mental Deficiency*, 83, 164-170.

McFall, R. M. (1982). A review and reformulation of the concept of social skills. *Behavioral Assessment*, 4, 1-33.

Melnick, S. H., & Hinshaw, S. P. (1996). What they want and what they get: The social goals of boys with ADHD and comparison boys. *Journal of Abnormal Child Psychology*, 24, 169-185.

Michelson, L., & Wood, R. (1980). Behavioral assessment and training of children's social skills. In M. Hersen, P. M. Miller, & R. M. Eisler (Eds.), *Progress in behavior modification* (Vol. 9, pp. 215-236) New York: Academic Press

Milich, R., & Landau, S. (1982). Socialization and peer relations in hyperactive children. *Advances in learning and behavioral disabilities* (Vol. 1, pp.365-436). Greenwich, CT: JAI Press.

O'Callaghan, P. M. (2001). Generalization of prosocial and attentive behaviors in a sports setting for children with Attention-Deficit/Hyperactivity Disorder. Unpublished Manuscript.

- Oden, S. L., & Asher, S. R. (1977). Coaching children in social skills for friendship making. *Child Development*, 48, 495-506.
- Orvaschel, H., & Walsh, G. (1984). The assessment of adaptive functioning in children: A review of existing measures suitable for epidemiological and clinical services research. Washington, DC: US Department of Health and Human Services, NIMH, Division of Biometry and Epidemiology.
- Pelham, W. E., & Bender, M. E. (1982). Peer relationships in hyperactive children: Description and treatment. *Advances in learning and behavioral disabilities* (Vol. 1, pp.365-436). Greenwich, CT: JAI Press.
- Pelham, W. E., Gnagy, E. M., Greiner, A. R., Hoza, B., Hinshaw, S. P. & Swanson, J. M. et al. (2000). Behavioral vs. behavioral and pharmacological treatment in ADHD children attending a summer treatment program. *Journal of Abnormal Child Psychology*, 28 (6), 507-525.
- Pelham, W. E., McBurnett, K., Harper, G. W., Milich, R., Murphy, D. A., & Clinton, J. et al. (1990). Methylphenidate and baseball playing in ADHD children: Who's on first? *Journal of Consulting and Clinical Psychology*, 58 (1), 130-133.
- Pinkston, E. M., Reese, N. M., LeBlanc, J. M., & Baer, D. M. (1973). Independent control of a preschool child's aggression and peer interaction by contingent teacher attention. *Journal of Applied Behavior Analysis*, 6, 223-224.
- Rutherford, R. B., Chipman, J., DiGangi, S. A., & Anderson, K. (1992). Teaching social skills: A practical instructional approach. Ann Arbor, MI: Exceptional Innovations.
- Sacks, S., & Gaylord-Ross, R. (1989). Peer-mediated and teacher-directed social skills training for visually impaired students. *Behavior Therapy*, 29, 619-638.
- Sharpe, T., Brown, M., & Crider, K. (1995). The effects of a sportsmanship curriculum intervention on generalized positive social behavior of urban elementary school students. *Journal of Applied Behavior Analysis*, 28, 401-416.
- Sharpe, T., Crider, K., Vyhldal, T., & Brown, M. (1996). Description and effects of prosocial instruction in an elementary physical education setting. *Education and Treatment of Children*, 19 (4), 435-457.
- Sisson, L. A., Babeo, T. J., & Van Hasselt, V. B. (1988). Group training to increase social behaviors in young multihandicapped children. *Behavior Modification*, 12, 497-524.
- Smith, R. E., & Smoll, F. L. (1990). Self-esteem and children's reactions to youth sport coaching behaviors: A field test of self-enhancement processes. *Developmental Psychology*, 26, 987-993.
- Smith, R. E., & Smoll, F. L. (1991). Behavioral research and intervention in youth sports. *Behavior Therapy*, 22, 329-344.
- Smith, R. E., Smoll, F. L., & Curtis, B. (1979). Coach effectiveness training: A cognitive-behavioral approach to enhancing relationship skills in youth sport coaches. *Journal of Sport Psychology*, 1, 59-75.

Smoll, F. L., Smith, R. E., Barnett, N. P., & Everett, J. J. (1993). Enhancement of children's self-esteem through social support training for youth sport coaches. *Journal of Applied Psychology*, 78 (4), 602-610.

Stormont, M., Zentall, S. S., Beyda, S., Javorsky, T., & Belfiore, P. (2000). Playground contexts for aggression for preschoolers with hyperactivity. *Journal of Behavioral Education*, 10 (1), 37-48.

Strain, P. S. (1984). Social behavior patterns of nonhandicapped and developmentally disabled friend pairs in mainstream preschools. *Analysis and Intervention in Developmental Disabilities*, 4, 15-28.

Weiss, M. R., & Duncan, S. C. (1992). The relationship between physical competence and peer acceptance in the context of children's sports participation. *Journal of Sport & Exercise Psychology*, 14, 177-191.

Whalen, C. K., Henker, B., Collins, B. E., McAuliffe, S., & Vaux, A. (1979). Peer interactions and structure communication task: Comparisons of normal and hyperactive boys and of methylphenidate (Ritalin) and placebo effects. *Child Development*, 50, 388-401.

Zametkin, A. J., & Rapoport, J. L. (1986). The pathophysiology of Attention Deficit Disorder with Hyperactivity: A review. In B. Lahey & A. Kazdin (Eds.), *Advances in clinical child psychology* (Vol. 9, pp. 177-216). New York: Plenum Press.

Zwald, L., & Gresham, F. M. (1982). Behavioral consultation in a secondary class: Using DRL to decrease negative verbal interactions. *School Psychology Review*, 11, 428-432.

Appendix

Consent Form

Louisiana State University Health Sciences Center in New Orleans Informed Consent

PARENT CONSENT FORM

- 1. Study Title:** Toward Validation of the Sport Behavior Checklist: Comparison of Attention-Deficit/Hyperactivity Disorder and Control Group Children in a Sports Setting
- 2. Performance Sites:** Parents will be recruited on a voluntary basis from the Pediatric clinic at Earl K. Long Hospital, local public and private elementary schools, and parent organizations in Baton Rouge.
- 3. Names and Telephone Numbers of Investigators:** If you have questions concerning this form or the study, please contact Mary Lou Kelley, Ph.D. or Aaron Clendenin at (225) 358-1321 on Monday through Friday, 8:00 AM to 4:30 PM, or the 24-hour Crisis Hotline at (225) 924-3924 hours a day.
- 4. Purpose of Study:** The purpose of this research study is to examine the differences in sports behavior between children who have and do not have Attention-Deficit/Hyperactivity Disorder. Parents/guardians with children from 5-12 years old who have seen this child participate in sports are eligible to be in the study. Information that we get from this study will help clinicians better understand and design treatments for children who may have difficulties in social settings such as these. Information that we will get from you about your child includes the amount of hyperactive and oppositional behavior they display, how they get along with peers and adults at home, how cooperative, assertive, responsible, and self-controlled they are, and type of sports participation and problems they may encounter in this setting. Information that we will get from your child's teacher or sports supervisor, such as coach or camp counselor, will include their view of the amount of hyperactive and oppositional behavior the children display, how they get along with peers and adults at school or in the community, how co-operative, assertive, and self-controlled they are, and type of sports participation and difficulties they may encounter in this setting. The study is being conducted in Baton Rouge, LA. Approximately 128 participants will be included in the study.
- 5. Description of Study:** Parents whose children are between the ages of 5 to 12 years old will be recruited from the Earl K. Long Hospital Pediatric clinic, local public and private schools, and parent organizations. If you agree to voluntarily participate in this study, you will be asked to complete several questionnaires regarding problem behaviors your child may have, how they act in different social situations, and type of sports they are involved in and problems they may have in that setting. Specifically, you will complete the Connors' Parent Rating Scale, Social Skills Rating System, Sports Behavior Checklist, and a demographic form. Upon completion and return of this packet, you will be paid \$5 for your participation. In addition, you will be asked to have a teacher or sports supervisor, if available, that is able to comment on your child's behavior in a sports setting complete and return a questionnaire packet regarding problem behaviors your child

may have, how they act in different social situations, and type of sports they have seen the child in and problems they may have in that setting. Specifically, the teacher or sports supervisor will complete the Conners' Teacher Rating Scale, Social Skills Rating System, and Sports Behavior Checklist. These either will be directly collected by the researcher or the teacher will be supplied with a self-addressed, stamped envelope to return it by mail. If you or your child becomes upset about the questions that we asked, a trained clinician will be available to assist you, either in person or by phone, at all times. If a clinician is present while you are completing questionnaires and you or your child becomes distressed and would like immediate assistance, we can go to a private room to discuss the worries that you have. If you would like to be seen by a clinician at a later time, we can make an appointment or the clinician can give you a referral card to a local mental health agency. Treatment will be provided to you and your child at no charge. Based on the answers given by you or your child's teacher or sports supervisor, you will be notified if any serious problems are discovered regarding your child.

6. Benefits to Subject: The information gained from this research will help us identify problem behaviors in a specific setting and design better treatments for children having difficulties with these behaviors.

7. Risks to Subject: You or your child may become upset when asked to think about problem behaviors and social functioning. Trained clinicians will be available in person or by phone in the event that this happens and you need assistance. We will provide help immediately, make an appointment with you, or refer you to a local agency to deal with in the worries you may have regarding the study. We will give referral card to everyone in case you or your child becomes emotionally upset later. Treatment will be provided at no charge to you. If we find out that your child is being physically, emotionally, or sexually abused or neglected, we are required to report this information. We will immediately tell you that we are making a report to Child Protective Services if your child is in danger of abuse or has been abused.

8. Alternatives to Participation in the Study: The alternative is not to participate.

9. Subject Removal: Participants may be removed from the study without their consent if they fail to complete all questionnaires.

10. Subject's Right to Refuse to Participate or Withdraw: Study subjects may refuse to participate or withdraw from the study at anytime without jeopardizing, in anyway, their medical treatment at this institution in the present or future. Should significant new findings develop during the course of the research which may relate to the subject's willingness to continue participation, that information will be provided to the subject. Participation is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled, and you may discontinue participation at any time without penalty or loss of benefits to which you are otherwise entitled.

11. Subject's Right to Privacy: The results of the study may be published, but the privacy of the participants will be protected and their names will not be used in any manner. Data will be kept confidential unless release is legally compelled.

12. **Release of Information:** The results of the study may be released to the LSU-Baton Rouge Department of Psychology or LSUHSC Institutional Review Board.

13. **Financial Information:** There is no cost for participation in the study. Parents will be paid \$5 for their participation.

14. **Signatures:**

"This study has been discussed with me and all my questions have been answered. I understand that additional questions regarding the study should be directed to investigators listed on page 1 of this consent form. I understand that if I have questions about subjects' rights, or other concerns, I can contact the Chancellor of LSU Health Sciences Center, at (504) 568-4801. I agree with the terms above, acknowledge I have been given a copy of the consent form and agree to participate in this study. I understand that I have not waived any of my legal rights by signing this form.

Signature of Subject

Date

Signature of Witness

Date

The study subject has indicated to me that the subject is unable to read. I certify that I have read this consent form to the subject and explained that by completing the signature line above the subject has agreed to participate.

Signature of Reader

Date

Signature of Person Administering Consent

Date

Signature of Principal Investigator

Date

Vita

Aaron Clendenin was raised in Orlando, Florida, where he completed his Bachelor of Science degree in psychology in 2000. He is currently a doctoral student in clinical psychology at Louisiana State University. His clinical and research interests include disruptive behavior disorders, child abuse and neglect issues, adolescent substance abuse, and spirituality as a factor of resilience and recovery.