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Construct Validity of the Behavior Assessment System for Children-Third Edition  
Teacher Rating Scales (BASC-3 TRS): Comparisons with the Adjustment Scales for  
Children and Adolescents (ASCA)

Shannon Burback

Eastern Illinois University

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### **Abstract**

The Behavior Assessment Scale for Children-Third Edition Teacher Rating Scale Child Form (BASC-3 TRS-C) and the Adjustment Scales for Children and Adolescents (ASCA) are both teacher rating scales which may be used by school psychologist to assess youth behavior problems. The BASC, BASC-2, and BASC-3 have limited replicated research of the studies reported in their respective manuals. Therefore, it was important to empirically compare the BASC-3 TRS-C with the ASCA to examine construct validity (convergent, discriminant, and divergent) as there were, at present, no published studies replicating BASC-3 Manual research. The present study analyzed BASC-3 TRS-C and ASCA ratings which were completed as part of educational evaluations or by teacher volunteers with children between the ages of 6 and 11 ( $n = 101$ ). Convergent validity was evident; results indicated significant correlations between similar constructs at the global and subscale levels. Both the BASC-3 TRS-C and the ASCA displayed convergent (e.g., the BASC-3 TRS-C Externalizing Problems Composite and the ASCA Overactivity Syndrome), discriminant (e.g., the BASC-3 TRS-C Hyperactivity scale and the ASCA Solitary Aggressive- Impulsive Syndrome), and divergent validity (e.g., the BASC-3 TRS-C Anxiety scale and the ASCA Attention-Deficit Hyperactivity syndrome).

Construct Validity of the Behavior Assessment System for Children- Third Edition  
Teacher Rating Scales (BASC-3 TRS): Comparisons with the Adjustment Scales for  
Children and Adolescents (ASCA)

### **Introduction**

Psychologists frequently use standardized behavior rating scales in addition to self-report scales, interviews, and direct behavior observation systems in assessment of child psychopathology or psychological disorders. Behavior-rating scales are popular for teachers and parents to complete to obtain more objective measurement and summary of children's behavior. Behavior rating scales provide samples of behavior and can be used to compare the child's behavior in certain areas with the behavior of other children of the same age using a normative peer comparison. Rating scales can help provide information for making decisions about classification and interventions for the child (Kamphaus & Frick, 1996).

The information obtained from assessment data should help educators better understand the student's specific areas of problem behavior compared to other children of the same age, and help professionals develop appropriate interventions specific to the child's needs. Antecedent, behavioral, and consequent data should also be collected during this process to better understand the function of the child's behavior, which then drives the need for and development of an intervention. By knowing the specific target behavior of the child and settings in which these behaviors occur, an intervention plan can be developed to help decrease the rate of the target problem behavior and/or hopefully increase an appropriate incompatible behavior. Behavior rating scales provide further information about the child's behavior and can be used in identifying, evaluating,

monitoring, and remediating behavioral and emotional problems in children and adolescents. Behavior-rating scales have many advantages such as assessing children and youth who cannot readily provide reliable or detailed information about themselves, provide more reliable and valid data than unstructured interviews, and capture data from individuals who are highly familiar with the child or adolescent's behavior, such as parents or teachers. Because of these advantages, it is easy to see why rating scales are widely used and how they capture the "big picture" in a short amount of time.

Child psychopathology is the manifestation of psychological disorders in childhood and adolescence; examples include Attention-Deficit/Hyperactivity Disorder and Oppositional Defiant Disorder (Mash & Barkley, 2014). It is important to note that a majority of children who experience mental health problems go unidentified and only about 20% receive help (Marsh & Barkley, 2014). A majority of children with unidentified mental health disorders often end up in the criminal justice and/or mental health system as young adults and are at greater risk of dropping out of school and not being fully functional members of society. This is why it is imperative that school psychologist assess psychopathology, emotional, or behavioral difficulties in the most reliable and valid manner.

Objective behavior-rating scales may also be used for classifying externalizing behaviors. Externalizing behavior problems refer to a grouping of behavior problems that are manifested in children's outward behavior and reflect the child negatively acting on the external environment (Campbell, Shaw, & Gilliom; 2000; Eisenberg et al., 2001). Behaviors including defiance, impulsivity, disruptiveness, aggression, antisocial features and overactivity are all known as externalizing behaviors (Achenbach & Edelbrock,

1978). Other syndrome terms used to describe externalizing behavior include “conduct problems,” “antisocial,” and “under controlled,” which are not diagnosed in childhood.

Similarly, behavior-rating scales may also screen for and assess internalizing behaviors. “Internalizing behaviors are associated with problematic internal feelings, such as anxiety, sadness, reticence, fearfulness, and oversensitivity” (Davis, Young, Hardman, & Winters, 2011, p. 2). Internalizing behaviors are important to assess using objective behavior-rating scales as the symptoms can affect the student’s academic performance, physical health, and future psychological adjustment (Merrell & Walker, 2004). The identification and understanding of students’ internalizing behaviors is an important role of school psychology professionals and teachers as this helps guide early identification and intervention.

Research indicates that there may be comorbidity among externalizing disorders and internalizing disorders. Children with externalizing behavior problems may not only negatively affect others, but also may be psychologically suffering internally (Liu, 2004). In other words, children with externalizing behaviors such as aggression may also experience anxiety and conversely children with depression may experience conduct problems. In addition, childhood aggression is a strong predictor of adult crime and violence (Liu, 2004). Children with externalizing behaviors such as conduct disorder are more likely to grow up to become delinquent as adolescents, and criminal and violent as adults. Research indicates that conduct disorder in childhood is highly associated with later delinquency both alone or in combination with hyperactivity (Morde, Grohold, Kjelsberg, Sandstad, & Myhre, 2001).

Standardized behavior-rating scales provide efficient methods for obtaining teacher and parent reports of student behavioral and emotional problems (McConaughy & Ritter, 1995). Behavior rating scales are some of the most effective and efficient methods to identify a student's behavioral strengths and weakness, validate initial concerns for a referral source, estimate severity of specific behaviors, and assess atypical behavioral patterns (Knoff, 1995). Behavior-rating scales are among the most common assessment methods used by school psychologists, with over 75% of school psychologists reporting inclusion of either parent or teacher scales in the majority of recent referral cases (Shapiro & Heick, 2004). Therefore, by utilizing a psychometrically sound behavior-rating scale, a school psychologist may recommend treatments that may help improve student functioning in the classroom environment and society.

### **The Behavior Assessment System for Children-Third Edition Teacher Rating Form**

The Behavior Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) was the original edition of the BASC and was created in 1992 (the most current version is the third edition of the BASC). The original BASC was a comprehensive behavior-rating system that was developed in response to the need for a diversified psychometrically sound rating system that could be used by a variety of professionals in school, clinic, or hospital settings for children and adolescents. The BASC was normed on children ages 4-18 and included specific scales for preschool (ages 4 and 5), school aged children (ages 6-11) and adolescents (ages 12-18). The BASC included a teacher rating scale, parent-rating scale, self-report of personality, structured observation, and developmental history. The BASC was designed to make differential diagnosis and educational classification of a variety of emotional behavioral disorder of children and

aid in the design of treatment (Reynolds & Kamphaus, 1992).

During the BASC development, teachers and students were surveyed about negative and positive behaviors they observed in their classroom. These responses helped create the original BASC items resulting in items that were relevant and easy for raters to answer (Reynolds & Kamphaus, 2015).

The Behavior Assessment System for Children Second Edition (BASC-2; Reynold & Kamphaus, 2004) was a revision of the Behavior Assessment System for Children (BASC). The BASC-2 was an integrated assessment system that used a variety of methods to gather information about a child. The BASC-2 was a multimethod, multidimensional system used to evaluate the behavior and self-perception of children and young adults aged 2-25 years. The BASC-2 was “multimethod” in that it included five components: two rating scales (Teacher Rating Scale, [TRS] and Parent Rating Scale [PRS]), a self-report scale (Self-Report of Personality [SRP]), a structured Developmental History (SDH) Form, and a form for recording and classifying directly observed classroom behavior (Student Observation System [SOS]). Each component could be used individually or in whatever combination was best suited to the situation at hand.

The BASC-2 was designed to facilitate the differential diagnosis and educational classification of a variety of emotional and behavioral disorders of children and adolescents and to help develop treatment plans. The primary objective in developing the BASC-2 was to make improvements that had been suggested by user feedback and research evidence gathered on the original BASC.

The standardization of the BASC-2 Teacher Rating Scale (TRS), Parent Rating

scale's (PRS), and self-Report of Personality (SRP) took place from August, 2002 through May, 2004 including a total of more than 13,000 TRS, PRS, and SRP cases from the ages of 2-18 years. The overall standardization sample came from over 375 sites in 257 cities and 40 states. In summary, the general norm sample closely reflected the 2001 U.S. population on variables including parental education, race/ethnicity, geographic region, and special-education classification.

The current version, Behavior Assessment System for Children-Third Edition (BASC-3, Reynolds & Kamphaus, 2015), continues to be a multimethod, multidimensional system used to evaluate the behavior and self-perceptions of children and young adult's ages 2 through 25 years. At the start of BASC-3 development, teachers and students were surveyed about negative and positive behaviors they observed in their classroom. These responses helped edit and modify BASC-2 items resulting in items that were relevant and easy for raters to answer. In addition to teachers and students, parents were also included in the survey in order to identify behaviors that might lead to new items. This resulted in 10 to 15 newly written items for the BASC-3 standardization forms (Reynolds & Kamphaus, 2015).

The BASC-3 system includes the following nine components: the Behavioral and Emotional Screening System (BESS), Teacher Rating Scales (TRS), Parent Rating Scales (PRS), Self-Report of Personality (SRP), Structured Development History (SDH), Student Observation System (SOS), Behavior Interpretation Guide, Flex Monitor, Parenting Relationship Questionnaire (PRQ), and the Behavioral and Emotional Skill Building Guide (Reynolds & Kamphaus, 2015). The primary components of the BASC-3 include the Teacher Rating Scales (TRS), the Parent Rating Scales (PRS), and the Self

Report Personality (SRP).

For the present thesis, the BASC-3 Teacher Rating Scale (TRS) was of primary focus and is a comprehensive measure of both adaptive and problem behaviors in the school setting designed to be used by teachers or others who fill a similar role. The TRS has three forms, with items targeting at three age levels: preschool (ages 2-5), child (ages 6-11), and adolescent (ages 12-21). The forms contain descriptors of behaviors that the respondent rates on a 4-point ordinal scale, from *Never* to *Almost Always*, based on what behavior the teacher has personally observed. The TRS takes approximately 10 to 15 minutes for teachers to complete.

The TRS purports to assess both broadband and narrowband behavioral and emotional domains as well as maladaptive and adaptive behaviors. The TRS contains 10 clinical scales (Aggression, Anxiety, Attention Problems, Atypicality, Conduct Problems, Depression, Hyperactivity, Learning Problems, Somatization, and Withdrawal), six adaptive scales (Activities of Daily Living, Adaptability, Functional Communication, Leadership, Social Skills, and Study Skills), and seven content scales (Anger Control, Bullying, Developmental Social Disorders, Emotional Self Control, Executive Functioning, Negative Emotionality, and Resiliency). The TRS standardization allows the examiner the option to compare rating results to General, Gender Specific, and/or Clinical norms.

The standardization of the BASC-3 TRS took place from April 2013 through November 2014. A total of more than 9,000 forms from 311 examiners in 44 states were collected as part of the BASC-3 standardization project. The clinical norm sample is composed of children ages 4 through 18 identified with a diagnosis or classification of

one or more emotional or behavioral problems. Participants were selected who met the specified inclusion criteria of the standardization samples. The BASC-3 TRS sample stated that one teacher completed one BASC-3 TRS form per student, with a maximum of up to 10 students (Reynolds & Kamphaus, 2015).

The BASC-3 TRS includes two options of scoring: scoring by hand or using Q-Global, a secure web-based platform that provides scoring and reporting. BASC-3 TRS form can be scored by hand using an additional hand scoring worksheet. On the hand scoring worksheet raw scores are added and then converted into *T* scores with a mean of 50 and a standard deviation of 10.

The validity of TRS results may be compromised for a variety of reasons, including positive and negative response sets, intentional dishonesty, emotional difficulties, teacher stress, or the inadequate familiarity of the respondent with the child being evaluated. However, when evaluating the TRS it remains important to apply available methods of detecting invalid results.

Psychometric support for the BASC was reported by studies within the BASC, BASC-2, and BASC-3 manuals (Reynolds & Kamphaus, 1992; Reynolds & Kamphaus, 2004; Reynolds & Kamphaus, 2015). Independent studies on the reliability (Distefano, Kamphaus, & Mindrila, 2010), validity (Flanagan, Alfonso, Primavera, Povall, & Higgins, 1996), and diagnostic utility (Hass, Brown, Brady, & Johnson, 2012) will be further examined in detail in the literature review section. In addition, it is important to note the BASC factor analysis. “Exploratory factor analysis (EFA) is a multivariate statistical method that has become a fundamental tool in the development and validation of psychological theories and measurements” (Watkins, 2018 p. 219). Exploratory factor

analysis identifies the common factors that explain the order and structure among measured variables. Although, exploratory factor analysis is not compared in this study, it is important to touch on BASC-3 factor structure as it is relevant to the individual scales and important when looking at test comparisons. The factor structure analyses reported for the BASC-3 (Reynolds & Kamphaus, 2015) is poor and lacks important detail (also problematic in the BASC and BASC-2). The BASC-3 included orthogonal rotations, which creates an illusion of uncorrelated factor structure but an unlikely and unsupported proposition. The BASC-3 also fails to adequately report item factor analyses, which also poses significant questions of the integrity of the scale. Another teacher report behavior-rating scale is the Adjustment Scales for Children and Adolescents (ASCA; McDermott, Marston, & Stott, 1993). This scale was used for comparison to the BASC-3 TRS, which was the purpose of this thesis.

### **Adjustment Scale for Children and Adolescents (ASCA)**

The Adjustment Scales for Children and Adolescents (ASCA; McDermott, Marston, & Stott, 1993) is a nationally normed behavior-rating instrument completed by the child's classroom teacher to indicate the presence or absence of problem behaviors related to child psychopathology. The ASCA was developed due to the lack of psychometrically sound objective behavior-rating scales that measured youth psychopathology with nationally representative norms. Previous rating scales lacked standardization procedures leading to poor reliability and validity. Unlike other scales, the ASCA is relatively short, specific, and inexpensive. Rather than including frequency or intensity ratings of behaviors, the ASCA includes items that require a teacher to choose from observable symptomatic or normal behaviors within specific school contexts

across multiple situations, which generalize across age, gender, and ethnicity. The ASCA differs from other behavior-rating scales (i.e., the BASC) as most present lists of problem behaviors or symptoms and then infer pathology based on reported estimated frequency of symptoms. The ASCA also provides the teacher with 26 behaviors that are positive so teachers are not simply presented with a problem behavior list (McDermott, 1994).

The ASCA consists of 156 behavioral descriptions of which 97 are scored and each assigned to only one of six core syndromes: Attention- Deficit Hyperactive (ADH), Solitary-Aggressive Provocative (SAP), Solitary-Aggressive Impulsive (SAI), Oppositional Defiant (OpD), Diffident (DIF), and Avoidant (AVO); or two supplementary syndromes: Delinquent (DEL) and Lethargic/Hypoactive (LEH). Factor analyses also show that the Attention-Deficit Hyperactive, Solitary-Aggressive Provocative, Solitary-Aggressive Impulsive, and Oppositional Defiant syndromes load on a common factor named Overactivity; while the Diffident and Avoidant syndromes load on a common factor named Underactivity. Overactivity and Underactivity are uncorrelated (orthogonal; McDermott, 1994). It was hypothesized that in comparison the composite scores of the BASC-3 and the ASCA should have convergent and discriminant validity.

Administration of the ASCA is straight forward as a teacher who is familiar with the behavior of the target youth completes the ASCA rating form. There are two versions of the ASCA provided (Male and Female), although, the versions present identical behaviors and situations but differ in the use of gender referents ("he," "him" vs. "she," "her," etc.). The ASCA rating form takes roughly 10-20 minutes to complete. Scoring of the ASCA and interpretation should be conducted by a trained psychologist. The ASCA

includes a self-scoring template printed on the reverse side of the rating form for easy and quick scoring. Raw scores are then converted to normalized *T* scores with a mean of 50 and a standard deviation of 10. Interpretation of the ASCA is based on cut-score, syndromic profile, and discriminant classification methods.

The ASCA was nationally normed and standardized on a random representative sample of 1,400 youths aged 5-17 (K-12) based on the 1988-90 U.S. census and 1989 U.S. Department of Education special education registry for demographic variables of age, gender, race/ethnicity, parent education, family structure, nation region, community size, and handicapping condition. The standardization sample excluded only those severely handicapped who did not attend common public or private schools. The sample consisted of 700 boys and 700 girls with an average of 108 students at each age level. All percentages of these subcategories closely resembled prevalence in the general population (McDermott, 1994). An additional 1,418 youths were included in the nationwide sample (total  $N = 2,818$ ) from co-norming with the Differential Abilities Scale (DAS; Elliott, 1990) and the Learning Behaviors Scale (LBS; McDermott, Green, Francis, & Stott, 1999).

Psychometric support for the ASCA is presented with studies in the manual (McDermott, 1994) and in various studies in peer-reviewed literature. Reliability (McDermott, 1996; McDermott & Schaefer, 1996; McDermott & Spencer, 1997; Canivez & Watkins, 1997; Canivez & Watkins, 2002), validity (Canivez & Sprouls, 2005), and diagnostic utility (McDermott, 2005 p. 14; McDermott, Watkins, Sichel, Weber, Keenan, Holland, & Leigh, 1995; McDermott & Weiss, 1995) studies will be further reviewed in the literature review section. In addition, and previously noted it is important to discuss

the factor analysis of the ASCA. The ASCA (McDermott, 1994) factor structure is well documented and supports the measurement of unique scales with an uncorrelated two-factor second-order structure. Unlike the BASC, the ASCA contains much higher subscale specificity indicating appreciable true score variance unique to the scales allowing separate interpretation. Factor analyses show that the Attention-Deficit Hyperactive, Solitary-Aggressive (Provocative), Solitary-Aggressive (Impulsive), and Oppositional Defiant syndromes load on a common factor named Overactivity; while the Diffident and Avoidant syndromes load on a common factor named Underactivity. This structure is similar to the Externalizing and Internalizing dimensions commonly found in youth psychopathology literature, but the ASCA uniquely has uncorrelated Overactivity and Underactivity scales. While structurally similar the ASCA Underactivity scale is not an “internalizing” scale as the ASCA intentionally does not measure internalizing problems.

Canivez (2004) found that the intercorrelations among the ASCA core syndromes were lower than what is typically seen in teacher report measures of child psychopathology, indicating greater independence and interpretability of the syndromes. This strength indicates that the ASCA core and supplementary syndromes measure unique variability beyond the common factors and error variance; unlike the BASC where there is substantial clinical scale covariance, which prevents interpretation of the individual scales.

Additionally, Canivez and Sprouls (2010) and Canivez and Beran (2009) replicated the ASCA factor structure with Hispanic and Canadian samples, respectively. Canivez and Bohan (2006) and Canivez (2006) replicated the ASCA factor structure with

two different Native American Indian tribal samples (Yarapai Apache and Ojibwe).

These studies support the uncorrelated two-factor structure of the ASCA core syndromes and the factorial independence of the Overactivity and Underactivity syndromes.

Canivez and Beran (2009) observed that the correlation between the Overactivity and Underactivity syndromes was .00 in a sample of Canadian youths. Consistent with the previous ASCA exploratory factor analysis studies, Canivez and Sprouls (2010) noted that the correlation between the Overactivity and Underactivity global syndromes *T* scores was .06, which indicated independence of the global scales based on the standardized *T* scores obtained from the ASCA norms.

### **BASC/ASCA Similarities**

Some BASC subscales and composites are fairly similar to the ASCA core syndromes and global scales in their nature and descriptions according to their respective manuals. The BASC-3 has raters estimate frequency of behaviors using a 4-point ordinal scale (Never, Sometimes, Often, Almost Always); while the ASCA has behaviors endorsed within specific contexts so items are dichotomously scored. Table 1 shows the specific scale similarities of the BASC- 3 TRS-C and ASCA. These scales serve as comparisons for convergent validity. Other dissimilar scales will serve for discriminant and divergent validity comparisons.

Table 1  
*Similar Subscales and Composites of the BASC-TRS and ASCA*

BASC-TRS	ASCA
Subscales	
Attention Problems	Attention-Deficit Hyperactivity
Hyperactivity	Attention-Deficit Hyperactivity
Withdrawal	Avoidant
Conduct Problems	Delinquent
Conduct Problems	Oppositional Defiant
Aggression	Solitary Aggressive-Provocative
Aggression	Solitary Aggressive- Impulsive
Composite Scores	
Externalizing Problems	Overactivity
Internalizing Problems	Underactivity

Note. BASC-TRS = Behavior Assessment System for Children-Teacher Rating Scale; ASCA = Adjustment Scales for Children and Adolescents

### Review of the Literature

Within this literature review, results are presented considering effect sizes using Cohen's effect size descriptions. Effect size is a way of judging the magnitude of relationships (correlations). The terms small, medium, and large are used to provide a rule of thumb for interpreting the effect size where Cohen (1988) suggested  $r = |.10-.29|$  represents a small effect size,  $r = |.30-.49|$  represents a medium effect size, and  $r = > |.50|$  represents a large effect size (Cohen, 1988). Thus,  $r < |.10|$  might represent a 'trivial' effect size.

### Behavior Assessment System for Children

#### Construct validity: convergent and discriminant studies.

**BASC Manual.** Initial research comparing the BASC with other behavior-rating scales was reported in the BASC Manual (Reynold & Kamphaus, 1992). The BASC-TRS was compared with the Child Behavior Checklist Teacher Report Form (CBCL-TRF; Achenbach 1991), the Revised Behavior Problem Checklist (RBPC; Quay & Peterson, 1983), Conner's Teacher Rating Scales (CTRS, Conners 1989), Burk's Behavior Rating

Scales (BBRS; Burks, 1977), and the Behavior Rating Profile Teacher Rating Scale (BRP-TRS; Brown & Hammill, 1983).

*Child Behavior Checklist Teacher Report (CBCL-TRF)*. The BASC-TRS and the Teachers Report Form (TRF; Achenbach, 1991) were completed for 50 children, aged 6 through 11, and 38 adolescents, aged 12 through 18 in a typical school setting. Mean BASC scores indicated that the TRS sample for ages 6-11 were slightly above average in Externalizing Problems ( $M = 53.7$ ) and School Problems ( $M = 55.8$ ) and below average in Adaptive Skills ( $M = 44$ ).

Reynolds and Kamphaus (1992) reported in the BASC Manual that the CBCL-TRF externalizing behavior subscales were highly correlated with the BASC-TRS externalizing problems subscales. The BASC Manual also reported that internalizing behavior subscales within the CBCL-TRF and the BASC-TRS were also highly correlated. Similar subscales of each instrument were highly correlated. For example, the BASC-TRS-C Aggression subscale correlated .86 with the CBCL-TRF-C Aggressive Behavior subscale, and correlations of .84 between the BASC-TRS-C Atypicality and the CBCL-TRF-C Thought Problems subscale and .81 between the respective Attention Problems subscales were reported. Correlations of .89 between the BASC-TRS-A Aggression subscale and the CBCL-TRF-A Aggressive Behavior subscale, .93 between the BASC-TRS-A Conduct Problems subscale and the CBCL-TRF-A Delinquent Behavior subscale, and .88 between the respective Attention Problems subscales were reported. Correlations of .88 between the BASC-TRS and CBCL-TRF Externalizing Problems composite scores and .73 between the respective Internalizing Problems

composite scores were reported. Both tests demonstrated a high degree of similarity between the constructs measured by the BASC-TRS and the CBCL-TRF.

**Revised Behavior Problem Checklist Teacher Report Scales (RBPC-TRS).** The BASC-TRS and the Revised Behavior Problem Checklist Teacher Report (RBPS-TRS; Quay & Peterson, 1983) were completed by teachers of 43 adolescents. Correlations between the BASC-TRS and the RBPC-TRS were large for scales that measured more observable (externalizing) behaviors but low to moderate for less observable (internalizing) behaviors. A correlation of .76 was obtained between the BASC-TRS Aggression subscale and the RBPC-TRS Conduct Disorder subscale and a correlation of .78 was reported between the TRS Attention Problems subscale and the RBPC Attention Problems-Immaturity subscale. For less observable (internalizing) behaviors, the highest correlation was .58 between the BASC-TRS Withdrawal subscale and the RBPC Anxiety-Withdrawal (Reynolds & Kamphaus, 1992). A correlation of .03 between the BASC-TRS Withdrawal subscale and the RBPC Socialized Aggression subscale produced divergent validity as they measure different constructs and should thus have low to near zero correlation.

**Conners Teacher Rating Scale (CTRS).** The BASC-TRS and the Conners Teacher Rating Scales (CTRS; Conners, 1989) were completed for 91 children ages 4 and 5. Given the many subscales, some measure different constructs but some are similar and should present convergent validity through moderate to high correlations. The highest correlation was produced between the internalizing scales. The BASC-TRS Depression subscale and the CTRS Emotional Overindulgent subscale produced a correlation of .69. The BASC TRS Depression scales and both CTRS Hyperactivity subscales produced

correlations of  $r = .58$  (TRS-P) and  $r = .55$  (TRS-C), respectively. The BASC-TRS Aggression scale correlated highly with the CTRS Conduct Problems scale ( $r = .63$ ), demonstrating convergent validity. Although there was overlap among similar scales from the BASC-TRS and the CTRS, the instruments are different measures with several nonparallel scales (Reynolds & Kamphaus, 1992).

***Burk's Behavior Rating Scales (BBRS).*** The BASC-TRS and Burk's Behavior Rating Scales (BBRS; Burks, 1977) were completed for 27 children from regular education classes. Correlations between the BASC-TRS scales with BBRS scales that were most similar in content had very high correlations, many exceeding .80, supporting convergent validity. Correlations of .92 were reported between the BASC-TRS Aggression subscale and the BBRS Excessive Aggressiveness subscale; .85 between the BASC-TRS Anxiety and the BBRS Excessive Anxiety subscale; .85 between the BASC-TRS Depression subscale and the BBRS Excessive Self-Blame subscale; .86 between BASC-TRS Attention Problems subscale and the BBRS Poor Attention subscale; .93 between the BASC-TRS Learning Problems subscale and the BBRS Poor Academics subscale; and .81 between the BASC-TRS Withdrawal subscale and the BBRS Excessive Withdrawal subscale. In addition, there were correlations, supporting divergent validity, between scales whose content similarity were less related. A correlation of .04 between the BASC-TRS-C Hyperactivity and the BBRS Excessive Anxiety subscale represented divergent validity. Another divergent correlation included .01 between the BASC-TRS-C Somatization and the BBRS Poor Coordination (Reynolds & Kamphaus, 1992).

***Behavior Rating Profile Teacher Rating Scale (BRP).*** The BASC-TRS-C and the Teacher Rating Scale of the Behavior Rating Profile (BRP; Brown & Hammill, 1983)

were completed for a sample of 37 children in regular education classes. The BRP yields a single standard score that reflects the absence of a variety of behavior problems; therefore, it correlated negatively with the BASC-TRS clinical scales and positively with the adaptive scales. The BASC-TRS Behavioral Symptoms Index produced a correlation of  $-.60$  with the BRP, as did the Learning Problems subscale for the TRS. The BASC-TRS School Problems composite produced a correlation of  $-.59$  with the BRP. All other correlations between the BRP and BASC-TRS were below  $-.50$  and all correlations of adaptive behavior scales of the BASC-TRS and BRP were below  $.41$ . (Reynolds, & Kamphaus, 1992).

#### **BASC independent studies.**

Flanagan, Alfonso, Primavera, Povall, and Higgins (1996) investigated convergent validity between the Social Skills Rating System (SSRS; Gresham & Elliot, 1990) and the BASC. Participants in the sample were 53 minority kindergarten students from a large urban area. Each child was rated on the BASC-TRS and the SSRS-TRS. A moderate correlation ( $r = .44$ ;  $p < .001$ ) was observed between the TRS Adaptability subscale and the SSRS Social Skills scale. Correlations between the TRS Hyperactivity, Aggression, and Externalizing problems and the SSRS Problem Behavior scale ranged from  $.50$  to  $.60$  ( $p < .001$ ). The correlation between the BASC-TRS Social Skills scale and the SSRS was  $.23$  ( $p > .05$ ). A small degree of similarity was present between the TRS and SSRS teacher form, according to Cohen's criteria for effect sizes, yet this similarity was not statistically significant. Overall, the correlation between the TRS Social Skills scales and SSRS teacher form ( $r = .23$ ) was not statistically significant ( $p > .05$ ) and resulted in less than 5% shared variance. It was concluded that the underlying

constructs of the BASC-TRS Social Skills scales and SSRS teacher form were more dissimilar than they were alike. Furthermore, the BASC-TRS Social Skills scale should have produced a much higher  $r$  than .23 indicating a lack of convergent validity with the BASC-TRS.

Vaughn, Riccio, Hynd, and Hall (1997) examined the validity of the BASC in comparison to the Child Behavior Checklist (CBCL; Achenbach, 1991) Parent and Teacher Rating Scales. The BASC and the CBCL behavior rating scale were used to discriminate Attention Deficit Hyperactivity Disorder (ADHD) subtypes. Participants for this study were children who were referred to a university-based child neuropsychology clinic for cognitive, academic, and/or behavioral concerns. All of the children were classified as ADHD with cognitive abilities within the average range. There were 73 children in the study who ranged in age from 6.7 to 11.9 years. Children with intelligence scores below 70, epilepsy, closed head injury, or other neurological disorders were excluded from this study. Parents and teachers were asked to complete the respective forms of the BASC and the CBCL. Comparisons of the TRS and CBCL indicated significant correlations on similarly labeled factors. A correlation of .73 was obtained between the BASC-TRS Inattention subscale and the CBCL Attention Problems subscale. A correlation of .69 was obtained between the BASC-TRS Anxiety subscale and the CBCL Anxiety-Depression subscale. A correlation of .90 was obtained between the BASC-TRS Aggression subscale and the CBCL Aggression subscale.

**Behavior Assessment System for Children - Second Edition****Construct validity: convergent and divergent validity studies.**

*BASC-2 Manual.* Reynold and Kamphaus reported in the BASC-2 Manual that several studies were conducted in which the TRS and another behavior rating scale were completed by the same teacher at about the same time. The correlations between scores on the two instruments indicated the degree to which they measured the same behavioral dimensions (Reynold & Kamphaus, 2004). The BASC-2 TRS was compared to the Achenbach System of Empirically Based Assessment Caregiver-Teacher Report Form (ASEBA; Achenbach & Rescorla, 2000), and the Conners' Teacher Rating Scale-Revised (CTRS-R; Conners, 1997).

*Achenbach System of Empirically Based Assessment Caregiver-Teacher Report Form (ASEBA).* The BASC-2 TRS and the Achenbach System of Empirically Based Assessment (ASEBA) Caregiver-Teacher Report Form for ages 1.5 – 5 (ASEBA; Achenbach & Rescorla, 2000) were completed for 46 children (of unspecified characteristics) ages 2 through 5 years. The BASC-2 TRS and the ASEBA Teacher's Report Form for ages 6-18 (ASEBA; Achenbach & Rescorla, 2001) also were completed for 57 children (of unspecified characteristic) ages 6 through 11 years and 39 adolescents ages 12 through 18 years.

A composite score correlation of .85 was obtained between the BASC-2 TRS-P Externalizing Problems and the ASEBA Externalizing Problems. A correlation of .72 was obtained between the BASC-2 TRS-P Internalizing Problems and the ASEBA Internalizing Problems (Reynold & Kamphaus, 2004).

BASC-2 TRS and ASEBA composites and scales that purported to measure the same construct tended to correlate highly. Correlations between similar clinical scale scores ranged from .78 to .81, including a correlation of .80 obtained between the BASC-2 TRS-C Hyperactivity subscale and the ASEBA Hyperactivity/Impulsivity subscale. For composite scores, a correlation of .75 was obtained between the BASC-2 TRS-C Externalizing Problems and the ASEBA Externalizing Problems and a correlation of .80 was obtained between both Internalizing Problems scales (Reynold & Kamphaus, 2004).

A correlation of .83 was obtained between the BASC-2 TRS-A Hyperactivity and the ASEBA Hyperactivity/Impulsivity subscales. For composite scores, a correlation of .76 was obtained between the BASC-2 TRS-A Externalizing Problems and the ASEBA Externalizing Problems and a correlation of .64 was obtained between both Internalizing Problems subscales (Reynold & Kamphaus, 2004).

Divergent/discriminant correlations obtained between the BASC-2 TRS and the ASEBA included a correlation of .12 between the BASC-2 TRS-C Hyperactivity subscale and the ASEBA Withdrawn/Depressed subscale. A correlation of .09 between the BASC-2 TRS-A Hyperactivity subscale and the ASEBA Withdrawn/Depressed subscale was reported. Another divergent/discriminant correlation was a correlation of .05 between the BASC-2 TRS-P Attention Problems subscale and the ASEBA Somatic Complaints subscale. Similarly, a correlation of .05 was obtained between the BASC-2 TRS-C Attention Problems subscale and the ASEBA Somatic Complaints subscale and a correlation of .02 was obtained between the BASC-2 TRS-A Attention Problems subscale and the ASEBA Somatic Complaints subscale (Reynold & Kamphaus, 2004).

*Conners' Teacher Rating Scale-Revised (CTRS)*. The BASC 2-TRS was completed along with the Conners Teacher- Rating Scales (CTRS; Conners, 1997) for 59 children ages 6 through 11 years, and 45 adolescents ages 12 through 18 years. Correlations between scales that measured similar constructs were generally higher in the child sample than in the adolescent sample and most scales were moderately to highly correlated. A correlation of .81 was obtained between the BASC-2 TRS-C Hyperactivity subscale and the CTRS Hyperactivity subscale and a correlation of .81 was obtained between the BASC-2 TRS-C Attention Problems subscale and the CTRS Cognitive Problems/Inattention subscale. A correlation of .68 was obtained between the BASC-2 TRS-A Attention Problem subscale and the Conners' Cognitive Problems/Inattention subscale (Reynold & Kamphaus, 2004).

An exception to the moderately/high correlations were the correlations between the BASC-2 TRS Anxiety Scale and the Conner's Anxious-Shy scale, which were .35 for the child sample and .26 for the adolescent sample. Reynolds and Kamphaus (2004) stated this was because the BASC-2 Anxiety Scale centered on general nervousness, fear, and worry; whereas the Conners' Anxious-shy scale focused on emotionality, withdrawal, and timidity.

### **BASC-2 independent studies.**

*Typology of child behavior.* DiStefano, Kamphaus, and Mindrila (2010) assessed the typology of child behavior using the Behavioral Assessment System for Children 2<sup>nd</sup> edition, Teacher Rating Scale (BASC-2 TRS). The typology was compared with the solution identified with the 1992 BASC TRS-Child norm database. Cluster analysis was used to identify groups of children underlying the BASC-2 TRS-C norming dataset. The

goal was to determine similarities and differences of behavioral groups underlying the U.S. population of school-aged children compared with the solution from the original BASC norm sample. Findings suggested that there were similarities between the BASC and BASC-2 seven cluster solutions. The 15 BASC-2 TRS-C clinical and adaptive scales were used but only 7 clusters were identified. Five of the seven clusters (adapted, average, disruptive behavior problems, academic problems, and worry/physical complaints) were similar to the profiles obtained in the original BASC. However, the externalizing and internalizing problem clusters were not identified with the original BASC. Children in the disruptive behavior problems increased by 4% in the BASC-2 sample. Overall, Distefano et al. (2010) suggested that more children may experience emotional and behavioral problems than the original typology.

***BASC-2 TRS diagnostic studies.*** Hass, Brown, Brady, and Johnson (2012) examined the utility of the BASC-2 TRS for the assessment of higher functioning children with an educational diagnosis of autism. This study addressed the question of “which domains of the BASC-2 TRS are most effective in discriminating students diagnosed with higher functioning autism” (Hass et al., 2012, p. 173). In this study, 67 teachers completed the BASC-2 TRS on 60 students identified with a diagnosis of autism. Of the 67 teachers, 26 returned protocols. These school personnel were familiar with the students and completed the BASC-2 TRS on 30 students who received special education services under the category of autism and 28 students were in the control group (typically developing). These protocols were scored using the BASC-2 ASSIST scoring software (Pearson, 2004). Results of the protocols suggested that the BASC-2 TRS discriminated students with a diagnosis of autism and their nondisabled peers. The two

samples differed significantly on almost all of the BASC-2 TRS clinical, content, and adaptive scales by examining the mean scores of each group. A stepwise discriminant function analysis was used to determine the extent to which the BASC-TRS scales collectively discriminated students with and without autism (control students). Hass et al. (2015) chose to use a stepwise discriminant function analysis because the BASC-3 does not report *a priori* order of scales indicating that a forward entry could not be carried out. Results of the discriminant function analyses indicated that for both the child and adolescent forms that the BASC-2 TRS scales significantly discriminated students with and without autism (control students). However, no follow up diagnostic utility statistics (Kessel & Zimmerman, 1993) were reported in this study indicating that this study inadequately demonstrated diagnostic utility of the BASC-3 TRS.

### **Behavior Assessment System for Children-Third Edition**

#### **Convergent and divergent validity studies.**

*BASC-3 Manual.* Reynolds and Kamphaus (2015) stated that several studies were conducted in which the same teacher, at about the same time, completed the BASC-3 TRS and another behavior-rating scale. Research comparing the BASC-3 TRS with other behavior rating scales was reported in the BASC-3 Manual (Reynolds & Kamphaus, 2015). The BASC-3 TRS was compared with the BASC-2, the Achenbach System of Empirically Based Assessment Caregiver-Teacher Report Form (ASEBA; Achenbach & Rescorla, 2000), the Conner's 3 Teacher Form (Conners 3<sup>rd</sup> Edition; Conners 2008), the Autism Spectrum Rating Scales Teacher Forms (ASRS; Goldstein & Naglieri, 2010), the Childhood Autism Rating Scale, Second Edition (CARS-2; Schopler & Van

Bourgondien, 2010), and the Delis Rating of Executive Functions Teacher Rating Form (D-REF; Delis, 2012).

*Achenbach System of Empirically Based Assessment Caregiver-Teacher Report Form (ASEBA)*. The BASC-3 Teacher Rating Scale Preschool (BASC-3 TRS-P) and the ASEBRA teacher report form for ages 1.5-5 were completed for 90 children ages 2 through 5 years. The TRS-P and the ASEBA teacher's report form for ages 6-18 also were completed for 45 children ages 6 through 11 years (TRS-C) and for 70 adolescents ages 12 through 18 years (TRS-A). Scales measuring externalizing behaviors typically produced higher correlations than did scales measuring internalizing behaviors, a finding consistent across the BASC editions. Composite scale and clinical scale correlations between corresponding BASC-3 TRS and ASEBA scales that measured similar constructs indicated convergent validity was moderate to high (Reynolds & Kamphaus, 2015).

Among the clinical scales, a correlation of .78 was obtained between the BASC-3 TRS-P Aggression subscale and the ASEBA Aggressive Behavior subscale and a correlation of .65 was obtained between the BASC-3 TRS-P Depression subscale and the ASEBA Anxious/Depressed subscale. A correlation of .61 was obtained between the BASC-3 TRS Attention Problems subscale and the ASEBA Attention Problems subscale. Composite scale comparisons included a correlation of .76 between the TRS-P and ASEBA Externalizing Problem subscales and a correlation of .57 between the TRS-P and the ASEBA Internalizing Problem subscales. A divergent validity correlation of .08 was obtained between the BASC-3 TRS Somatization subscale and the ASEBA Attention Problems subscale (Reynolds & Kamphaus, 2015).

For the BASC-TRS-C clinical scale comparisons, a correlation of .91 was obtained between the BASC-3 TRS-C Aggression subscale and the ASEBA Aggressive Behavior subscale, a correlation of .93 was obtained between the BASC-3 TRS-C and the ASEBA Hyperactivity subscale, and a correlation of .78 was obtained between the BASC-TRS-C Depression subscale and the ASEB Withdrawn/Depressed subscale. Composite scale score comparisons produced a correlation of .70 between the TRS-C and ASEBA Externalizing Problem subscales and a correlation of .57 between the TRS-C and the ASEBA Internalizing Problem subscales. A divergent validity correlation of -.14 was obtained between the BASC-3 TRS Somatization subscale and the ASEBA Attention Problems Total subscale (Reynolds & Kamphaus, 2015).

For the BASC-3 TRS-A clinical scale comparisons, a correlation of .78 was obtained between the BASC-3 TRS-A Aggression subscale and the ASEBA Aggressive Behavior subscale, a correlation of .74 was obtained between the BASC-3 TRS-A Hyperactivity subscale and the ASEBA Hyperactivity/Impulsivity subscale, and a correlation of .63 was obtained between the BASC-3 TRS-A Depression subscale and the ASEBA Withdrawn/Depressed subscale. Composite scale score comparisons produced correlations of .75 between the TRS-A and the ASEBA Externalizing Problem subscales and a correlation of .72 between the TRS-A and the ASEBA Internalizing Problem subscales. A divergent correlation of .16 was obtained between the BASC-3 TRS Somatization subscale and the ASEBA Attention Problems Total subscale (Reynolds & Kamphaus, 2015).

***Conners' 3 Teacher Form.*** The BASC-3 TRS-C and TRS-A forms were completed along with the teacher form of the Conners third edition Teacher Form

(Conners-3; Conners, 2008) for 65 children ages 6-11 years, and for 44 adolescents ages 12-18 years. Correlations between the BASC-3 TRS and Conner's-3 teacher form scale scores that measure similar constructs were generally high across both BASC-3 TRS levels; the adolescent level correlations were somewhat higher than the child level across several scales. The BASC-3 content scales and clinical indices correlated moderately to highly across a number of similar Conners scales (Reynolds & Kamphaus, 2015).

Correlations obtained were .70 between the BASC-3 TRS-C Hyperactivity subscale and the Conners-3 Hyperactivity/Impulsivity subscale, .80 between the BASC-3 TRS-C Learning Problem Subscale and the Conners-3 Learning Problem subscale, .82 between the BASC-3 TRS-C Aggression subscale and the Conners-3 Aggression subscale, and .80 between the BASC-3 TRS-C Negative Emotionality content subscale and the Conners-3 Oppositional Defiant Disorder subscale. Divergent/discriminant validity was supported by correlations of .05 between the BASC-3 TRS-C Somatization subscale and the Conners Peer Relations subscale and .24 between the BASC-3 TRS-C Withdrawal subscale and the Conners ADHD Impulsive subscale (Reynolds & Kamphaus, 2015).

Convergent validity was supported by correlations of .87 between the BASC-3 TRS-A Hyperactivity subscale and the Conners-3 Hyperactivity/Impulsivity subscale, .79 between the BASC-3 TRS-A Learning Problems and the Conners-3 Learning Problems subscales, .89 between the BASC-3 TRS-A Aggression subscale and the Conners-3 Aggression subscale, and .90 between BASC-3 TRS-A Anger Control content subscale and Conners-3 ADHD Impulsive subscale. Divergent/discriminant validity was supported by correlations of .30 between the BASC-3 TRS-A Somatization subscale and the

Conners-3 Peer Relations subscale and .20 between the BASC-3 TRS-A Withdrawal subscale and the Conners-3 ADHD Impulsive subscale (Reynolds & Kamphaus, 2015).

*Autism Spectrum Rating Scales Teacher Forms (ASRS).* The Autism Spectrum Rating Scales Teacher Forms (ASRS; Goldstein, & Naglieri, 2010) were completed along with the BASC-3 TRS-P for 92 children (of unspecified characteristics) ages 2-5 years and the TRS-C for 52 children (of unspecified characteristics) ages 6-11 years.

Correlations between similar BASC-3 TRS and ASRS scales were moderate (Reynolds & Kamphaus, 2015).

A correlation of .61 was obtained between the BASC-3 TRS-P Developmental Social Disorders subscale and the ASRS Total score. A correlation of .45 was obtained between the BASC-3 TRS-P Atypicality subscale and the ASRS Unusual Behaviors subscale. Divergent/discriminant validity was supported by a correlation of .13 between the BASC-3 TRS-P Somatization subscale and the ASRS Social/Emotional Reciprocity subscale. Other discriminant validity comparisons included correlations of .13 between the BASC-3 TRS-P Anxiety subscale and the ASRS Peer socialization subscale and .06 between the BASC-3 TRS-P Somatization subscale and the ASRS Adult Socialization subscale (Reynolds & Kamphaus, 2015).

A correlation of .55 was obtained between the BASC-3 TRS-C Developmental Social Disorders subscale and the ASRS Total Score. A correlation of .41 was obtained between the BASC-3 TRS-C Atypicality subscale and the ASRS Unusual Behaviors subscale. Importantly, a correlation of .53 was obtained between the BASC-3 TRS-C Autism Probability Index and the ASRS DSM-IV-TR subscale. A divergent/discriminant validity correlation of .18 was obtained between the BASC-3 TRS-C Somatization

subscale and the ASRS Social/Emotional Reciprocity subscale. Other discriminant validity comparisons included correlations of .11 between the BASC-3 TRS-C Hyperactivity subscale and the ASRS Social/Communication subscale and .13 between the BASC-3 TRS-C Attention Problems subscale and the Peer Socialization subscale (Reynolds & Kamphaus, 2015).

*Childhood Autism Rating Scale, Second Edition (CARS-3).* The BASC-3 TRS-C and the Childhood Autism Rating Scale, Second Edition (CARS-2; Schopler & Van Bourgondien, 2010) High Functioning version form were completed for 30 children ages 6-11 years. The BASC-3 TRS-C scale mean scores indicated that these samples were average to slightly below average in their levels of problem behaviors ( $M = 48.4$ ,  $SD = 7.6$ ) and were slightly above average in adaptive skills ( $M = 54.2$ ,  $SD = 9.7$ ). Among the clinical scales, a correlation of .69 was obtained between the BASC-3 TRS-C Learning Problems subscale and the CARS-2 Total Score. Correlations of .64 were obtained between the BASC-3 TRS-C Functional Impairment Index subscale and the CARS-2 Total Score and .44 was obtained between the BASC-3 TRS-C Autism Probability Index subscale and the CARS-2 Total Score (Reynolds & Kamphaus, 2015).

*Delis Rating of Executive Functions Teacher Rating Form (D-REF).* The Delis Rating of Executive Functions Teacher Rating Form (D-REF; Delis, 2012) was completed along with the BASC-3 TRS-C for 46 children (of unspecified characteristics) ages 6-11 years and the TRS-A for 54 children (of unspecified characteristics) and adolescents ages 12-19 years. The mean BASC-3 TRS scores indicated that the samples were generally average in their levels of externalizing problem behaviors (TRS-C  $M =$

51.0;  $SD = 10.7$ ; TRS-A  $M = 48.6$ ;  $SD = 10.3$ ) and internalizing problems at the child level were also average ( $M = 53.0$ ;  $SD = 12.4$ ; Reynolds & Kamphaus, 2015).

For clinical scales, correlations obtained were .87 between the BASC-3 TRS-C Attention Problems subscale and the D-REF Attention/Working Memory Index subscale, .74 between the BASC-3 TRS-C Hyperactivity subscale and the D-REF Behavioral Functioning index subscale, and .78 between the BASC-3 TRS-C Aggression subscale and the D-REF Compliance/Anger Management Index subscale. For composite scales, correlations of .78 were obtained between the BASC-3 TRS-C Externalizing Problems and the D-REF Behavioral Functioning Index and .78 between the BASC-3 TRS-C External Problems and the D-REF Compliance/Anger Management subscales. A correlation of .57 was obtained between the BASC-3 TRS-C Internalizing Problems and the D-REF Emotional Functioning Index subscale. Divergent/discriminant validity evidence was supported by a correlation of .34 between the BASC-3 TRS-C Somatization subscale and the Attention/Working Memory Index subscale (Reynolds & Kamphaus, 2015).

Correlations of .92 were obtained between the BASC-3 TRS-A Attention Problems subscale and the D-REF Attention/Working Memory Index subscale, .81 between the BASC-3 TRS-A Hyperactivity subscale and the D-REF Behavioral Functioning index subscale, and .80 between the BASC-3 TRS-A Aggression subscale and the D-REF Compliance/Anger Management Index subscale. For composite scales, a correlation of .86 was obtained between the BASC-3 TRS-A Externalizing Problems and the D-REF Behavioral Functioning Index. A correlation of .67 was obtained between the BASC-3 TRS-A Internalizing Problems and the D-REF Emotional Functioning Index

subscale. A correlation of .73 was obtained between the BASC-3 TRS-C Behavioral Symptoms Index subscale and the D-REF Compliance/Anger Management index subscale. Divergent/discriminant validity was supported by a correlation of .38 between the BASC-3 TRS-A Somatization subscale and the Attention/Working Memory Index subscale (Reynolds & Kamphaus, 2015).

The BASC Manuals included preliminary validity evidence; however, there are currently no published independent studies examining the convergent and discriminant/divergent validity of the BASC-3. Independent convergent and discriminant/divergent validity research needs to be conducted to replicate findings reported in the BASC-3 to confirm the validity that is reported within the manuals and is the focus of this thesis.

### **Adjustment Scales for Children and Adolescents**

#### **Convergent and divergent validity studies.**

*ASCA Manual.* Previous research comparing the ASCA to other behavior rating instruments such as the Conner's Teacher Rating Scale (CTRS; Conner's, 1989) and the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) were presented in the ASCA Manual (McDermott, 1994).

*Conners Teacher Rating Scale (CTRS).* The convergent validity coefficients from the ASCA and the Conner's Teacher Rating Scale (CTRS, Trites et al, 1982) ranged from .42-.75 among similar subscales/syndromes. Higher correlations were found between the CTRS Hyperactivity and Conduct Problem factors and the ASCA Overactive scale (.78-.80). Near-zero or negative correlations between Underactive and Overactive syndromes were found when comparing the CTRS with the ASCA.

*Child Behavior Checklist (CBCL).* In comparison to the Child Behavior Checklist (CBCL; Achenbach & Edelbrock, 1983) the ASCA Overactivity syndromes (Attention-Deficit Hyperactivity, Solitary Aggressive- Proactive, Solitary Aggressive-Impulsive, Oppositional Defiant) correlated .42-.75 with the CBCL Externalizing syndromes (Delinquent behavior and Aggressive behavior domains) and the ASCA Underactivity syndromes (Diffident and Avoidant syndromes) correlated .44-.50 with the CBCL Internalizing syndromes (Withdrawn, Somatic Complaints, and Anxious/Depressed scales). Near-zero or negative correlations between Underactive and Overactive syndromes were found when comparing the CBCL with the ASCA.

**ASCA independent studies.**

*Base rates/population prevalence.* McDermott (1996) investigated the prevalence of distinct psychopathology syndromes across developmental levels and gender as they presented in most maladjusted youths. Psychopathology was measured in this study using the ASCA. Maladjustment was assessed in two ways. First, gender was held constant while adjustment was examined from a developmental perspective. Second, developmental levels were held constant while maladjustment was studied across gender. Results suggested that Attention-Deficit Hyperactive (ADH), Solitary Aggressive Impulsive (SAI), and Solitary Aggressive Provocative (SAP) syndromes occurred more frequently among younger children ages 5-11 and diminished as children age. Solitary Aggressive Provocative (SAP) and Solitary Aggressive Impulsive (SAI) were found more prevalent among boys. The Avoidant (AVO) syndrome was represented more by girls' ages 9-11 and 11-17 years. When compared to girls, boys were shown to dominate every syndrome except Diffident (DIF; McDermott, 1996).

McDermott and Schaefer (1996) analyzed ASCA standardization sample base rates for rank-order precedence and prevalence of problem behaviors. Base rates for certain problem behaviors may vary across gender and age, SES, and ethnicity. Prevalence was calculated for the 20 most common behaviors and the 20 most rare behaviors from each demographic subgroup and overall surface syndromes including Delinquent, Solitary Aggressive (Impulsive), Solitary Aggressive (Provocative), Oppositional Defiant, Lethargic (Hypoactive), Attention-Deficit Hyperactive, and Avoidant. Items endorsed by at least 50% of raters were positive behaviors. Items with fewer than 30% endorsement were problem behaviors. Significant behavioral differences were found between boys and girls. Boys tended to engage in more provocative behaviors including sexually offensive behaviors and mistreating weaker students. Boys also tended to dominate the most common behaviors like ADHD and refusal to speak. Girls were shown to dominate only in two areas, diffident behaviors and lack of participation. Behavior problems were greater among children whose parents were lower in educational completion and SES. Results of this study showed that precedence of problem behaviors remained fairly consistent across demographic variables. However, differential prevalence among gender and social class was apparent and consistent with developmental psychopathology research.

McDermott and Spencer (1997) investigated the population base rates of youth psychopathology across racial and social classes using the national sample of the ASCA and included children ages 5 through 17. Behavior pathology was measured by the ASCA (McDermott, 1994) and this study examined how to effectively diagnose and treat any youth and unique ethnic and social class distinctions needed to be acknowledged. Race

and ethnicity consisted of 4 mutually exclusive categories (White, African American, Hispanic, and other). Parent education served as the primary indicator of social class. Results indicated that most psychopathology was equally distributed across both ethnic background and social class; however, some differences were observed. One exception to this was the Diffident syndrome in which Hispanics tended to have greater representation when compared to African Americans. African American youths demonstrated higher prevalence of Impulsive Aggression and Oppositional Defiance. Increased Diffidence and less Oppositional Defiance and Solitary Aggressive Impulsive were more frequent among children from less educated families. Moreover, less aggression was found among White/Caucasian children whose parents did not have college education. As parents' education level increased, maladjustment decreased. Results suggested that the level of parent education did not result in a decrease in youth psychopathology to the degree for non-Whites as it did for Whites. However, results suggested that social class, as a sole predictor was not a good predictor of youth psychopathology.

*Distinct group differences.* Canivez and Sprouls (2005) examined the construct validity of the ASCA examining group differences and the ASCA's ability to discriminate individuals with ADHD from a random and matched control sample. A sample of 106 students ranging from grade 1 through 6 (53 met the DSM-IV criteria for ADHD and 53 were randomly selected and matched as a control group). Teachers in a southwest suburban school district were informed to refer for screening students demonstrating behavioral problems. Once referred the teachers (blind to ADHD status) were asked to complete the ASCA rating forms for both the referred student and a control student. Results of the distinct group differences analyses were as expected using a one-

way MANOVA for differences were conducted between the ADHD group and the control group. Six ASCA core syndromes served as the dependent variables and were statistically significant,  $p < .0001$ . Results also indicated that subsequent one-way univariate ANOVAs were statistically significant ( $p < .001$ ) for five of the six ASCA core syndromes including the Attention-Deficit Hyperactivity, Solitary Aggressive-Proactive, Solitary Aggressive-Impulsive, Oppositional Defiant, and Avoidant scales. Overall, students in the ADHD group obtained higher ASCA scores than students in the control group.

*Diagnostic utility.* McDermott et al. (1995) assessed the overall accuracy of the ASCA in detecting emotional disturbance. Participants included 150 nondisabled students and 150 students who were receiving special education services for social or emotional disturbances. All participants were age 5 through 17. All students in the disturbed and not disturbed groups were matched on age, gender, race, and grade level. Discriminant function analysis, cross-validation, validity generalization, and differential classification studies were conducted. Overall, sensitivity and specificity estimates suggested classification accuracy of approximately 80%. The ASCA was shown to have positive predictive power of 80.6% and negative predictive power of 78%. ASCA was superior to other measures when identifying children with SED and was equivalent to other measures when identifying children without SED. Overall, results suggested that the ASCA consistently and accurately detected emotional disturbances among individual children.

Canivez and Sprouls (2005) examined diagnostic utility following their examination of distinct group differences. The results indicated that the ASCA accurately differentiated those meeting DSM-IV criteria for ADHD from those in the control sample

with sensitivity of .98, specificity of .95, positive predictive power of .94, negative predictive power of .98, and an overall correct classification rate of .96. These results indicated that in classifying individuals with and without ADHD, the ASCA has very few false positive and false negative classifications.

McDermott and Weiss (1995) examined the subtypes of normal as well as abnormal behaviors using minimum variance three stage clustering procedure of the six ASCA core syndromes. Twenty-two clusters emerged with twelve adequate or marginal types of behavioral styles and 10 at-risk or maladjustment behavioral styles. There were 7 replication trials and 18 common profiles were found, creating a total of 19 profiles. *T* scores below 60 were associated with adequate adjustment, scores between 60-66 were associated with at risk classification, and scores 67 and higher were classified as maladjusted. In this study of the ASCA standardization sample, 78.6% of the children were adjusted, with 44.2% of that group being adequately adjusted, and 34.2% being marginally adjusted. Girls dominated Type 1 (Good Adjustment), Type 2 (Adequate Adjustment with Inhibition), Type 6 (Marginal Withdrawal), and Type 10 (Moodiness). Boys dominated 10 Behavioral profiles characterized by aggressiveness and excessive acting out. All other profile types were more evenly distributed among gender. Behavior profiles are helpful in providing information about children with similar adjustment characteristics.

***Interrater agreement studies.*** Canivez and Watkins (1997) examined the interrater reliability of the ACSA. In total there were 29 raters comprising 71 pairs within 24 classrooms in 6 different schools; teachers and other raters were in the same classroom at the same time to fairly assess agreement on ASCA. Results indicated that interrater

reliability coefficients ranged from .55 to .80 for core syndromes, and .83 to .85 for composites. Conclusions indicated adequate interrater reliability was established for the ASCA and these results replicated the findings in the ASCA Manual.

Canivez and Watkins (2002) examined interrater agreement of profile classifications on the ASCA. The study included 71 students whose classroom behaviors were jointly observed for a minimum of one hour each day by two professionals or paraprofessionals. Results indicated that the 22 syndromic profile classifications and their resulting five, three, and two-level broad classifications all demonstrated statistically significant interrater agreement beyond chance. Of the 71 children rated by two independent raters, 60 received the identical syndromic profile classification by both raters resulting in an observed agreement of 85% and a kappa coefficient of .68 ( $p < .00001$ ).

***Discriminant validity.*** McDermott (1995) reported a national study comparing the ASCA with the intelligence and achievement indices of the Differential Ability Scales (DAS; Elliott, 1990) with 1,200, 5-17 year old students. The purpose was to investigate the extent to which a child's cognitive ability, academic achievement, and social adjustment were influenced by demographic characteristics such as age, gender, ethnicity, social class, national region, and community size. Correlations of youth problem behaviors with DAS scores were low, ranging from .01 to .24, suggesting little to no relationship with intelligence and school achievement. However, demographic variables accounted for 18.9% of variation in the children's cognitive abilities, suggesting that demographics affect cognitive ability to a greater extent than they affect social and emotional adjustment.

Overall, the ASCA consists of scores with good psychometric support, which was articulated in the Manual and also in independent research. This psychometric support makes the ASCA a viable measure of child psychopathology for comparative studies.

### **Purpose**

The purpose of this thesis was to investigate the construct validity of the BASC-3 TRS (Reynolds & Kamphaus, 2015) through convergent, discriminant, and divergent validity with the ASCA (McDermott, 1994). Convergent validity is the extent to which different measures, purporting to measure the same construct, produce high correlations. Conversely, divergent validity is the degree to which different tests or different scales that measure distinctly different constructs produce low to near zero correlations. Discriminant validity is indicated by lower correlations between test scores from tests measuring different but somewhat related constructs, but produce correlations lower than convergent validity but higher than divergent validity. The present thesis examined the construct validity of the BASC-3 TRS with comparisons to the ASCA as both scales use teachers as informants and measure several similar child psychopathology syndromes.

Present examination of this literature found no independent studies assessing the validity of the BASC-3, so replication of preliminary findings in the BASC-3 Manual was needed. A study of this nature is beneficial to school psychologists and other educational professionals seeking validation for the use of these instruments.

### **Statement of the Problem**

The use of objective behavior rating scales to aid with evaluations of children and adolescents with behavioral difficulties have become increasingly more prevalent in school psychology. It is the ethical and professional responsibility of the examiner to use

the most reliable and valid instruments when evaluating a child. Many objective behavior-rating scales used in the past lack satisfactory documented research pertaining to their convergent evidence of construct validity when compared to other instruments which have been designed to measure the same construct.

The BASC, BASC-2, and BASC-3 have limited replicated research of the studies reported in their respective manuals. Therefore, it is important to empirically compare the BASC-3 TRS-C with the ASCA to examine convergent, discriminant, and divergent validity of construct validity, as there are no published studies replicating BASC-3 Manual research. This present study provided the needed research by comparing the BASC-3 TRS-C with the ASCA.

## **Method**

### **Participants**

Participants included 101 students either referred for educational evaluations ( $n = 30$ ) or completed by a teacher volunteer ( $n = 71$ ). All students attended public schools in Northern, and Central Illinois. Student Demographics are presented in Table 2. Of the 101 students, 57% of the students were male and 43% were female. Ages ranged from 6 to 11 years, with most of the students between grades 4 and 6 ( $M = 9.50$ ,  $SD = 1.51$ ). Student demographic data are presented with the group they were obtained: education evaluation or if they were completed by a teacher volunteer.

Table 2  
*Student Demographics for Two Data Sources*

Variable	Special Education Evaluations ( $N = 30$ )		Teacher Volunteer Ratings ( $N = 71$ )	
	$n$	%	$n$	%
<b>Sex</b>				
Female	12	40.0	31	43.7
Male	18	60.0	40	56.3
<b>Grade</b>				
K	0	0.0	2	28.2
1	1	3.3	9	12.7
2	4	13.3	5	7.1
3	4	13.3	9	12.7
4	7	23.3	11	15.5
5	5	16.7	13	18.3
6	9	30.0	22	31.0

*Note.* Percentages are within data source rounded to the nearest tenth.

Teacher demographics are presented in Table 3. Teachers years of teaching experience ranged from of 1 to 38 years of teaching ( $M = 14.50$ ,  $SD = 8.22$ ). The majority of teachers were Caucasian/White, female, and general education teachers.

Table 3  
*Teacher Demographics for Two Data Sources*

Variable	Special Education Evaluations ( $N = 30$ )		Teacher Volunteer Ratings ( $N = 71$ )	
	$n$	%	$n$	%
<b>Sex</b>				
Female	26	25.7	70	69.3
Male	4	4.0	1	1.0
<b>Race/Ethnicity</b>				
Caucasian/White	26	25.7	65	64.4
Hispanic/Latino	3	3.0	6	5.9
Mixed Race	1	1.0		
<b>General/Special</b>				
General	23	22.8	46	45.5
Special	7	6.9	25	24.8

*Note.* Percentages are within data source rounded to the nearest tenth.

## **Instruments**

### **Behavior Assessment System for Children-Third Edition Teacher Rating**

**Scale.** The BASC-3 TRS is a nationally normed teacher rating scale and is a comprehensive measure of a child's adaptive and problem behaviors in the school setting. The TRS has three forms: Preschool (ages 2 through 5), Child (ages 6 through 11), and Adolescent (ages 12 through 21). It is recommended that the teacher observe the student for 6–8 weeks prior to completing the BASC-TRS. The teacher rates the student's behavior on a four-point ordinal scale ranging from “never” to “almost always.” The TRS-C contains 10 clinical scales, five adaptive scales, and five composite scales (Reynolds & Kamphaus, 2015).

**Adjustment Scales for Children and Adolescents.** The ASCA is a nationally normed, objective behavior rating scale for students ages 5 to 17 and is completed by the child's special or regular education teacher. It is recommended that the teacher observe the student for 40–50 school days prior to completing the ASCA. The ASCA contains 156 behavioral descriptions with references to 29 specific social, recreational, or learning situations. Each situation contains several behavioral descriptions and the teacher chooses the descriptions that best fit the behavior the child exhibits in the specific situation. The teacher may select more than one behavior as appropriate. Raw scores for six core syndromes, two supplementary syndromes, and two overall adjustment scales are converted to percentiles and normalized *T* scores (McDermott, 1994).

## **Procedure**

IRB approval was obtained prior to collecting data. A total of 101 teachers rated student behaviors using the Behavior Assessment System for Children-Third Edition

Teacher Rating Scale-Child (BASC-3 TRS-C) and the appropriate form (male/female) of the Adjustment Scales for Children and Adolescents (ASCA). Teachers were recruited to participate during an after-school meeting, and voluntarily completed the scales on their own time. School psychologists from central and northern IL were asked to help obtain the sample. School psychologists were asked to participate in the study by selecting students from their caseload who had referrals for special education evaluations, and data from those special education evaluations were included. Both instruments are nationally standardized behavior rating scales designed to be completed by general or special education teachers and are interpreted by a qualified professional. The classroom teachers were asked to complete the appropriate form of the BASC-3 TRS and the ASCA on their student. Teachers received a form regarding teacher demographic information and which rating scale they preferred. Appendix A shows the form that the teachers were provided. Teachers were presented the ASCA and BASC-TRS forms in random counterbalanced order. The primary researcher assigned numbers to de-identify participants prior to distribution of the BASC-3 and ASCA forms. Parental consent was not required for this thesis as all data were de-identified teacher ratings and remained anonymous. Data were collected throughout the 2018-2019 school year and continued into the 2019-2020 school year.

### **Data Analyses**

The BASC-3 TRS-C and ASCA scores are represented by *T* scores that are determined by converting the raw scores of the scales and composite scale scores into standard *T* scores using norm tables from the respective manuals. The BASC-3 provides numerous norm groups but the general combined norms were used for direct comparison

to the ASCA. Pearson product-moment correlation coefficients were calculated between the BASC and ASCA *T* scores from the different subscale and composite scores. In addition, dependent *t*-tests were conducted to determine if significant mean differences were present between the scales, which are listed in Table 4.

Table 4  
*Specific Scale Comparisons of the BASC-TRS and ASCA*

	BASC-3 TRS-C	ASCA
Subscales		
	Attention Problems	Attention-Deficit Hyperactivity
	Hyperactivity	Attention-Deficit Hyperactivity
	Withdrawal	Avoidant
	Conduct Problems	Delinquent
	Conduct Problems	Oppositional Defiant
	Aggression	Solitary Aggressive-Provocative
	Aggression	Solitary Aggressive- Impulsive
Composite Scores		
	Externalizing Problems	Overactivity
	Internalizing Problems	Underactivity

*Note.* BASC-3 TRS-C = Behavior Assessment System for Children-Third Edition Teacher Rating Scale-Child; ASCA = Adjustment Scales for Children and Adolescents

## Results

Pearson product moment correlation coefficients between BASC-3 TRS-C scales and ASCA syndromes were used to determine convergent, discriminant, and divergent validity. Convergent validity is evidenced by high correlations between scales that measure the same construct. Discriminant validity is evidenced by lower correlations among variables reflecting different constructs but that might still be related. Divergent validity is evidenced by low to near zero correlations between variables reflecting constructs that are thought to be completely different and independent. Pearson product moment correlation coefficients between all BASC-3 TRS-C scales and ASCA

syndromes are presented in Table 5. Many comparisons illustrate convergent and discriminant validity between the BASC-3 TRS-C scales and the ASCA syndromes.

### **Global Level Comparisons**

**Convergent validity.** The BASC-3 TRS-C Externalizing Problems Composite scale was significantly correlated with the ASCA Overactivity syndrome ( $r = .79, p < .01$ ) and supported convergent validity, sharing 62% measurement variance. The ASCA does not measure internalizing problems therefore there is no convergent validity comparisons for the BASC-3 TRS-C Internalizing Problems Composite scale.

**Discriminant and divergent validity.** The BASC-3 TRS-C Internalizing Problems scale, as expected, did not correlate highly with the ASCA Underactivity syndrome ( $r = .22, p < .05$ ), sharing 5% measured variance, illustrating divergent validity. The BASC-3 TRS-C Externalizing Problems Composite scale, as expected, did not correlate highly with the ASCA Underactivity syndrome, sharing less than 1% measured variance, and also supported divergent validity. Similarly, the BASC-3 TRS-C Internalizing Problems scale as expected, did not correlate highly with the ASCA Overactivity syndrome, sharing only 11% measured variance.

### **Subscale/Syndrome Comparisons**

**Convergent validity.** The BASC-3 TRS-C Hyperactivity scale was significantly correlated with the ASCA Attention Deficit Hyperactivity syndrome ( $r = .75, p < .01$ ) and supported convergent validity, sharing 56% measured variance. The BASC-3 TRS-C Attention Problems scale was also significantly correlated with the ASCA Attention Deficit Hyperactivity syndrome ( $r = .66, p < .01$ ) and supported convergent validity, sharing 44% measured variance. The BASC-3 TRS-C Withdrawal scale was significantly

correlated with the ASCA Avoidant syndrome ( $r = .64, p < .01$ ) and supported convergent validity, sharing 41% measured variance. The BASC-3 TRS-C Withdrawal scale was also significantly correlated with the ASCA Lethargic/Hypoactive syndrome ( $r = .58, p < .01$ ) and also supported convergent validity, sharing 34% measured variance. The BASC-3 TRS-C Aggression scale was significantly correlated with the ASCA Solitary Aggressive Provocative syndrome ( $r = .60, p < .01$ ) and supported convergent validity, sharing 36% measured variance. The BASC-3 TRS-C Aggression scale was also significantly correlated with the ASCA Solitary Aggressive Impulsive syndrome ( $r = .59, p < .01$ ) and supported convergent validity, sharing 35% measured variance. The BASC-3 TRS-C Aggression scale was also significantly correlated with the ASCA Oppositional Defiant syndrome ( $r = .70, p < .01$ ) and supported convergent validity, sharing 49% measured variance. The BASC-3 TRS-C Conduct Problems scale was significantly correlated with the ASCA Solitary Aggressive Provocative syndrome ( $r = .59, p < .01$ ), sharing 35% measured variance, the ASCA Attention Deficit Hyperactive syndrome ( $r = .62, p < .01$ ), sharing 38% measured variance; the ASCA Solitary Aggressive Impulsive syndrome ( $r = .59, p < .01$ ), sharing 35% measured variance; and the ASCA Oppositional Defiant syndrome ( $r = .56, p < .01$ ), sharing 32% measured variance. The BASC-3 TRS-C Atypicality scale was significantly correlated with the ASCA Lethargic/Hypoactive syndrome ( $r = .61, p < .01$ ) and supported convergent validity, sharing 37% measured variance.

#### **Discriminant and divergent validity for Externalizing Problems scales.**

Comparisons of correlations between the BASC-3 TRS-C and the ASCA supported both discriminant and divergent validity (see Table 5). The BASC-3 TRS-C Hyperactivity

scale demonstrated discriminant validity through correlations with the ASCA Solitary Aggressive- Proactive, Solitary Aggressive- Impulsive, and Oppositional Defiant syndromes that ranged from .54 to .64. The BASC-3 TRS-C Hyperactivity scale demonstrated divergent validity through correlations with the ASCA Diffident, Avoidant, and Lethargic/Hypoactive syndromes that ranged from -.05 to .29. The BASC-3 TRS-C Aggression scale demonstrated discriminant validity through its correlation with the ASCA Attention-Deficit Hyperactivity syndrome ( $r = .51$ ) and the BASC-3 TRS-C Aggression scale demonstrated divergent validity through correlations with the ASCA Diffident, Avoidant, Lethargic/Hypoactive, and Delinquent syndromes that ranged from -.09 to .22. The BASC-3 TRS-C Conduct Problems scale demonstrated divergent validity through correlations with the ASCA Diffident, Avoidant, and Lethargic syndromes that ranged from -.05 to .21.

**Discriminant and divergent validity for Internalizing Problems scales.** The BASC-3 TRS-C Anxiety scale demonstrated discriminant validity through correlations with the ASCA Lethargic/Hypoactive ( $r = .34$ ) syndrome. The BASC-3 TRS-C Anxiety scale demonstrated divergent validity through correlations with the ASCA Attention-Deficit Hyperactivity, Solitary Aggressive- Proactive, Solitary Aggressive- Impulsive, Oppositional Defiant, Diffident, Avoidant, and Delinquent syndromes that ranged from -.16 to .28. The BASC-3 TRS-C Depression scale demonstrated discriminant validity through correlations with the ASCA Attention-Deficit Hyperactivity, Solitary Aggressive- Proactive, Solitary Aggressive- Impulsive, Oppositional Defiant, and Lethargic/Hypoactive syndromes that ranged from .33 - .59. The BASC-3 TRS-C Depression scale demonstrated divergent validity through correlations with the ASCA

Diffident and Delinquent syndrome with correlations ranging from  $-.10$  to  $.20$ . The BASC-3 TRS-C Somatization scale demonstrated divergent validity through correlations with the ASCA Attention-Deficit Hyperactivity, Solitary Aggressive- Proactive, Solitary Aggressive- Impulsive, Oppositional Defiant, Diffident, Avoidant, and Delinquent syndromes that ranged from  $.00$  to  $.15$ .

**Discriminant and divergent validity for School Problems scales.** The BASC-3 TRS-C Attention Problems scale demonstrated discriminant validity through correlations with the ASCA Solitary Aggressive- Proactive, Solitary Aggressive- Impulsive, Oppositional Defiant, Diffident, Avoidant, and Lethargic/Hypoactive syndromes that ranged from  $.31$  to  $.58$ . The BASC-3 TRS-C Attention Problems scale demonstrated divergent validity through correlations with the ASCA Diffident and Delinquent syndromes with correlations ranging from  $.08$  to  $.31$ . The BASC-3 TRS-C Learning Problems scale demonstrated discriminant validity with the ASCA Attention-Deficit Hyperactivity, Diffident, Avoidant and Lethargic syndromes that ranged from  $.33$  to  $.53$ . The BASC-3 TRS-C Learning Problems scale demonstrated divergent validity through correlations with the ASCA Solitary Aggressive- Proactive, Solitary Aggressive- Impulsive, Oppositional Defiant, and Delinquent syndromes that ranged from  $-.02$  to  $.23$ .

**Discriminant and divergent validity for Atypicality and Withdrawal.** The BASC-3 TRS-C Atypicality scale demonstrated discriminant validity with the ASCA Attention-Deficit Hyperactivity, Solitary Aggressive- Proactive, Solitary Aggressive- Impulsive, Oppositional Defiant, and Avoidant syndromes that ranged from  $.30$  to  $.49$ . The BASC-3 TRS-C Atypicality scale demonstrated divergent validity through correlations with the ASCA Diffident and Delinquent syndromes that ranged from  $.12$  to

.29. The BASC-3 TRS-C Withdrawal scale demonstrated discriminant validity with the ASCA Attention-Deficit Hyperactivity, Solitary Aggressive- Proactive, Solitary Aggressive- Impulsive, Oppositional Defiant, and Diffident syndromes with correlations that ranged from .25 to .43. The BASC-3 TRS-C Withdrawal scale demonstrated divergent validity through correlations with the ASCA Delinquent syndrome ( $r = -.18$ ).

The BASC-3 TRS-C Adaptive scales are not similarly measured in the ASCA, which measures only psychopathology, so convergent validity could not be assessed; however as expected, moderate negative correlations were observed with almost all ASCA syndromes (see Table 5).

### **Mean Scale/Syndrome Comparisons**

Table 6 presents the descriptive statistics and *t*-test results for specific BASC-3 TRS-C and ASCA comparisons. These comparisons were selected due to similarities in scale constructs, names, and content. Effect sizes (*d*) for significant contrasts were small to medium (see Table 6), with significant mean differences ranging from .24 to .75 standard deviation units. Statistically significant mean differences were observed between the BASC-3 TRS-C Withdrawal scale and the ASCA Avoidant syndrome, the BASC-3 TRS-C Conduct Problems scale and the ASCA Delinquent syndrome, and between the BASC-3 TRS-C Internalizing Composite scores.

Table 5

*Correlations Between the BASC-3 TRS-C Subscale and Composite Scale T Scores and ASCA Core, Supplemental, and Global Syndrome T Scores*

BASC-3 TRS-C	Adjustment Scales for Children and Adolescents									
	ADH	SAP	SAI	OPD	DIF	AVO	DEL	LEH	OVR	UNR
<b>Clinical Scales</b>										
Hyperactivity	.75**	.57**	.64**	.54**	-.05	.12	-.01	.29**	.81**	.06
Aggression	.51**	.60**	.59**	.70**	-.09	.02	.04	.22*	.71**	-.01
Conduct Problems	.62**	.59**	.59**	.56**	-.05	.01	.08	.21*	.73**	-.01
Anxiety	.10	.20*	.19	.28**	.15	.19	-.16	.34**	.16	.19
Depression	.33**	.41**	.43**	.59**	.20*	.30**	-.10	.44*	.48**	.25*
Somatization	.12	.08	.03	.11	.15	.07	.00	.31**	.10	.12
Attention Problems	.66**	.35**	.44**	.34**	.31**	.42**	.08	.58**	.62**	.38**
Learning Problems	.33**	.14	.23*	.12	.44**	.46**	-.02	.53**	.28**	.45**
Atypicality	.39**	.30**	.43**	.34**	.29**	.49**	.12	.61**	.40**	.46**
Withdrawal	.25*	.30*	.40**	.41**	.43**	.64**	-.18	.58**	.36**	.58**
<b>Adaptive Scales</b>										
Adaptability	-.53**	-.50**	-.47**	-.60**	-.17	-.26**	-.10	-.35**	-.67**	-.27**
Social Skills	-.27**	-.31**	-.38**	-.33**	-.41**	-.53**	-.02	-.34**	-.38**	-.55**
Leadership	-.36**	-.26**	-.30**	-.29**	-.47**	-.56**	.02	-.56**	-.41**	-.57**
Study Skills	-.55**	-.30**	-.29**	-.30**	-.40**	-.48**	-.12	-.54**	-.54**	-.48**
Functional Communication	-.24*	-.13	-.30**	-.16	-.48**	-.57**	.15	-.53**	-.26**	-.59**
<b>Composite Scales</b>										
Externalizing	.65**	.62**	.64**	.64**	-.01	.06	.06	.27**	.79**	.03
Internalizing	.24*	.32**	.30**	.43**	.19	.23*	-.12	.42**	.33**	.22*
School Problems	.54**	.27**	.37**	.26**	.40**	.48**	.04	.60**	.50**	.45**
BSI	.60**	.53**	.62**	.63**	.20*	.40**	-.08	.56**	.71**	.33**
Adaptive Skills	-.43**	-.33**	-.44**	-.36**	-.41**	-.56**	-.05	-.50**	-.50**	-.54**

*Note:* BASC-3 TRS-C = Behavior Assessment System for Children-3rd Edition Teacher Rating Scale-Child, ADH = Attention Deficit Hyperactive, SAP = Solitary Aggressive Provocative, SAI = Solitary Aggressive Impulsive, OPD = Oppositional Defiant., DIF = Diffident, AVO = Avoidant, DEL = Delinquent, LEH = Lethargic Hypoactive, OVR = Overactivity, UNR = Underactivity.

$N = 101$  for all scales except Delinquent ( $n = 58$ ). \* $p < .05$ . \*\* $p < .01$ .

Table 6  
*Descriptive Statistics and Dependent t-tests for Selected BASC-3 TRS-C Scales and ASCA Syndrome T Score Comparisons*

Scale/Syndrome	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>d</i>
BASC Attention Problems	56.75	10.36	1.82	.0717	.18
ASCA Attention Deficit Hyperactive	58.24	9.28			
BASC Hyperactivity	59.01	12.52	-.95	.3451	.09
ASCA Attention Deficit Hyperactive	58.24	9.28			
BASC Withdrawal	57.74	12.73	-7.56*	.0001	.75
ASCA Avoidant	50.05	11.26			
BASC Conduct Problems	61.84	12.82	-3.41*	.0012	.45
ASCA Delinquent	54.31	12.04			
BASC Conduct Problems	59.79	13.22	-2.39	.0187	.24
ASCA Oppositional Defiant	56.74	13.92			
BASC Aggression	59.34	15.93	-2.52	.0134	.25
ASCA Solitary Aggressive Provocative	56.04	12.95			
BASC Aggression	59.34	15.93	-2.47	.0154	.25
ASCA Solitary Aggressive Impulsive	56.17	11.55			
BASC Externalizing	60.09	14.04	-1.40	.1649	.14
ASCA Overactivity	58.86	9.36			
BASC Internalizing	55.34	14.38	-3.83*	.0002	.38
ASCA Underactivity	49.28	10.59			

*Note.* \* $p < .05$  (Bonferroni correction  $\alpha = .006$ ).

### Discussion

The purpose of this study was to investigate the construct validity of the BASC-3 TRS-C (Reynolds & Kamphaus, 2015) through convergent, discriminant, and divergent validity with the ASCA (McDermott, 1994). This study examined the construct validity of the BASC-3 TRS-C in comparisons to the ASCA. Both scales use teachers as informants and measure several similar child psychopathology syndromes. Several scales

are the same or similar, which can be compared to assess convergent validity (e.g., the BASC-3 TRS-C Externalizing Problems Composite and the ASCA Overactivity Syndrome). Some scales are different but likely related, which can be compared to assess discriminant validity (e.g., the BASC-3 TRS-C Hyperactivity scale and the ASCA Solitary Aggressive- Impulsive Syndrome). Some scales are very different, which can be compared to assess divergent validity (e.g., the BASC-3 TRS-C Anxiety scale and the ASCA Attention-Deficit Hyperactivity syndrome).

The BASC, BASC-2, and BASC-3 have limited replicated research of the studies reported in their respective manuals. Therefore, it was important to empirically compare the BASC-3 TRS-C with the ASCA to examine construct validity, as there were no published studies replicating BASC-3 Manual research. Research comparing the BASC-3 TRS-C with other behavior rating scales are reported in the BASC-3 Manual (Reynolds & Kamphaus, 2015). The BASC, BASC-2, and BASC-3 manuals include preliminary validity evidence; however, there are currently no independent published studies examining the convergent, discriminant, and divergent validity of the BASC-3. Previous studies comparing the BASC and BASC-2 have been conducted to support construct validity. For example, Vaughn, Riccio, Hynd, and Hall (1997) examined the validity of the BASC in comparison to the Child Behavior Checklist (CBCL; Achenbach, 1991) Parent and Teacher Rating Scales. Comparisons between the BASC-TRS and CBCL indicated significant correlations on similarly labeled factors (convergent validity).

Participants in the present study included 101 students either referred for educational evaluations ( $n = 30$ ) or random students selected by a teacher volunteer ( $n =$

71). The classroom teachers rated the student's behaviors using the Behavior Assessment System for Children-Third Edition Teacher Rating Scale-Child (BASC-3 TRS-C) and the appropriate form (male/female) of the Adjustment Scales for Children and Adolescents (ASCA) in counterbalanced administration order. Pearson product-moment correlation coefficients were calculated between the BASC-3 TRS-C and ASCA subscale/syndrome and composite *T* scores. In addition, dependent *t*-tests were conducted to determine if significant mean differences were present between specifically selected scales measuring the same or similar constructs.

### **Global Composite Comparisons**

**Convergent validity for global scales.** The present results provided strong convergent evidence of construct validity for the BASC-3 TRS-C Externalizing Problems Composite scale and the ASCA Overactivity syndrome with 62% shared variance. These results were similar to various comparisons reported in the BASC-3 Manual (Reynolds and Kamphaus, 2015), and the ASCA Manual (McDermott, 1994). Specifically, the BASC-3 TRS-C Externalizing Problems Composite in comparison with the ASEBA Teachers Report Form Externalizing Problems scale ( $r = .70$ ), demonstrated convergent validity, sharing 49% measured variance. Another comparison reported in the BASC-3 Manual included the BASC-3 TRS-C Externalizing Problems Composite in comparison with the Delis-Rating of Executive Functioning (D-REF) External Functioning Index scale ( $r = .78$ ), demonstrating convergent validity. The convergent evidence between the BASC-3 TRS-C Externalizing Problems Composite and the ASCA Overactivity syndrome had a stronger correlation than those listed in the BASC-3 Manual, indicating that the BASC-3 TRS-C and the ASCA share greater common variance than previously

compared behavior rating scales with the BASC-3. This may be the result of the ASCA being a superior indicator as the ASCA measures behaviors within specific contexts.

**Discriminant and divergent validity for global scales.** The present results provided discriminant and divergent evidence of construct validity for the BASC-3 TRS-C and the ASCA global composite scale comparisons. The BASC-3 TRS-C Internalizing Problems Composite scale and the ASCA Underactivity syndrome shared 5% measured variance, supporting divergent validity due to the fact that the ASCA Underactivity syndrome was not designed to measure internalizing problems. The BASC-3 TRS-C Externalizing Problems Composite scale and the ASCA Underactivity syndrome shared less than 1% measured variance, supporting divergent validity. The BASC-3 TRS-C Internalizing Problems Composite scale and the ASCA Overactivity syndrome shared 11% measured variance, supporting discriminant validity. Similarly, the BASC-3 Manual reported that when the BASC-3 TRS-C Externalizing Problems Composite scale was compared with the ASEBA Internalizing Problems scale ( $r = .13$ ), it supported divergent validity sharing 2% measured variance. In addition, when the BASC-3 TRS-C Internalizing Composite scale was compared with the ASEBA Externalizing Problems scale ( $r = .16$ ), it supported divergent validity, sharing 3% measured variance.

### **Subscale/Syndrome Comparisons**

**Convergent validity for subscales/syndromes.** At the subscale/syndrome level, results provided strong convergent evidence of construct validity for the following comparisons: the BASC-3 TRS-C Hyperactivity scale with the ASCA Attention-Deficit Hyperactivity syndrome ( $r = .75$ ), the BASC-3 TRS-C Attention Problems scale with the

ASCA A Attention-Deficit Hyperactivity syndrome ( $r = .66$ ), the BASC-3 TRS-C Withdrawal scale with the ASCA Avoidant ( $r = .64$ ), and Lethargic/Hypoactive ( $r = .58$ ) syndromes, the BASC-3 TRS-C Aggression scale and the ASCA Solitary Aggressive- Proactive ( $r = .60$ ), Solitary Aggressive- Impulsive ( $r = .59$ ), and Oppositional Defiant ( $r = .70$ ) syndromes, the BASC-3 TRS-C Conduct Problem scale with the ASCA Solitary Aggressive- Proactive ( $r = .59$ ), Attention-Deficit Hyperactivity ( $r = .62$ ), Solitary Aggressive- Impulsive ( $r = .59$ ), and Oppositional Defiant ( $r = .56$ ) syndromes.

The most evident correlation reflecting convergent validity was found between the BASC-3 TRS-C Hyperactivity scale and the ASCA Attention-Deficit Hyperactivity syndrome ( $r = .75$ ), sharing 56% measured variance. These findings replicate similar findings reported in the BASC-3 Manual: The BASC-3 TRS-C Aggression subscale compared with the ASEBA Aggressive Behavior subscale ( $r = .91$ ), supporting convergent validity. The BASC-3 TRS-C Learning Problems subscale compared to the Conners-3 Learning Problem Subscale ( $r = .80$ ), and the BASC-3 TRS-C Attention Problems subscale and the D-REF Attention/Working Memory Index subscale ( $r = .87$ ), both supported convergent validities.

**Discriminant validity of subscales/syndromes.** At the subscale/syndrome level, results provided discriminant evidence of construct validity. The BASC-3 TRS-C Hyperactivity scale in comparison with the ASCA Solitary Aggressive- Impulsive syndrome ( $r = .64$ ), supported discriminant validity. Similarly, within the BASC-3 Manual, the BASC-3 TRS-C Hyperactivity scale in comparison with the ASEBA Aggressive Behavior scale ( $r = .69$ ), also supported discriminant validity. A common

observation is the moderate to high correlation between hyperactivity and aggression scales and this was observed in the present study as in the BASC-3 Manual. In addition, the BASC-3 TRS-C Depression scale in comparison with the ASCA Oppositional Defiant syndrome ( $r = .59$ ) supported discriminant validity. The BASC-3 Manual, reported that the BASC-3 TRS-C Depression scale in comparison with the Conners Oppositional Defiant Disorder scale ( $r = .79$ ) supported discriminant validity. Some other discriminant validity evidence found in this present study included comparisons between the BASC-3 TRS-C Attention Problems scale in comparison with the ASCA Lethargic syndrome ( $r = .58$ ) and the BASC-3 TRS-C Atypicality scale in comparison with the ASCA Avoidant syndrome ( $r = .49$ ).

**Divergent validity of subscales/syndromes.** At the subscale/syndrome level, present results provided divergent evidence of construct validity. The BASC-3 Manual reported comparisons to similar behavior rating scales but did not use “divergent” validity terminology. The present study found divergent validity for many subscales/syndromes of the BASC-3 TRS-C and the ASCA. Specifically, the BASC-3 TRS-C Anxiety subscale in comparison to the ASCA Attention-Deficit Hyperactivity syndrome ( $r = .10$ ) shared only 1% measured variance, supporting divergent validity. Similarly, the BASC-3 Manual noted a low to near zero correlation between the BASC-3 TRS-C Anxiety scale and the ASEBA Hyperactivity Impulsivity scale ( $r = -.12$ ), so it demonstrated “divergent” validity. The BASC-3 TRS-C Somatization subscale and the ASCA Solitary Aggressive- Impulsive ( $r = .03$ ) demonstrated divergent validity. Similarly, The BASC-3 Manual reported a low to near zero correlation between the BASC-3 TRS-C Somatization subscale and the Conners-3 Aggression scale ( $r = .19$ ) and

reflected divergent validity, with only 4% shared variance. Although the BASC-3 Manual does not use divergent validity terminology, some scales evidenced divergent validity.

### **Observed Versus Inferred Constructs**

Overall, the highest correlations were found among scales that measure observable (overt) behaviors (e.g., externalizing or overactive behaviors), which was expected. Correlations among BASC-3 TRS-C internalizing behaviors were much lower than those of externalizing behaviors. Correlations between scales that measure more overt, observable behaviors were much higher (e.g., BASC-3 TRS-C Externalizing Problems with the ASCA Overactivity syndrome, BASC-3 TRS-C Hyperactivity with the ASCA Attention-Deficit Hyperactivity syndrome). This tendency is similar to and supported by other studies. Reynolds and Kamphaus (2015) reported correlations of .87 between the BASC-3 TRS-A Hyperactivity subscale and the Conners-3 Hyperactivity/Impulsivity subscale, .79 between the BASC-3 TRS-A Learning Problems and the Conners-3 Learning Problems subscales, .89 between the BASC-3 TRS-A Aggression subscale and the Conners-3 Aggression subscale, and .90 between BASC-3 TRS-A Anger Control content subscale and Conners-3 ADHD Impulsive subscale. Similarly, when comparing the ASCA and the Conners Teacher Rating Scale, McDermott (1994) reported the highest correlations were among overactive and externalizing syndromes. McDermott found the highest correlation was between the ASCA Attention-Deficit Hyperactivity syndrome and the Conners Hyperactivity Index ( $r = .75$ ). Example convergent validity comparisons of the BASC-3 Internalizing type scales similar to the ASCA included the BASC-3 TRS-C Withdrawal scale with the ASCA Avoidant ( $r = .64$ ) syndrome and with the ASCA Lethargic. ( $r = .58$ ) syndrome. These

convergent validity coefficients are a bit lower than those of Externalizing or Overactive scales.

The common finding that overactive/externalizing behaviors correlate more highly than underactive/internalizing behaviors may be due to various reasons. Less inference is needed to assess observable behaviors and overactive/externalizing behaviors are more likely to be observed by teachers, more than internalizing behaviors.

The BASC-3 TRS-C Anxiety scale did not have strong relationships with ASCA scales which was expected given the ASCA does not measure internalizing characteristics like anxiety. In addition, the BASC-3 TRS-C Adaptive scales are not similarly measured in the ASCA so convergent validity of BASC-3 Adaptive scales could not be addressed.

### **Limitations**

Limitations of the present study revolve around participants. The sample consisted of only 101 student ratings and most of the students were Caucasian/White and teachers who rated them were also Caucasian/White, female, and regular education teachers. This sample was not representative of the entire population for which these instruments may be used due to the limited number of schools and school districts, and geography. This non-representativeness limits generalizability to other racial/ethnic groups and geographic regions. To increase generalizability, future research comparing the BASC-3 TRS-C and the ASCA should utilize larger and more representative samples of teachers as well as larger and more representative samples of students. To further explore the construct validity of these two scales, the BASC-3 TRS Adolescent and the ASCA should be compared. Another limitation of the present study may relate to the

ASCA norms which are over 30 years old. Updated norms would be useful to have for future research to see if similar construct validity evidence is obtained.

### **Summary**

In summary, the present study provided strong evidence of convergent validity with large significant correlations between similar scales. For the BASC-3 TRS-C and ASCA global composite scales convergent validity was established for the BASC-3 TRS-C Externalizing composite and the ASCA Overactivity global adjustment scale. As expected, the BASC-3 TRS-C Internalizing composite scale did not correlate highly with the ASCA Underactivity global adjustment scale, but the ASCA intentionally does not directly measure internalizing behaviors. Overall, both scales provided specific details about a child's overall behavior, and are beneficial tools for school psychologists and other educational professional who seek an accurate assessment youth problem behavior.

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Appendix A

## Instruction for completing the BASC-3 TRS and the ASCA

Please provide the following information on each scale: grade, race, gender, and special education classification (if applicable).

After completing both the BASC-3 TRS and the ASCA please answer the following questions listed below:

## 1. Teacher gender

- Male
- Female
- Not listed: \_\_\_\_\_
- Prefer not to answer

## 2. Please specify your race/ethnicity

- Caucasian/White
- Black/African America
- Asian
- Hispanic/Latino
- Native American
- Pacific Islander
- Mixed Race
- Other

## 3. How many years teaching experience do you have?

4. Please indicate the following:

Special Education Teacher

Regular Education Teacher

5. Approximately how many minutes did it take you to complete the BASC-3 TRS?

6. Approximately how many minutes did it take you to complete the ASCA?

7. Which scale provided easier to report format?

ASCA

BASC-3 TRS

8. Assuming both scales measure similar dimensions of problematic behaviors in children and adolescents, which scale would you prefer?

ASCA

BASC-3 TRS