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Comparisons: BASC-2 Parent and Teacher Reports for Children on the DSM-5 Autism Spectrum

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Comparisons: BASC-2 Parent and Teacher Reports for Children
on the DSM-5 Autism Spectrum


By

Kimberly Ellison

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Date

6-25-15

Comparisons: BASC-2 Parent and Teacher Reports for Children
on the DSM-5 Autism Spectrum

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Submitted to the Faculty of the Graduate School of
Eastern Kentucky University
in partial fulfillment of the requirements
for the degree of
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DEDICATION

This thesis is dedicated to my mother, Marilyn, for her unwavering love and support throughout my entire academic career and to Shane, who will always remain my inspiration for working with children with autism.

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ABSTRACT

With the publication of the DSM-5, the diagnosis of Autism Spectrum Disorder (ASD) has been altered to follow a dimensional model that captures the essence of the autism spectrum. This new model features severity ratings of Social Communication (SC) and Restrictive/Repetitive Behaviors (RRB). Research indicates that there has also been a recent increase in the administration and adoption of broadband behavior-rating scales by clinicians, to ascertain a summary of the client's behavior. A widely known and accepted measure is the Behavior Assessment System for Children, Second Edition (BASC-2), a multidimensional measure assessing internalizing and externalizing behaviors as well as adaptive functioning for individuals 2-25 years of age. Considerably less research has compared the Parent Rating Scale (PRS) and Teacher Rating Scale (TRS) of the BASC-2. The current study examined the PRS and TRS of the BASC-2 for children on the DSM-5 autism spectrum. Utilizing a sample of 67 children and adolescents with ASD, the PRS and TRS of the BASC-2 were compared to determine if a pattern of behavior exists for children and adolescents with ASD. Paired Sample T-tests were used to compare the BASC-2 Subscales scores on the PRS and TRS. Hierarchical linear regression analysis was conducted to determine the extent to which Parent and Teacher Ratings of logically selected BASC-2 Subscales account for the DSM-5 SC Severity Rating and RRB Severity Rating. Implications of these results for the assessment of children and adolescents with ASD are explained.

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I. INTRODUCTION

A multitude of research indicates that children with Autism Spectrum Disorder (ASD) behave differently in comparison to their neurotypical counterparts across a variety of behavioral domains. Children with ASD tend to have different behavioral profiles when compared to typically developing children (Mahan & Matson, 2011). These behavior profiles can be seen through the use of broadband behavior rating scales. Since advancements in the development of behavior rating scales in the mid-1980s, clinicians have utilized this type of assessment measure more frequently. The increased use of behavior rating scales has allowed for clinicians to gain key information about the child's development and behavior as part of a formal assessment as well as prior to selecting an appropriate intervention (Merrell, 2008). Additionally, the use of broadband behavioral measures to summarize an individual's behavior as a universal screener has increased due to a heightened vigilance for early detection and intervention purposes (Kamphaus, Petoskey, & Rowe, 2000; Glover & Albers, 2007). The objective of this thesis study was two fold: 1.) To determine the typical behavioral profile for children diagnosed with ASD according to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (*DSM-5*) as reported using the Behavior Assessment System for Children, Second Edition (*BASC-2*) and 2.) To investigate how both parents and teachers view and report behaviors of children and adolescents with ASD according to the *BASC-2*, a broadband behavioral measure. Prior to outlining the procedure and results of this study, it is imperative to discuss the foundational concepts that formed the research hypotheses. This section will provide background information about Autism Spectrum Disorders including past research examining behavioral differences across the population. Additionally,

information comparing the former and the current diagnostic criteria for ASD will be discussed. Furthermore, the use of broadband behavioral measures and a review of the use of the BASC-2 with children with autism will be presented. Finally, this chapter will be followed by the current study's research questions and hypotheses.

Autism Spectrum Disorder

The Prevalence of Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neurological and developmental disorder that manifests in infancy and childhood and has been traditionally characterized by a triad of core impairments: deficits in social interaction, atypical language development and communication, and restricted/repetitive behaviors (Amarel, Dawson, & Gerschwind, 2011). Increased rates of autism have been found through studies of incidence and prevalence. Over the last twelve years, there has been an increasing concern for the drastic increase of cases of individuals with autism. Since 2002, there has been a dramatic 289.5% increase in the prevalence of autism diagnoses (Centers for Disease Control, 2012). A recent report from the CDC indicated that the current prevalence rate for autism spectrum disorder is 1 in 68; it is also commonly found more in males than females (5:1), although the presentation in females tends to be more severe (Fombonne, 1999; CDC, 2014). Moreover, the presentation of symptoms varies widely not only across individuals but also between males and females diagnosed with ASD. These gender differences have been suggested by multiple epidemiological studies (Kirkovski, Enticott, & Fitzgerald, 2013).

Currently, the etiology of the Autism Spectrum disorder remains unknown. Despite not knowing the exact underlying cause of ASD, there is a general understanding

across the field that there are genetic and neurological components involved in combination with environmental stressors (Amaral et al., 2011). For example, investigators recently found perinatal effects of a variety of air pollutants including diesel, lead, methylene chloride and mercury, which may increase the risk for ASD (Roberts et al., 2013). Additionally, increased awareness of the disorder as well as a rise in the research and development of more valid and reliable assessment tools have also been debated as reasons impacting the increasing prevalence (Wing & Potter, 2002). Furthermore, the changing diagnostic criteria for ASD and an understanding of associated features and disorders have also contributed. At present, there has not been a research study to empirically and definitively validate any of the above claims as a sole or predominant cause of the increase of diagnosis of autism.

Diagnostic History of Autism Spectrum Disorder

For the last sixty-five years, there has been ongoing debate concerning how individuals with mental illness should be classified and the way in which these classifications were to be organized and maintained. Since the first publication of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) in 1952, there have been multiple changes, additions, and subtractions to our currently known diagnostic system. Additionally, the set of disorders recognized as Pervasive Developmental Disorders (also known as Autism Spectrum Disorders) have been undergoing similar changes since their conception. The Autism Spectrum Disorders are a spectrum of neurodevelopmental conditions involving core differences in social, communication, and behavioral areas. The definition of this disorder however, has been evolving since Autism was first described by Leo Kanner (1943) and Hans Asperger (1968) and has not been without

controversy. Autism was first recognized as “infantile autism” and contained the characteristics described by Kanner such as a delay in language production, difficulties in developing relationships with people, and apparent aloofness (Volkmar et al., 1994). During this time, many researchers believed that autism was related to schizophrenia and that it began in early infancy (Amaral et al., 2011; Tsai, 2014). When the DSM-III was published in 1980, the category of Pervasive Developmental Disorders, which contained Autism, was introduced.

In 1987, the name was changed to “Autistic Disorder.” Autistic Disorder had three main criteria (impairments in social interaction, communication, and the presence of restrictive, repetitive behaviors), which contained criteria-specific symptomology. In order to be diagnosed with Autistic Disorder, individuals had to present with a minimum of six total symptoms, with at least 2 symptoms from the social interaction criteria and at least 1 from the other two categories. In 1994, with the publication of the DSM-IV, Asperger’s Disorder and Pervasive Development Disorder- Not Otherwise Specified (PDD-NOS) were added (American Psychiatric Association, 2014). All three of these disorders were known as Autism Spectrum Disorders and were intended to differentiate between the features of autism, hence the autism spectrum. For example, the addition of Asperger’s Disorder attempted to capture those individuals with the social oddities associated with the disorder rather than the cognitive or language and communication impairments. The PDD-NOS diagnosis was also created to capture those individual who exhibited some symptoms but did not present with the Autistic Disorder criteria-meeting core, classical symptoms of Autistic Disorder. Additionally, Childhood Disintegrative Disorder, a rare condition characterized by late onset of language, social, and motor

delays, and Rett Syndrome, a genetic postnatal neurological disorder found in mostly females, were part of the Pervasive Development Disorder category in the DSM-IV (APA, 2014). Most recently, after several years of research and revision, the DSM-5 was published in 2013. This new version of the diagnostic system contained many changes including a major transformation to the widely accepted category of Autism Spectrum Disorders. These changes were not without controversy, particularly the elimination of the Asperger's Disorder category.

Current Diagnostic Status

As discussed earlier, the DSM-IV contained three distinct disorders that aimed at capturing individuals who displayed similar characteristics associated with autism. Researchers in the field had felt that the current diagnostic system was not capturing the “spectrum” that evidently exists for the disorder.

Presently, the DSM-5 outlines the current diagnostic criteria for a single classification, an umbrella term: Autism Spectrum Disorder. The original three core impairment domains were collapsed into two: social communication and restricted, repetitive behaviors. The Social Communication domain includes three criteria of deficits in social-emotional reciprocity, nonverbal communication, and the developing, maintaining, and understanding of relationships (American Psychiatric Association, 2013). The Restrictive, Repetitive Behaviors domain is made up of four criteria, in which at least two must be met. This domain includes sensory difficulties, fixated and restrictive interests, inflexibility and need for sameness, and stereotyped or repetitive motor movements, use of objects, or speech (American Psychiatric Association, 2013).

One goal of this new definition is to capture the wide spectrum of children who have autism, implying that the previous definition was lacking accuracy. One study revealed that when conducting an assessment with DSM-IV criteria, multiple clinicians were found to be diagnosing the same person with different disorders (Gibbs, Aldridge, Chandler, Witzlsperger, & Smith, 2012). In order to further accomplish this, severity levels must be selected that are based on the amount of support needed due to each individual's challenges with social communication and restricted interests and repetitive behaviors. A table of severity levels and clinical descriptions that range from Level 1 "Requiring Support" to Level 3 "Requiring Very Substantial Support" is provided in the DSM-5 to assist in this designation. In other words, an individual diagnosed with Autism Spectrum Disorder will also be designated two separate severity levels, which may match or vary across the social communication and restricted/repetitive domains.

Broadband Behavioral Measure Use in the Field of Child Psychology

In 1951, Wittenborn was determined to develop a quantitative method to examine adult psychopathology; he developed a list that contained 55 symptoms and these items were called "rating scales" (The SAGE Handbook, 2008). Ten years after this development, Peterson conducted a study aimed at constructing a checklist for childhood problem behaviors. Peterson identified 58 of the most common referral problems for children at a child guidance center (determined from 427 cases) and had 28 different teachers rate 831 children in school on these behavioral problems. This study influenced the first behavior rating scale, the 55-Item Behavior Problem Checklist, created by Quay and Peterson in 1967.

Prior to the late 1970s, many behavior-oriented psychologists did not favor using behavior-rating scales because they were less direct than observation or structured interviewing (Merrell, 2000). Since improvements were made to these measures and more research began to support their use, clinicians began incorporating these tools into their assessment batteries. Today, clinical psychologists use behavior rating scales as broadband measures of behavior across a variety of contexts in order to gain the more insight into the client's behavioral patterns. Moreover, clinical psychologists use behavior rating scales to collect more objective data as compared to information collected from an interview as well as to capture more rare or low frequency behaviors that may not be accounted for during a limited observation time (The SAGE Handbook, 2008).

As a clinical psychologist, best practice in the overall assessment of mental illness, behavioral disorders, and developmental disabilities includes having multiple assessments methods that not only examine behavior across varied settings, but that also include measures completed by multiple sources (Bergeron, Floyd, McCormack, & Farmer, 2008). Moreover, a thorough assessment includes multiple components such as structured and unstructured interviews, standardized assessment measures, broadband behavioral measures, and syndrome specific measures. Broadband or omnibus behavioral measure/behavior rating scales tend to be in the form of self-report; these measures can be a great source of information of a child's functioning across contexts. These measures typically contain behavioral statements in which an informant can rate himself or herself or another individual's behavior in a standardized format (Dever & Kamphaus, 2013). Generally, broadband behavioral measures can be used in the screening process prior to or as part of a formal diagnostic evaluation. As a screener, broadband measures can be

utilized to determine if an individual is at risk for developing emotional or behavioral difficulties. The first use of broadband behavioral measures/behavior rating scales was in the 1950s by hospital nurses whose job was to rate the patient's symptoms (Dever & Kamphaus, 2013). Since these types of measures have been utilized frequently, it has become even more important to have measures that are affordable, brief, easy to complete, and accurate (Dever & Kamphaus, 2013). The ease of completing broadband measures has made it more likely for both parents and teachers to contribute to an individual's formal assessment. There are positive and negative aspects of having multiple raters, and these aspects will be discussed below.

In order to aid in the diagnosis of any individual, receiving information from multiple informants (such as parents and teachers) is imperative because it allows for information to be gathered beyond what can be obtained from a single informant and for behavior to be represented as it occurs in multiple contexts (Kamphaus et al., 2000; Lane, Paynter, & Sharman, 2013). Parent ratings and input is important to the diagnostic evaluation process but may not be solely sufficient in demonstrating a complete conceptualization of a child's behavior (Kanne, Abbacchi, Constantino, 2009). Therefore, teacher ratings can be utilized in combination with parent ratings to arrive at a more comprehensive understanding. Teacher ratings are important because teachers are highly knowledgeable about how the children in their classroom behave since they are able to compare one child's behavior to that of the rest of the class. Additionally, teachers are with their students for at least six hours of the day, five days a week when parents are at work, so a child's behavior in the school setting can be indicative of their overall psychological functioning and behavior (Kamphaus & Frick, 2005).

Teachers are able to report deficits that are seen in classroom due to the multiple demands that are typically required of the students in the classroom, including impairments in social skills; teacher ratings can also contribute important information that could aid in the development of the most appropriate intervention for a child (Watson & Gresham, 1998; Kamphaus & Frick, 2005). The teacher's perspective of a child's behavior can contribute to the overall conceptualization of that child's presenting problems.

Additionally, utilizing childhood behavioral rating scales as broadband measures allows for the clinician to gain a broad understanding of problem areas and is cost effective (Kamphaus et al., 2000; Bergeron et al., 2008). Shapiro and Heick (2004) found that behavioral rating scales, along with observations and interviews, were used in 60% to 90% of cases when surveying over 1000 practicing psychologists. According to a 1997 survey of school psychologist assessment practices utilized in Reschly's (1998) triple survey comparison study, three broadband behavioral measures, the original BASC, the Achenbach, and the Connors, were in the top 15 utilized measures. This supports the wide use of behavior rating scales at this time. Notably, the original Behavior Assessment System for Children (BASC) was only published for 5 years prior to this study; therefore, the publication of this behavior rating scale demonstrates how quickly clinicians were not only willing to adopt this measure but to also frequently use it (The SAGE Handbook, 2008). This study in combination with the many advantages mentioned previously (i.e., cost effectiveness, ease of completion, more objective data collection etc.) demonstrates that there has been an increased use of broadband measures by clinicians since their first gain of acceptance in the 1980s (Kamphaus et al., 2000; Merrell, 2008).

One possible limitation of using multisource broad band/omnibus behavior rating scales, such as the BASC-2, is response bias. Response bias or source variance is how the individual completing the rating approached the task; response bias can factor into the validity and accuracy of the raters responses. Literature reveals that the difference in ratings completed by two individual informants has more to do with behavior changing across environments rather than solely due to measurement error (Kanne et al., 2009). It is difficult for researchers to parse out this type of variance when comparing scores; however, the use of separate rating forms for both a parent and teacher help to eliminate some of the existing bias as well as provide two different viewpoints to compare (Bergeron et al., 2008). Comparatively examining the BASC-2 Parent Rating Scale (PRS) and Teacher Rating Scale (TRS) scores has yielded a slight increase in the correlations between the clinical scales across the three different age levels (Reynolds & Kamphaus, 2003). As a child increases in age the relationship between the PRS and TRS scores become strengthened. Additionally, these correlations demonstrate that the scales are measuring the same construct correlate more highly across the forms. Overall, having a multisource broadband behavioral assessment measure available to clinicians during the diagnostic evaluation process allows important information to be uncovered.

Broadband Behavioral Measure Use in Autism

As mentioned previously, the use of broadband behavior measures as part of the evaluation process has increased over recent years. Even with this increase and widespread clinical interest in the use of these types of checklists, there has been limited research conducted investigating the sensitivity and specificity of broadband behavioral screeners with detecting symptoms related to ASD. On the other hand, there are a variety

of autism specific screeners such as the Modified Checklist of Autism in Toddlers (M-CHAT) that are utilized and have been well researched as first steps in the early detection of ASD (Amaral, Dawson, & Geschwind, 2011). The use of a broadband measure can aid in focusing referrals and detecting disorders such as ASD earlier (Glascoe, Mascias, Wegner, & Robertshaw, 2007).

One set of researchers wanted to determine if broadband measures can ultimately detect those individuals in need of further ASD evaluations. This group utilized the Parent's Evaluation of Developmental Status (PEDS) as the broadband behavioral measure and the M-CHAT as the autism specific screener in order to test their hypothesis (Glascoe et al., 2007). They found that the PEDS indicated high-risk scores for the entire sample, 427 children between the ages of 18 and 59 months, while the M-CHAT revealed a much lower percentage as at high risk for autism ($n=283$). The high rate of false positives in this study demonstrated that a broadband behavioral screener cannot solely be used to discern children who potentially have ASD and an autism specific screener should be utilized in order to obtain the most appropriate referral.

There have been a variety of studies examining broadband behavioral measures such as the BASC-2 and what behavioral profiles exist for children with ASD according to these measures. This current study utilizes the BASC-2 and a university clinic's clinical sample in order to explore the behavior profiles for children diagnosed with ASD according to the latest version of the American Psychiatric Association's diagnostic manual: the DSM-5.

Behavior Assessment System of Children, Second Edition (BASC-2)

The Behavior Assessment System for Children, Second Edition (BASC-2) is a multidimensional measure intended to assess internalizing and externalizing behaviors and adaptive functioning for individuals, ages 2-25. The BASC-2 provides a triangulated view of child's behavioral functioning by considering rating by teachers and parents, self-ratings, and relevant background information (Reynolds & Kamphaus, 2003). Overall, the BASC-2 focuses on both positive and adaptive behaviors and negative and maladaptive behaviors. The BASC-2 is separated into three different forms for the following age ranges: 2-5 years of age (preschool), 6-11 years of age (child), and 12-21 years of age (adolescent).

The BASC -2 contains five different components, although only two, the Parent Rating Scale (PRS) and Teacher Rating Scale (TRS), were utilized in this study. The other three parts include a Self Report of Personality (SRP), a Structured Developmental History (SDH), and a Student Observation System (SOS). The PRS and TRS differ slightly on what Primary scales are included in the measure based on age group and context. In addition, the Primary scales cover both broad behavioral issues as well as more specific scales that may indicate a differential diagnosis, such as the Anxiety subscale, Depression subscale, and Hyperactivity subscale (Reynolds, 2010). The PRS and TRS are comprehensive measures of both adaptive and maladaptive behaviors in the home and school setting respectively. Both forms contain ratings that are based on a four-point scale of frequency ranging from "Never" to "Almost always." The BASC-2 forms are simple to complete, but the TRS was purposefully shortened and seemingly made easier to complete by teachers who did not have extensive time to dedicate to filling out

these types of assessments (Reynolds, 2010). The item similarities on the PRS and TRS allow for a comparison between home and school environments, while the differences in items promote the detection of important differences across these settings (Reynolds & Kamphaus, 2003).

The BASC-2 contains both composite scores and subscale scores that can be interpreted. There are four composite scores including the Behavioral Symptom Index (BSI), which is a broad composite score that assesses the overall level of problem behaviors. Furthermore, the PRS and TRS assess the broad domains of Externalizing and Internalizing behaviors as well as Adaptive Functioning. There are minor differences between age levels due to developmental changes in behavior but the subscales and composites with the same name measure essentially the same content across all age levels (Reynolds & Kamphaus, 2003).

In addition to the composite scores, there are Primary scales that can be viewed separately as Clinical scales and Adaptive Scales. The Clinical scales for both the PRS and TRS include: Aggression, Anxiety, Attention Problems, Atypicality, Conduct Problems, Depression, Hyperactivity, Somatization, and Withdrawal. The TRS also contains the clinical subscale Learning Problems. The Adaptive scales for both forms of the BASC-2 include: Adaptability, Functional Communication, Leadership, and Social Skills. The PRS contains an additional scale measuring Activities of Daily Living while the TRS has a Study Skills measure. Each composite and scale yields a mean *T* score of 50 and a standard deviation of 10. Those *T* scores that fall more than 1 standard deviation away from the mean are considered to be “at risk” while those *T* scores that exceed 2 standard deviations are considered to be “clinically significant.” Lastly, The BASC-2

manual documents psychometrics including coefficient alpha scores above .8 for all scales and composites; this demonstrates an appropriate level of internal consistency (Reynolds & Kamphaus, 2003). Construct validity for all BASC-2 scales was demonstrated by correlations with similar behavioral scales (Reynolds & Kamphaus, 2003). For each BASC-2 scale, the median interrater reliability scores were in the .70s for parent respondents and ranged between .53 and .74 for scores between teacher respondents.

BASC-2 in Autism

Although not autism specific, the BASC-2 is considered to have utility as a broadband assessment measure incorporated in the diagnostic evaluation of an individual with ASD since some of the items that compose the BASC-2 map onto the DSM-IV symptomology of autism (Volker, Lopata, Smerbeck, Knoll, Thomeer, Toomey, & Rodgers, 2010). There have been a variety of studies examining the behavioral profiles of children with autism under the DSM-IV criteria either by general categories (i.e., high or low functioning autism) or by specific DSM-IV disorders (i.e., Autistic Disorder, Asperger's Disorder [AD], and Pervasive Developmental Disorder-Not Otherwise Specified [PDD-NOS]).

Researchers have examined the clinical and adaptive features of children with normal level cognitive functioning and autism spectrum disorder (high functioning autism) by utilizing the BASC-2 PRS. When compared to age and gender matched controls, all four of the BASC-2 PRS composites were found to be significantly different for the individuals with ASD (Volker et al., 2010). Furthermore, significant differences between the autism and control sample were found for all of the clinical scales (with

autism scoring in a more pathological direction) with the exception of the Somatization subscale, Conduct Problems subscale, and Aggression subscale (Volker et al., 2010). Overall, this population of 62 children produced a general BASC-2 profile for children with high functioning autism spectrum disorder. For the autism group, the clinically significant mean scores were found for the Atypicality and Withdrawal clinical subscales while mean scores on the Hyperactivity subscale, Attention Problems subscale, and Depression subscale were in the at risk range (Volker et al., 2010). These three scales can be seen as reflecting associated features of the disorder while the Atypicality and Withdrawal subscales appear to reflect the core features. Additionally, all five of the BASC-2 PRS Adaptive scale mean scores were found to be in the at risk range. Individual differences between children with ASD may influence whether the adaptive scale scores reach the clinically significant range.

Several additional studies have examined the BASC-2 and individuals with autism in relationship to specific diagnoses according to DSM-IV. DeVries, Bundy, and Gore (2013) utilized the Adaptive Scales of the BASC-2 PRS completed for a small university clinic sample of children with autism (6 with Autistic Disorder, 11 with AD, and 2 with PDD-NOS) in order to determine if a general adaptive profile appeared to exist for each specific diagnosis under the DSM-IV-TR. They found that this group of children significantly varied on the Adaptability scale; specifically, the group of children diagnosed with Autistic Disorder was rated as being more adaptable than the AD and PDD-NOS groups (DeVries, Bundy, & Gore, 2013).

Furthermore, the use of typically developing controls have aided in the ability of researchers to evaluate the ability of a broadband measure, such as the BASC-2, to

discern behavioral differences of children with ASD. A well-known study conducted by Mahan and Matson (2011) compared children with autism spectrum disorders ($n = 38$) to typically developing (TD) controls ($n = 42$) on the BASC-2. All individuals in the sample had confirmed autism spectrum disorder DSM-IV-TR diagnoses. The range of individuals used in this study was from 6-16 years of age. These researchers found that children with ASD had significantly higher scores on the Hyperactivity subscale, Conduct Problems subscale, Externalizing Composite, Depression subscale, Somatization subscale, Atypicality subscale, Withdrawal subscale, Attention Problems subscale, and the Behavioral Symptoms Index (Mahan & Matson, 2011). Multiple studies have revealed that the Atypicality subscale, Withdrawal subscale, and Attention Problems subscale were significantly higher for children and adolescents with ASD in comparison to the TD group (Knoll, 2008; Mahan & Matson, 2011). As in many previous studies, Mahan and Matson's (2011) ASD and typically developing groups had significantly discrepant scores across all of the Adaptive Composite subscales. The Functional Communication subscale and the Social Skills subscale were found to have significantly lower scores for the ASD group, as subscales related to the core features of the disorder. Overall, children with an autism spectrum disorder tended to have lower mean scores than the typically developing group across the scales involving adaptive functioning, which indicates children with ASD exhibit more abnormal behavioral characteristics in domains involving social skills, functional communication, and daily living skills.

The most recent study examining the BASC-2 and individuals with ASD separated the sample into three groups, ASD ($n = 57$), atypically developing, including other disorders such as Attention-Deficit Hyperactive Disorder, Developmental Delay

etc. ($n = 28$), and typically developing controls ($n = 66$) (Goldin, Matson, Knost, & Adams, 2014). The ASD group was found to be more significantly impaired than the typically developing group across all composites and subscales with the exception of Somatization, Aggression, and Internalizing behaviors. Unlike past research, individuals with ASD were not found to show significantly different scores on the Adaptability subscale (Knoll, 2008; Mahan & Matson, 2011; DeVries, Bundy, Gore, 2013; Goldin et al., 2014). A limitation of the study conducted by Goldin and colleagues (2014) is that it did not specifically look at the ASD group according to the DSM-5 and it only used the PRS to determine the profile differences from the typically developing group, rather than utilizing a sample with confirmed diagnoses based on the DSM-5 criteria for ASD and incorporating the TRS as a additional protocol to compare behaviors.

Finally, one study was found that examined the BASC-2 Parent and Teacher ratings for individuals diagnosed by the DSM-IV autism criteria. Lane and colleagues (2013) found that parents and teachers only differed significantly on the Adaptive Skills Composite; parents on average rated individuals in the sample as having clinically elevated adaptive functioning while teachers on average rated individuals in the sample as having an at-risk level of adaptive functioning. Additionally, there were no significant differences between the parent and teacher ratings of externalizing and internalizing behaviors as indicted by the composite scores. Parents did rate the sample as being in at-risk range for Hyperactivity as compared to teachers. Teachers had also rated the sample a higher score on the internalizing scales of Anxiety and Depression, but neither approached the at-risk range. One limitation to this study is that the researchers had a

small sample size ($N = 22$) and did not compare the individual scales within each composite on the BASC-2 (Lane et al., 2013)

Overall, the literature has revealed that the BASC-2 is an acceptable broadband assessment tool to measure behavioral characteristics and is able to discriminate children and adolescents with Autism Spectrum Disorder from typically developing children. Previous research suggests that when examining the BASC-2 profile for an individual with ASD, one would expect to see clinical elevations in Atypicality, Withdrawal, and the Adaptive Skills Composite and subscales. With that said, there has been minimal research examining the differences in the behavior profiles according to the BASC-2 for children and adolescents with ASD when comparing two different informants' ratings.

II. THE CURRENT STUDY

With the publication of the DSM-5 and the creation of a single Autism Spectrum Disorder as recently as 2013, published research examining the behavioral profiles for children and adolescents with ASD under this new criteria is scarce. Additionally, there is limited research investigating the differences in perception of parents and teachers in rating an individual with ASD's behavior. The current study differs from all other previous studies because the entire sample of individuals used are diagnosed under the DSM-5 Autism Spectrum Disorder criteria and have been rated both by a parent and a teacher on the BASC-2.

Based upon previous research regarding the BASC-2 behavioral profiles of children and adolescents with Autism Spectrum Disorder, the following hypotheses will be examined in the present study:

Hypothesis I: Both parent and teacher ratings of children and adolescents with autism on the BASC-2 will yield clinical significant elevations on the Adaptive Skills Composite and the Behavioral Symptoms Index.

Hypothesis II: Both parent and teacher ratings of children and adolescents with autism on the BASC-2 will yield clinical significant elevations on the following subscales: Atypicality, Withdrawal, Adaptability, Functional Communication, Social Skills, and Aggression.

Hypothesis III: Based on the research conducted by Lane and colleagues (2013), when compared to each other, it is predicted that parent raters are likely to rate children as more clinically elevated on Externalizing Composite Subscales (Hyperactivity, and Aggression) while teachers are likely to rate the same children

as more clinically elevated on the Internalizing Composite scales (Anxiety, Depression, and Somatization).

Hypothesis IV: When compared to each other, it is predicted that parents are likely to rate children as more clinically elevated on the Adaptive Composite subscales (Adaptability, Functional Communication, Social Skills) than teachers who rate the same children.

Hypothesis V: It is predicted that the teacher ratings on the BASC-2 Subscales (Atypicality, Withdrawal, Adaptability, Functional Communication, Social Skills, and Aggression) will add incrementally to parent ratings when predicting the DSM-5 Autism Spectrum Disorder Severity Ratings for both the Social Communication and Restrictive/Repetitive Behavior domains.

III. METHOD

Participants

The current study was composed of data from a total sample of 67 children and adolescents. For this study, the age of each individual was reported in months rather than in years. Overall, this sample of individuals fell between the age range of 26 months and 217 months ($N=67$, $M=98.86$, $SD=39.49$). These individuals can be further divided into three distinct age groups as reflected on the BASC-2 forms: 24-71 months ($n=23$, $M=56.8$, $SD=11.77$), 72-143 months, ($n=34$, $M=106.94$, $SD=17.52$), and 144-252 months ($n=10$, $M=164.70$, $SD=19.83$). Of these individuals there were 59 males and 8 females, roughly consistent with the typical gender ratio found in ASD. The ethnicity most predominant in this sample was Caucasian; however, there were three participants who specified a culturally diverse background.

Data was collected as part of an archival study of clients at the Eastern Kentucky University Psychology Clinic in Richmond, Kentucky and in a private psychological practice in Lexington, Kentucky; The Eastern Kentucky University Institutional Review Board approved this study. This data was gathered from closed case files and included Intelligence Quotient data, diagnostic information and both the parent and teacher forms of the Behavior Assessment System for Children, Second Edition (BASC-2) for each individual.

The average IQ scores for the current group of participants ranged from below 38 to 128 with an average IQ ($M=100$, $SD=15$) of 83.85. Of the 67 participants, 15 individuals either had invalid IQ assessments or this data was unable to be determined from their case file. The IQ tests given were the Wechsler Intelligence Scale for

Children-IV (WISC-IV), Kaufman Brief Intelligence Test (KBIT-2), Kaufman Assessment Battery for Children – Second Edition (KABC-2), Wechsler Adult Intelligence Scale-III (WAIS-IV), Stanford-Binet Intelligence Scales-V (SB-V), Mullen Scales of Early Learning (MULLEN), Leiter-Revised (Leiter-R), Leiter-Third Edition (Leiter III). Universal Nonverbal Intelligence Test–Second Edition (UNIT-2), Wechsler Preschool and Primary Scale of Intelligence (WPPSI), Bayley Scales of Infant Development (BSID), or the Battelle Developmental Inventory, Second Edition (BDI-2). All tests are standardized with a mean score of 100 and a standard deviation of 15.

Assessment Measure

In this study, both the parent and teacher rating forms of the BASC-2 were used (Reynolds & Kamphaus, 2003). For the Clinical Composites and Clinical subscales, Clinically Significant elevations are scores over 70 while At-Risk scores are between 60 and 69. For the Adaptive Skills Composite and Adaptive subscales, the ratings are inverted so, Clinically Significant elevations are scores under 30, while At-Risk scores are between 31 and 40. Only composite domains and clinical scales that appeared on both forms were utilized in this study; the School Problems composite and Learning Problems clinical scale from the teacher rating form were not included. Correspondingly, identical subscales for the Adaptive Scale composite were used whereas the Activities of Daily Living scale on the parent rating form and the Study Skills scale on the teacher rating form was discarded from analyses. Furthermore, depending on the age of the individual, certain subscales are included/excluded from the BASC-2; therefore, for this study the Conduct Problems scale and the Leadership scale were excluded from analysis. This methodology was followed in order to have four composites and eleven scales

consistently compared between the parent and teacher. All three age-group forms were used in order to increase the amount of individuals available for this study.

The BASC-2 parent and teacher forms contain Validity Indices that are used to examine the quality of responses by each of the raters. The F-Index measures the rater's tendency to be excessively negative in describing the child. The Consistency Index is a validity measure reflecting how the rater has answered differently on similar items. The Pattern Response Index measures whether the rater answered in a specific pattern. If there are no cautions with the three validity indices, the term "Acceptable" is used. A BASC-2 form is still considered valid even with a Caution on the F-Index (Caution F) and Consistency Index (Caution C). For this sample, the Parent Ratings were found to have validity as Acceptable ($n=60$), Caution F ($n=5$) and Caution C ($n=2$). The Teacher Ratings were found to have validity as Acceptable ($n=41$), Caution F ($n=18$), and Caution C ($n=4$), and both Caution F and C ($n=4$).

Procedure

The case files for this study were selected based on the following criteria: a) the individual's file was either a closed therapy or assessment case; b) the individual was diagnosed with autism either by DSM-IV or DSM-5 criteria; and c) the case file contained both the BASC-2 PRS and TRS forms.

Individual diagnoses were confirmed to ensure that all of the children and adolescents in this sample were previously accurately diagnosed with an Autism Spectrum Disorder. Record review showed that diagnoses were made after a complete psychological evaluation using a variety of measures and methods (i.e., observation, broadband behavioral measures, autism-specific measures, developmental history,

intelligence testing, and adaptive functioning assessments). In each case, either a graduate student in psychology or a master's level psychological practitioner, both under the direct supervision of a qualified licensed clinical psychologist, assigned these diagnoses. The sample contains children who were previously diagnosed by the DSM-IV ($n=32$), as well as cases with current diagnoses according to the DSM-5 ($n=35$).

In the event that the individual was originally diagnosed according to the DSM-IV, two raters, the primary researcher (a second year master's candidate in clinical psychology) and one clinical faculty member (a licensed clinical psychologist with twenty-five years of experience specializing in autism spectrum disorders), independently reviewed the case files and made ratings to assign a DSM-5 diagnosis of ASD, including severity levels for both the social communication and restrictive, repetitive behavior domains. In order to maintain consistency, raters used the developmental history, the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2) measure, other autism-specific measures, and the most recent psychological evaluation available in that individual's record, to render a DSM-5 diagnosis of Autism Spectrum Disorder.

If the individual's case file contained a completed ADOS-2 ($n=52$), the score was recorded and used in the determination of the DSM-5 diagnosis. All of the ADOS-2 scores for this sample exceeded the autism-cutoff provided by the diagnostic measure. If the individual's case file did not contain an ADOS-2 ($n=15$) the raters used the other documents mentioned previously to determine if the individual met diagnostic criteria according to the DSM-5. Cases were discarded if there was not enough evidence in the file to substantiate a DSM-5 diagnosis of ASD. The interrater reliability for the DSM-5 diagnosis for all 67 cases was analyzed: The assigned Social Communication and

Restrictive Repetitive Behavior domain severity levels between the two raters were found to be highly reliable (67 items: $\alpha = .827$ and $\alpha = .815$ respectively). For this study, the primary researcher's severity levels were used in analyses.

The current sample contains individuals across the three DSM-5 severity levels for both the social communication and restrictive, repetitive behavior domains. View Table 1¹ for complete count and distribution of ASD severity levels.

The BASC-2 PRS and TRS forms were checked for validity and the data was entered into a master file by an undergraduate student who assisted in the data collection process. Neither the primary researcher nor the clinical faculty member advising this thesis was aware of the BASC-2 data for the sample when ranking severity levels or conducting analyses.

¹ All tables are located in the appendix.

IV. RESULTS

The following analyses were performed and results were found for the five core hypotheses of this study.

Descriptives and Paired-Sample T-tests

Hypothesis I predicted that both parent and teacher ratings of children and adolescents with autism on the BASC-2 would yield clinically significant elevations on the Adaptive Skills Composite and the Behavioral Symptoms Index (see Table 2). Results showed that on average, parents yielded clinically significant elevations for both the Adaptive Skills Composite ($M=28.28$, $SD=10.67$) and the Behavioral Symptoms Index ($M=71.31$, $SD=11.41$) while teachers yielded only a clinically significant elevation for the Behavioral Symptoms Index ($M=70.71$, $SD=12.66$). The Adaptive Skills Composite ($M=35.58$, $SD=7.81$) for teachers yielded a score in only the At-Risk range rather than the clinical range as hypothesized.

Furthermore, Hypothesis II predicted that both parent and teacher ratings of children and adolescents with autism on the BASC-2 would yield clinically significant elevations on the following subscales: Adaptability, Aggression, Atypicality, Functional Communication, Social Skills, and Withdrawal (see Table 2). Contrary to the hypothesis, results indicated that on average parents yielded clinically significant elevations only for the Atypicality subscale ($M=76.25$, $SD=18.04$), Functional Communication Subscale ($M=29.75$, $SD=10.24$), and Withdrawal Subscale ($M=70.34$, $SD=14.34$). Teachers on average yielded clinically significant elevations for only the Atypicality subscale ($M=77.00$, $SD=16.46$) and Withdrawal Subscale ($M=74.31$, $SD=16.29$). Results also showed Adaptability for parents' ($M=32.49$, $SD=8.86$) and teachers' ($M=36.91$

SD=12.06) ratings, Functional Communication for the teacher ratings ($M=35.70$, $SD=8.62$), and Social Skills for parents' ($M=34.48$, $SD=10.75$) and teachers' ($M=38.75$, $SD=8.45$) ratings yielded scores in the At-Risk range. Neither parents' ($M=55.67$, $SD=10.97$) nor teachers' ($M=57.84$, $SD=11.43$) ratings on the Aggression subscale were in the Clinically Elevated range or At-Risk range.

In order to test my Hypothesis III, which predicted that parent raters are likely to rate children as more clinically elevated on Externalizing Composite Subscales (Hyperactivity, and Aggression) while teachers are likely to rate the same children as more clinically elevated on the Internalizing Composite scales (Anxiety, Depression, and Somatization). Paired Sample T-tests were conducted to compare the BASC-2 Subscales scores in PRS and TRS conditions (see Table 2). When the PRS and TRS ratings were compared to each other, only Clinical subscale ratings of Hyperactivity, Anxiety, and Attention Problems were found to yield significant results. Similarly to what was predicted, there was a statistically significant increase in the rating of Hyperactivity PRS ($M=68.39$, $SD=13.48$) than of Hyperactivity TRS ($M=63.36$, $SD=12.78$); $t(66)=2.79$, $p=.007$. These results show that parents rate our sample of individuals with autism higher on Hyperactivity than teachers. Results also showed that there was a statistically significant decrease in comparing the scores for Anxiety PRS ($M=53.09$, $SD=11.62$) and Anxiety TRS ($M=58.15$, $SD=16.34$); $t(66)=-2.733$, $p=.008$; Teachers' ratings were found to be significantly higher than Parent ratings on Anxiety. Overall, this demonstrates that our sample was rated significantly higher on at least one Externalizing subscale by parents and at least one Internalizing subscale by teachers. Additionally, there was a significant difference in the scores for Attention Problems PRS ratings ($M=66.15$,

$SD=7.60$) and Attention Problems TRS ($M=63.43$, $SD=7.85$); $t(66)=2.84$, $p=.006$.

Parents rated our sample as having more attention problems than teachers did.

In order to test Hypothesis IV, which predicted that that parents were likely to rate children as more clinically elevated on the Adaptive Composite subscales (Adaptability, Functional Communication, Social Skills) than teachers who rate the same children, additional Paired-Sample T-Tests were conducted for the BASC-2 Adaptive Skills Composite and Adaptive Subscales (see Table 2). As predicted for our sample, when the Adaptive Skills Composite PRS and TRS scores were compared, a statistically significant difference was found between Adaptive Skills Composite PRS ($M=28.12$, $SD=10.69$) and Adaptive Skills Composite TRS ($M=35.58$, $SD=7.81$); $t(66)=-6.338$, $p=.000$. These results suggest that parents rated our sample as having more adaptive problems than teachers. When the PRS and TRS Adaptive Subscale ratings were compared to each other, Adaptability, Functional Communication, and Social Skills were found to yield significant results. Results showed a statistically significant difference in comparing the scores for the Parent Ratings of Adaptability ($M=32.49$, $SD=8.86$) and the Teacher Ratings of Adaptability ($M=36.91$, $SD=12.06$); $t(66)=-2.72$, $p=.008$. There was also a statistically significant difference in comparing the scores for the Parent Ratings of Functional Communication ($M=29.38$, $SD=9.79$) and the Teacher Ratings of Functional Communication ($M=35.70$, $SD=8.69$); $t(62)=-5.65$, $p=.000$. Lastly, the results indicated a statistically significant difference in comparing the scores for the Parent Ratings of Social Skills ($M=34.48$, $SD=10.74$) and the Teacher Ratings of Social Skills ($M=38.75$, $SD=8.45$); $t(66)=-3.31$, $p=.002$. These results suggest that the person who is rating our sample has an effect on the score the individuals in our sample receives on the BASC-2

Adaptive Subscales. Specifically, results show that when individuals are rated by parents, their scores on the BASC-2 Subscales decrease demonstrating that parents are rating our sample as more clinically elevated on these adaptive scales.

Regression Analysis

In order to test Hypothesis V, which projected that teachers would add incrementally to parent ratings when predicting the DSM-5 Autism Spectrum Disorder Severity Ratings for both the Social Communication and Restrictive/Repetitive Behavior domains, hierarchical linear regression analysis was conducted. These analyses were used to determine the extent to which Parent and Teacher Ratings of rationally-selected BASC-2 Subscales (Adaptability, Aggression, Atypicality, Functional Communication, Social Skills and Withdrawal) predict the Severity Rating for Social Communication (SC) (see Table 3) and Restrictive/Repetitive Behavior (RRB) (see Table 4). The Severity Rating for SC represented a dimensional dependent variable in the regression equation. The Parent Ratings (PRS) of these BASC-2 Subscales were entered into the first block of the regression, followed by the Teacher Ratings (TRS) in the second block of the regression, in predicting SC Severity ratings. An R^2 change variable was calculated to determine the incremental prediction of SC Severity Ratings with the TRS. R^2 change was examined via an F test to determine whether the increments at each block of the regression equation were statistically significant. Results (see Table 3) showed that Adaptability PRS accounted for 1.5% of the variance ($p > .05$) in predicting SC Severity Ratings. Adaptability TRS added 6.1% of the additional variance ($p < .05$), which is a significant increment, F change = 4.24, $p < .05$. Moreover, Atypicality PRS accounted for 8.1% of the variance ($p < .05$) in predicting SC Severity Ratings. Atypicality TRS added

11.5% of the additional variance ($p < .05$), which is a significant increment, F change = 9.10, $p < .05$. Results also showed that Functional Communication PRS accounted for 22.6% of the variance ($p < .001$) in predicting SC Severity Ratings. Functional Communication TRS added 9.6% of the additional variance ($p < .05$), which is a significant increment, F change = 8.44, $p < .05$. Additionally, results indicated that Social Skills PRS accounted for 19.8% of the variance ($p < .001$) in predicting SC Severity Ratings. Social Skills TRS added 8.4% of the additional variance ($p < .05$), which is a significant increment, F change = 7.44, $p < .05$. Lastly, results showed that Withdrawal PRS accounted for 5.7% of the variance ($p > .05$) in predicting SC Severity Ratings. Withdrawal TRS added 9.2% of the additional variance ($p < .05$), which is a significant increment, F change = 6.91, $p < .05$. In the final regression model, several BASC-2 Subscales exhibited significant unique predictions, including: Adaptability TRS ($\beta = -.25$, $p < .05$), Atypicality TRS ($\beta = .39$, $p < .05$), Functional Communication PRS ($\beta = -.27$, $p < .05$), Functional Communication TRS ($\beta = -.37$, $p < .05$), Social Skills TRS ($\beta = -.32$, $p < .05$), Social Skills PRS ($\beta = -.31$, $p < .05$), and Withdrawal TRS ($\beta = .31$, $p < .05$).

A second hierarchical linear regression analysis was conducted to determine the extent to which Parent and Teacher Ratings of rationally-selected BASC-2 Subscales (Adaptability, Aggression, Atypicality, Functional Communication, Social Skills and Withdrawal) account for the Severity Rating of RRB (see Table 4). The Severity Rating for RRB represented the dimensional dependent variable in this regression equation. The PRS of these BASC-2 Subscales were entered into the first block of the regression, followed by the TRS in the second block of the regression, in predicting RRB Severity ratings. An R^2 change variable was calculated to determine the incremental prediction of

RRB Severity Ratings with the TRS. Similarly, the significance of R^2 change was examined via an F test. Results showed that Atypicality PRS accounted for 9.7% of the variance ($p < .05$) in predicting RRB Severity Ratings. Atypicality TRS added 9.0% of the additional variance ($p < .05$), which is a significant increment, F change = 7.05, $p < .05$. Additionally, results showed that Functional Communication PRS accounted for 25.5% of the variance ($p < .001$) in predicting RRB Severity Ratings. Functional Communication TRS added 5.7% of the additional variance ($p < .05$), which is a significant increment, F change = 4.94, $p < .05$. Results also indicated that Withdrawal PRS accounted for 9.9% of the variance ($p < .05$) in predicting RRB Severity Ratings. Withdrawal TRS added 8.6% of the additional variance ($p < .05$), which is a significant increment, F change = 6.74, $p < .05$. In the final regression model, several BASC-2 Subscales exhibited significant unique predictions, including, Atypicality TRS ($\beta = .35, p < .05$), Functional Communication PRS ($\beta = -.35, p < .05$), Functional Communication TRS ($\beta = -.28, p < .05$), Social Skills PRS ($\beta = -.30, p < .05$), Withdrawal PRS ($\beta = .24, p < .05$), and Withdrawal TRS ($\beta = -.30, p < .05$).

Next, the order of predictors was reversed to determine whether the PRS would add incrementally to the TRS. The R^2 change variable was used to determine the incremental prediction of SC (see Table 3) and RRB Severity Ratings (see Table 4) with the PRS. Results showed that Functional Communication TRS accounted for 26.8% of the variance ($p < .001$) in predicting SC Severity Ratings. Functional Communication PRS added 5.3% of the additional variance ($p < .05$), which is a significant increment, F change = 4.66, $p < .05$. Results also indicated that Social Skills TRS accounted for 20.0% of the variance ($p < .001$) in predicting SC Severity Ratings. Social Skills PRS added

8.1% of the additional variance ($p < .05$) which is a significant increment, F change = 7.23, $p < .05$.

Additionally, results showed that Functional Communication TRS accounted for 22.5% of the variance ($p < .001$) in predicting RRB Severity Ratings. Functional Communication PRS added 8.6% of the additional variance ($p < .05$), which is a significant increment, F change = 7.50 $p < .05$. Results also suggest that Social Skills TRS accounted for 9.8% of the variance in predicting the severity ratings of RRB. Social Skills PRS added 7.3% of the additional variance ($p < .05$), which is a significant increment, F change = 5.70 $p < .05$. Lastly, results showed that Withdrawal TRS accounted for 13.2% of the variance ($p < .05$) in predicting RRB Severity Ratings. Withdrawal PRS added 5.3% of the additional variance ($p < .05$), which is a significant increment, F change = 4.15, $p < .05$.

V. DISCUSSION

The current study aimed to examine the BASC-2 PRS and TRS forms for individuals diagnosed on the DSM-5 Autism Spectrum. Previous research on the BASC-2 used samples diagnosed by the DSM-IV criteria; these studies provide a basis for what the pattern on the BASC-2 should look like for children and adolescents with ASD. The most recent study of the BASC-2 suggested that individuals with ASD in compared to typically developing controls tended to have clinically elevated scores across all subscales with the exception of Somatization, Aggression, and Adaptability subscales (Goldin et al., 2014). The lack of significance regarding the Adaptability scale is contrary to most other research examining the BASC-2 (Knoll, 2008; Mahan & Matson, 2011). Furthermore, Lane and colleagues (2013) found that the Adaptive Skills Composite significantly differed when comparing the BASC-2 PRS and TRS for twenty-two individuals. With the exception of this study, there is a sparse amount of research comparing the PRS and TRS forms of the BASC-2 for children with ASD and no research exists examining the value of the PRS and TRS in predicting the new DSM-5 ASD severity ratings.

Utilizing our sample of 67 PRS-TRS pairs, it was expected to replicate findings from previous research. Results demonstrated that the BASC-2 PRS scores for individuals with ASD were clinically elevated for Atypicality, Withdrawal, and the Behavioral Symptoms Index Composite. Additionally, for the BASC-2 PRS the Adaptive Skills Composite and the subscales (Functional Communication, Social Skills, and Adaptability) were clinically elevated. Similar to other research findings the Somatization and Aggression subscales were found to be non-clinically elevated or at-

risk range. These results confirm that certain subscales tend to be specific pattern markers for individuals with ASD. It should be noted that although a few subscales (Atypicality, Withdrawal, and all of the Adaptive Skills subscales) are consistently found to be clinically elevated for individuals with ASD, the remaining scale elevations tend to depend on the sample being used in the study. Our sample found BASC-2 PRS scores in the at-risk range for the Externalizing Composite and the following subscales: Hyperactivity, Attention Problems, Adaptability, and Social Skills.

When examining the comparisons between the BASC-2 PRS and TRS pairs, results indicated that similarly to past research the Adaptive Skills Composite was the only composite to yield a significant difference between PRS and TRS scores. The subscales that were found to yield significant differences when comparing the PRS and TRS average scores were Hyperactivity, Anxiety, and Attention Problems. For our sample, parents tend to rate individuals with ASD as having more problems with Hyperactivity and Attention while teachers tend to rate individuals with ASD as having more problems with Anxiety. Past research indicated a similar pattern, although our sample reached clinical elevations for the Hyperactivity and Anxiety subscales while the study conducted by Lane and colleagues (2013) was unable to produce the same clinical elevations. These parent-teacher differences could be due to the fact that school is a different environment and anxiety can be seen more easily in individuals with ASD when environmental change occurs. Parents may have rated children as having more issues with being overly active and having trouble paying attention because environments in homes are often less structured than at school. Furthermore, parents rated our sample as having more maladaptive adaptive functioning for all three Adaptive Skills subscales.

(Adaptability, Functional Communication, and Social Skills) when compared to teachers. This is surprising since there tends to be additional pressure placed on students to socially engage in the classroom. This pressure typically stems from teachers and school norms that create a social learning environment. This pressure could force an individual with ASD to use the social skills and functional communication skills he or she has, even if the individual has impairments in both areas. It would seem that the pressure for social engagement is more at school than at home. Moreover, teachers rated this sample as having less maladaptive adaptability than parents. This finding was surprising because many individuals with ASD have problems with adapting to new environments and have negative reactions to change. The majority of our sample may not exhibit this type of reaction; therefore, the ratings by teachers for the Adaptability subscale would be higher (more adaptive).

Our study intended to demonstrate the incremental validity of the BASC-2 TRS and its ability to add information to the BASC-2 PRS when predicating the DSM-5 ASD Severity Ratings. It is important to note that it is not uncommon for variables to add incrementally (significantly) over each other when the order of predictors is reversed. When predicating Social Communication Severity Ratings, the Adaptability TRS, Atypicality TRS, Withdrawal TRS, Functional Communication TRS, and Social Skills TRS added significantly more to the PRS than when it was reversed. For predicating Restrictive/Repetitive Behaviors, the Atypicality TRS and the Withdrawal TRS add more incrementally to the PRS than when the order is reversed.

For Functional Communication, however, the parent ratings added significantly more to the teacher ratings when predicting the Restrictive/Repetitive Behavior Severity

Ratings. This could be due to parents being around their children more than teachers are, so parents are able to witness more restrictive/repetitive behaviors that affect their child's functional communication. The Functional Communication scale on the BASC-2 PRS and TRS have items that examine an individual's ability to present ideas, to respond appropriately, and to communicate clearly. Individuals with ASD may exhibit stronger reactions to change at home, may not change focus or actions as easily, and lack the organization and planning in their own house than while they are in a more structured environment like school. Teachers may not see the intensity of these behaviors while at school. Additionally, the Social Skills PRS added significantly more to the Social Skills TRS for the Restrictive/Repetitive Behavior domain only. This finding is surprising because parents are seeing more social skills deficits than teachers when schools tend to lend themselves to being more diverse social environments than homes. This could be due to the parents not being able to see their children socialize at home as much as teachers do at school or due to the fact that the restrictive and repetitive behaviors these individuals exhibit are more intense at home therefore, parents would have more maladaptive ratings of social skills.

Predominately, teacher reports accounted for more predictive variance in our sample; the BASC-2 TRS exhibited greater predicative validity than the BASC-2 PRS for the DSM-5 ASD severity ratings. When the final regression equation is examined for our sample, consistently higher beta weights are seen for the TRS version of the scale. These findings indicate that it is important to have teachers rate these individuals on the BASC-2; they are providing incremental information above what is provided by the parents themselves. This is not to say that parents are unnecessary in the assessment process. As

previous research demonstrates, parent interviews and parent-completed behavior ratings are a necessary and integral part to understanding a child's behavior because parents have insights about their child that are unique (Bergeron et al., 2008). The results indicate that having teachers rate a child with ASD on the BASC-2 is necessary in addition to having the parents rate the same child. Parent ratings on the BASC-2, in addition to teacher ratings, still had unique predicative variance for particular scales such as Social Skills. Together, this information shows that both parents and teachers provide their own unique data when rating individuals with ASD and teachers have important, additional viewpoints that should be utilized. Moreover, our study demonstrates that having teacher ratings on the BASC-2 scales that research has shown and this study has replicated are clinically elevated for individuals with ASD, adds incrementally and significantly in prediction of both social communication and restrictive/repetitive behavior severity deficits above and beyond the parent ratings of the same BASC-2 scales. There are many reasons why this trend may exist. First, teachers tend to have fresh perspectives of the individuals in their classrooms. This perspective may lend itself to teachers observing specific behaviors and/or deficits that parents do not see. Parents may have very close relationships with their children. If they are completely involved in their child's life, their ratings of children may be biased with how they chose to view their child. Parents may have skewed views of their child's behavior stemming from the natural inclination of wanting to have a child that is considered "typically developing." Although this does not make all parents inaccurate or biased raters, this can influence how a parent might rate their child on self-report measures, so that additional viewpoints are valuable. Third, the environment in which a child is in at school is likely different than the environment

they are used to at home. This change in environment can cause children with ASD to have difficulties. Additionally, the difficulties that a child with ASD may have at home may be different than at school, so when a parent and teacher are rating the child's behavior on the BASC-2, they may not be seeing the same and/or consistent behavior. Lastly, since the disorder of autism is found to be on a spectrum, individuals with the disorder tend to present with differently symptomology and the severity of the symptomology may be different as well. Our sample was made up of more individuals with lower diagnosed severity levels on both social communication and restrictive/repetitive behaviors (1 and 1) than those with more severe levels (3 and 3).

Overall, this study bears significant implications for future psychological evaluations aimed at determining if an ASD diagnosis is appropriate. In line with the recent research of Lane, Goldin and colleges (2014), a pattern exists of specific BASC-2 scales that tend to be clinically elevated for individuals in this population. Moreover, our study showed that the amount of variance predicated or accounted for between the BASC-2 scales and the ASD severity rating on both social communication and restrictive'/repetitive behaviors, substantially increases when the teachers' ratings are added to parents' ratings.

Limitations and Future Research

Future investigations comparing the BASC-2 PRS and TRS forms for children with ASD should address the limitations of this study. One limitation of this study was the sample size. Although our study's sample of 67 individuals with ASD is considered a larger sample when compared with samples used in past research studies, more participants would allow for greater effect size and could lead to more significant results.

A second limitation is that the sample was made up of more individuals that had lower severity ratings than higher severity ratings. The severity levels given to an individual with ASD tend to be reflective of their symptomology and behavior. Having more individuals with Level 1 and Level 2 in both social communication and restrictive/repetitive behaviors may have influenced the results or their generalizability to the more intensely affected end of the ASD spectrum. Additionally, the sample was limited to mostly males in the two younger age brackets. Further research should strive to have more females in the sample as well as older children/adolescents. A more evenly dispersed sample would allow for all of the BASC-2 scales to be used in analyses. Despite the current limitations, the current investigation is associated with certain strengths. In particular, as previously mentioned, the amount of research utilizing only DSM-5 Autism Spectrum Disorder diagnoses is limited and this study was able to solely use the updated diagnostic criteria and severity ratings. Additionally, the TRS BASC-2 was compared to the BASC-2 PRS and was found to be of value when predicting the DSM-5 rated severity levels of individuals with ASD

Future research should extend this investigation of the BASC-2 PRS and TRS and this study should be replicated with a larger sample to determine if different patterns exist for the different ASD severity levels. It could be hypothesized that the clinical elevations on the BASC-2 scales would be different depending on the severity levels rated for the individual. Additionally, given that research has shown there are differences between the PRS and TRS ratings for individuals with ASD, future research should also compare these forms to similar behavior scales utilizing the DSM-5 ASD criteria and severity levels.

Summary

Overall, this study has replicated past research examining the BASC-2 and has outlined a typical profile for children and adolescents with ASD as indicated by the PRS form of the BASC-2. This investigation has also contributed valuable information regarding the TRS form and the significance of the addition of teacher ratings to parent ratings when predicting the DSM-5 ASD severity levels of a child with ASD. This does not discount the value of parent reports and ratings, as they are vital to understanding a child with autism's behavior. Rather it highlights that teachers have a unique and viable role in describing an individual with autism's behavior and should be incorporated in formulating an overall conceptualization of an individual's behavioral profile.

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APPENDIX

Table 1.
Autism Spectrum Disorder DSM-5 Severity Levels for Sample

		Restrictive, Repetitive Behavior Domain		
		Level 1	Level 2	Level 3
Social Communication Domain	Level 1	28	4	0
	Level 2	4	22	1
	Level 3	0	3	5

Table 2.
Descriptives and Differences for PRS and TRS on the BASC-2

BASC-2 Scales	PRS		TRS		PRS - TRS		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>SD</i>	<i>t</i>
<i>Externalizing</i>	61.73	11.64	60.12	11.65	1.61	12.93	-1.58
Aggression	55.67	10.97	57.84	11.43	-2.16	12.99	-1.36
Hyperactivity	68.39	13.48	63.36	12.78	5.03	14.75	2.79*
<i>Internalizing</i>	57.55	14.62	60.57	14.72	-3.01	15.66	1.02
Anxiety	53.09	11.63	58.12	16.34	-5.06	15.15	-2.73*
Depression	61.51	14.66	62.67	14.92	-1.16	15.39	-.62
Somatization	53.72	16.27	55.04	12.52	-1.33	16.10	-.68
<i>Behavioral Symptoms</i>	71.31	11.41	70.71	12.66	.60	13.31	.37
Atypicality	76.25	18.04	77.00	16.46	-.75	17.29	-.35
Withdrawal	70.34	14.34	74.31	16.29	-3.97	18.75	-1.73
Attention Probs.	66.15	7.60	63.43	7.85	2.72	7.84	2.84*
<i>Adaptive Skills</i>	28.28	10.67	35.58 ⁺	7.81	-7.46	9.49	-6.34*
Adaptability	32.49	8.86	36.91	12.06	-4.42	13.32	-2.72*
Functional Comm.	29.75 [§]	10.24	35.70 [^]	8.62	-6.32	8.87	-5.65*
Social Skills	34.48	10.75	38.75	8.45	-4.27	10.57	-3.31*

Note. PRS = Parent Rating Scale, TRS = Teacher Rating Scale, MD = Mean Difference, Comm. = Communication, Probs. = Problems, ⁺ *n* = 65 for TRS for the Adaptive Skills, [§] *n* = 65 for PRS Functional Communication [^] *n* = 64 for TRS Functional Communication **p* < .05

Table 3.
Predicting Social Communication Severity Ratings

BASC-2 Scales	Order of Predictors: PRS, TRS				Order of Predictors: TRS, PRS	
	<i>r</i>	<i>R</i> ²	ΔR^2	Final β	<i>R</i> ²	ΔR^2
<i>Adaptability</i>						
PRS	-.12	.02		-.07	.08	.01
TRS	-.27	.08	.06*	-.25*	.07	
<i>Aggression</i>						
PRS	-.09	.01		-.12	.01	.01
TRS	.04	.01	.01	.08	.01	
<i>Atypicality</i>						
PRS	.28	.08		.09	.20	.01
TRS	.44	.20	.12*	.39*	.19	
<i>Functional Comm.</i>						
PRS	-.48	.23		-.27*	.32	.05*
TRS	-.52	.32	.10*	-.37*	.27	
<i>Social Skills</i>						
PRS	-.45	.20		-.31*	.28	.08*
TRS	-.45	.28	.08*	-.32*	.20	
<i>Withdrawal</i>						
PRS	.24	.06		.16	.15	.02
TRS	.35	.15	.09*	.31*	.13	

Note. PRS = Parent Rating Scale, TRS = Teacher Rating Scale, Comm. = Communication, **p* < .05.

Table 4.
Predicting Restrictive/Repetitive Behavior Severity Ratings

BASC-2 Scales	Order of Predictors: PRS, TRS				Order of Predictors: TRS, PRS	
	<i>r</i>	<i>R</i> ²	ΔR^2	Final β	<i>R</i> ²	ΔR^2
<i>Adaptability</i>						
PRS	-.09	.01		-.06	.03	.00
TRS	-.15	.03	.02	-.14	.02	
<i>Aggression</i>						
PRS	-.08	.01		-.12	.02	.01
TRS	.08	.02	.01	.15	.01	
<i>Atypicality</i>						
PRS	.31	.10		.14	.19	.01
TRS	.42	.19	.09*	.35*	.17	
<i>Functional Comm.</i>						
PRS	-.51	.23		-.35*	.31	.09*
TRS	-.48	.31	.06*	-.28*	.23	
<i>Social Skills</i>						
PRS	-.38	.14		-.30*	.17	.07*
TRS	-.31	.17	.03	-.19	.10	
<i>Withdrawal</i>						
PRS	.32	.10		.24*	.19	.05*
TRS	.36	.19	.09*	.30*	.13	

Note. PRS = Parent Rating Scale, TRS = Teacher Rating Scale, Comm. = Communication, **p* < .05.