

VALIDITY EVIDENCE FOR THE *PRESCHOOL AND KINDERGARTEN BEHAVIOR  
SCALES, SECOND EDITION*, FOR AUTISM SPECTRUM DISORDERS

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## ABSTRACT

CARLY KAYE HOFFEND: Validity Evidence for the *Preschool and Kindergarten Behavior Scales, Second Edition*, for Autism Spectrum Disorders  
(Under the direction of Barbara H. Wasik)

The primary purpose of this study was to address a gap in previous research by providing additional validity evidence for the *Preschool and Kindergarten Behavior Scales, Second Edition*, for children with and without diagnoses of Autism Spectrum Disorders (ASD). The study sample consisted of 76 parent informants and their children, ranging in age from 4 to 6 years, without a diagnosis of ASD ( $n = 59$ ) or with a diagnosis of ASD ( $n = 17$ ). This study demonstrates that the PKBS-2 is sensitive to ASD group membership with a similar classification rate as those yielded in previous research examining the discriminant validity of this instrument. The results of this study provide additional validity evidence that support the PKBS-2 as having great potential as a screening device and research tool. A discussion is provided regarding directions for future research.

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## LIST OF ABBREVIATIONS

ADHD	Attention Deficit/Hyperactivity Disorder
AS	Asperger's Syndrome
ASD	Autism Spectrum Disorders
PKBS	Preschool and Kindergarten Behavior Scale
PKBS-2	Preschool and Kindergarten Behavior Scale, Second Edition
PDD	Pervasive Developmental Disorders
PDD-NOS	Pervasive Developmental Disorder – Not Otherwise Specified



## CHAPTER I

### Introduction

Accurate assessment is among the most critical components of best practice in working with children. Use of valid and reliable instruments in the process of evaluating children is recommended by professional organizations (AERA, APA, & NCME, 1999; NASP, 2005) as well as mandated by federal statutes and regulations (DOE, 2006; IDEA, 2004; NCLB, 2001). Especially in early childhood, effective assessment is essential to identifying children in need of interventions and improving service quality (Schaefer et al., 2004). Unfortunately, the quality of psychometric properties of early childhood assessment instruments has historically been poor (Merrell, 2008). As a result, there is a need for test developers and investigators to establish high standards of validity and reliability for early childhood scales (AERA, APA, & NCME, 1999; Merrell, 2008). The current research addresses this need by providing validity evidence for one specific early childhood behavior rating scale: the *Preschool and Kindergarten Behavior Scale, Second Edition* (PKBS-2), by exploring whether PKBS-2 scores of children experiencing social-emotional problems are different based on the presence of an Autism Spectrum Disorders (ASD) diagnosis. In the following sections, the literature related to early childhood social skills, children with ASD, and the PKBS-2 is reviewed to determine the need for further validity evidence for the PKBS-2.

## CHAPTER II

### Literature Review

#### *Social Skills in Early Childhood*

Recent estimates suggest that 9.5 to 14.2 percent of children between the ages of 0 to 5 experience social-emotional problems that interfere with their development (Brauner & Stephens, 2006). Especially considering the transition to more limited adult/caregiver support and emphasis of large peer group activities in kindergarten, a child's foundational ability to interact with peers and develop relationships is crucial (National Research Council, 2008). In practice and research, assessment and intervention within the social-emotional domain has been of strong interest to school and child psychologists, special educators, and other professionals working with children (Merrell, 2008).

Social competence is a loosely defined broad construct that includes a variety of behavioral and cognitive characteristics, as well as aspects of emotional adjustment that are relevant to the development of adequate social relations and obtaining desirable social outcomes (Merrell & Gimple, 1998; Nangle et al., 2010). Social competence, along with its underlying concepts, has been a significant topic of investigation for the majority of the twentieth century and carries momentum into current research (Rubin et al., 2006). As with social competence, the concept of social skills is also loosely defined and lacks a universal definition. Based on an extensive review of the relevant literature, Merrell (2008) conceptualized social skills as "...specific behaviors, that when initiated, lead to desirable social outcomes for the person initiating them" (p. 381). Social skills are both

verbal and nonverbal abilities that enable needs to be met and unpleasant events to be avoided (Topper et al., 2000). Social skills can be characterized as one of several important behavioral components that lead to social competence and result in the quality of peer relationships (Erdley et al., 2010; Rose-Krasnor & Denham, 2009).

Early peer relations in childhood are vital to later social development. Merrell (2008) defines early childhood as the ages of three to five or six years. Children between ages two and six years spend increasing time with peers (Campbell et al., 2010) and during this period of rapid social growth children gain critical interpersonal skills, including verbal and nonverbal communication, turn taking, theory of mind (the ability to understand and predict the cognitions and feelings of others; Eisenberg & Harris, 1984), and the ability to produce multiple solutions and consider consequences (Shure & Spivack, 1980). A growing body of literature in the fields of psychology, child development, and education has established that development of appropriate and adequate social skills and peer relations during this early childhood period are essential for later development (Merrell, 2008), especially for the development of social self-worth, enhancement of interpersonal understanding, and support of critical social skills (Hartup, 1983; Parker et al., 1995). Socially competent children possess the social skills to develop relationships with adults and peers essential for success across environments (Mendez et al., 2002). By three to four years of age, children are considered socially competent if they utilize effective and appropriate behaviors, have reciprocal friendships, and are accepted within their peer group (Vaughn et al., 2001). As children mature through school years and adolescence, peers take on an increasingly meaningful and

influential role (Furman & Buhrmester, 1992) becoming key providers of support, companionship, advice, and affirmation. Social development is a continuous process and critically important throughout early and later stages of development in terms of an individual's sense of well-being and adjustment (Rubin et al., 2006).

While in recent years the literature has focused more on the relation of negative outcomes to poor social skills, past research has demonstrated that young children with higher social skill levels tend to have more positive outcomes (Merrell & Gimpel, 1998). Social competence has been cited as a critical protective factor for preventing emotional and behavioral problems in children (Feshbach & Feshbach, 1982) and reducing the likelihood of negative outcomes under conditions of risk (Kazdin, 1991; Luthar, 1993). Children with higher levels of social skills, as would be expected, also tend to experience more interpersonal success (Wolpe & Lazarus, 1966) and they are more likely to exhibit higher self-esteem and self-confidence (Kelly, 1982). Higher levels of social skills have been related to academic success (Walker & Hops, 1976). In fact, social, emotional, and behavioral competencies in early childhood predict academic success in early elementary school more so than do other factors, such as cognitive skills, family background, and prior school experience (Ladd, 1990; Raver & Knitzer, 2002).

Given the critical and widespread implications of building an adequate foundation of social skills early in life, it is understandable that social deficits in early childhood may negatively affect later child adjustment and lead to poorer social development (Kopp et al., 1992; Merrell, 2008; Merrell & Holland, 1997). Numerous studies have explored the way in which childhood peer relations are associated with and/or predict difficulties experienced later in development (Parker et al., 1995; Rubin et al., 2006). Specifically,

early social relations are associated with and predict academic, psychological, and behavioral problems.

As demonstrated by several longitudinal studies, children experiencing difficulties with peers tend to have later academic problems. Children who are disliked by peers in school are more likely to fail a subsequent grade, drop out of school (Hymel et al., 2002; Ollendick et al., 1992), and experience more educational underachievement (Woodward & Fergusson, 2000). Similarly, children with greater social problems, such as those experiencing high levels of rejection, tend to have higher levels of absenteeism (DeRosier et al., 1994). Moreover, Ladd (1990) found that early social relations with peers predicted kindergarten adjustment more so than the child's mental age, sex, and preschool experience. Measures of adjustment showed that children who experienced rejection tended to have less favorable perceptions of school, higher levels of school avoidance, and lower school performance levels. In addition, children who made more friendships were more likely to increase in their school performance. Each of these studies demonstrates the critical associational and predictive relationships between early peer relations and academic experiences.

Difficulties with peer relationships can have an immense effect on the psychological adjustment of children (Kupersmidt et al., 1990; Parker et al., 1995; Rubin et al., 2006). Results of following a large number of children ( $n = 657$ ) from first through fourth grades revealed that early peer rejection and aggression uniquely contribute to the prediction of later conduct problems (Miller-Johnson et al., 2002). Higher levels of peer rejection also predict more aggression, externalizing, and antisocial behaviors (Brendgen et al., 1998; DeRosier et al., 1994; Ollendick et al., 1992) as well as more delinquent

offenses (Ollendick et al., 1999). In addition, children with social skill deficits and problems with peers are at a higher risk for depression (Boivin & Hymel, 1997), suicide (Carney, 2000), and substance abuse (Ollendick et al., 1992; Spooner, 1999). Difficulty with peer relationships is extremely stressful for children. In fact, children report the stress of experiencing peer rejection is so high that only death of a parent exceeds it (Johnson, 1986). In addition, a high level of stress due to peer rejection has been shown to predict increased physical health problems (Brendgen & Vitaro, 2008).

The literature provides extensive evidence that early peer rejection increases a child's risk for behavioral, psychological, and academic adjustment difficulties beyond individual characteristics. Along with the spectrum of extensive and long-lasting outcomes of social skill deficits in typically developing children (Merrell & Gimpel, 1998), research in the past few decades indicates that children with disabilities and clinical disorder demonstrate a clearly heightened risk for developing social skill deficits and peer rejection (Campbell et al., 2010; Merrell, 2008). One specific population in early childhood that are at an extreme risk for developing later developmental issues due to social skills deficits are those diagnosed with Autism Spectrum Disorders (ASD) (Campbell et al., 2010; Little, 2001).

### *Autism Spectrum Disorders*

Autism, as first described by Kanner in 1943, is identified as a developmental disability that impairs three areas of functioning: communication, social skills, and behavior. Autistic Disorder (hereinafter Autism) is classified in the DSM-IV-TR (APA, 2000) under Pervasive Developmental Disorders (PDD), along with Asperger's Syndrome (AS), Pervasive Developmental Disorder – Not Otherwise Specified (PDD-

NOS), Childhood Disintegrative Disorder, and Rett's Disorder. Similar distinctions are also made within the ICD-10 (WHO, 1993). According to the DSM-IV-TR, "Pervasive Developmental Disorders are characterized by severe deficits and pervasive impairment in several areas of development: reciprocal social interaction skills, communication skills, or the presence of stereotyped behavior, interests, and activities" (APA, 2000, p.69).

Typically, a broader category of Autism Spectrum Disorder (ASD) encompasses Autism, AS, and PDD-NOS, as these neuropsychiatric disorders evidence similar deficits, prognoses, and developmental courses, which are inherently different from those of Childhood Disintegrative Disorder and Rett's Disorder (Boyd et al., 2010; Matson & Boisjoli, 2007; Mattila et al., 2010). Autism has been conceptualized as a spectrum disorder, or one that lies on a continuum from severe impairment in cognitive abilities, adaptive behavior, communication, social skills, and persistent and/or intrusive behavioral oddities to persons demonstrating mild atypical social behavior and have typical intellectual and verbal abilities (Schopler, 2001). Those on the less severe end of the spectrum, demonstrating autistic features at upper levels of intelligence, tend to be diagnosed with AS or High Functioning Autism (HFA) (Campbell et al., 2010; Gilchrist et al., 2001). Recent estimates of the United States prevalence of ASD among children range from 1 in 150 (Kuehn, 2007) to 1 in 91 (Kogan et al., 2009), with occurrence in males estimated at four times higher than in females (Gerhardt & Mayville, 2010). Before the age of three, impairments are noted in reciprocal social interaction and communication, as well as restricted, repetitive, and stereotyped behaviors and interests (Warreyn & Roeyers, 2007).

While social development ranges in typically developing children, children diagnosed with ASD experience significant impairments in social interaction (Klin et al., 2000). In fact, social skills impairments have been shown to be the most significant characteristic of ASD (Rogers, 2000). Young children with ASD exhibit impairments in early social-communicative abilities, which include imitation, joint attention, and symbolic play (Warreyn & Roeyers, 2007). Joint attention refers to the basic social relatedness ability to coordinate one's attention in order to share with a partner (Mundy & Burnette, 2005), such as combining eye contact and gestures to share information (Gerhardt & Mayville, 2010). These abilities are viewed as necessary precursors for the development of theory of mind, or inferring the mental states of another person to predict or explain the person's behavior, which is a deficit of children with ASD (Warreyn & Roeyers, 2007).

Limitations in precursors to theory of mind, perspective taking, and interpersonal relatedness result in a deficient concept of self and others as well as an impersonal relationship with others (Hobson, 1990, 1993, 2005). Children with ASD demonstrate difficulty in both verbal and nonverbal social behaviors, such as volume and prosody of speech, vocabulary, syntax, making appropriate eye contact, and standing at a typical distance from the other person (Gerhardt & Mayville, 2010). Often, children with ASD fail to respond appropriately (Dennis et al., 2001), make errors in decoding and interpreting social information (Webb et al., 2004) and fail to understand or use jokes and metaphors (Newsom & Hovanitz, 2006). In turn, their ability to learn through social modeling is restricted as they struggle to attend to and process social information (Koegel et al., 1995).



Given these symptoms, children diagnosed with ASD are at heightened risk for developing previously discussed negative outcomes related to social skill deficits. Children diagnosed with ASD tend to report greater feelings of loneliness (Bauminger & Kasari, 2000) and are more likely to approach adults than peers (Jackson et al., 2003). It has been suggested that children with ASD stand “outside” of social relationships, and observe behaviors rather than participating in them, stemming from an inability to understand the concept of friendship (Baumringer & Kasari, 2000). Children with HFA/AS often lack true friendships and are frequently excluded from social opportunities (Myles et al., 2001). Children with ASD also tend to be targets of bullying. Victimization (i.e., being bullied, assaulted, intimidated, teased, humiliated, and being the subject of rumors) of children with ASD by peers occurs at a disturbingly high rate. Due to their social skill deficits, these children have been described as the “perfect victims” to peer victimization (Klin et al., 2000, p. 6). For example, in a sample of over 400 mothers of children with Asperger’s Disorder, ages 4 to 17 years, 94% reported that their child had been significantly socially excluded, bullied, and/ or attacked by peers (Little, 2001). As a child is more likely to be victimized when less sociable and lacking in friends (Perren & Alsaker, 2006), children diagnosed with ASD exhibiting such social skill deficits certainly have a greater likelihood of becoming bullying victims. In addition, children with ASD are at greater risk for developing psychiatric disorders such as depression, anxiety, and affect disorders (Howlin, 2005).

While social interest increases significantly during adolescence, children with ASD continue to experience difficulties in interactions due to their history of social skill deficits (Carter et al., 2005). While they express desire to form relationships, “...their

social clumsiness and difficulty with appreciating the other individual's point of view tends to result in social isolation" (Marriage et al., 1995, p. 58). Long-term implications of such deficits have been shown to affect later employment. For instance, Jackson and colleagues (1998) found that lack of social skills is associated with employment termination more so than nonsocial factors. Similarly to typically developing children with poor social skills, children with ASD experience negative peer relations and a gamut of lasting outcomes, and are at an extreme risk for continued social skills impairment. Such difficulties in building communication methods affect social development and thus further divide children with ASD and non-diagnosed peers (Plimley & Bowen, 2007).

#### *Assessment of Social Skills in Early Childhood*

For nearly 40 years, assessment of social skills in early childhood has been a major focus within the fields of education and psychology (Merrell, 2008; Merrell & Gimple, 1998). Understanding the social-emotional development of young children is critical to identifying important intervention strategies for decreasing the risk for later developmental and psychological maladjustment (Matson & Wilkins, 2009; Merrell, 2008). Especially in early childhood, socio-emotional development relates to a child's ability to form and maintain relationships, and has a major impact on psychological adjustment and well-being throughout life (Campbell et al., 2010; National Research Council, 2008).

An assortment of techniques for assessing social development is available, including interviews, observations, sociometrics, self-reports, and behavior rating scales (Erdley et al., 2010). Behavior rating scales have become increasingly popular and are considered best practice as they are both effective and time-efficient (Erdley et al., 2010;

Knoff, 2002; McConaughy & Ritter, 2002). In fact, it has been found that school psychologists assess emotional and behavioral difficulties of children most frequently using behavior rating scales (Stinnett et al., 1994). Such instruments typically utilize a Likert-type scale for rating occurrence of items representing particular behaviors (Boisjoli & Matson, 2009). Informants, such as parents, teachers, and peers, provide judgments across settings and time about the child being assessed (Erdley et al., 2010). A score earned by an individual on these norm-referenced instruments is compared to those of a standardization sample (Sattler & Hoge, 2006).

While rating scales are widely used in research and practice, a review by Matson and Wilkins (2009) found that of 48 available social skills rating scales, very few have been researched extensively. Historically, development of early childhood social-emotional assessment techniques lags behind instrumentation used for school-aged children. For instance, fewer assessments are available, psychometric properties are weaker than desirable, and sensitivity to development specific to early childhood lacks when downward extensions are made from instruments used for school-aged children (Merrell, 2008). Many rating scales targeted at the early childhood population have inadequate standardization samples and have not been developed specifically for use with this population (McLean et al., 1991; Merrell & Holland, 1997). One instrument that has aimed to address existing weaknesses in early childhood scales is the *Preschool and Kindergarten Behavior Scales, Second Edition* (PKBS-2, Merrell, 2002).

*Preschool and Kindergarten Behavior Scales, Second Edition (PKBS-2)*

The PKBS-2 is a nationally-normed behavior rating scale designed to assess social skills and problem behaviors in the early childhood population. Informants may

include teachers, parents, or others familiar with the child. Unlike many other instruments used in early childhood created as downward extensions of established instruments for use with young children, this instrument was developed specifically for ages 3 through 6 years old. The PKBS-2 is comprised of a total of 76 items separated into the Social Skills and Problem Behavior Scales and are rated on a 4-point Likert-type scale according to frequency of occurrence. The Social Skills Scale is divided into three subscales: *Social Cooperation*, *Social Interaction*, and *Social Independence*. The Problem Behavior Scale is comprised of two broad-band subscales: Externalizing and Internalizing Problems. The Externalizing Problems subscale is further divided into three narrow-band subscales (*Self-Centered/Explosive*, *Attention Problems/Overactive*, and *Antisocial/Aggressive*) and the Internalizing Problems subscale is divided into two narrow-band subscales (*Social Withdrawal* and *Anxiety/Somatic Problems*) (Merrell, 2002). The original items and rating format were retained from the original PKBS (Merrell, 1994); however, the normative sample was increased to include a more diverse representation of race and ethnicity (Serwick et al., 2010).

In terms of psychometric properties, reviews of both the PKBS and PKBS-2 demonstrate adequate internal consistency, test-retest reliability, and validity evidence (e.g. Bracken et al., 1994, 1998; Edwards et al., 2003; Jentzsch & Merrell, 1996; MacPhee, 1998; Merrell, 2008; Riccio, 1995; Watson, 1998). Reliability estimates of the PKBS-2 have been shown to be adequate to excellent and the theoretical factor structure of the scale has been supported by exploratory and confirmatory factor analyses (Serwick et al., 2010). Convergent validity studies have demonstrated strong correlation with widely used instruments containing similar constructs. Divergent validity studies have

resulted in weak or inversely correlated scores from other widely used instruments with dissimilar or opposing constructs (Merrell, 2002). In considering the development and psychometric properties of this instrument, the PKBS-2 holds great potential as a screening device, a research tool, and an instrument for assessing social-emotional behavior in young children (Canivez & Rains, 2002) (for a more detailed report of psychometric properties, refer to the Methods section of this thesis).

In research and practice, standardization samples of assessments should reflect the characteristics of the individuals being assessed (Bordignon & Lam, 2004). The extent to which those characteristics match demonstrates the representativeness of the norm group and ultimate utility of the measure (Sattler & Hoge, 2006). In terms of the representativeness of the standardization sample used for norming the PKBS-2, the nationwide sample included 3,313 preschool and kindergarten students, ages 3 through 6, which reflected the ethnicity, socioeconomic status, and special education classification similar to those characteristics of the U.S. population according to the 2000 U.S. Census (Merrell, 2002). The developer has reported the results of several studies, which investigate the sensitivity of the PKBS-2 to various group differences. Specifically, construct validity was established through samples that included behaviorally at-risk children (Jentsch & Merrell, 1996), children with ADHD (Carney & Merrell, 2005; Merrell & Wolfe, 1998), and children with internalizing problems (Merrell, 1995).

In addition, Merrell and Holland (1997) investigated the construct validity of the PKBS with children identified as having a developmental delay. More specifically, this study examined the "...ability of the PKBS to accurately distinguish social skills and problem behavior patterns between children with developmental delays and children

without such delays” (p. 396). Results indicated that preschoolers identified as having developmental delays demonstrated significantly lower levels of social skills and higher levels of problem behaviors than typically developing peers, according to ratings by parents and teachers (Merrell & Holland, 1997).

According to the Individuals with Disabilities Education Act (IDEA, 2004), a child is eligible under the category of developmental delay if the child is experiencing a delay in one or more of the following categories: physical development, cognitive development, communication development, social or emotional development, or adaptive development. Unfortunately, a major limitation of the study by Merrell and Holland (1997) is that the specific category for which the child was eligible for developmental delay was unknown to the researchers. With such a broad category as developmental delay, the heterogeneity of the sample is unavailable. As such, it is difficult to infer the extent to which the results provide validity for this population (Merrell & Holland, 1997). In addition, this is the only study that has attempted to examine the sensitivity of the PKBS or PKBS-2 to group differences based on children with and without significant developmental problems. As a high percentage of children with developmental delay fall into the ASD category (Matson & Fodstad, 2010), a critical need exists to specifically investigate the PKBS-2 with children diagnosed with ASD.

#### *Importance of Validity in Assessment Scales*

Establishing sound psychometric properties of assessments has been identified as a need and requirement within research and practice (Bordignon & Lam, 2004; Lutz et al., 2002). Use of valid and reliable instruments in the process of evaluating children is recommended by professional organizations (AERA, APA, & NCME, 1999; NASP,

2005) as well as mandated by federal statutes and regulations (DOE, 2006a; IDEA, 2004; NCLB, 2001). According to the *Standards for Educational and Psychological Testing* (AERA, APA, & NCME, 1999), test validity is defined as "...the degree to which evidence and theory support the interpretations of test scores entailed by proposed uses of tests" (p.9). Traditionally, validity has been divided into distinct categories, such as predictive validity and content validity. The *Standards* (1999) describes validity as a unitary concept of evidence that accumulates to strengthen or weaken the validity of an instrument. Such sources of validity evidence include: test content and its relation to the construct proposed as being measured; response processes, such as an individual's test-taking strategies; internal structure of the relations among items within a scale; relations to external variables, including concurrent, predictive, convergent, and discriminant validity evidence; and evidence based on the consequences of testing. Accumulation and integration of validity evidence from each of these sources supports the unitary concept of validity.

#### *Examining Validity Evidence for the PKBS-2*

Instruments designed to assess preschoolers often lack adequate psychometric properties, which may lead to inaccurate assessment and identification of children (Satz & Fletcher, 1988; Schaefer et al., 2004). The increasing need for identifying young children and their families for services underscores the critical need to remedy these issues. One of the purposes of the PKBS-2, as stated by the instrument's developer is "...as a research instrument for studying the behavioral, social, and emotional characteristics and patterns of young children" (Merrell, 2002, p. 2). This instrument has also been described as "...useful as a general problem behavior and social skills

assessment tool for young children, particularly those exhibiting typical types of behavioral problems in typical types of settings, such as Head Start programs and preschool or kindergarten classrooms” (Merrell, 2008, p. 426). The individuals for whom the instrument is designed to assess should mirror those represented by the standardization population (National Research Council, 2008; Sattler & Hoge, 2006). As children diagnosed with ASD are typically found in the settings described by the instrument’s developer, this population is necessary to be included within the standardization population.

While the PKBS-2 is designed to assess overall normative-based social skills and problem behaviors and not those specific to the ASD symptoms, such a rating scale assists in identifying broad deficits and strengths. In fact, recommended guidelines for assessing children with ASD include instruments designed to assess content areas specifically addressing symptoms of ASD as well as broad-based measures of social skills used with typically developing children (Gerhardt & Mayville, 2010). Evidence for the utility of the PKBS-2, however, is lacking for use with the early childhood ASD population. According to Validity Standard 1.4 of the *Standards* (AERA, APA, & NCME, 1999), “If a test is used in a way that has not been validated, it is incumbent on the user to justify the new use, collecting new evidence if necessary” (p. 18). Further, the Fairness in Testing and Test Use Standard 7.1 suggests that validity evidence is necessary for specific subgroups in which there may be a question of appropriateness of test content or internal structure of test responses (AERA, APA, & NCME, 1999). There is a critical need for additional studies to explore the psychometric properties of the PKBS-2 with



diverse samples (Edwards et al., 2003; Matson, 2009; Merrell, 2002; Merrell & Holland, 1997). The current study aims to address this concern.

### *Research Question*

The purpose of this study is to provide validity evidence for the *Preschool and Kindergarten Behavior Scales, Second Edition* (PKBS-2, Merrell, 2002). As such, two groups of children, those with a diagnosis of ASD and those without a diagnosis of ASD, are compared using the standard scores of the three broad-band subscales of the Social Skills Scale (*Social Cooperation, Social Interaction, and Social Independence*), the three narrow-band subscales of the Externalizing Problems scale (*Self-Centered/Explosive, Attention Problems/Overactive, and Antisocial/Aggressive*), and the two narrow-band subscales of the Internalizing Problems scale (*Social Withdrawal and Anxiety/Somatic Problems*). The following research question will be addressed: Does the PKBS-2 accurately differentiate between children with ASD and children without such disorders?

### *Hypothesis*

It is hypothesized that children with and without ASD can be accurately discriminated based on PKBS-2 scores.

## CHAPTER III

### Method

#### *Participants*

Recruited children were part of a larger study and were between 4 and 6 years of age. Prior to acceptance into the study, parents completed the BASC-2 to determine eligibility. Children whose BASC-2 Aggressive Scale t-score was greater than 70 (the clinical cut-off score) were excluded from the study for purposes of the larger study due to the possibility that significant aggressive behaviors displayed during the group sessions could negatively affect the learning process of other group members (Dishion et al., 1999). Families who did not meet criteria for the study were given a list of community resources deemed appropriate (i.e., individual mental health referrals for significant aggressive behavior). English was required as the primary language of all participants. No one was excluded on the basis of gender, race, or ethnic background. The child was also required to primarily reside with the parent participants.

Participants include 78 children (ages 4-6 years) and their parents as part of a larger study. The accepted participants are likely to represent a large range of behavioral problems and social skill deficits. A wide range of socio-economic status was demonstrated and the majority of parent respondents were biological mothers (85.9%). Demographic information of child participants is reported in Table 1.

Table 1

*Child Demographic Information*

<b>Child Characteristic</b>	<b>Percent</b>
<b>Race</b>	
Asian	2.6%
Black/African American	5.1%
White	87.2%
Other	5.1%
<b>Considered Hispanic</b>	
No	98.7%
Yes	1.3%
<b>Gender</b>	
Male	66.7%
Female	33.3%
<b>Grade</b>	
Pre-K	61.5%
Kindergarten	26.9%
1 <sup>st</sup> Grade	9.0%
Other	2.6%
<b>Diagnosed with ASD</b>	
No	76.9%
Yes	23.1%

<b>Child Characteristic</b>	<b>Percent</b>
Total Household Income	
\$25,001-\$50,000	6.4%
\$50,001-\$75,000	29.5%
\$75,001-\$100,000	26.9%
\$100,001 or above	35.9%
Missing	1.3%

*Recruitment*

Recruitment of participants as part of a larger study included flyers sent to area elementary schools, preschools, daycares, pediatricians, community health clinics, and local parent support groups. All recruitment materials included a brief description of the project, targeted criteria, and contact information.

*Procedure*

As part of a larger study, parents completed a brief paper-and-pencil screening questionnaire during a scheduled appointment. Research assistants administered the questionnaire in a standardized, confidential way and were available to address any questions or concerns. All participants were assigned an identification number prior to data collection. No names ever appeared on the data collection instruments. The list connecting names with numbers was kept private and separate by the Primary Investigator (PI). All data were stored in a locked cabinet and kept confidential by the PI. Research assistants collected identical measures from all participants.

Participation in this research involved minimal risk and the Institutional Review Board approved the study. Procedures were implemented to minimize risk of confidentiality violation. Informed consent from parents and verbal assent from child participants were obtained, which clearly described the voluntary nature of the study and the purpose and use of the data collected.

### *Measures*

Demographic Questionnaire. Parents provided information about child and family demographic factors, including any child diagnoses, gender of parent and child, race/ethnicity of parent and child, education of parents, and household income.

Preschool and Kindergarten Behavior Scales, Second Edition (PKBS-2). The PKBS-2 was used to assess children's social skills and problem behavior levels. The PKBS-2 is an individually administered behavior rating scale designed to assess social skills and problem behaviors of young children, ages 3 to 6 years. This edition of the instrument is an updated and revised version of the PKBS (Merrell, 1994). The PKBS-2 is comprised of a total of 76 items separated into the Social Skills and Problem Behavior Scales. All items contain a 4-option Likert-type response ("Never," "Rarely," "Sometimes," and, "Often"). The directions state, "Ratings should be based on your observations of this child's behavior during the past 3 months" (Merrell, 2002). Standard Scores ( $M = 100$ ,  $SD = 15$ ) and percentiles are provided for the Social Skills and Problem Behavior Scales Composite Standard Scores, as well as the corresponding subscales. Administration time for the parent version is reported by the publisher to be 8 to 12 minutes. Parent participants completed this measure.

The Social Skills Scale of the PKBS-2 is comprised of 34 items and is divided into three broad-band subscales: *Social Cooperation*, *Social Interaction*, and *Social Independence*. The *Social Cooperation* subscale is comprised of 12 items and reflects the child's ability to comply with adults and expectations of peer interactions. Example items from this subscale include "Follows instructions from adults," "Takes turns with toys or other objects," "Gives in or compromises with peers when appropriate," and, "Cleans up his or her messes when asked." The *Social Interaction* subscale is comprised of 11 items relating to appropriate peer interactions critical for "gaining and maintaining acceptance and friendship from others" (Merrell, 2002, p. 3). This subscale represents several items related to prosocial aspects of social skills, such as empathy and affect. Example items from this subscale include "Tries to understand another child's behavior ('Why are you crying?)," "Comforts other children who are upset," "Shows affection for other children," and "Invites other children to play." The *Social Independence* subscale is comprised of 11 items relating to social adjustment and confidence in the peer group domain as well as appropriate independence from adult caregivers. Example items from this subscale include "Is able to separate from parent without extreme distress," "Works or plays independently," "Makes friends easily," and, "Is accepted and liked by other children" (Merrell, 2002).

The Problem Behavior Scale of the PKBS-2 is comprised of 42 items and is divided into two broad-band subscales: Externalizing and Internalizing Problems (Merrell, 2002). The Externalizing Problems subscale is comprised of 27 items that reflect a child's disruptive and overactive behaviors. The development of this scale is consistent with the theoretical and empirical breakdown of externalizing/internalizing

problem dichotomy (Cicchetti & Toth, 1991). Examples of items include, “Acts impulsively without thinking,” “Will not share,” “Calls people names,” and “Is easily provoked – has a ‘short fuse.’” The Internalizing Problems subscale is comprised of 14 items and reflects a child’s emotional-behavioral problems. The behaviors are often “related to social isolation from their peers” (Merrell, 2002, p. 4). Examples of items include, “Becomes sick when upset or afraid,” “Is anxious or tense,” “Withdraws from the company of others,” and “Is overly sensitive to criticism or scolding” (Merrell, 2002).

The Problem Behavior Subscale can also be divided into five narrow-band supplemental subscales. Items from the Externalizing Problems subscale comprise three of the narrow-band subscales: *Self-Centered/Explosive*, *Attention Problems/Overactive*, and *Antisocial/Aggressive*. Items from the Internalizing Problems subscales comprise the remaining two narrow-band subscales: *Social Withdrawal* and *Anxiety/Somatic Problems*.

Psychometric properties were reported in the PKBS-2 manual (Merrell, 2002). The standardization sample included 3,313 children, ages 3 through 6 years, from 18 states in the four United States geographical regions (Northeast, South, Midwest, and West). This sample reflected the demographics of the U.S. population according to the 2000 U.S. Census regarding gender, race, ethnicity, and socio-economic status (Merrell, 2002). Boys included 51.7% ( $n = 1716$ ) and girls included 46.7% ( $n = 1542$ ) of the PKBS-2 standardization sample (with 1.6%,  $n = 55$ , gender not identified). Originally, scores from 2,855 of the standardization sample were collected during the norming process of the PKBS from 1992 to 1994, with an additional 458 participants from 1996-2000 for the PKBS-2. Both the Social Skills and Problem Behavior scales of the PKBS-2 were normed using the same nationwide standardization sample. The PKBS-2 manual

and other publications “provide evidence for adequate to excellent psychometric properties” (Merrell, 2008, p. 423).

Merrell (2002) reported internal consistency, test-retest, and interrater reliability results for the PKBS-2. High coefficients of internal consistency reliability were demonstrated using the entire normative sample through Cronbach’s coefficient alpha and the Spearman-Brown split-half reliability formula. Specifically, estimates ranged from 0.94 to 0.97 for the Social Skills and Problem Behavior total scores. For the broad-band subscales, estimates ranged from 0.86 to 0.97, and from 0.81 to 0.94 for the narrow-band subscales. Merrell (2002) reported that all of the test-retest coefficients were considered to be in the moderate to high range and were statistically significant at the  $p < 0.001$  level. At the three-week follow-up, bivariate Pearson product-moment correlation test-retest reliability estimates ranged from 0.58 to 0.86 for the Social Skills and Problem Behavior total scores, from 0.62 to 0.87 for the broad-band subscales, and from 0.68 to 0.87 for the narrow-band subscales. At three months follow-up, test-retest estimates ranged from 0.69 to 0.78 for the total scores, from 0.66 to 0.78 for the broad-band subscales, and from 0.81 to 0.87 for the narrow-band subscales, with the exception of Anxiety/Somatic Problems at 0.36 and Social Withdrawal at 0.63. Interrater reliability of the PKBS-2 within preschool settings yielded moderate to moderately strong Pearson bivariate product-moment correlation coefficients that were all statistically significant at the  $p < .001$  level. Estimates ranged from 0.36 to 0.61 for the Social Skills scores, and from 0.42 to 0.63 for the Problem Behavior scores, including narrow-band subscales. Interrater reliability across home and school settings ranged from very weak (0.13) to moderate (0.57) across all subscales and total scores. These results indicate that ratings



vary significantly between informants in different settings, though Merrell (2002) reports similar discrepancies reported in Achenbach et al. (1987).

Merrell (2002) also reported findings related to various forms of validity, including content, internal structure, convergent and discriminant validity, and construct validity involving demonstrated sensitivity to group differences. Content development procedures included investigation of social-behavioral development in early childhood, item evaluation by an expert panel, and factor analyses. Bivariate Pearson product-moment correlations were calculated between individual items and their respective total scale scores to examine the extent to which items fit within their domain. For the Social Skills Scale, most items correlated in the 0.60 to 0.70 range, with five items in the 0.52 to 0.59 range, three items in the 0.44 to 0.49 range, and one item at 0.32. For the Problem Behavior Scale, items were relatively evenly distributed between 0.4 and 0.75.

A principal components factor analysis was conducted using the entire standardization sample to examine validity evidence based on internal structure. Items in the Social Skills Scale produced three factors: Social Cooperation (12 items), with item-subscale correlations from 0.61 to 0.80 and accounting for 40% of explained variance and; Social Interaction (11 items), with item-subscale correlations from 0.44 to 0.79 and accounting for 9.8% of explained variance; and Social Independence (11 items), with item-subscale correlations from 0.33 to 0.76 and accounting for 4.3% of explained variance. Every item in the Social Skills Scale had a factor loading of 0.42 or higher. Seven items, which were not specifically reported, had cross loadings of 0.40 or higher and were assigned to the factor that had the highest loading. Items in the Problem Behavior Scale yielded two factors: Externalizing Problems (27 items), with item-

subscale correlations from 0.60 to 0.81 and accounting for 38.6% of explained variance; and Internalizing Problems (15 items), with item-subscale correlations from 0.35 to 0.67 and accounting for 6.9% of explained variance. One item (*Is overly sensitive to criticism or scolding*) had a cross loading into both factors at .40 or higher, and was assigned to Internalizing Problems.

Another principal components analysis was conducted using the two broad-band subscales of the Problem Behavior scale. Analyses yielded three narrow-band subscales of the Externalizing Problems subscale: Self-Centered/Explosive (11 items), with item-subscale correlations from 0.67 to 0.80 and accounting for 53.1% of explained variance; Attention Problems/Overactive (8 items), with item-subscale correlations from 0.68 to 0.82 and accounting for 5.7% of explained variance; and Antisocial/Aggressive (8 items), with item-subscale correlations from 0.64 to 0.77 and accounting for 4.8% of explained variance. Analyses produced two narrow-band subscales of the Internalizing Problems subscale: Social Withdrawal (7 items), with item-subscale correlations ranging from 0.52 to 0.72 and accounting for 42.4% of explained variance; and Anxiety/Somatic Problems (8 items), with item-subscale correlations from 0.48 to 0.66 and accounting for 8.9% of explained variance. Each item in the Problem Behavior subscale loaded at 0.43 or higher into the respective narrow-band subscale. A few items, which were not specifically reported, had cross loadings of 0.40 or higher and were assigned to the factor that had the highest loading. Confirmatory factor analyses provided strong evidence for highly stable factor structure for both the Social Skills Scale and Problem Behavior Scale.

In terms of convergent and discriminant validity, the PKBS-2 was compared with seven widely used child behavior rating scales. Correlations between the PKBS-2 social

skills scores and the Social Skills Rating System (SSRS; Gresham & Elliott, 1990, as cited in Merrell, 1995) social skills scores were moderate to strong, ranging from 0.32 to 0.76. Negative correlations, ranging from -0.11 to -0.66, were found between social skills and problem behavior scores of the instruments (Merrell, 1995B). Moderate to very strong correlations from 0.62 to 0.85 were found between the PKBS-2 and the Matson Evaluation of Social Skills with Youngsters (MESSY; Matson, Esvelt-Dawson, & Kazdin, 1983; Matson, Rotari, & Helsel, 1983, 1985, as cited in Merrell, 1995) social skills scores, and very weak to moderate for dissimilar constructs (Merrell, 1995B). With the PKBS-2 Externalizing Problems scores and the Conners' Teacher Rating Scale-39 (CTRS-39; Conners, 1990 as cited in Merrell, 1995) were strong, especially with Hyperactivity (0.85), Hyperactivity Index (0.85), and Conduct Problem (0.87). Correlations were also high between the Internalizing Problems scores from the PKBS-2 and the CTRS-39 Emotional-Overindulgent scale (0.78) and Anxious-Passive scale (0.61) (Merrell, 1995B). The PKBS-2 and the School Social Behavior Scales (SSBS; Merrell, 1993, as cited in Merrell, 1995) social scores correlations were moderate to very strong, ranging from 0.68 to 0.86 (Merrell, 1995B). With the Walker-McConnell Scale of Social Competence and School Adjustment (SSCSA; Walker & McConnell, 1995, as cited in Jentsch & Merrell, 1996) correlations ranged from 0.46 to 0.88 on similar constructs and from -0.28 to -0.80 on dissimilar constructs. Correlations with the Teacher's Report Form (TRF; Achenbach, 1991, as cited in Jentsch & Merrell, 1996) and the Adjustment Scales for Children and Adolescents (ASCA; McDermott, Marston, & Stott, 1993, as cited in Merrell, 2002) were also consistent with expected direction and magnitude. These results indicate that the PKBS-2 were consistently moderately to

strongly correlated with similar constructs, and weakly to inversely correlated with dissimilar constructs on other assessments.

Several studies were conducted to investigate the sensitivity of the PKBS-2 to group differences. The results supported evidence for classification of individuals who are at-risk for social-behavioral problems (Holland & Merrell, 1998; Merrell & Holland, 1997), experiencing externalizing or internalizing problem behaviors (Jentzsch & Merrell, 1996; Merrell, 1995), diagnosed with Attention Deficit/Hyperactivity Disorder (ADHD) (Merrell & Wolfe, 1998), and gender differences (Merrell, 2002). While the overall evidence of the reliability and validity results provide strong support for the PKBS-2, the developer acknowledges "...test validation is an on-going process...each additional piece of evidence that accrues adds to our understanding to the validity of that measure" (Merrell, 2002, p. 73). As such, the purpose of the current study responds to this request for further attempts to gather validity evidence.

#### *Analytic Procedures*

The University of North Carolina at Chapel Hill Institutional Review Board approved all research procedures in advance of the statistical analyses of the data. The statistical analyses were designed to address the following research question: Does the PKBS-2 accurately differentiate between children with Autism Spectrum Disorders (ASD) and children without such disorders? Analytic procedures were similar to those presented by the PKBS-2 developer's original study examining validity of the PKBS-2 subscales in children ( $n = 398$ ) with and without developmental delays (Merrell & Holland, 1997) and children ( $n = 94$ ) with and without behavioral difficulties (Jentzsch & Merrell, 1996).

Data were screened to verify the assumptions of discriminant function analysis, specifically that the observations are independent, multivariate normality of observations on the dependent variables, and homogeneity of variance. Data were also screened for missing data. The Box's M test for homogeneity of dispersion matrices was used in order to evaluate the homogeneity of variance-covariance matrices (Green & Salkind, 2008).

Discriminant Function Analysis using the step-wise procedure was used to determine the degree of accuracy for discriminating between the two groups (ASD and Non-ASD) using the subscales of the PKBS-2. The stepwise variable selection method was chosen as it is most widely used for variable selecting and ordering (Duarte Silva & Stam, 2001). The purpose of this multivariate analysis was to determine how well a linear combination of the PKBS-2 subscales discriminate between the two groups. Membership status (ASD vs. Non-ASD) served as the grouping variable. The standard scores of the most specific set of behaviors in the overall scale served as the classification variables, including the three broad-band subscales of the Social Skills Scale (*Social Cooperation*, *Social Interaction*, and *Social Independence*), the three narrow-band subscales of the Externalizing Problems broad-band scale (*Self-Centered/Explosive*, *Attention Problems/Overactive*, and *Antisocial/Aggressive*), and the two narrow-band subscales of the Internalizing Problems broad-band scale (*Social Withdrawal* and *Anxiety/Somatic Problems*). Broad-band subscale totals were not analyzed using the discriminant function analysis due to redundancy, as these totals are comprised of the narrow-band subscales.

## CHAPTER IV

### Results

#### *Preliminary Analyses*

Prior to the completion of a formal analysis, all data were screened to verify the assumptions of discriminant function analysis. Screening was conducted for missing data. Screening indicated that two cases contained missing data and were excluded from the analysis, resulting in a total of 76 cases included in the analysis. Box's test of equality of variance-covariance indicated non-significant differences in equality of variance-covariance matrix (Box's  $M = 46.639$ ,  $F = 1.040$ ,  $p = 0.404$ ). Overall, screening indicated that all 76 cases met the assumptions of discriminant function analysis and could be included in the analyses.

#### *Primary Analyses*

*Research Question: Does the PKBS-2 accurately differentiate between children with ASD and children without such disorders?*

The stepwise discriminant function was significant (Wilks' Lambda  $F = 0.587$ ,  $\chi^2(8) = 37.289$ ,  $p < .001$ ), demonstrating that the PKBS-2 scores separated and classified the ASD and Non-ASD groups in a statistically significant manner. These results support the hypothesis that the two groups can be classified based upon PKBS-2 scores with a high degree of accuracy. Overall, the variables resulted in a correct classification rate of 61 of the total 76 cases (80.3%). The specificity of the scale (correctly identifying

individuals who did not have an ASD diagnosis) was 79.7%, while the sensitivity of the scale (correctly identifying individuals who had an ASD diagnosis) was 82.4%. The false positive rate was 20.3%, with 17.6% of cases resulting in false negative. The procedure correctly classified 82.4% of the ASD group and 79.7% of Non-ASD group. A summary of the classification results is demonstrated in Table 2.

Table 2

*Discriminant Function Analysis Classification Results with the PKBS-2*

Actual group	Number of cases	Predicted group membership	
		Non-ASD	ASD
Non-ASD	59	47	12
		79.7%	20.3%
ASD	17	3	14
		17.6%	82.4%

Percent of “grouped” cases classified correctly: 80.3%

## CHAPTER V

### Discussion

#### *Discriminant Validity Evidence for the PKBS-2*

The current study is the first to provide support for the discriminant validity of the PKBS-2 with children specifically diagnosed with ASD. The statistically significant discriminant function analysis further established the discriminant validity of the measure. It was hypothesized that the PKBS-2 could accurately discriminate between ASD and Non-ASD groups on the basis of their scores. Discriminant function analysis demonstrated support for this hypothesis with an 80.3% overall classification rate into ASD and Non-ASD groups on the basis of PKBS-2 subscale scores. These current findings demonstrate that the PKBS-2 was sensitive to the ASD group membership with a similar classification rate as those yielded in previous research examining the discriminant validity of the PKBS. For example, discriminant function analysis results reported by Merrell and Holland (1997) indicated that the PKBS accurately discriminated between children in two groups (Developmental Disability and comparison) with an overall correct classification rate of 71.36%. Specifically, 67.3% of children were correctly classified as DD and 75.4% as comparison. Jentsch and Merrell (1996) demonstrated that the PKBS was highly sensitive to internalizing, externalizing, and control group membership with an overall classification rate of 89.36%. The current study builds upon the validity evidence reported in these studies with comparable



classification rates, indicating that such preliminary results support that the PKBS-2 is similarly sensitive to ASD and Non-ASD group membership.

Consistent with most social skills assessment tools, it is important to consider that the PKBS-2 does not identify certain verbal and non-verbal behaviors specific to ASD (Gerhardt & Mayville, 2010). Such behavior includes rarely smiling at familiar people, inflexible insistence on rituals or routines, difficulty with changes, and preference for solitude (Ben-Arieh & Miller, 2009; Gerhardt & Mayville, 2010; Matson, Compton, & Sevin, 1991). While the PKBS-2 was not developed specifically to measure social skills within the ASD population, the results of this study indicate that the PKBS-2 is useful in evaluating the social skills and problem behaviors in children with ASD.

Finally, it is important to consider that this study relied on parent reported ASD diagnosis and did not include assessment for diagnosis. It is unknown whether any of children in the Non-ASD group had been evaluated. To fully understand the predictive value of the PKBS-2, it would be important to know if children were evaluated and did not meet criteria for ASD, or if ASD criteria would have been met if these children had been assessed. If non-evaluated children were found to meet the criteria for ASD, the current classification rates may be underestimations of the ability of the PKBS-2 to discriminate between the two groups and the false positive cases may be an overestimation of error in classification.

### *Study Limitations*

Although the present results are promising, they represent only a preliminary evaluation of the use of the PKBS-2 with the ASD population. This study is limited by the use of a small sample of children who were identified primarily as White, non-

Hispanic children whose families were considered to be within the middle to upper socioeconomic status. The participating families were also able to commit to attending 6 consecutive weeks of the social skill group intervention as part of the larger study. Thus, the participants represent those who have the means to make such a commitment. These recruitment limitations relating to demographics, partly a result of the nature of secondary data, limit the generalizability of the current results. In addition to demographic homogeneity limitations, the children included in this study were identified as appropriate for participating in a social skills group. For example, children who scored in the clinical range in aggression, children who were primarily nonverbal or did not speak English, and children who were judged to be significantly low functioning were not included in this study. As a result, the participants diagnosed with ASD may not represent the full range ASD symptoms. The findings are likely more representative of the higher functioning ASD population.

Limitations also exist due to solely using rating scales to examine child behavior. For example, the parent rating scales used in this study rely on the informant perceptions rather than objectively observed behavior. As each assessment method contains sources of error variance, it is more desirable to obtain multiple types of data. Assessing multiple traits and by multiple methods, such as demonstrated by the multitrait-multimethod matrix, would provide more data to support the study conclusions (Merrell, 1994). For example, direct observations across settings would provide more information about the validity of the PKBS-2. Additional measures, such as peer nominations, teacher ratings, and standardized instruments, would also provide more data and may increase the confidence with which the results may be interpreted (Pelligrini & Glickman, 1990).

### *Future Research*

Further research that builds upon the current study is required to determine the generalizability of the current findings given the limitation of a small sample size. It is strongly recommended that future studies utilize broader clinical samples to provide further validity evidence. It would also be beneficial to obtain a sample that is more racially, ethnically, and financially representative. Further replications and applications to diverse populations may determine the generalizability of the PKBS-2 as well as further elucidate its validity. Finally, future research should also consider building upon the current study through analysis of individual subscales coefficients. With a larger sample size, there is potential for determining an optimal model for discriminating between the ASD and Non-ASD groups. Such efforts would enable further refinement of assessment instruments for young children with ASD.

### *Conclusion*

Within research and clinical practice, it is important to further the development of technically adequate assessment instruments (Bordignon & Lam, 2004; Lutz et al., 2002). As early childhood assessment instruments have historically poor psychometric properties (Merrell, 2008), obtaining validity evidence is essential in order to improve the psychometric standards for early childhood scales. The PKBS-2 has been identified as a useful instrument for studying the behavioral, social, and emotional characteristics and patterns of young children in typical settings (Merrell, 2002), which frequently include children diagnosed with ASD. This preliminary analysis shows the promise of the PKBS-2 as a valid, sensitive, and specific tool for assessing the social skills and problem behavior of children with ASD. Given these findings, the PKBS-2 may be a useful tool

in both clinical and research arenas that include children with ASD diagnoses. In addition to accurate group prediction, the PKBS-2 is a widely used and easily administered assessment tool (Merrell, 2008). The results of the present study suggest the potential utility of this scale in a variety of contexts, as the PKBS-2 is designed for use in settings with children diagnosed with ASD. Such settings include Head Start programs, preschool, and kindergarten classrooms (Merrell, 2008). While the PKBS-2 is able to distinguish among children with and without ASD, further research is warranted to strengthen these findings.

Though the current study is limited due to the sample size and single-informant design, the results support the PKBS-2 as a good discriminator of children who have a diagnosis of ASD. Specifically, it appeared to discriminate between an ASD and Non-ASD group with a high degree of accuracy. These results provide additional evidence for the validity of the PKBS-2 because of the sensitivity to group differences in social-emotional behavior. The combination of the current results with the aforementioned validity evidence supports the growing evidence for the use of the PKBS-2 in the assessment of young children in a variety of research and clinical settings.

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