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Child Behavior Checklist Behavioral Profiles of Children with Autism Spectrum Disorders

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CHILD BEHAVIOR CHECKLIST BEHAVIORAL PROFILES OF CHILDREN WITH AUTISM SPECTRUM DISORDERS

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J. J.: You are “My Best Friend” and the reason that I was able to persevere through the “Dissertation” chapter of my life. Your willingness to change your life so that I could have the opportunity to complete this project is only one of the millions of things you have done to encourage and support this grand finale. You can now send the final invoice so we can begin to celebrate. I love you with all my heart and thank God daily that you are in my life.

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ABSTRACT

Behavior checklists have been utilized by psychologists since the early 1900’s and continue to play integral roles in the screening and monitoring of behavior based disorders (Achenbach & Rescorla, 2001). The Achenbach System of Empirically Based Assessment - Child Behavior Checklist (CBCL) is one of the few widely used broad-based behavior rating scales that have excellent psychometric properties (Achenbach & Rescorla, 2001). Recent research has focused on the CBCL’s ability to screen for behaviors associated with autism spectrum disorders (ASD; Bolte, Dickhunt, & Poustka., 1999; Duarte, Bordin, Oliveira, & Bird, 2003; Rescorla, 1988, Sikora, et al, 2008). A combination of increasing rates of ASD and the need for earlier identification has created an urgency to find broadband screening tools that identify accurately this group of individuals since ASD-specific screening tools are not readily available. Therefore, the purpose of this study was to determine if patterns of normative strengths and weaknesses on the subscales of the CBCL are similar for individuals with ASD, nonASD controls, and those clinic-referred for behavior disorders. Profile analysis was used to compare the behaviors of (a) individuals with ASD to their normal controls, and (b) individuals with ASD to individuals clinic-referred for behavior difficulties. Results revealed that individuals with ASD displayed significantly higher scores on seven out of the eight CBCL subscales when compared to their nonASD controls. When compared to individuals clinic-referred for behavior difficulties, the ASD group displayed significantly higher scores on two of the CBCL areas. These findings support the use of the CBCL as a screening tool. Implications and conclusions are discussed and areas for future research are provided.
CHAPTER 1

INRODUCTION

Behavior rating scales and checklists are commonly used tools in the assessment of internal and external behaviors, social skills, and emotional functioning (Heckamena, Conroy, East, & Chait, 2000). These screening tools are capable of screening for a range of behavior disorders and are utilized in multiple settings. Contributing factors to their growing popularity include (a) provision of quantifiable information, which can be held to standards of reliability and validity; (b) efficient completion and scoring; (c) provision of systematic and organized information; (d) inclusion of normative data, allowing for comparisons of individual behaviors to larger groups; and (e) ability to compare ratings of multiple respondents across settings (Hosp, Howell, & Hosp, 2003). In addition, there are numerous behavior rating scales commercially available (i.e., Behavioral Assessment System for Children [Reynolds & Kamphaus, 1992], Behavioral and Emotional Rating Scale [Epstein & Sharma, 1998], Behavior Rating Profile [Brown, 1990], Burks’ Behavior Rating Scales [Burks, 1996], Child Behavior Checklist [Achenbach & Rescorla, 2001], Conner’s Rating Scales [Conners, 1997], Revised Behavior Problem Checklist [Quay & Peterson, 1987], Social-Emotional Dimension Scale [Hutton & Roberts, 1986], and The Walker-McConnell Scale of Social Competence and School Adjustment [Walker & McConnell, 1995].

The Achenbach System of Empirically Based Assessment (ASEBA) Child Behavior Checklist (CBCL) is the most well-known dimensional approach to behavior assessment (Achenbach, 1991). It is widely used, reliable, valid, and typically referred to in research and relied upon in clinical practice (Hosp, Howell, & Hosp, 2003). This empirically based system uses three broad band syndromes: (a) Total Problems, (b) Internalizing, which include items that are problematic for the child rather than for the child’s environment; and (c) Externalizing, which include items that are disruptive for the child’s environment. Underlying the two broad-band dimensions are eight narrow-band syndromes: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior. The CBCL was developed in 1966 while scoring clinical records with a symptom checklist (Achenbach, 1966). There have been multiple revisions and current versions encompass the lifespan (ages 1.5 to 90+ years of age). For children ages six to
There are three versions: (a) CBCL, (b) Teacher’s Report Form (TRF), and (c) Youth Self-Report Form (YSR). The CBCL has excellent psychometric properties and a large body of research that demonstrates its reliability and validity in both clinical and nonclinical practices (Achenbach, 1991).

Many studies have examined the validity of the CBCL in screening for unique populations such as ADHD subtypes, bipolar depression, mania, maladjustment, and anxiety (Aschenbrand, Angelosante, & Kendall, 2005; Biederman, Wozniak, Kiely, Ablon, Faraone, Mick, Mundy, & Kraus, 1995; Bird et al., 1988; Krol et al., 2006; Rescorla et al., 2007). However, one population that has received little attention regarding the use of the CBCL are those with autism spectrum disorders (ASD).

Autism spectrum disorders are a group of developmental disorders defined by impairments in the areas of communication and socialization, as well as patterns of restricted or repetitive behaviors (American Psychiatric Association [APA], 2000). Recent epidemiological studies indicate one out of 150 children in the general population experiences symptoms of ASD (National Center on Birth Defects and Developmental Disabilities [NCBDDD], 2007). Increased prevalence rates, along with heightened public awareness, have generated a sense of urgency to better identify individuals with ASD for specific medical, educational, and behavioral interventions. With mounting evidence demonstrating the effectiveness of early intervention, there is constant pressure to improve early identification of ASD so critical interventions can be implemented (Wetherby et al., 2004). Given that there is no biological or genetic marker for ASD, screening and diagnosis must be based on the behavioral features of ASD (Fillipek et al., 1999). Therefore, research on behavior rating scales, such as the CBCL, is imperative to the ability of professionals working with this unique population to accurately identify and diagnose as early as possible.

Only four studies have investigated whether the CBCL can identify a general behavior pattern in children with ASD (Bolte, Dickhunt, & Poustka., 1999; Duarte, Bordin, Oliveira, & Bird, 2003; Rescorla, 1988, Sikora, et al, 2008). The first study to examine the CBCL was a cluster analytic study conducted by Rescorla (1988) on the symptom profiles of a clinical sample comprised of 204 three to five year old boys. The clinical sample included 79 autistic and autistic-like children, 82 children with reactive and more typical behavior disorders, and an
“other” category which included 43 children with relatively mild impairments. Given that the data was archival from the 1960’s and 1970’s, parent report on the CBCL was not available; therefore, behaviors were rated by coders based on existing chart material (Rescorla, 1988). The CBCL’s syndrome scales were not used due to the differences in age and proportion of autistic children included in the clinical sample from those in the CBCL’s original standardization sample. Patterns of results across 2-, 3-, 4-, 5-, and 6-cluster solutions presented, with the first cluster to emerge as the Autistic/Bizarre cluster, which included five of the items from the CBCL (Rescorla, 1988). Overall, this study showed that when the eight-factor CBCL symptom profiles of preschool children manifesting a wide range of psychiatric and developmental disturbances were submitted to cluster analysis, autistic males differentiated from preschool boys with other behavior disturbances (Rescorla, 1988).

A second study conducted in Germany also suggested that the CBCL can identify a general behavior pattern in children with Autistic Disorder (AD) (Bolte, Dickhunt, & Poustka, 1999). When compared to normative (N=2,856) and clinical samples (N= 1,655), a sample of 77 individuals with AD, ages 4 to 18, scored more than two standard deviations higher on the Total Problems scale of the CBCL. A closer look at the individual syndrome scales revealed that the individuals with AD scored higher than the normal and clinical group on all but one of the eight subscales. The exception was Somatic Complaints, on which individuals with AD scored below the clinical and normal population. This finding was not surprising given the lack of or inappropriate communication style that is typical of individuals with AD. The greatest score elevation for the group with AD was on the Social, Thought, and Attention subscales. In summary, the authors conclude that the CBCL shows sufficient ability to record clinically relevant behavioral patterns of autistic behavior (Bolte, Dickhunt, & Poustka, 1999).

The ability of the CBCL to identify children with autism and related conditions in ages four through 11 was further investigated by Duarte, Bordin, de Oliveira, & Bird (2003). They found that the broad band scores on the CBCL (Internalizing Problems, Externalizing Problems, and Total Problems) did not distinguish children with autism and related conditions from children with other psychiatric disorders. The Externalizing Problems broad band score of autistic children was similar to those of normal schoolchildren and the Internalizing Problems broad band score did not distinguish children with autism and related conditions from children.
with other psychiatric disorders. The authors also investigated the narrow band scales on the CBCL and found that both the Thought Problems and Autistic/ Bizarre subscales (the latter was developed by Rescorla, 1988) provided differentiation between the two groups (autism and related conditions and school children) with the Thought Problems scale alone supplying the best differentiation (Duarte, Bordin, de Oliveira, & Bird, 2003). When comparing autistic children with children with other psychiatric disorders, the Thought Problems, Autistic/Bizarre, and Aggressive Behavior Scales were able to distinguish the two groups.

The most recent study examined the utility of the CBCL (1.5/5), which was developed for children ages 18 months to five years, 11 months of age, and the Gilliam Autism Rating Scale (Gilliam, 1995) in discriminating children with ASD (ages 36 to 71 months) from individuals referred for ASD evaluations but not found to be ASD (Sikora et al., 2008). Results revealed that the Withdrawn and Pervasive Developmental Problem subscales of the CBCL were higher among children with ASD than nonASD children (Sikora et al., 2008). The sensitivity and specificity of the CBCL were also better than that of the GARS suggesting that the CBCL is a useful behavior checklist for screening ASD.

The CBCL was not originally intended to identify individuals with ASD, yet it has recently been used to screen for particular behaviors that are characteristic of ASD prior to pursuing more formal evaluations. While there have been four studies that have looked at the CBCL with various populations, there has yet to be a study to look at the distinct profiles produced by the CBCL with a group of six to 18 year olds in the United States. This line of research is important for several reasons. Primarily it would assist in identifying characteristics that differentiate groups of individuals (e.g., ASD, nonASD Controls, and Clinic-Referred for behavior difficulties). If differences are found, it would be helpful to know which areas certain groups of individuals are likely to be identified as requiring further screening and evaluation. This would be of extreme interest to psychologists and other professionals who specialize in working with unique populations of children, such as ASD. Secondly, this additional knowledge of all the CBCL subscales that contribute to these unique populations profiles is important for identification (e.g., individuals in need of further screening and evaluation) and intervention (e.g., individuals in need of behavioral remediation). Therefore, the purpose of this study is to
determine if patterns of normative strengths and weaknesses on the subscales of the CBCL are similar for individuals with ASD, nonASD Controls, and Clinic-Referred for behavior.
CHAPTER 2

REVIEW OF LITERATURE

Broad Behavior Screening Instruments

Behavior rating scales and checklists are commonly used tools in the assessment of internalizing and externalizing behaviors, social skills, and emotional functioning (Heckamena, Conroy, East, & Chait, 2000). These screening tools are capable of screening for a range of behavior disorders and are utilized in multiple settings. Contributing factors to their growing popularity include (a) provision of quantifiable information, which can be held to standards of reliability and validity; (b) efficient completion and scoring; (c) provision of systematic and organized information; (d) inclusion of normative data, allowing for comparisons of individual behaviors to larger groups; and (e) ability to compare ratings of multiple respondents across settings. (Hosp, Howell, & Hosp, 2003). In addition, there are numerous behavior rating scales commercially available (i.e., Behavioral Assessment System for Children [Reynolds & Kamphaus, 1992], Behavioral and Emotional Rating Scale [Epstein & Sharma, 1998], Behavior Rating Profile [Brown, 1990], Burks’ Behavior Rating Scales [Burks, 1996], Child Behavior Checklist [Achenbach & Rescorla, 2001], Conner’s Rating Scales [Conners, 1997], Revised Behavior Problem Checklist [Quay & Peterson, 1987], Social-Emotional Dimension Scale [Hutton & Roberts, 1986], and The Walker-McConnell Scale of Social Competence and School Adjustment [Walker & McConnell, 1995]).

Components of Broad Behavior Screening Instruments

In searching for a comprehensive broad behavior screener to identify individuals with an array of presenting problems, it is important to focus on some key factors: a) the ability of the instrument to be read and understood, b) allowance of information from multiple sources, c) ability to distinguish the individual from others, d) efficiency and economic availability, e) interpretability, f) high internal consistency, g) availability in multiple languages, h) norms based on large representative samples, i) consistency among scales, j) the ability to document for further decisions, and k) the ability to detect outcome evaluations.

Frequency of Use of Broad Behavior Screening Instruments

Assessment methods commonly associated with the process of behavioral assessment and screening, such as structured interviews, behavior checklists, rating scales, and systematic
observations have gained more prominence and acceptance over time. Shapiro and Heick (2004) surveyed 1000 practicing psychologist at a national convention about their use of assessment instruments with students who were referred for social, behavioral, and/or emotional problems. Results of the study indicated that although the use of intelligence, achievement, and visual-motor assessments remain a popular choice for school based psychological assessments, these remain only a portion of the assessments. The use of interviews, rating scales, and observations were reported in 60% to 90% of cases (Shapiro & Heick, 2004). These data suggest that the use of rating scales has substantially increased over the past 10 years. It is important to note that broad behavior screening instruments are typically included with referral information; thus psychologists and educational diagnosticians may look at the child’s behavior before anything else. Therefore, these screening instruments also play an integral role in planning the evaluation.

**Commonly Used Broad Behavior Screening Instruments**

Commonly used behavior rating scales and screeners are the Conner’s Rating Scales (Conners, Parker, Sitarenios, & Epstein, 1998), the Behavior Assessment System for Children (Reynolds & Kamphaus, 1992), and the Achenbach Child Behavior Checklist (Achenbach, 1991).

The Connors Rating Scale – Revised (CRS-R) is a research and clinical tool for assessing classroom behaviors in children ages three to 17. Although it is mainly used for the assessment of ADHD, the subscales provide useful information for the assessment of conduct problems, cognitive problems, family problems, emotional problems, anger control, and anxiety problems (Conners, et al., 1998). The CRS-R provides three scales (parent, teacher, and adolescent) with long and short versions of each scale. While the long versions require more time to complete, they correspond more closely to the ADHD criteria of the *DSM-IV*. The short version is useful when time is limited or when repeated administrations are needed. CRS-R scales include 1) Oppositional, 2) Cognitive Problems/Inattention, 3) Hyperactivity, 4) Anxious-Shy, 5) Perfectionism, 6) Social Problems, 7) Psychosomatic, 8) Conners’ Global Index, 9) DSM-IV Symptom Subscales, and 10) ADHD Index. Computer and hand scoring are available which calculates standardized T-scores from raw scores, and provides a graphic display and a report of the results.
The coefficient alphas for internal reliability were highly satisfactory for the normative groups. For the long form there was a range from .73 to .94 and .86 to .94 for the short form of the CRS-R, indicating that the CRS-R items measure the same construct. The results indicate that the CRS-R is able to identify childhood and adolescent ADHD behavioral problems and psychopathology. Validity studies are continuing. The normative sample consisted of over 8000 cases. Data for parent, teacher, and self-report are from over 200 schools, 45 states, and 10 provinces throughout the U.S. and Canada.

The Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) is a coordinated system of instruments that evaluates the behaviors, thoughts, and emotions of children and adolescents ages four to 18. It focuses on assessing both adaptive and maladaptive behaviors. The BASC, parent and teacher forms, are measures described as providing a multidimensional approach to evaluating dimensions of behavior and personality in children, both positive and negative (Reynolds & Kamphaus, 2002). These questionnaires require a parent–guardian or teacher to rate a number of observable behaviors according to frequency evidenced during the past 6 months. Regarding school-age children, the BASC–PRS (Parent Rating Scale) has nine clinical scales including Hyperactivity, Aggression, Conduct Problems, Anxiety, Depression, Somatization, Atypicality, Withdrawal, and Attention Problems, and three adaptive scales including Adaptability, Social Skills, and Leadership. This emotional/behavioral measure also yields four composite scores including Externalizing Problems, Internalizing Problems, Behavioral Symptoms Index, and Adaptive Skills. The BASC–TRS (Teacher Rating Scale) includes the aforementioned nine scales and also adds the Learning Problems clinical scale, as well as the Study Skills adaptive scale and a School Problems composite score (Reynolds & Kamphaus, 2002). Each scale yields a mean T score of 50 and a standard deviation of 10. Confidence intervals and percentile ranks also are reported for each scale. Adequate reliability and validity has been shown for this measure (Reynolds & Kamphaus, 2002). The parent report version, test-retest reliability is reported at .88, interrater reliability is .57, internal consistency ranges from .80 to .90, and criterion validity was assessed and found to be acceptable. The teacher report version, test-retest reliability is purported at .90, interrater reliability ranges from .63 to .83, internal consistency ranges from .62 to .95, and criterion validity was assessed and found to be acceptable.
**CBCL**

*History*

The Achenbach System of Empirically Based Assessment (ASEBA) approach originated in the 1960s with Dr. Thomas M. Achenbach’s efforts as a graduate student in personality research to develop a differentiated picture of child and adolescent psychopathology (1966). The first scientific report of ASEBA findings was presented at the Society for Research in Child Development (Achenbach, 1965), and the first scientific publication was a monograph in the American Psychological Association’s *Psychological Monographs* series (Achenbach, 1966).

The 1966 publication carefully describes the advancement in achieving a classification system based upon theoretical principles. The purpose of that paper was to “attempt to elucidate, in the child symptom domain, the relationship between the general symptom clusters found by Hewitt and Jenkins (1946), Phillips and Rabinovitch (1958), and Guertin (1952) and the specific functional syndromes employed in adult psychiatry and found in the Wittenborn (1953) study” (Achenbach, 1966). Additional purposes of the study were a) to obtain more differentiated empirical classification of child psychiatric cases, b) to classify individual cases according to factors, and c) explicate relationships between empirical groupings of symptoms. To answer the above questions, case histories from 300 males and 300 females, ages 4 to 16, were obtained from the University of Minnesota Hospital Child Psychiatry Unit. Each case history was rated on a 91 item symptom checklist that was constructed from items regularly appearing in prior studies, which involved minimal inference, mutually exclusive, and “not excessively molecular” (Achenbach, 1966). The symptoms were intercorrelated and factor analyzed, separately for each sex, by the principal factor method, and the factors were rotated to the varimax, quartimax, and oblimin criteria for simple structure. The first principal to emerge for both sexes was bipolar, with antisocial behavior “Externalizing” at one end and internal problems “Internalizing” at the other. For both sexes, factors labeled Somatic Complaints, Obsessions, Compulsions and Phobias, Rule Breaking Behavior, Aggressive Behavior, Hyperreactive Behavior, and Schizoid Thinking and Behavior were found. For the boys, a factor labeled Sexual Problems was revealed, and for the girls alone, factors labeled Depressive Symptoms, Anxiety Symptoms, Neurotic and Rule Breaking Behavior, Enuresis and Other Immaturities, and Obesity were found. Overall
results showed that the factors obtained can be used directly for the classification of child psychiatric cases for research purposes (Achenbach, 1966).

In 1971, Achenbach and Lewis applied the empirically based approach in new research and laid the groundwork for the Child Behavior Checklist (CBCL). The conceptual framework for the ASEBA was outlined in relation to the developmental study of psychopathology in the first and second editions of the book *Developmental Psychopathology* (Achenbach, 1974, 1982). Based on the framework presented in *Developmental Psychopathology*, the first CBCL Manual was published in 1983 in collaboration with Craig Edelbrock, Ph.D. The CBCL Manual was followed by Manuals for the Teacher’s Report Form (TRF; Achenbach & Edelbrock, 1986) and the Youth Self-Report (YSR; Achenbach & Edelbrock, 1987). In 2001, the most recent edition of the CBCL/6-18 was released with the statistical foundation and normative data (Achenbach & Rescorla, 2001).

*Evaluation of the Child Behavior Checklist (CBCL)*

The CBCL was designed to address the problem of defining child behavior problems through direct observation and/or experience. It also has a teacher (Teacher Report Format-TRF), youth (Youth Self Report-YSR), and adult (Adult Self-Report) extension of the checklist. The CBCL can be self-administered or administered by an interviewer and consists of 118 items related to behavior problems which are scored on a 3-point scale ranging from not true to often true of the child. The CBCL is intended to serve as only one component of a multiaxial empirically based assessment, which includes parental report, teacher report, cognitive assessment, physical assessment, and direct assessment of the child. The CBCL exceeds other broad behavior screeners in that it includes 20 social competency items used to obtain parents’ reports of the amount and quality of their child’s participation in sports, hobbies, games, activities, organizations, jobs and chores, friendships, how well the child gets along with others and plays and works by himself/herself, and school functioning, which provides the clinician with a more intimate look at the child’s strengths and weaknesses.

Although behavior rating scales such as the Conner’s and the BASC gather useful information, they do not allow the responder to personalize the child being assessed. However, the Achenbach Child Behavior Checklist provides open-ended questions, fill-in-the-blank answers, and has a special area devoted to independence, adaptive behavior, and personal
interests of the individual. These open-ended areas allow the clinician to gain a much needed personal look at the individual’s personal strengths and weaknesses according to the caregiver. This crucial information is then added to the quantitative data to determine the extent the child’s behavior is affecting his or her daily functioning.

The 118 items of the CBCL break down each child’s behavior into the “broad band” scores of Internal Behavior Problems, External Behavior Problems, and Total Behavior Problems to give the clinician an idea of how the child is processing their emotions and outputting their behaviors. The 118 items yield scores for eight “narrow band” or problem scales: Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior. The standard scores for these eight subscales have a mean of 50 and a standard deviation of 10. These scales were derived and defined by the items that make up each scale. For example, the Thought Problems scale is defined by the ratings items: can’t get his/her mind off certain thoughts/obsessions; deliberately harms self or attempts suicide; hears sounds or voices that are not there; nervous movements or twitching; picks nose, skin, or other parts of body; plays with own sex parts in public; plays with own sex parts too much; repeats certain acts over and over; compulsions; sees things that are not there; sleeps less than most kids; stores up too many things he/she does not need; strange behavior; strange ideas; talks or walks in sleep; and trouble sleeping.

Relevance-Item Scores

Reliability of the item scores were computed using intraclass correleation coefficients from one way ANOVA’s. Inter-Interviewer ICC’s using three interviewers and 241 children matched for age, gender, ethnicity, and SES for a total sample of 723 were computed for the 20 competence items (.93) and for the 118 specific problem items (.96), both of which were significant (p<.001), indicating high inter-interviewer reliability (Achenbach & Rescorla, 2001). Test-retest reliability was computed over one week intervals. Overall ICC was 1.00 for the 20 competence items and .95 for the 118 specific problem items, which indicates high test-retest reliability (Achenbach & Rescorla, 2001).
**Reliability-Scale Scores**

*Internal Consistency.* Cronbach alphas for each scale were moderately high, ranging from .63 to .79. These alphas are about as high as expected for scales that have as few as four items. For the syndrome/problem scales, the alphas ranged from .78 to .97. For the DSM-oriented scales, scales of items judged to be “very consistent” with the DSM-IV diagnostic categories, the alphas ranged from .72 to .91. Table 1 displays Cronbach alphas for each scale.

<table>
<thead>
<tr>
<th>Empirically Based</th>
<th>Test-Retest Reliability</th>
<th>Alpha Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxious/Depressed</td>
<td>.82</td>
<td>.84</td>
</tr>
<tr>
<td>Withdrawn/Depressed</td>
<td>.89_a,b</td>
<td>.80</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>.92</td>
<td>.78</td>
</tr>
<tr>
<td>Social Problems</td>
<td>.90</td>
<td>.82</td>
</tr>
<tr>
<td>Thought Problems</td>
<td>.86</td>
<td>.78</td>
</tr>
<tr>
<td>Attention Problems</td>
<td>.92</td>
<td>.86</td>
</tr>
<tr>
<td>Rule-Breaking Behavior</td>
<td>.91</td>
<td>.85</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>.90</td>
<td>.94</td>
</tr>
<tr>
<td>Internalizing</td>
<td>.91_a</td>
<td>.90</td>
</tr>
<tr>
<td>Externalizing</td>
<td>.92</td>
<td>.94</td>
</tr>
<tr>
<td>Total Problems</td>
<td>.94_a,b</td>
<td>.97</td>
</tr>
<tr>
<td>Mean r</td>
<td>.90</td>
<td></td>
</tr>
</tbody>
</table>

*Test-Retest Reliability.* To assess reliability in both the rank ordering and magnitude of scale scores, Pearson r correlations and t tests of differences were calculated between CBCL ratings of both referred and nonreferred children at mean intervals of 8 to 16 days. Total scale scores correlations ranged from .91 to .94. Table 1 displays high reliability coefficients for most scales with the majority of test-retest rs ranging from .80 to .90. It should be noted that there were four significant declines or test-retest attenuation effects (p<.05) in scores from the 8-day interval to the 16-day interval, which are marked with subscript a. All were expected by chance.
based on the numerous analyses, using a p<.05 protection level. Subscript $b$ indicates that the differences were most likely due by chance, due to the yielding of the smallest $t$ values. These declines are supported by years of research on practice effects (Achenbach & Rescorla, 2001). The declines were small and account for a mean of <3% of the variance in scores (Achenbach & Rescorla, 2001). The authors advise users to all at least one month between assessments to minimize test-retest attenuation effects and to allow time for behavioral change (Achenbach & Rescorla, 2001).

**Cross-Informant Agreement.** Pearson $r$s were calculated for CBCL’s completed by mothers and fathers of children referred for a variety of mental health services and for combinations of CBCL, Achenbach Youth Self Report (YSR) and Achenbach Teacher Report Form (TRF) for children assessed in the national survey and those assessed in mental health settings. All cross-informant $r$s were significant at p<.05 and can be found in Table 2. Additionally, there was a fairly consistent tendency for mothers to score their children higher than the fathers on the empirically based problem scales and the DSM oriented scales.

### Table 2. Cross-Informant Agreement on CBCL Scale Scores

<table>
<thead>
<tr>
<th>Scales</th>
<th>CBCL</th>
<th>CBCL X YSR</th>
<th>CBCL X TRF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxious/Depressed</td>
<td>.68</td>
<td>.45</td>
<td>.19</td>
</tr>
<tr>
<td>Withdrawn/Depressed</td>
<td>.69</td>
<td>.40</td>
<td>.24</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>.65</td>
<td>.40</td>
<td>.15</td>
</tr>
<tr>
<td>Social Problems</td>
<td>.77</td>
<td>.49</td>
<td>.31</td>
</tr>
<tr>
<td>Thought Problems</td>
<td>.75</td>
<td>.37</td>
<td>.18</td>
</tr>
<tr>
<td>Attention Problems</td>
<td>.73</td>
<td>.48</td>
<td>.44</td>
</tr>
<tr>
<td>Rule-Breaking Behavior</td>
<td>.85</td>
<td>.55</td>
<td>.38</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>.82</td>
<td>.52</td>
<td>.33</td>
</tr>
<tr>
<td>Internalizing</td>
<td>.72</td>
<td>.48</td>
<td>.21</td>
</tr>
<tr>
<td>Externalizing</td>
<td>.85</td>
<td>.56</td>
<td>.36</td>
</tr>
<tr>
<td>Total Problems</td>
<td>.80</td>
<td>.54</td>
<td>.35</td>
</tr>
<tr>
<td>Mean $r$</td>
<td>.76</td>
<td>.48</td>
<td>.29</td>
</tr>
</tbody>
</table>
Stability. Stability of scale scores were computed using Pearson \( r_s \). The CBCL was completed at 12 and 24 months by 7 through 9 year olds involved in a longitudinal study. Particularly, that sample included low birth weight and normal birth weight children. All Pearson \( r_s \) were significant and can be found in Table 3. It should also be noted that none of the scale scores changed significantly over the 12- or 24-month periods.

Table 3. Stabilities on Scale Scores of the CBCL

<table>
<thead>
<tr>
<th>Scales</th>
<th>CBCL 12 Months</th>
<th>CBCL 24 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxious/Depressed</td>
<td>.68</td>
<td>.56</td>
</tr>
<tr>
<td>Withdrawn/Depressed</td>
<td>.71</td>
<td>.73</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>.64</td>
<td>.50</td>
</tr>
<tr>
<td>Social Problems</td>
<td>.69</td>
<td>.73</td>
</tr>
<tr>
<td>Thought Problems</td>
<td>.72</td>
<td>.61</td>
</tr>
<tr>
<td>Attention Problems</td>
<td>.70</td>
<td>.60</td>
</tr>
<tr>
<td>Rule-Breaking Behavior</td>
<td>.67</td>
<td>.71</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>.82</td>
<td>.81</td>
</tr>
<tr>
<td>Internalizing</td>
<td>.80</td>
<td>.70</td>
</tr>
<tr>
<td>Externalizing</td>
<td>.82</td>
<td>.82</td>
</tr>
<tr>
<td>Total Problems</td>
<td>.81</td>
<td>.80</td>
</tr>
<tr>
<td>Mean r</td>
<td>.74</td>
<td>.70</td>
</tr>
</tbody>
</table>

Validity

Content Validity. Beginning in the 1960’s, CBCL problem items have been developed and refined on the basis of practical experience and research (Achenbach & Lewis, 1971). The development and refinement of the competence items began in the 1970’s and consisted of extensive literature reviews, consultations with mental health professionals and special educators, and pilot testing with parents and other caregivers. Over the years leading up to the current version of the CBCL, there were only two problem items that better discriminate between
referred and non-referred children. The two new items that are expected to discriminate between the two groups. All of the new problem items were scored significantly higher (p<.01) for the referred group than the non-referred group (Achenbach & Rescorla, 2001).

**Criterion-Related Validity.** Criterion related validity of the CBCL focuses on associations between scales comprising particular sets of items and external criterion variables. Multiple regressions, odds ratios, and discriminant analysis were all utilized to determine criterion-related validity. Structural Equational Modeling (SEM) was used to regress the raw scores of each scale on the independent variables of (referral status, age, gender, SES, and ethnicity). Referral status effects were greater than demographic effects on all problem scales. SEM was also used on the 17 CBCL scales (eight syndrome scales, six DSM-oriented scales, and the Internalizing, Externalizing, and Total Problems). Mean effect sizes averaged over the gender/age groups were large for nine scales, medium for six scales, and small for only the Somatic Complaints and the DSM Somatic Problems scale. The largest effect sizes were on the CBCL Attention Problems, Aggressive Behavior, Externalizing, Total Problems, and DSM-oriented Conduct Problems. Odd Ratios (OR) were also used to analyze associations between categorical classifications (deviant scores and referral status). Of the CBCL scales, 12 of the 17 yielded ORs ≥10, indicating strong associations with referral status. All other problem scales on all three instruments yielded ORs ≥4. Finally, discriminant analysis was used to test the weighted combinations of scores to determine if they produce better discrimination between criterion groups that were demographically matched referred and non-referred children. This analysis revealed high accuracy (=85%) on the specific competence and adaptive scales. More accurately, classification was achieved using all competence and all problem items as predictors. The correct classification rate for the CBCL was 80%. In summary, discriminant analysis achieved the best cross-validated accuracy for the CBCL (88%).

*Screening for Unique Populations Using the CBCL*

The CBCL has been utilized over the past 43 years to identify patterns of functioning in children. More recently, the profiles of the CBCL have been used to screen and identify unique populations, such as anxiety disorders, Attention Deficit Hyperactivity Disorder (ADHD), Pediatric Bipolar Disorder (PBD) and headaches and recurrent abdominal pain (Aschenbrand, Angelosante, & Kendall, 2005; Biederman et al., 1995; Ivarsson, Melin, & Wallin, 2008;
Ostrander et al., 1998; Holtman, et al., 2008; Galli, et al., 2007). Researchers and clinicians are interested in finding patterns that are generated when these groups are screened. For example, in a study examining the validity of several scales (Withdrawn/Depressed, Somatic Complaints, Anxious/Depressed, Social Problems, and Internalizing Problems) of the CBCL with anxiety-disordered youth, the authors determined that the CBCL could function as a rapid and useful screening tool and used for multiple gating to identify children with anxiety disorders such as Generalized Anxiety Disorder (GAD), Social Phobia (SP), and Separation Anxiety Disorder (SAD). Aschenbrand et al., used discriminant function analysis to determine which variables discriminated between a group of anxiety disordered youth and for those without anxiety disorders. Results revealed that there are significant correlations between the Internalizing Problems scale and a principal diagnosis of GAD and SP. When looking at the syndrome scales, Somatic Complaints was a good predictor of GAD when reported by the mothers and the Social Problems and Withdrawn/Depressed subscales were the best predictors of a diagnosis of SP when reported by the fathers. The Withdrawn/Depressed subscale was most correlated with SP severity, which indicated concurrent validity of the CBCL. The authors also found the Anxious/Depressed subscale was successful in ruling in and ruling out individuals for a future diagnosis of an anxiety disorder. In a similar study examining child psychopathology, Biederman et al. (1995), evaluated the discriminative ability of the CBCL to differentiate children with Bipolar Disorder from those with ADHD and normal controls. Results revealed significant differences between those with Bipolar Disorder and ADHD on Rule-Breaking Behaviors, Aggressive Behaviors, Anxious/Depressed, and Thought Problems. The CBCL is also being used with nontraditional medically-referred groups of children. A study conducted by Galli et al., (2007) looked at the CBCL’s ability to differentiate between groups of Italian children experiencing psychosomatic headaches and recurrent abdominal pain from normal controls. Significant differences were found on the Internalizing scale between the control group and children experiencing migraines, tension-type headaches (TTH), functional abdominal pain (FAP), irritable bowel syndrome (IBS), and control groups. Somatic Complaints produced significant differences between groups with children experiencing IBS, migraine, TTH, and FAB, respectively, when compared to the control group. Finally, significant differences were found on the Attention Problems subscale with migraine patients. This study illustrates the
usefulness of the CBCL in not only childhood psychopathology, but in identifying and treating children with psychosomatic symptoms. Another population that has recently received research attention in using the CBCL for identification and screening purposes is Autism Spectrum Disorders.

**Autism Spectrum Disorders**

Autism Spectrum Disorders, also known as Pervasive Developmental Disorders (PDD’s), refer to a continuum of related cognitive and neurobehavioral disorders, including, but not limited to, a triad of impairments in reciprocal social interaction, verbal communication, and nonverbal communication (Filipek et al., 1999). Patterns of repetitive stereotyped activities, behaviors, and interests have also been noted, as described in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.) (*DSM-IV TR*) (American Psychiatric Association [APA], 2000). Many terms have been used over the years to refer to these disorders (e.g., infantile autism, pervasive developmental disorder-residual type, childhood schizophrenia, and autistic psychoses). According to the *DSM-IV*, a diagnosis of PDD includes autistic disorder, Asperger’s Syndrome (AS), pervasive developmental disorder not otherwise specified (PDD-NOS), Rhett’s disorder, and childhood disintegrative disorder (CDD) (*DSM-IV*, 2000).

**Prevalence.** Autism spectrum disorders are rare disorders, but they are more prevalent than cancer, diabetes, spina bifida, and Down’s syndrome in the pediatric population (Filipek et al., 1999). Early epidemiological studies noted prevalence rates of infantile autism of 4 to 5 per 10,000 (Lotter, 1966). With a broader clinical classification and improved clinical recognition, prevalence estimates have continued to increase. Fombonne (2005) estimated the rate for all PDD’s to be between 37 and 60 per 10,000. Fombonne (2005) further calculated the prevalence of autism to be 13 per 10,000, 3 per 10,000 for AS, and .2 per 10,000 for CDD. The conservative rate of 37 per 10,000 translates into 300,000 individuals with PDD’s and the less conservative rate of 60 per 10,000 renders 486,000 individuals under the age of 20 living in the United States will have a diagnosis of PDD (Fombonne, 2005).

The Centers for Disease Control (CDC) released a prevalence study that used data from two studies. The CDC report disclosed prevalence research from studies conducted in 2000 and 2002. The 2000 study revealed that ASD ranges from one in 222 children to one in 101 eight-year old children in the six communities with an average of one in 150 third grade children
The 2002 study found ASD rates ranging from one in 303 to one in 94 with the average of 6.6 and 6.7 per 1,000 eight-year-olds. These estimates translate into approximately one in 150 children in these communities. This finding is consistent with the upper end of prevalence estimates from previously published studies (CDC, 2007). The notion of these increasing prevalence rates affirms the need for improved early screening and diagnosis (Filipek et al., 1999). With the rising prevalence rates across the nation and the world, educational systems are now being given the greater responsibility of identifying and referring these individuals for services.

**Importance of Early Identification.** Autism spectrum disorders, in many cases, are likely to be present at birth, but developmental delays and ASD’s in infants, toddlers and young children are under identified, which means that early intervention is prohibited or severely delayed for those children that need it (Wetherby et al., 2003). In some cases children appear to develop normally for a period of time, then begin lose early communication and social skills or fail to develop more advanced language and social skills. Other more capable and verbal children show few characteristics until they are eight to 10 years of age, when the demand for higher level thinking skills, social judgments, and time pressures pronounce the early indicators of ASD. Statistics from the 28th Annual Report to Congress indicated that 9.16% of all school-age children (ages 6 to 21) receive special education services in contrast to 5.9% of pre-school children (ages 3 to 5) and 2.3% of infants and toddlers receiving early intervening services (U.S.DOE, 2009). Given these statistics, there is considerable need to improve the early identification of children who require special education services and early intervention prior to beginning school. This group of unidentified children presents difficulty for the local school districts to appropriately implement the Individuals with Disabilities Education Act (IDEA, 1997).

Growing consensus in the literature agrees that intervention is valuable and, within limits, the more intense the intervention, the greater the gains despite variability in outcomes within groups of children treated (Symes, Remington, & Brown, 2006). This continued press for early identification is gathered from 15 years of evidence that intensive early intervention prior to five years of age results in improved outcomes in children with ASD (Filipek et al., 1999). The advantages of early identification include earlier educational planning, reduction of family stress,
and delivery of appropriate interventions and medical care (Cox et al., 1999). Therefore, screening activities are crucial for quick referral for full assessment and interventions.

**Screening for ASD in Schools.** Prevalence estimates suggest that educational personnel are likely to encounter children with ASD and thus need better methods to identify children requiring ASD specific educational intervention services (Filipek et al., 1999). A report from The Special Educator in September 2000 indicated that children with ASD continue to be under-identified and that schools are failing to provide comprehensive multidisciplinary evaluations (Noland & Gabriels, 2004). “These issues have heightened concerns among public school administrators and educators to take on the responsibility of screening for children with ASD in order to more efficiently provide appropriate special education services as outlined by the Individuals with Disabilities Education Act (IDEA)” (Noland & Gabriels, 2004).

Time, high cost, and specialized training for direct observation measures limit their use in primary care and educational settings. Psychologists, developmental interventionist, social workers, physicians, and other personnel are looking to use broad behavior screening instruments to screen for ASD in these settings (Sikora et al., 2008). Behavior checklists have the benefit of requiring minimal time, cost, and can be administered by non-specialists. Additionally, scores can be compared to normative data, “potentially providing more objective information about a child and limiting the number of ‘mistakes’ that might be made by a non-specialist” (Sikora et al., 2008).

Numerous behavior checklists are available commercially that assess behaviors consistent with autism, Asperger’s Syndrome, and PDD-NOS; however, these ASD-specific screening instruments are not always practical for educational settings because of the cost, time, and availability. Therefore, continued evaluation of broad behavior checklists is imperative to understanding their use with disorders such as ASD.

**Screening for ASD Using the Child Behavior Checklist.** The first study to examine the ASD screening ability of the CBCL was a cluster analytic study conducted by Rescorla (1988) on the symptom profiles of a clinical sample comprised of 204 three to five year old boys. The clinical sample included 79 autistic and autistic-like children, 82 children with reactive and more typical behavior disorders, and an “other” category which included 43 children with relatively mild impairments who had not been diagnosed as atypical or reactive. Coders rated each child’s
presenting symptoms using the 1979 edition of the CBCL. Given that the data was archival from the 1960’s and 1970’s, parent report on the CBCL was not available and thus behaviors were rated by coders based on existing chart material (Rescorla, 1988). Only 73 items from the 113 item CBCL were used; 40 items were eliminated due to 95% of the entire sample scoring zero. The CBCL’s syndrome scales were not used due to the differences in age and proportion of autistic children included in the clinical sample from those in the CBCL’s original standardization sample. Patterns of results across 2-, 3-, 4-, 5-, and 6-cluster solutions presented, with the first cluster to emerge as the Autistic/Bizarre cluster, which included five of the items from the CBCL (confused/in a fog, strange behavior, stereotypic behaviors, withdrawn, and strange ideas), "which suggested that the future use of the CBCL in samples with autistic children might be fruitful” (Rescorla, 1988). Overall, this study showed that when the eight-factor CBCL symptom profiles of preschool children manifesting a wide range of psychiatric and developmental disturbances were submitted to cluster analysis, autistic males differentiated from preschool boys with other behavior disturbances (Rescorla, 1988). It should be noted that the sample was limited in that it only included males between the ages of three to five.

Bolte, Dickhunt, and Poustka (1999) investigated if the patterns of scores on the eight CBCL subscales could be found in children with ASD. Data was collected within a research project and article on the genetics of autism titled, “Autistic behavior domains and their relation to self-injury behavior.” The sample included three groups of German children: 1) an autistic sample comprising of 54 males and 23 females ranging in age between four and 18 years of age; 2) an unpublished German CBCL normative sample (N=2,856); and 3) an unpublished German CBCL clinical sample (N=1,655). The data was analyzed using a one-way MANCOVA with sex, age, and IQ as covariate predictors for all 8 CBCL syndrome scales. Analyses revealed that when compared to the normative sample, autistic subjects had higher Total Problem scores (Bolte, Dickhunt, and Poustka, 1999). It should also be noted that “autistic subjects exhibited striking social, attentional, and thought impairment even in comparison with a mixed clinical sample” (Bolte, Dickhunt, and Poustka, 1999). The authors added that these three scales reflect behavior representing social immaturity and social dependency, bizarre and compulsive as well as agitated, impulsive patterns, which in combination can be interpreted as quite typical autistic symptoms. In addition, on the scale for somatic complaints the mean autistic individual ranged
below the clinical and normal samples. The authors concluded that the CBCL seems to show sufficient ability to record strong hints for autistic behavior as clinically relevant. The CBCL also helps to register comorbid symptoms in autism which are only marginally represented in the structured diagnostic interview, ADI-R (Bolte, Dickhunt, and Poustka, 1999).

Duarte, Bordin, Oliveira, and Bird (2003) examined the validity of the CBCL in identifying autism and related conditions in children ages four to 18 years in Brazil. The CBCL/4-18 is one of the few standardized means available for assessing child mental health in Brazil. This study compared three groups of children: those with autism and related conditions, childhood psychiatric disorders (Attention Deficit Hyperactivity Disorder, Depressive Disorder, Conduct/ Oppositional Defiant Disorder, Separation Anxiety/ Obsessive Compulsive Disorder), and average school children, randomly selected from two neighboring public schools. The Brazilian version of the CBCL/4-18 (Portuguese language) was used and the eight syndrome scales and the Autistic/Bizarre factor (Rescorla, 1988), developed in a previous study was examined. The Autistic/Bizarre factor is an informal factor comprised of the following items from the CBCL: confused (13), repeats acts (66), strange behavior (84), strange ideas (85), and withdrawn (111; Duarte, Bordin, Oliveira, & Bird, 2003). Autism and other psychiatric disorders were diagnosed by experienced child psychologists and psychiatrists based on the ICD-10 criteria. Clinical evaluations were carried out in two mental health clinics in Brazil and included several contacts with patients and interviews with parents during which the diagnostic criteria (ICD-10) were established. The schoolchildren’s parents were administered the CBCL by trained interviewers.

Initially, a principal axis factor analysis of the CBCL was conducted using 110 items. Logistic regression analysis was used to identify combinations of CBCL scales that discriminate among the three groups using separate logistic regression models to compare autistic to other psychiatric disorders, and autistic to the schoolchildren. The analysis proceeded from the most general level of CBCL scores to more specific levels, with the Autistic/ Bizarre factor being entered last (Duarte, Bordin, Oliveira, & Bird, 2003). Then forward stepwise logistic regression was used to determine if CBCL subscales would be better predictors of autism than the non-standardized Autistic/ Bizarre factor.
Results of the principal factor analysis were unstable due to the small sample size, the large number of items, and the sample composition. Neither the global measures nor the broad band measures on the CBCL/4-18 were able to identify group differences, but the narrow band measures of Autistic/Bizarre and Thought Problems were able to distinguish between the three groups of children, with the Thought Problems scale better distinguishing between the autistic children and the schoolchildren than the Autistic/Bizarre scale. This pilot study demonstrates that there is a promising alternative to the systematic identification of autism and related conditions in contexts in which more specific instruments are not readily available. Overall, the CBCL/4-18 was able to identify autism in both clinical and school samples in Brazil.

The most recent study examined the utility of the CBCL (1.5/5) and the Gilliam Autism Rating Scale (Gilliam, 1995) in their ability to discriminate children with ASD (ages 36 to 71 months) from individuals referred for ASD evaluations but not found to be ASD (Sikora et al., 2008). The usefulness of the CBCL and the GARS was investigated among 147 children with Autism, ASD, and children deemed nonASD via the Autism Diagnostic Observation Schedule-Generic (ADOS-G). All children participated in an evaluation through the Autism Program at the Child Development and Rehabilitation Center at Oregon Health and Science University. Participants were divided into three groups based on their ADOS-G classifications (autism=79, ASD=18, and nonspectrum=50).

Pearson correlations were used to evaluate the associations between the scale scores on the CBCL and the GARS AQ. There were significant correlations between the GARS AQ and all scale scores from the CBCL. The CBCL Withdrawn (r=.58) and Pervasive Developmental Problems (r=.66) scales were correlated the highest with the GARS AQ. Multivariate analyses of variance’s were used to determine potential differences between the three groups on the GARS and the CBCL. Significant differences with small to moderate effects were identified among ADOS-G classifications for the Pervasive Developmental Problems, Anxious/Depressed, Withdrawn, and Aggressive Behavior. Post-hoc analyses revealed significant differences between the Non-Spectrum and the Autism groups. No differences were noted between the Non-Spectrum versus the ASD group and the ASD versus the Autism groups. No significant differences were identified for the three groups on the GARS AQ. Multivariate analyses of covariances’s were used to determine whether the GARS AQ and the CBCL scales were able to
differentiate among ASDOS-G classifications when controlling for group characteristics. Results revealed significant multivariate effects between ADOS-G classifications. Significant effects were not identified for the GARS AQ. Significant group effects were found for the CBCL Withdrawn and the Pervasive Developmental Problems. Sensitivity and specificities were conducted for those with Autism versus those without Autism on the GARS AQ and the Withdrawn and Pervasive Developmental Problems on the CBCL. In all analyses the CBCL Withdrawn and the Pervasive Developmental Problems scale had better sensitivity than the GARS. The CBCL Withdrawn scale had better specificity than the GARS AQ. These results suggest that the CBCL is a useful behavior checklist for screening ASD, which adds the benefit of supplying information on a broad array of behavior difficulties and offers a profile of personal strengths and weakness to guide the development of individualized interventions.

Although the CBCL was not originally intended to identify individuals with ASD, it has recently been used to screen for particular behaviors that are characteristic of ASD prior to pursuing more formal evaluations. While there have been four studies that have looked at the CBCL with various populations, there has yet to be a study to look at the distinct profiles produced by the CBCL with a group of six to 18 year olds in the United States. This line of research is important for several reasons. Primarily it would assist in identifying characteristics that differentiate groups of individuals (e.g., ASD, nonASD Controls, and Clinic-Referred). If differences are found, it would be helpful to know which areas these groups of individuals are likely to be identified as requiring further screening and evaluation. This would be of extreme interest to psychologists and other professionals who specialize in working with individuals with ASD. Secondly, knowledge of the particular scales of the CBCL that contribute to these unique populations profiles is important for intervention (e.g., individuals in need of behavioral remediation and educational supports). Therefore, the purpose of this study was to determine if patterns of normative strengths and weaknesses on the subscales of the CBCL were similar for individuals with ASD, nonASD controls, and those with clinic-referred disorders. The research questions that were answered via this study include:
Research Questions

ASD Versus nonASD Controls

1) Was there a significant difference between individuals who were diagnosed with ASD and nonASD controls in their pattern of behavioral, emotional, and social problems along eight CBCL syndrome scales?

2) Was there a significant difference between individuals who were diagnosed with ASD and nonASD controls in their behavioral, emotional, and social problems when all eight CBCL syndrome scales were considered simultaneously?

ASD Versus Clinic-Referred

1) Was there a significant difference between individuals who were diagnosed with ASD and those who were clinic-referred for behavior problems in their pattern of behavioral, emotional, and social problems along eight CBCL syndrome scales?

2) Was there a significant difference between individuals who were diagnosed with ASD and those who were clinic-referred for behavior problems in their behavioral, emotional, and social problems when all eight CBCL syndrome scales were considered simultaneously?
CHAPTER 3
METHODOLOGY

Participants

For the purpose of this investigation, the following procedures were used to obtain participants and classify them into one of three criterion groups: (a) individuals with ASD (ASD group), (b) individuals without ASD (nonASD Controls), and (c) individuals referred for a variety of behavior disorders (Clinic-Referred). Participants with ASD included a sample of 68 male and female children ages six to 18 years of age (mean age=9.5; SD=3.22) diagnosed with ASD by the Florida State University (FSU) Multidisciplinary Center (MDC). The nonASD Control group and the Clinic-Referred group included individuals from the Achenbach Child Behavior Checklist (CBCL) standardization sample, and were matched with the ASD group on age, gender, race and socioeconomic status (SES). All participants from the MDC had a CBCL completed by a caregiver and received a diagnosis of ASD using the Autism Diagnostic Observation Schedule-Generic (ADOS-G: Lord et al., 2000) between January 2001 and April 2008. Participants of all races, ethnicities, and socioeconomic status were included. Treatment of all human subjects was in accordance with the ethical standards of APA (APA, 1992).

The CBCL standardization sample was utilized as a normative group of 68 (mean age=9.5; SD=3.22) individuals matched to the ASD sample according to age, gender, race, and SES. This sample excluded children who received services from a mental-health professional or for any problems related to drugs and alcohol. The CBCL standardization sample from which the nonASD Control sample was drawn was a stratified sample of 1,753 subjects distributed throughout 40 contiguous United States and the District of Columbia (Achenbach & Rescorla, 2001).

The CBCL Clinic-Referred standardization sample included 1,605 children, who were receiving special education services and/or mental health services for major behavioral, emotional, or developmental problems (Achenbach & Rescorla, 2001). For the current study, a subsample of 68 children (mean age=9.5; SD=3.22) matched on age, gender, race, and SES with the ASD group was selected. Characteristics of the three samples are listed below.
Table 4. Demographic Characteristics of the CBCL ASD, nonASD Controls, and Clinic Referred Samples

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>ASD Sample (N=68)</th>
<th>nonASD Controls Standardization Sample (N=68)</th>
<th>Clinic-Referred Standardization Sample (N=68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>57 (84%)</td>
<td>57 (84%)</td>
<td>57 (84%)</td>
</tr>
<tr>
<td>Girls</td>
<td>11 (16%)</td>
<td>11 (16%)</td>
<td>11 (16%)</td>
</tr>
<tr>
<td>SES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>11 (16%)</td>
<td>12 (18%)</td>
<td>7 (10%)</td>
</tr>
<tr>
<td>Middle</td>
<td>24 (35%)</td>
<td>28 (41%)</td>
<td>28 (41%)</td>
</tr>
<tr>
<td>Lower</td>
<td>33 (49%)</td>
<td>28 (41%)</td>
<td>33 (49%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Latino/ White</td>
<td>33(49%)</td>
<td>28 (41%)</td>
<td>33 (49%)</td>
</tr>
<tr>
<td>African American</td>
<td>11 (16%)</td>
<td>10 (15%)</td>
<td>10 (15%)</td>
</tr>
<tr>
<td>Latino</td>
<td>2 (3%)</td>
<td>3 (4%)</td>
<td>2 (3%)</td>
</tr>
<tr>
<td>Mixed or Other</td>
<td>5 (7%)</td>
<td>5 (7%)</td>
<td>6 (9%)</td>
</tr>
<tr>
<td>Completed:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>61 (90%)</td>
<td>68 (85%)</td>
<td>57 (84%)</td>
</tr>
<tr>
<td>Father</td>
<td>5 (7%)</td>
<td>7 (10%)</td>
<td>5 (7%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (3%)</td>
<td>3 (5%)</td>
<td>6 (9%)</td>
</tr>
</tbody>
</table>

Archival participant data for the ASD group was gathered from the MDC’s data base. The MDC is a full service, university-based diagnostic and training center. The center provides therapeutic interventions, comprehensive diagnoses, and consultative services to 18 school districts in the Panhandle region of north Florida and the research schools at FSU and Florida A&M University, as well as Children's Medical Services, the FSU Center for Autism and
Related Disabilities (CARD), Tallahassee Pediatric Foundation, and other state and community agencies. The MDC serves preschool and school-aged children who are experiencing severe and/or complex academic, medical, and/or behavioral/emotional problems. The staff includes professionals from School, Counseling, and Clinical Psychology and Social Work.

Prior to each MDC evaluation, legal guardians and/or the referring agencies of the child were required to complete an application form. The application form provides basic demographic information and reason for referral. Applications were then reviewed by the clinical director and supervising licensed psychologists prior to scheduling an evaluation. They were later re-reviewed by supervising licensed psychologists and the student evaluator in an effort to tailor each comprehensive diagnostic assessment to the client’s individual needs. After an appointment was scheduled, standardized behavior checklists, including the CBCL, were sent to the child’s legal guardians and teachers to be completed and returned by the day of the scheduled evaluation.

Individual psychoeducational evaluations consisted of a consent form Appendix C, one or more measures of cognitive abilities (i.e., *Wechsler Intelligence Scale for Children* [Wechsler, 2003], *Stanford Binet Intelligence Scale* [Roid, 2003], *Differential Ability Scale* [Elliot, 1990], and the *Woodcock Johnson Test of Cognitive Processing* [Woodcock, 2001]), measures of academic achievement [e.g., *Woodcock Johnson Tests of Achievement* (Woodcock, 2001), *Kaufman Survey of Early Academic and Language Skill* (Kaufman & Kaufman, 1993), *Bracken Basic Concept Scale-Revised* (Bracken, 1984)], and behavior screeners [*Achenbach Child Behavior Checklist –Caregiver and Teacher Report Form* (Achenbach & Rescorla, 2001), *Behavior Assessment Scale for Children (BASC)* (Reynolds & Kamphaus, 1992)]. Individuals referred for autism evaluations were additionally administered the *Autism Diagnostic Observation Schedule-Generic* (ADOS-G; Lord, 1994), *Social Communication Questionnaire* (Rutter et al., 2003), and the *Childhood Autism Rating Scale* (Schopler, et al., 1988).

ASD evaluations took place at the MDC weekdays from 8am to 3pm and were conducted by licensed psychologists, autism specialists from CARD, social workers, and student evaluators. Student evaluators were third or fourth year students in clinical, counseling, or school
psychology doctoral graduate programs. ASD evaluators were provided formal ADOS-G training through workshops and training seminars. Additionally, students were supervised throughout each ADOS-G administration by the other team members assigned to each ASD evaluation. It should be noted that the professionals working with children at risk for ASD are not research reliably trained on the ADOS-G, but it is utilized as one of many tools to diagnose ASD. Children with autistic disorder, PDD-NOS, and Asperger’s syndrome were formally diagnosed according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition and Fourth Edition Text Revision (DSM-IV; APA, 1994; DSM-IV TR, 2000) by licensed psychologists. Table 5 indicates the differential diagnoses received by the individuals in the ASD group. The rare ASD’s of Childhood Disintegrative Disorder (CDD) and Rhett’s Syndrome were not included in this study.

Table 5. Differential Diagnosis of the ASD Sample (N=68)

<table>
<thead>
<tr>
<th>DSM-IV Diagnosis</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autistic Disorder</td>
<td>30</td>
<td>44%</td>
</tr>
<tr>
<td>Asperger’s Syndrome</td>
<td>21</td>
<td>31%</td>
</tr>
<tr>
<td>PDD- NOS</td>
<td>17</td>
<td>25%</td>
</tr>
</tbody>
</table>

The day of the ASD evaluation, the parent joined the individual suspected of having an ASD to the evaluation. The parent later left the child to complete a clinical interview with a licensed clinical social worker. After the ADOS-G, additional academic and/or behavioral testing was completed; afterwards a break was taken to score the formal assessments and to collaborate and confer with the ASD team on the diagnosis. The caregiver and child returned to the MDC later in the afternoon to meet with the team, receive feedback, recommendations, and the results from the evaluation. Reports detailing the evaluation observations, test results, and findings were completed within 4 to 6 weeks of the initial evaluation and mailed to the parent.

For the purpose of this study, descriptive data (age, gender, SES, and race) and quantitative data from the CBCL (8 syndrome scale raw and T-scores) were collected and analyzed. No identifiable information was recorded and upon completion of the study all
participant information will be destroyed. The computer used for data collection and analysis was password protected.

Instruments

*Child Behavior Checklist/6-18.* The Achenbach System of Empirically Based Assessment’s Child Behavior Checklist CBCL/6-18 is a revision of the 1991 version of the CBCL/4-18. The CBCL/6-18 is completed by parents, caregivers, surrogates, and any others who may see the child in a family-like context (Achenbach et al., 2001). The CBCL/6-18 gathers demographic information on the child and the respondent and requests ratings on 118 items addressing behavioral, emotional, and social problems. Respondents rank each item as 0= *not true*, 1= *somewhat or sometimes true*, or 2= *very true or often true* based on the child’s symptomatology during six months. The 118 items yield three problem scales (Internalizing, Externalizing, and Total Problems) and eight syndrome scales (Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior). Standard scores are based on the T-score, with a mean of 50 and a standard deviation of 10. Test-retest reliability r’s for the eight syndrome scales ranged from .79 to .88. Scale scores for the eight syndrome scales were found to be stable over 12 and 24 month periods. Internal consistency is supported for the empirically based syndrome scales with alphas ranging from .78 to .97. Content, criterion-related, and construct validity have all been supported by decades of research (Achenbach & Rescorla, 2001), which were described in Chapter 2.

Data Analyses

Profile analysis was used to compare the CBCL subscale profiles of three groups: ASD, nonASD Controls, and a Clinic-Referred group. The group profiles were based on the eight syndrome scales from the Achenbach Child Behavior Checklist (Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, Rule-Breaking Behavior, and Aggressive Behavior). Profile analysis is a special application of multivariate analysis of variance (MANOVA) to situations where there are several DV’s all measured on the same scale (Tabachnick & Fidell, 2007).
by profile analysis is whether groups have different profiles on a set of measures. Several statistical tests were employed for each profile analysis: a) test of parallelism, used to determine if patterns of highs and lows on the CBCL syndrome scales were similar across groups; and b) levels test, used to determine if any group scored lower than its comparison group on the CBCL syndrome scales as a set. Raw scores were used due to the changing nature of the T-scores across gender and age groups (Achenbach & Rescorla, 2001; Graetz et al, 2001). A theoretical issue in profile analysis accounted for by using the CBCL is that all DV’s are commensurate, meaning that they have all been subjected to the same scaling procedures. Practical assumptions of profile analysis are sample size, missing data, power, multivariate normality, absence of outliers, homogeneity of variance-covariance matrices, linearity, and absence of multicolinearity and singularity. Unequal sample sizes do not create any special difficulty due to each hypothesis being tested as if in a one-way design. In addition, due to profile analysis’s extreme sensitivity to outliers, tests of univariate and multivariate normality were applied to all DV’s.

Subjects included (N= 204, 68 in each group) ASD, nonASD Controls, and Clinic-Referred children age 6 to 18 years. ASD participants were selected based on a clinical diagnosis of ASD, derived from the procedure outlined in the Participants section.
CHAPTER 4
RESULTS

Profile analysis (Tabachnick & Fidell, 2007) was performed on the eight problem subscales of the CBCL: Withdrawn/Depressed, Attention Problems, Anxious/Depressed, Rule-Breaking Behavior, Somatic Complaints, Aggressive Behavior, Social Problems, and Thought Problems. Individuals were grouped into three categories: 1) Individuals with ASD; 2) nonASD Controls; and 3) Individuals Clinic-Referred for behavior problems. The first Profile Analysis was conducted on the CBCL subscales to compare the levels of behavioral, emotional, and social problems of individuals with ASD and nonASD controls. A second profile analysis was conducted on the CBCL subscales to compare the levels of behavioral, emotional, and social problems of individuals with ASD and individuals who were clinic-referred for behavior problems.

SPSS version 15.0 was used to conduct data screening procedures. Assumptions regarding normality of the sample, homogeneity of variance-covariance, linearity, absence of significantly influential outliers, and multicolinearity were all met (SPSS, 2007). Univariate outliers are cases with an extreme value on one variable while multivariate outliers are cases with an unusual combination of scores on two or more variables (Tabachnik and Fidell, 2007). To test for univariate outliers, z-scores for each of the 8 CBCL subscales across all subjects were obtained. Cases with standardized scores in excess of 3.29 (p<.001, two tailed test) are potential outliers. Two participants had z-scores beyond 3.29. However, Tabachnick and Fidell (2007) indicated that for a large N, a few standardized scores in excess of 3.29 are expected. Mahalanobis distance was computed to check for multivariate outliers. The criterion for multivariate outliers is Mahalanobis distance at p<.001. With 8 subscales, any case with a Mahalanobis distance greater than chi-square (8) =26.125 is a multivariate outlier. None of the possible cases mentioned exceeded the 26.125 criterion. The sample size in each group is an important issue in profile analysis and necessitates more research subjects in the smallest group than there are dependent variables (DV's); thus, the total sample size (N= 204) and the individual sample sizes (n=68) in each of the groups is acceptable. The assumption of multivariate normality is also met given that there are more cases than DV’s in the smallest group and group sizes are equal. Box’s M test available in SPSS MANOVA is overly sensitive when evaluating
the assumption of homogeneity of variance-covariance matrices; but, given that the sample sizes are equal, the evaluation of homogeneity of variance-covariance matrices was not necessary and the assumption is safely met (Tabachnik and Fidell, 2007). Linearity of relationships between the eight subscales of the CBCL is assumed for the parallelism and flatness tests and was evaluated by examining the scatter plots between all pairs of DVs.

Table 6 presents the CBCL raw score subscale means and standard deviations for the following groups: ASD, Clinic-Referred, and nonASD Controls.

Table 6. CBCL Raw Score Subscale Means and Standard Deviations

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ASD (n=68)</th>
<th>NonASD Controls (n=68)</th>
<th>Clinic-Referred (n=68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Withdrawn/Depressed</td>
<td>4.94 3.39</td>
<td>1.32 1.61</td>
<td>4.29 2.76</td>
</tr>
<tr>
<td>Attention Problems</td>
<td>11.57 3.87</td>
<td>3.706 3.558</td>
<td>9.294 4.769</td>
</tr>
<tr>
<td>Anxious/Depressed</td>
<td>6.44 4.55</td>
<td>2.90 2.94</td>
<td>6.97 4.49</td>
</tr>
<tr>
<td>Rule Breaking Behavior</td>
<td>3.12 2.95</td>
<td>2.25 2.85</td>
<td>6.65 5.00</td>
</tr>
<tr>
<td>Somatic Complaints</td>
<td>2.66 2.71</td>
<td>.94 1.81</td>
<td>2.46 2.52</td>
</tr>
<tr>
<td>Aggressive Behavior</td>
<td>10.38 6.75</td>
<td>4.82 4.93</td>
<td>15.46 8.54</td>
</tr>
<tr>
<td>Social Problems</td>
<td>7.91 3.81</td>
<td>2.47 3.11</td>
<td>6.24 3.86</td>
</tr>
<tr>
<td>Thought Problems</td>
<td>7.47 4.94</td>
<td>1.65 2.33</td>
<td>4.82 4.20</td>
</tr>
</tbody>
</table>

**ASD Versus nonASD Controls**

Profile Analysis was used to examine whether the pattern of behavioral, emotional, and social problems was similar for ASD diagnosed individuals (n = 68) and nonASD controls (n = 68). This multivariate analysis of variance (MANOVA) procedure compares profiles of group measures on several different scales, all at one time.
Figure 1: CBCL profiles for ASD versus nonASD controls

The parallelism test determined if the patterns of highs and lows on the CBCL subscales were similar between groups. To test for parallelism, difference scores (i.e., segments) were created from juxtaposed pairs of the eight CBCL subscales. A one-way MANOVA using these segments as dependent variables and the group as the independent variable, tests for the presence of an interaction between group and CBCL subscales. Using the Wilks’s lambda criterion, the test for parallelism was significant, $F(7, 128) = 25.14, p<.001$, partial $\eta^2 = .35$. This effect size is considered very large using Cohen’s guidelines (.01 small, .06 medium, .14 large; Cohen, 1988). The significant result suggests that the two groups exhibited different high and low points in their profiles. It is possible to gain an understanding of the nature of this significant result by referring to Figure 1. If parallelism between the two groups held, the lines in Figure 1 would follow identical patterns. However, it can be visually inspected that individuals with ASD had
higher means for most of the subscales except Rule-Breaking behavior where the two groups have almost identical means.

The departure from parallelism implies that the two groups must be compared separately on each CBCL subscale because the difference between the two groups varies, depending on which subscale is considered (Harris, 2001; Stevens, 2002). To accomplish this, t-tests for independent samples comparing the means of the individuals with ASD and the nonASD controls on the eight CBCL subscales were computed to further investigate the nature of the significant parallelism result. To guard against the possibility of an inflated Type 1 error, the Bonferroni correction procedure (Abdi, 2007) was utilized to account for multiple hypotheses testing in running eight t-tests, and \( p \) was set at .006. Using this adjusted alpha level, significant differences were found between the means of individuals with ASD and those without ASD on seven of the eight CBCL subscales: Withdrawn/Depressed (\( d = 1.07 \)), Attention Problems (\( d = 2.04 \)), Anxious/Depressed (\( d = .78 \)), Somatic Complaints (\( d = .64 \)), Aggressive Behavior (\( d = .82 \)), Social Problems (\( d = 1.43 \)), and Thought Problems (\( d = 1.18 \)). All the effect sizes are considered large with the exception of Anxious/Depressed and Somatic Complaints, which were medium when using Cohen’s guidelines for \( d \) (.20 small, .50 medium, .80 large; Cohen, 1988).

The results indicate that individuals who were diagnosed with ASD were observed by their caregivers to have significantly greater behavioral, emotional, and social problems along these seven dimensions compared to individuals who were not diagnosed with ASD. On the other hand, there was no significant difference in the sample means of the two groups on the Rule-Breaking behavior subscale (refer to Table 5 for the sample means).

The test of levels allows for the comparison of the ASD and nonASD group means on the eight CBCL measures taken together. It was found that these group means differed significantly from each other, \( F(1, 134) = 92.57, p < .001, \) partial \( \eta^2 = .41 \). This effect size is considered very large using Cohen’s guidelines (Cohen, 1988). The significant finding on the levels test indicates that individuals with ASD have significantly more behavioral, emotional, and social problems than those from the nonASD Control group when all eight CBCL subscales were considered simultaneously.
Profile Analysis was used to examine whether the pattern of behavioral, emotional, and social problems was similar for individuals diagnosed with ASD (n = 68) and individuals who were clinic-referred for behavior problems (n = 68). This multivariate analysis of variance (MANOVA) procedure compares profiles of group measures on several different scales, all at one time.

The parallelism test determined if the patterns of highs and lows on the CBCL subscales were similar between the groups. To test for parallelism, difference scores (i.e., segments) were created from juxtaposed pairs of the eight CBCL subscales. A one-way MANOVA using these segments as dependent variables and the group as the independent variable, tests for the presence of an interaction between group and CBCL subscales. Using the Wilks’s lambda criterion, the test for parallelism was significant, $F(7, 128) = 12.56986$, p < .001, partial $\eta^2 = .23$. This effect size is considered large using Cohen’s guidelines (.01 small, .06 medium, .14 large) (Cohen, 1988). The significant result suggests that the two groups exhibited different high and low points in their profiles. It is possible to gain an understanding of the nature of this significant result by referring to Figure 2. If parallelism between the two groups held, the lines in Figure 2 would follow identical patterns. However, it can be visually inspected that individuals with ASD had higher means for some subscales such as Social, Thought, and Attention Problems; whereas clinic-referred individuals had higher sample means in Rule-Breaking and Aggressive behaviors. The two groups had seemingly identical means for Anxious/Depressed, Somatic Complaints, and Withdrawn/Depressed subscales.
The departure from parallelism implies that the two groups must be compared separately on each CBCL subscale because the difference between the two groups varies, depending on which subscale is considered (Harris, 2001; Stevens, 2002). To accomplish this, t-tests for independent samples comparing the means of the individuals with ASD and those who were clinic-referred for behavior problems on the eight CBCL subscales were computed to further investigate the nature of the significant parallelism result. To guard against the possibility of an inflated Type 1 error, the Bonferroni correction procedure (Abdi, 2007) was utilized to account for multiple hypotheses testing in running eight t-tests, and $p$ was set at .006. Using this adjusted alpha level, significant differences were found between the means of individuals with ASD and those who are clinic-referred for behavior problems on four of the eight CBCL subscales: Attention Problems ($d = .59$), Rule-Breaking Behavior ($d = .70$), Aggressive Behavior ($d = .59$), and Thought Problems ($d = .54$). All the effect sizes are considered medium using Cohen’s
guidelines for $d$ (.20 Small, .50 Medium, .80 Large; Cohen, 1988). Individuals who were diagnosed with autism spectrum disorders were observed by their caregivers to have significantly greater attention and thought problems compared to individuals who were clinic-referred for behavior problems (see Table 6 for the sample means). On the other hand, individuals who were clinic-referred for behavior problems were observed by their caregivers to have significantly greater rule-breaking and aggressive behaviors compared to individuals who were diagnosed with autism spectrum disorders (see Table 6 for the sample means). Finally, there were no significant differences in the sample means of the two groups along the following CBCL subscales: Withdrawn/Depressed, Anxious/Depressed, Somatic Complaints, and Social Problems.

The test of levels allows for the comparison of the ASD and clinic-referred group means on the eight CBCL measures taken together. It was found that these group means did not differ significantly from each other, $F(1, 134) = .16, p = .691$, partial $\eta^2 = .001$. The insignificant finding on the levels test indicates that individuals with ASD and individuals who were clinic-referred for behavior problems scored at similar levels when all eight CBCL subscales were considered simultaneously.
Concerns of ASD often present in primary care and educational settings, where personnel do not have the time, financial resources, or training needed for specialized comprehensive ASD evaluations. Therefore, behavior checklists are typically initially used to gather behavioral information and guide future referrals (Sikora et al., 2008). The CBCL is a broad behavior screening measure that obtains parents’ reports of children’s behavior, emotional problems, and competencies (Achenbach & Rescorla, 2001). Given that the original intention of the CBCL was not to screen individuals for ASD, it has recently been used to screen for particular behaviors that are characteristic of ASD (Bolte, Dickhunt, & Poustka, 1999; Duarte, Bordin, Oliveira, & Bird, 2003; Rescorla, 1988). While there have been four studies that have looked at the CBCL with ASD populations, there has yet to be a study to look at the distinct profiles produced by the CBCL with a group of six to 18 year olds with ASD in the United States. Therefore, the purpose of this study was to determine if patterns of normative strengths and weaknesses on the subscales of the CBCL are similar for individuals with ASD, nonASD controls, and those with clinic-referred disorders.

**ASD versus Normal Controls**

In the first comparison, individuals diagnosed with an ASD were compared on the eight subscales of the CBCL (Withdrawn/Depressed, Attention Problems, Anxious Depressed, Rule Breaking Behavior, Somatic Complaints, Aggressive Behavior, Social Problems, and Thought Problems) to a matched sample of individuals from the CBCL normative sample (i.e., nonASD Controls). The first analysis revealed that the ASD group exhibited different high and low points in their profiles when compared to the normative control group. Individuals in the ASD group had reliably higher scores on the Anxious/Depressed, Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention Problems, and Aggressive Behavior. The Rule-Breaking subscale was the only subscale where reliable differences were not found, suggesting that the ASD group did not exhibit greater concerns on items addressing deviant behaviors such as drinking alcohol, breaking rules, bad/poor friend choices, lying, cheating, setting fires, sexual problems, tobacco use, truant behavior, and vandalism than the nonASD
Control group. Additionally this finding verifies research conducted by Bolte, Dickhut, and Pouska (1999) in which they found the “autistic” group scored three SD’s higher than the “normal” group on all but the Somatic Complaints scale.

One area that the ASD group scored significantly higher on that was a bit surprising and contradictory to what previous research has found is the area of Somatic Complaints. Bolte, Dickhut, and Pouska (1999) found the mean of their autistic group fell below that of the “clinical” group and comparable to the “normal” group. The Somatic Complaints subscale measures behavioral issues related to the body and its signals to the individual that there is some discomfort; this would include nightmares, dizziness, aches/pains, headaches, nausea, eye problems, skin problems, stomachaches, and vomiting. Previous research has found that the Somatic Complaints subscale has not been able to significantly differentiate between those with and without ASD. There could be several reasons why this particular group of children with ASD differed from the nonASD control group on the Somatic Complaints subscale: 1) this population of individuals with ASD potentially had better communication skills, which could lead to a greater possibility of the individual with ASD being able to communicate their symptoms than individuals with ASD in previous studies; and 2) higher functioning, which could indicate that they have better adaptive functioning skills that would allow the individual with ASD to indicate and attempt to solve their symptom with their caregivers. The above hypothesized reasons for the lack of difference between the ASD and nonASD Control group on the Somatic Complaints subscale could be due to the average age of initial diagnosis of this group of children with ASD being older than previous research groups, which could indicate earlier misdiagnosis, stronger communication skills and better adaptive behaviors.

The Rule-Breaking Behavior scale was not able to significantly differentiate between the two groups. In Bolte, Dickhut, and Poustuka’s (1999) study of German children, they found that the Rule Breaking Behavior scale was able to differentiate between the two groups. It is hypothesized that differences between the cultures could account for the disparate findings, including the way parents perceive behaviors, their tolerance levels for behaviors, or what is considered acceptable behavior at home and at school that may have led to this finding in the German population that was not replicated in the Brazilian or United States populations.
Clinically, the present study’s findings are congruent with the DSM-IV-TR’s definition of ASD and supports previous research on social deficits and interactions of individuals with ASD. By definition, children with ASD demonstrate impairments in relationships with peers, imitation, symbolic and dramatic play, and the use of nonverbal communication behaviors in social exchanges. These deficit areas in children with ASD typically inhibit the individual from freely engaging in deviant behaviors. Given that the Rule-Breaking behavior scale is largely comprised of items that require peer relationships and imitation of others, the finding that individuals with ASD do not engage in these types of behaviors at a clinical level is not surprising. An additional defining characteristic of ASD is strict adherence to rules. Individuals with ASD typically unwaveringly follow rules as set by adults and do not experience the peer pressure of typically developing peers. This obedience to rules decreases the individuals with ASD’s likelihood of breaking rules and succumbing to peer pressure. Clinically, this finding is important by providing evidence that the ASD group is truly not mirroring a typical profile at an elevated level; rather the behaviors of the child with ASD are occurring at varying intensities on different subscales.

The second analysis revealed that when averaged over all subscales, the ASD group displayed significant differences from the nonASD control group in terms of the overall level of their scores. This finding indicates that the ASD group had reliably higher scores on the set of CBCL subscales than their nonASD counterparts. This finding was expected given that ASD is a behavior based disorder and the CBCL subscales measure behaviors that are not typically present in normal children. This finding is practically significant by allowing researchers and practitioners to feel secure that a child suspected of having an ASD will score higher than the average child on the CBCL, thus leading to a confident decision to refer the child for a more specialized ASD assessment and early intervention. Overall this result was not surprising and further verified research conducted in Germany, Brazil, and the United States (Bolte, Dickhunt, & Poustka, 1999; Duarte, Bordin, Oliveira, & Bird, 2003; Rescorla, 1988; Sikora, et al. 2008). The practical implications of this finding include encouragement for using the CBCL as a screener for ASD, using the CBCL to progress monitor the individual with ASD, and for follow-up and progress monitoring.
**ASD versus Clinic-Referred**

The second comparison looked at the differences in the CBCL subscale profiles of individuals diagnosed with an ASD and those matched individuals from the CBCL normative population who were clinic-referred for behavior difficulties. The test for parallelism was significant, indicating that the two groups exhibited different high and low points in their profiles. Individuals in the ASD group had reliably higher scores on the Attention Problems and Thought Problems subscales and reliably lower means on the Rule-Breaking Behavior and Aggressive Behavior subscales. The ASD group scoring lower on the Rule-Breaking Behavior and Aggressive Behavior subscales is congruent with findings from the Sikora et al. (2008) study. The Attention Problems and Thought Problems subscales averaging reliably higher scores for the ASD group is similar to a finding by Bolte, Dickhunt, and Postuka (1999). One subscale that was not found to differentiate individuals with ASD in this study was the Somatic Complaints subscale. The Somatic Complaints subscale was found to differentiate among individuals in a German sample (Bolte, Dickhunt, & Postuka, 1999), but was not replicated in this study, a sample of younger children from the United States (Sikora, et al., 2008), or an older sample from Brazil (Duarte, et al., 2003). As previously stated, this finding could be attributed to a variety of factors including: acceptable versus unacceptable learned behaviors and rules, parenting practices, and what behaviors are deemed to be somatic in nature.

It should be noted that this study confirmed findings from previous studies and the applicability of the CBCL in identifying children at risk for ASD. These findings should increase practitioners’ and researchers’ confidence in the CBCL’s ability to identify children thought to have an ASD. The pattern of elevated scores on the Attention Problems and Thought Problems scales and lower scores on the Rule Breaking Behavior and Aggressive Behavior scales of the CBCL, in particular, may be helpful in differentiating between children with ASD from children with other disorders and indicate the need for a diagnostic evaluation for ASD.

Clinically significant scores on the Attention Problems and Thought Problems scales indicate areas of difficulty that are inherent to a diagnosis of ASD. The significant finding on the Thought Problems scale was replicated by Duarte et al., (2003) and Bolte, Dickhut, and Poustka (1999). A significant finding on the Attention Problems scale was also found by Bolte, Dickhut, and Poustka (1999). A closer look at the items that comprise the Attention Problems and
Thought Problems scales details the behavioral difficulties typically present in a diagnosis of ASD. The Attention Problems scale includes items: acts too young for his/her age; fails to finish things he/she starts; can’t concentrate; can’t sit still, restless, or hyperactive; confused or seems to be in a fog; daydreams or gets lost in his/her thoughts; impulsive or acts without thinking; poor school work; inattentive or easily distracted; and stares blankly. The Thought Problems subscale includes items: can’t get his/her mind off certain thoughts; obsessions; deliberately harms self or attempts suicide; nervous movements or twitching; picks nose, skin, or other parts of body; plays with own sex parts in public; repeats certain acts over and over/compulsions; sees things that aren’t there; sleeps less than most kids; stores up too many things he/she doesn’t need; strange behavior/ strange ideas; talks or walks in sleep; and trouble sleeping. The items present in both scales would be endorsed at different degrees, but all tap the three main areas of an ASD diagnosis: communication, social interaction, and restricted, repetitive behavior and interests.

The levels test did not indicate significant differences between ASD and Clinic-Referred groups when scores were averaged over all subscales. This finding was anticipated given that both groups exhibit significant behavior difficulties. Although this finding was not significant, the behavioral information provided to the practitioner about the nature and severity of the presenting behavioral problems for that specific referral is valuable information. However, this does indicate that the CBCL is able to identify behavior disorders at similar levels. This result provides practitioners with confidence in their referral for further assessment if an individual at-risk for a behavior based disorder receives high scores on the CBCL.

Bolte, Dickhunt, and Postuka’s (1999) found a clinically significant elevation on the Social Problems subscale that was not replicated in this study. It was surprising that this finding was not replicated due to the social impairment that is innate to a diagnosis of ASD. It should be noted that in this study, the ASD group’s score was elevated on the Social Problems scale, but was not significantly higher than the Clinic-Referred group. The Social Problems scale is comprised of items such as: too dependent, lonely, doesn’t get along, jealous, others out to get him/her, accident prone, gets teased, not liked, clumsy, prefers younger kids, and speech problems. These are all items that are addressed throughout the literature on ASD as being areas of social differences. The items that comprise this scale indicate the potential for the presence of
bullying. Being bullied by peers is typically first identified by teachers as being an area of concern for children at risk for an ASD. Teachers typically have greater opportunities to observe the interactions of the individual at-risk for an ASD with children of all ages and identify bullying early on. Therefore, it would be of great interest to distinguish if teacher’s reports of children with ASD were clinically significant on the Social Problems subscale.

Overall, this study provides preliminary evidence for the CBCL’s ability to screen for autism and related conditions among children in the Unites States. The results are congruent with previous studies in Brazil (2003), Germany (1999), and the United States (2008). This study found that individuals with ASD had significantly higher scores on all but the Rule-Breaking Behavior subscale when compared to a normative control group and the Attention Problems and Thought Problems subscales when compared to a group of individuals referred for behavior difficulties. Additionally, the ASD group received overall lower scores on the Aggressive Behavior and Rule Breaking Behavior scales when compared to a group of children Clinic-Referred for behavioral difficulties.

Limitations

Limitations are inherent in any research study and can be mild to severe and in the end affect the results, conclusions, validity, and generalizability of the findings. Limitations in this study were primarily rooted in the sample. The present study utilized an archival clinical sample of children who were diagnosed with an ASD at a university based multidisciplinary clinic. The majority of the children assessed and diagnosed at the MDC are from 20 rural school districts in the panhandle of Florida. The use of the archival clinical sample increased ecological validity of findings, but prevented a true experimental design.

The ASD sample is representative of the children referred to a multidisciplinary clinic at Florida State University. The higher prevalence of males as compared to females parallels the rates of ASD (APA, 2001). The large standard deviations within the ASD sample parallels previous research utilizing ASD samples and possibly masks true differences from detection. An additional limitation to this study was the lack of knowledge about and the differences that could be inherent between the children who were referred for the ASD evaluations and the ones who actually attended their evaluation appointments. Although the MDC attempts to address this limitation by offering transportation and reminder telephone calls, this factor could have limited
the generalizability of the study. Although, the nonASD, Clinic-Referred, and the ASD groups were matched on age, SES, sex, and race, further information about school performance, adaptive functioning, or intelligence were not available for these groups; therefore, it is difficult to ensure that the three samples were similar outside of their general demographic information. Lack of knowledge about the intellectual functioning of the ASD sample limits the ability to detect similarities and differences within the group.

The ASD sample utilized in this study was not randomly assigned; it was a convenience sample that used all subjects that qualified to be a part of the study from January of 2001 to April of 2008. A convenience sample limits the generalizability of this study by making it difficult to discern the differences between those caregivers who did not complete the CBCL from those who completed the CBCL. It should also be noted that lack of control over co-morbid disorders that have yet to be identified in the ASD group and potentially accounted for in the behavioral reports was a potential limitation that could also reduce the generalizability of this study.

**Future Research**

The rising prevalence rate of ASD has created an urgency to further investigate the use of broad behavior screening instruments to earlier identify individuals at risk for having an ASD. This research focused on the CBCL with individuals ages six to 18 who have been diagnosed with an ASD. It may be of interest to replicate the present study with a larger, more diverse sample with respect to the matching variables (gender, ethnicity, age, and SES). This would increase the generalizability of the results and conclusions.

Additional research regarding the difference in profiles produced from caregivers and teachers would be of importance for school psychologists working in educational settings who rely heavily on teacher report. Research detailing the difference between parent and teacher report in ASD populations is not yet available. The addition of such research detailing the differences between parent and teacher report of individuals at risk for having an ASD would be invaluable. Knowledge of the differences teachers notice during the day of structured and unstructured activities and parents notice in the evening during a different set of structured and unstructured activities would allow practitioners to use this essential data to drive decisions and develop effective interventions. Differences would be anticipated and depend heavily on a variety of factors including; 1) the teacher’s knowledge of ASD, 2) teacher’s level of familiarity
with the child, 3) teacher and school’s tolerance for behaviors, and 4) behavior management techniques and schools behavior management practices.

Additional knowledge about the profiles generated by the individual DSM-IV diagnosis of ASD (Autistic Disorder, Asperger’s Syndrome, PDD-NOS) would be helpful to inform researchers of the differences that may occur across diagnoses.

These results need confirmation by future studies based on more representative samples. Certainly, the usefulness of these findings would be amplified if the children with ASD could be compared to children with other developmental disorders (e.g. intellectual disabilities, speech and language impairments, and coordination) and if more female children could be included in the sample. Controlling for developmental and intellectual level would also be of great importance.

Further investigation of the underlying items of each of the eight subscales may provide additional information that will link assessment results to intervention; for example, if a child with ASD is experiencing extreme difficulty with aggressive behaviors, as indicated on the CBCL, interventions could target the items on the CBCL that are endorsed as frequently occurring. Further analysis into the items frequently endorsed by individuals with ASD provides a starting point for interventions and a means to measure the success of the intervention. Item analysis could ultimately replicate Rescorla’s (1988) factor analytic study, which found an Autistic/Bizarre factor, comprised of items: (13) confused, (66) repeats acts, (84) strange behavior, (85) strange ideas, and (111) withdrawn, for children ages two to five. Research such as this could possibly indicate the need for a similar scale to be included on the CBCL in future editions.
APPENDIX A

HUMAN SUBJECTS APPROVAL LETTER
Office of the Vice President For Research
Human Subjects Committee
Tallahassee, Florida 32306-2742
(850) 644-8673 · FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 8/4/2008
To: Lauren Giovingo
Address: 900 Joseph Street, New Orleans, LA 70115
Dept.: EDUCATIONAL PSYCHOLOGY AND LEARNING SYSTEMS
From: Thomas L. Jacobson, Chair

Re: Use of Human Subjects in Research
CBCL BEHAVIORAL PROFILES OF CHILDREN WITH ASD, NORMAL CONTROLS, AND CHILDREN CLINIC-REFERRED FOR BEHAVIOR DISORDERS

The application that you submitted to this office in regard to the use of human subjects in the research proposal referenced above has been reviewed by the Human Subjects Committee at its meeting on 05/14/2008. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh the risk to the human participants and the aspects of the proposal related to potential risk and benefit. This approval does not replace any departmental or other approvals, which may be required.

If you submitted a proposed consent form with your application, the approved stamped consent form is attached to this approval notice. Only the stamped version of the consent form may be used in recruiting research subjects.

If the project has not been completed by 5/13/2009 you must request a renewal of approval for continuation of the project. As a courtesy, a renewal notice will be sent to you prior to your expiration date; however, it is your responsibility as the Principal Investigator to timely request renewal of your approval from the Committee.

You are advised that any change in protocol for this project must be reviewed and approved by the Committee prior to implementation of the proposed change in the protocol. A protocol change/amendment form is required to be submitted for approval by the Committee. In addition, federal regulations require that the Principal Investigator promptly report, in writing any unanticipated problems or adverse events involving risks to research subjects or others.

By copy of this memorandum, the Chair of your department and/or your major professor is reminded that he/she is responsible for being informed concerning research projects involving human subjects in the department, and should review protocols as often as needed to insure that the project is being conducted in compliance with our institution and with DHHS regulations.

This institution has an Assurance on file with the Office for Human Research Protection. The Assurance Number is IRB00000446.

Cc: Briley Proctor, Advisor    HSC No. 2008.135
APPENDIX B

ASD CODING SHEET
ASD Coding Sheet

Group = ________ (1= Autistic; 2 = Aspergers/HFA; 3 = PDD-NOS)

**Demographics:**

Age at Eval. = ______________

Gender = ________________
(1=male; 2=female)

Ethnicity = ________________
(1=Caucasian; 2= African Am.; 3 = Hispanic; 4 = Other)

Social Economic Status=______________
(0-90) according to Hollingshead

ADOS SCORE___________

**Behavior Checklists**


Completed BY: (1=Mother; 2=Father; 3=Other)

Withdrawn/Depressed (cbclwd) ______ Attention Problems (cbclatt) ______

Anxious/Depressed (cbclanx) ______ Rule Breaking Beh. (cbcldel) ______

Somatic Complaints (cbclsoma) ______ Aggressive Behavior (cbclagg) ______

Social Problems (cbclsoc) ______ Thought Problems (cbclthot) ______

Internalizing (cbclint) ______ Externalizing (cbclext) ______

Total Scale (cbcltot) ______
APPENDIX C

FSU MULTIDICPLINARY EVALUATION AND CONSULTING CENTER DISTRICT

REFERRAL FORM
REFERRAL – DISTRICT FORM

School District: ______________________ School: ______________________ Date: __________

Child Name: ___________________________ Grade: ___ Teacher: ______________________

Date of Birth: ___________  Age: _______  Ethnicity _____________ Gender: M  F

Parent(s) or Guardian: ___________________________ Relationship: _______________

(Please indicate relationship: i.e., parent, step-parent, foster parent, maternal grandparent, etc.)

Reason for Referral (Please be as specific as possible):

_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________
_________________________________________________________________________________

Has this child previously been evaluated? (by a school district or other professional)?  Yes  No

(If yes, please include a copy of the report(s) with this application, if available.)

Is this child currently in, or ever been in, Exceptional Student Education?  ______ Yes  _____ No

If yes, please indicate which program(s): ________________________________

If yes, is this placement full-time?  ___Yes  ___No

Is this child currently on any medication(s)?  ___Yes  ___No

If yes, please indicate what type(s):___________________________________________

Does this child wear glasses?  ___Yes  ___No

Is a signed copy of the Parental Consent (Part A&B) and Information Sheet (Part C) attached to this

application?  _____Yes  _____No

Form Completed by: ___________________________  Date: ________________

Authorized District Signature: _______________  Date: ________________
Dear Parent or Guardian,

Your child has been referred to the Multidisciplinary Evaluation and Consulting Center at Florida State University. The Center provides diagnostic evaluations for children who are experiencing academic difficulties and/or behavior problems in their academic environment, for children who might benefit from placement in an enrichment program at their school or within their school district, and for preschool-age children who are experiencing developmental delays.

The Center is a training facility for graduate students in psychology programs at both FSU and Florida A&M University, as well as graduate and undergraduate students in the College of Social Work at FSU. In addition, students from around the country complete their internship and/or residency training through the Center in both the fields of school psychology and social work. All students work under the direct supervision of experienced and appropriately licensed psychologists and social workers. Evaluation services are funded by the Florida Legislature and provided at no fee to you.

Please read the attached consent forms carefully. If you have any questions, contact one of the clinical supervisors listed below. When the referral form from the referring school district or agency is received in our office, along with your consent (Part A & B) and Information Sheet (Part C), you will be contacted to set up a date for your child’s evaluation. Testing is generally scheduled Tuesday through Friday beginning at 9:00 a.m. EST, and lasts approximately four to six hours. During this time you will be interviewed and asked to provide all pertinent background information relevant to your child, including information about birth, medical, developmental, school, and social history. Please bring all supporting documentation that will be helpful in gaining this information. Examples might include copies of school report cards or standardized test results, medical records, and previous psychological reports. This interview generally takes one to two hours to complete. You should also plan for your child’s lunch break; you can bring a bag lunch or there are several restaurants in the area.

Following the evaluation and the receipt of all necessary documents, a written report will be made of the test results and subsequent outcomes. This information will be fully explained to you in a feedback session at the Center or in a meeting at your child’s school. You will be contacted concerning the date, time, and location for this meeting. A copy of the report will be provided to you, as well as mailed to the referring school district or agency. On some occasions, raw test data may also be required by the school district if your child is being considered for placement in an Exceptional Student Education program.

Clinical Staff:   (Director) Beverly Atkeson, Ph.D.  Licensed Psychologist, PY3382
Anne Selvey, Ph.D.  Licensed Psychologist, PY4527
Ann P. Cituk, Ph.D.  Licensed Psychologist, PY5469 and
Licensed School Psychologist, SS608
Lauren M. Hutto, Ph.D.  Licensed Psychologist, PY7211 and
Licensed School Psychologist
Alicia Nohle, MSW  Social Work Coordinator
Debra Horton-Colbert  Program Coordinator

Consent1: 11/07
PERMISSION TO TEST, OBSERVE, AND EXCHANGE INFORMATION
(Part A)

The FSU Multidisciplinary Center, in addition to providing school psychological services to twenty school districts in North central and Northwest Florida, functions as a training center for students of psychology and social work. This includes training at the practicum, intern, or residency level. In order for these students to receive thorough training, it is necessary for their work to be observed by the Center’s professional staff, as well as their peers who are in training at the Center. The observation takes place using one-way mirrors that are located in each evaluation room, with all efforts made to minimize its impact on your child’s final results. A fully qualified professional, who in turn is responsible for all procedures and services rendered, supervises each assessment. This supervisor will counsel and direct the examiner as the evaluation procedures are completed and subsequently interpreted in a written report, which is signed by both the examiner and the supervisor. These reports, with the licensed psychologist’s signature, are accepted by public school districts and state agencies.

Consent to the above procedure(s) is required of all clients or their legal guardian. Within the purview of the Florida Public Records Law (119 F.S.), the Center staff will safeguard your confidentiality. In addition, your relationship with the Center will not be revealed to anyone without your prior written consent. However, under certain conditions, the Center is legally and ethically obligated to release information about a client whether or not the client approves. These conditions include the following:

1. Suspected abuse (physical, sexual, or neglect) of children, the aged, and the disabled: As licensed psychologists and social workers, we are required by law to report suspected abuse to the Florida Department of Children and Families.
2. Potential homicide or suicide: In instances where a client threatens homicide, we may have to notify the intended victim and police. Likewise, if a client is thought to be at risk for suicide, family and/or authorities will need to be notified in order to protect the individual.
3. Court-orders: We must release a client’s records if a judge issues a court order compelling us to do so.

By initialing here, I certify that I have read and understand the above information and its relevance to my child’s referral.

Consent2: 11/07
PERMISSION TO TEST, OBSERVE, AND EXCHANGE INFORMATION (Part B)

Given the training nature of the Center, the evaluation will be completed by a graduate student, intern, or resident, who is supervised by a licensed professional. Please be aware that observation of your child may take place.

It is the policy of the Multidisciplinary Center that copies of a client’s psychoeducational evaluation report and/or raw test data be released to the initial referring school system or community agency as part of the evaluation process. You may also request that the report be released to other professionals that currently are working with your child, or professionals who you anticipate might work with your child as a result of the assessment. To this end, and as part of the evaluation process, it may be necessary to speak with and/or exchange information with school personnel, medical professionals, local or state agencies, or individuals who have served your child. Please list below those individuals or groups with whom we may exchange information. Please list your school district in order for us to obtain school records, if needed.

1. __________________________________________________________________________
2. __________________________________________________________________________
3. __________________________________________________________________________
4. __________________________________________________________________________

By signing below, you indicate that you are the legal guardian of the referred child, that you have read and understand the above information, that you give permission to exchange information with the listed schools/agencies/individuals, and that you grant the Center permission to evaluate your child.

___________________________________  ___________________________________  _____________________________________
Signature of Parent or Guardian          Date                      Witness                      Date

_____________________________________
Print Name

(____)_____________ (____)_____________ (____)_____________
Daytime phone           Home phone          Cell phone

__________________________________________
Mailing Address

 _____________________________________________
City    State    Zip

Consent3: 02/07
INFORMATION FOR SCHEDULING APPOINTMENT
(Part C)

Please indicate by checking the appropriate boxes below any special circumstances related to our attempts to contact you. Please keep in mind that the fewer restrictions there are on contacting you, the easier it will be for us to work out evaluation arrangements. We will use the phone numbers you listed on the previous page unless otherwise noted.

Name of the best person to call for scheduling: ________________________
Relationship to child ____________________________________________

☐ You may call me at home. (Check only those boxes that apply.)
  ☐ You may leave a message for me if I am not there.
  ☐ Please DO NOT identify yourself by name on a voice mail message.
  ☐ Call at home between the hours of _____ a.m./p.m. and _____ a.m./p.m.
    ☐ Eastern Standard Time
    ☐ Central Standard Time

☐ Please do not call my cell phone.

☐ Please do not call me at work.

☐ You may call me at work. (Check only those boxes that apply.)
  ☐ You may leave a message if I am not available.
  ☐ Please DO NOT identify yourself at my workplace.
  ☐ The best time to call my workplace is between the hours of ___ a.m./p.m. & ___ a.m./p.m.

Name of workplace: ____________________________ Phone (_____)______________

Please provide any other instructions/considerations about contacting you in an attempt to schedule the appointment.

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Consent: 01/07
REFERENCES


detection, intervention, education, and psychopharmacological management.

Psychological Services.

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with autism: An investigation of empathy, pretend play, joint attention, and imitation.
*Developmental Psychology, 33*, 781-789.


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Psychiatry, 42*, 1143-1170.


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Conners, C.K., Sitarenios, G., Parker, J.D.A., & Epstein, J.N. (1998). Revision and re-
standardization of the Conners Teacher Rating Scale (CTRS-R): Factor structure,

structure, reliability, validity and diagnostic sensitivity. *Journal of Abnormal Child

Constantino, J., Davis, S., Todd, R., Schindler, M. Gross, M., Brophy, S., Metzger, M.,
measure of autistic traits: comparison of the Social Responsiveness Scale with the Autism
Diagnostic Interview-Revised. *Journal of Autism and Developmental Disorders, 33*, 427-
433.

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Individuals with Disabilities Education Act-IDEA 97 (1997). *Public Law 105-17*.


BIOGRAPHICAL SKETCH

Lauren K. Giovingo

Educational History

Florida State University, Tallahassee, FL
Combined Program in Counseling and School Psychology
Specialization in School Psychology: Ph.D., November 2008
Degree

University of Georgia, Athens, GA
Double Major: Psychology & Sociology
Degree: B.S., B.A., May 2001

Fellowship

Psychology Post-Doctoral Fellowship: Louisiana State University Health Sciences Center,
Human Development Center-Interdisciplinary Training Coordinator, New Orleans, LA.
Supervisor: W. Alan Coulter, Ph.D.

American Psychological Association Accredited Pre-Doctoral Internship

Psychology Pre-Doctoral Fellowship: Louisiana State University Health Sciences Center,
Human Development Center, Pupil Appraisal Support Services Project, New Orleans, LA.
Supervisors: W. Alan Coulter, Ph.D., George Hebert, Ph.D.
General Training Responsibilities: participate in and coordinate weekly seminars and didactics,
weekly individual and group supervision, provide individual and group therapy, collaborate and
consult with schools in the Recovery School District (RSD), provide appraisal services in the
New Orleans RSD, collaborate to update and re-organize LAS*PIC, collaborate and coordinate
RtI Tier I research project

Psychology Intern: University of North Carolina School of Medicine, University of North
Carolina Department of Psychiatry, Chapel Hill, N.C. Full-Time position, September 26, 2005-
September 1, 2006.
Supervisors: Lee M. Marcus, Ph.D. (TEACCH: Autism Spectrum Disorders); Becky Edmondson
Pretzel, Ph.D. (Clinical Assessment); Caroline McKnight, Ph.D. (Intervention).
General Training Responsibilities: provide individual/family/group therapy and psychological
assessment at Dorthea Dix Mental Hospital, psychoeducational assessment and interdisciplinary
collaboration for children and families with severe genetic disorders, consulted and provided
behavioral interventions for Chapel Hill Head Start, clinical assessment of ASD, provided
individual long-term therapy for long-term hospital patients, consulting and multidisciplinary
collaboration for families and infants in the Wake Medical NICU, participation in weekly
seminars/didactics, and weekly group/individual supervision.

Supervisors: Scuddy Fontenelle, Ph.D; Wayne Stuart, Ph.D; Alan Coulter, Ph.D.

General Training Responsibilities: individual and group therapy, psychoeducational assessment batteries, consulting with RSD on academic and behavioral interventions, participation in weekly seminars/didactics, crisis intervention, and weekly group and individual supervision.

Grants Awarded

Principal Investigator (2005-2006)
Authored grant awarded by the Easter Seals Project ACTION and the Association of University Centers on Disabilities to conduct research that relates to transportation for people with disabilities. The title is “Disaster Preparedness: Are hurricane vulnerable states prepared to transport individuals with disabilities in the event of a natural disaster”. Award: $2000

Professional Experience

Assessment

Autism Evaluator: Florida State University Multidisciplinary Center, Florida State University, Part-Time position, Fall 2004-Spring 2005. Observe and assess young children displaying red flags for autism and related disabilities in the Tallahassee and northwest Florida region. Conduct initial interviews, administer autism instruments tests of intelligence, academic achievement, cognitive processing, evaluate results, provide recommendations, staffing support, and follow-up. Measures Administered: ADOS-G, ASDS, CARS, Developmental Profile, Vineland

Psycho-educational Test Administrator: Florida State University Multidisciplinary Center, Florida State University, Part-Time position, Summer 2003 – Summer 2005. Assess students in grades K through 12 for possible learning disabilities, developmental problems, behavioral difficulties, sensory deficits, and mental handicaps in the Tallahassee and northwest Florida region. Conduct initial interviews, administer psycho-educational tests of overall intelligence, academic achievement, and cognitive processing abilities; evaluate results, and provide recommendations.
Student Examiner. Dr. Carol Oseroff, Tallahassee, FL Summer 2004 – Fall 2004
Assist in conducting Psycho-educational evaluations and observations for a private psychologist in Northwest Florida. Administered tests to seven clients, ranging in age from two years to 16 years of age.

Assess adolescent juveniles to aid in the determination of their current Department of Juvenile Justice facility placements. Conduct in-depth history, developmental, and mental status interviews, administer tests of overall intelligence, evaluate results, and provide extensive recommendations. Attend bi-weekly workshops and supervision meetings.
Measures Administered: Beck Depression Inventory, Sentence Completion Series, WAIS-I, Jessness Inventory

Practicum Student: Florida State University Multidisciplinary Center, Fall 2002-Spring 2003.
Assess students in grades K-12 for possible learning disabilities, behavioral problems, and mental handicaps. Attend weekly workshops and supervision meetings.
Evaluations completed: 11

Psycho-educational Test Administrator: Adult Learning Evaluation Center, Florida State University, Part-Time position, Summer 2002 –Spring 2003
Assess college students attending two-year and four-year institutions in the Tallahassee area for possible learning disabilities. Conduct initial interviews, administer psycho-educational tests, and provide extensive feedback.

Student Examiner: Dr. Edward Taylor, Jacksonville, FL, Summer 2001-Fall 2002
Assist in conducting Psycho-educational evaluations and observations for individuals in Northeast Florida. Administered tests to 53 clients, ranging in age from 5 years to 44 years of age.
Measures Administered: Woodcock-Johnson Test of Cognitive Abilities-Revised, Woodcock Johnson Test of Achievement-Revised, Wechsler Intelligence Achievement Test, Gray Oral Reading Test, TOWRE, CTOPP, Bender, WRAML, and the VMI.
Counseling

Practicum Student: Florida State University Human Services Center, Spring 2004.
Conduct phone intakes, initial clinical interviews, conceptualization of client concerns, develop treatment plans, and provide counseling services to clients.
Measures Administered: Mental Status Exam, Beck Depression Inventory.

Practicum Student: Florida State University Curricular-Career Information Service Center, Fall 2003.
Maintenance of individual career counseling caseloads as well as providing self-directed career decision-making assistance to individuals.
Measures Administered: Career Thought Inventory, Self-Directed Search, SIGI Plus, E-Choices.

Practicum Student: Florida State University Adult Learning Evaluation Center, Spring 2002-Summer 2002
Led and co-led study skill groups, which included researching and preparing workshops, advertising, organizing client files, scheduling group, and preparing presentations.

Research and Teaching

Teaching Assistant: Florida State University, Department of Educational Psychology and Learning Systems, Part-Time position, Fall 2002 –Spring 2003
Orient and train first year graduate students in the proper administration and scoring of intellectual instruments.

Graduate Assistant: Florida State University Charter School Accountability Center and Voluntary Public School Choice Center, Part-Time position, Summer 2002-Fall 2004
Conduct telephone surveys, present information at conferences, and conduct internet research on accountability issues for charter schools in the state of Florida.

Research Assistant: Florida State University, Part-Time position, Summer 2002
Assisted in conducting research concerning the agreement rate in diagnosing learning disabilities using the different Woodcock-Johnson discrepancy models.

Graduate Assistant: Florida State University Employee Assistance Program, Part-Time position, Fall 2001-Spring 2002
Assisted in preparing workshops, advertising, organizing client files, scheduling appointments, and preparing presentations.

Research Assistant: University of Georgia, Part-Time position, Summer 2000-Spring 2001
Conducted research on developmental and individual differences in behavioral and physiological measures of attention and learning in infants ranging from one to four months of age. Organized
and entered data for later analysis and comparison. Coded videotapes to decipher the eye-
movement and tracking abilities of infants through 1 year of age.

Research Assistant: University of Georgia, Part-Time position Fall 2000- Spring 2001
Conducted research to understand more fully the contexts of risk in elementary school and to
help teachers acquire more effective classroom strategies to intervene in these children’s
academic pursuits. Administer and/or interpret surveys and questionnaires to elementary school
children. Organized, coded and entered data into a computer for further analysis and
comparison.

Membership in Professional Associations

American Psychological Association (Student Associate)

National Association of School Psychologists (Student Member)

Florida Association of School Psychologists (Student Member) (2001-2006)

Louisiana School Psychology Association (Student Member)

Graduate Counseling Psychology Organization (Vice President 2001-2002)

Consortium of Combined and Integrated Doctoral Programs In Psychology (CCIDPIP) (Florida
State University Student Representative and CCIDPIP Student Representative Board Member)
(2004-2006)

Publications


Manuscript submitted and accepted at the Florida Department of Education.

Results: Building Family School Partnerships. U.S. Department of Education and Rehabilitative
Services, Office of Special Education Programs. Louisiana State University Health Sciences
Center Human Development Center.
Professional Presentations

California Department of Education, Santa Barbara, California

California Department of Education, Sacramento, California

AUCD Conference, Washington, D.C.

Giovingo, L. (October 2008). Preventing Chronic Failure In Your Classroom: Implementing Early Intervening Services (RtI).
Hoover-Schrum Memorial School District, Thornton, Illinois

Michigan Department of Education, Lansing, Michigan

Missouri Department of Education, Jefferson City, Missouri

Louisiana Department of Education, Baton Rouge, Louisiana

Louisiana State University Human Development Center Autism Institute, New Orleans, LA

Florida Association of School Psychologists, Tampa Bay/ Palm Harbor, FL.

Louisiana School Psychology Association; Layfayette, LA.

Florida Association of School Psychologists, Jacksonville, FL.


Rippner, J. & Giovingo, L. (November 2002). Training Florida charter school governance boards. Florida State University Charter School Accountability Center, Tallahassee, FL.


