Examining the Relationships Between Internalizing and Externalizing Problems and Academic Achievement

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EXAMINING THE RELATIONSHIPS BETWEEN INTERNALIZING AND
EXTERNALIZING PROBLEMS AND ACADEMIC ACHIEVEMENT

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ABSTRACT

EXAMINING THE RELATIONSHIPS BETWEEN INTERNALIZING AND EXTERNALIZING PROBLEMS AND ACADEMIC ACHIEVEMENT

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The relationship between internalizing and externalizing problems and academic achievement for children and adolescents has been inconclusive. Particularly the relationship between the Behavior Assessment System for Children, Second Edition (BASC-2) reports of internalizing and externalizing problems and academic performance on the Woodcock-Johnson, Tests of Achievement, Third Edition (WJ-III:ACH). The current study examined the self and parent reports of internalizing and externalizing problems as measured by the BASC-2 and the relationship with academic skills as measured by the WJ-III:ACH. The referral source (private practice or school setting) was evaluated for severity of presenting internalizing and externalizing symptoms. Secondary data analysis was done with matched samples from each referral source. Participants included school-aged children from eight to 18. The samples were matched by age, grade and gender. Parent reports completed by mothers were the only parental reports included in the analysis. Many correlations were statistically significant; however, most correlations were low. One-way ANOVAs identified significant differences between self and parent-reported internalizing problems and parent-reported externalizing problems in
the private and school settings. Cluster analysis identified two distinct clusters based on high and low scores on the BASC-2 with self-reported somatization as the main predictor. Multiple linear regression analyses indicated affective distress may have more of an effect on academic achievement test scores when internalizing and externalizing problems are considered together. Moderation analysis found no significant evidence of referral source as a moderating influence on internalizing and externalizing scores.
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CHAPTER 1
INTRODUCTION

Research examining the relationship between internalizing and externalizing problems and academic performance has mixed results. Illustrative examples include the following studies. A study conducted by Barriga et al. (2002) found aggression and delinquency behaviors were associated with underachievement while internalizing problems with anxiety and depression were not. Although anxiety and depression were not significantly associated with underachievement in their study, internalizing problems with somatization and withdrawal were related to underachievement. Hodges and Plow (1990) identified a significant relationship between depression and mathematics, but no relationship between anxiety and academic areas. Anxiety and depression were found to have no impact on writing skills in Mayes and Calhoun’s (2007) study. Masi et al. (2000) found a reciprocal relationship between negative affect and school achievement with each impacting the other. Undheim and Sund (2008) did not find a reciprocal relationship between depressive symptoms and reading difficulties. In their study, reading difficulties predicted depressive symptoms. Delinquency and aggressive behaviors resulted in lower reading abilities in a study by Kennedy, Burnett and Edmonds (2011).

The research literature did not appear to provide clear-cut answers to questions regarding the relationship between academic performance and the presence of behavioral and/or emotional symptoms. Knowing the extent to which relationships may exist has important implications for the practice of school psychology. For example, a study conducted by Yoo, Brown and Luthar (2009) revealed findings that suggest children with co-occurring disorders, particularly anxiety and externalizing disorders, have a higher
risk of school failure and more difficulty gaining adaptive skills as they age. By examining the relationship between internalizing/externalizing symptoms and academic performance, interventions can be better tailored to the students’ needs. Also according to Yoo et al. (2009) children with anxiety symptoms should be assessed for externalizing problems considering the serious implications for those individuals with co-occurring disorders. If potential problems in students can be detected earlier, this could result in the prevention and reduction of further issues (Fox, Halpern, & Forsyth, 2008).

Internalizing problems are described as problematic internal feelings associated with anxiety, fear, shyness, low self-esteem, sadness, and depression (Ollendick & King, 1994). Reynolds and Kamphaus (2002) created an Internalizing Problems composite scale for the first edition of the Behavior Assessment System for Children (BASC) by combining anxiety, depression and somatization subscales. They suggest that these behaviors are not disruptive to others and are not characterized by acting-out behavior.

Externalizing problems, as described for the BASC, are disruptive to both peers and adults and can lead to problems with peers. Reynolds and Kamphaus (2002) define externalizing problems as a combination of hyperactivity, aggression and conduct problems. These are also described as under-controlled behaviors (Achenbach & Edelbrock, 1978).

Knowing whether internalizing or externalizing problems have a relationship with academics has important implications for the practice of school psychology. Whether the correlations are positive or negative, practitioners may be able to take information from behavior rating scales to assist in academic planning and interventions. Correlational studies between the Child Behavior Checklist and academic achievement revealed
negative relationships between behavior problems and academic achievement (Mingyue, Rengang, & Jian, 2001; Wang, Li, Gao & Zheng, 2008). Despite the wide-spread use of the BASC-2 rating scales, the research literature is strangely silent in regard to the relationship between the BASC-2 and academic achievement. In fact, only one study done by Kwon, Kim and Sheridan (2012) was found that reported correlations between BASC-2 rating and performance on standardized achievement tests. Their study, using BASC-2 ratings of externalizing problems, found no significant correlations with reading or math achievement.

When students are referred for evaluation, the behavior rating scales may be an indicator of the severity of the problems. For example, parents may be more likely to refer children for externalizing problems such as defiance or aggression (Cohen, Kasen, Brook & Struening, 1991). Teachers or other educational professionals commonly refer students for externalizing problems as well, but may also be more likely to identify internalizing symptoms (Reigstad, Jorgensen & Wichstrom, 2004).

Parents with significant concerns may choose to take their children to private practitioners rather than request evaluations through the school. In a comparison of private versus public referrals, private referrals were more commonly initiated by parents while public referrals were made by educational professionals (Southam-Gerow, Chorpita, Miller & Gleacher, 2008). This could occur when the school is not experiencing the same issues as the parent reports at home. Referrals for mental health services are associated with poor family functioning and are often sought out in times of emergency such as suicidality or other indicators of self-harm (Reigstad et al., 2006). Angold, Costello and Worthman (1998) found the strongest correlate for mental health
care referrals by parents to be the impact of a child’s symptoms on the parents. Those children or adolescents with more disruptive disorders such as conduct or oppositional defiance were more likely to be referred (Cohen et al., 1991).

This study examined whether there are any significant relationships between internalizing/externalizing symptoms and academic achievement considering both self-report and parent report. This study also explored the severity of reported internalizing/externalizing symptoms and their relationship with academic achievement depending on whether the evaluation occurred in a school or a private practice.

PURPOSE OF THE STUDY

The purpose of this study was to examine the extent of a relationship between internalizing and externalizing symptoms, as rated by the individual student and his or her parent, and academic achievement. A comparison of self and parent reports can provide a better understanding of what behaviors are observed or reported. In the event that self and parent reports were different, this information could guide future parent education about identifying internalizing and externalizing problems within children and adolescents. This study also investigated the difference in self-reported ratings of internalizing and externalizing problems based on private and school referrals. In addition, the difference in parent reported ratings of internalizing and externalizing symptoms based on private and school referrals were explored. Through the comparison of ratings between settings, the level of severity of the presenting problems was examined based on referral source. The patterns found throughout the analyses may help practitioners prepare for the severity of symptoms they might encounter with students depending on where services are provided.
STATEMENT OF THE PROBLEM

It can be assumed that academic achievement deficits can have a negative influence on students throughout schooling and into adulthood. However, internalizing problems such as anxiety, depression and somatization and externalizing problems such as hyperactivity, aggression and conduct problems have shown varying degrees of impact on academic achievement in the research literature. In some studies, externalizing problems adversely impact reading, while in others externalizing problems have no apparent impact on academic performance. Anxiety and depression contribute to overall lower academic scores in some studies while in others there is no apparent relationship. Due to the mixed data surrounding internalizing and externalizing problems and achievement and the lack of published studies relating the BASC-2 and academic performance, another study to evaluate the relationships was warranted.

SIGNIFICANCE OF THE PROBLEM

Approximately 34 percent of elementary students read below the basic reading level and 19 percent perform below the basic math level (U.S. Department of Education, 2010). Across the United States, approximately 447,000 students during the 2008-2009 school year were retained from grades one through eight (Warren & Saliba, 2012). This is a large number of students retained in one year and alludes to the fact that academic underachievement is a major issue in our schools.

Research suggests that depressive and anxiety disorders during youth are highly prevalent and can have short and long term effects. During adolescence, eight percent of teens from the ages of 13 to 18 have anxiety disorders while 11 percent of adolescents have depressive disorders (National Institute of Mental Health [NIMH], 2012). While
students are in school, internalizing problems can lead to: difficulties making friends and focusing on school work (Birmaher, Bridge, Williamson, Brent, Dahl & Axelson et al., 2004; Langley, Bergman, McCracken & Piacentini, 2004) school refusal, truancy (Egger, Costello & Angold, 2003), and lower academic achievement (Aluja & Blanch, 2004; Wood, 2006). Over the life span, internalizing issues remain relatively stable and contribute to higher rates of attempted suicide, treatment seeking and impairment in psychosocial development and interpersonal functioning (Decker et al., 2007; Weissman et al., 1999). Anxiety can also lead to anxiety disorders in adulthood, mood disorders and problems with substance abuse (Kendall, Safford, Flannery, Schroader & Webb, 2004; Woodward & Fergusson, 2001). Because of the life-long implications of internalizing problems, identifying at-risk children is imperative.

Students with externalizing problems may experience a loss of motivation for academic work and be more inclined towards substance abuse and school dropout (Breslau et al., 2009). Arnold (1997) found when children or adolescents are unable to behave appropriately in the classroom; they may be removed from the activity. In the event the student was acting out through aggression and/or non-compliance to avoid the activity, the inappropriate behaviors may occur more frequently with the goal of escaping undesired activities. Peer rejection (Barriga et al., 2002), aggression and delinquent behaviors (Barriga, Doran & Newell, 2003) can also be influenced by underachievement. Additionally, disruptive behaviors such as conduct problems, hyperactivity and aggression are disorders commonly identified in detained youth after involvement with the juvenile justice system (Rogers, Pumariega & Cufle, 2001). By properly identifying both the academic and behavioral needs of students, school psychologists can assist in
planning and intervention development to target school performance in both the academic and behavioral realms.

In addition, with the Response to Instruction (RTI) framework being implemented in many schools, teachers may only intervene on a certain academic area while other areas of deficit may not be identified. If the evaluation approach is changed to first identify behavioral/emotional symptoms and then academic deficits, classroom interventions could be more appropriate and targeted at the true problems presented by the student.

NATURE OF THE STUDY

In order to answer the research questions posed in this study, comparable samples in gender and age were drawn from two existing databases. The data were gathered from students in a metropolitan city referred in a school district and a private practitioner. The data consist of parent and self-reported Behavior Assessment System for Children, Second Edition (BASC-2) scores and achievement test scores from the Woodcock-Johnson, Third Edition, Achievement Test (WJ-III:ACH). Correlational analysis procedures were used to examine the relationships between internalizing and externalizing symptoms and academic achievement with additional attention to differential relationship patterns associated with the different referral settings. Cluster analysis was also applied to the data obtained from different referral settings to determine if distinct subgroups could be identified among the reported internalizing and externalizing problems.

RESEARCH QUESTIONS

The following research questions will guide the proposed study:
Is there a relationship between the extent of internalizing problems and scores on measures of academic achievement?

Is there a relationship between the extent of externalizing problems and scores on measures of academic achievement?

Is the extent of relationship between internalizing problems and academic achievement different for measures of reading and math?

Is the extent of relationship between externalizing problems and academic achievement different for measures of reading and math?

Is there a difference in parent ratings of severity of internalizing problems between referrals in the private practice setting and school referrals?

Is there a difference in self-reported ratings of severity of internalizing problems based on private or school referral?

Is there a difference in parent ratings of severity of externalizing problems between referrals in the private practice setting and school referrals?

Is there a difference in self-reported ratings of severity of externalizing problems based on private or school referral?

Will cluster analysis of the patterns among BASC-2 scores generate a cluster solution typology that differentiates the private practice setting and school referrals?

HYPOTHESES

Thirteen hypotheses will be tested to address the nine research questions:

1. There is not a statistically significant correlation between student ratings of internalizing problems on the BASC-2 and total achievement test scores.
2. There is not a statistically significant correlation between parent ratings of internalizing problems on the BASC-2 and total achievement test scores.

3. There is not a statistically significant correlation between student ratings of externalizing problems on the BASC-2 and total achievement test scores.

4. There is not a statistically significant correlation between parent ratings of externalizing problems on the BASC-2 and total achievement test scores.

5. Differences in the relationship between self-reported internalizing problems and scores on measures of reading and math are not statistically significant.

6. Differences in the relationship between parent-reported internalizing problems and scores on measures of reading and math are not statistically significant.

7. There is not a statistically significant difference in the relationship between self-reported externalizing problems and scores on measures of reading and math.

8. Difference in the relationship between parent-reported externalizing problems and scores on measures of reading and math are not statistically significant.

9. The differences in severity of self-reported internalizing problems among referrals from private practice and school settings are not statistically significant.

10. The differences in severity of parent-reported internalizing problems among referrals from private practice and school settings are not statistically significant.
11. The differences in severity of self-reported externalizing problems among referrals from private practice and school settings are not statistically significant.

12. The differences in severity of parent-reported externalizing problems among referrals from private practice and school settings are not statistically significant.

13. Cluster analysis of the BASC-2 scores associated with internalizing and externalizing problems will not identify a pattern differentiating private practice and school referrals.

DEFINITION OF TERMS

In order to provide a consistent framework around which a discussion of the recurring themes of the study can be addressed, the following definitions are clarified:

*Internalizing Problems:* defined by the BASC-2 (Reynolds & Kamphaus, 2004) as a scale consisting of anxiety, depression and somatization. These behaviors are not disruptive to others and are not characterized by acting-out behavior.

*Externalizing Problems:* defined by the BASC-2 as a scale consisting of aggression, hyperactivity and conduct problems. Externalizing Problems on the BASC-2 self-report forms are defined as attitude to teachers, hyperactivity and sensation seeking.

*Total Achievement:* defined for this study as the Academic Skills subtest on the WJ-III:ACH that measures basic academic skills: reading decoding, math calculation and spelling (Woodcock, McGrew & Mather, 2007).

*Academic Underachievement:* “academic performance that is below normative age level rather than discrepant from one’s general cognitive ability” (Barriga et al., 2002, p. 233).
Standard scores from the WJ-III: ACH will be used to determine level of academic underachievement.

**ASSUMPTIONS**

This study made several assumptions. It was assumed that the academic achievement tests were administered following standardization procedures and were scored correctly. It was assumed that the parent and student rating scales are true and accurate reports of the student’s behavior. It was also assumed that the data were correctly entered in the databases.

**LIMITATIONS AND DELIMITATIONS**

The results of this study are limited to a similar sampling population. Additionally, the data used were gathered by outside practitioners. Thus the knowledge of adherence to standardization procedures during test administration is unknown. Parent and student report are assumed to be accurate reports of the students’ behavioral and emotional symptoms within four weeks prior to completion of the scale.

This study was delimited to school-aged children and adolescents from the ages of eight to 18 years in Nevada. The students were evaluated either in a school or private setting. The data used were those that were available through an existing private practice database and school district archives. A comparable sample to the private practice database was drawn from school district multidisciplinary team reports. For those individuals included in the study, the evaluation data included self and parent-reports of internalizing/externalizing behaviors and common standardized academic achievement scores. In the event a student had multiple parent rating scales, only the form completed by the mother of the child was used.
IMPLICATIONS IN SCHOOL PSYCHOLOGY

By further evaluating the relationship internalizing and externalizing symptoms have with specific academic areas such as reading and mathematics, school psychologists can provide better evaluation interpretations. Just as quantitative reasoning deficits on a cognitive assessment may indicate math difficulties, elevated anxiety may be an indicator of reading fluency deficits. Schools have a unique advantage for conducting comprehensive evaluations. In a school environment, practitioners have access to parent, teacher and student reports on the issues at hand. Additionally, observational data can be gathered from a variety of settings (classroom, lunch, passing periods) that can assist in the collection of social, emotional and behavioral data. Schools can be an ideal place for the prevention of mental health issues for specific individuals as well as entire schools (Gillham & Reivich, 1999; Paternite, 2005).

Identifying relationships between internalizing and externalizing symptoms and specific academic areas can assist in developing specialized interventions. In the event a child or adolescent has externalizing behaviors, schools can serve as a protective factor (Piko, Fitzpatrick & Wright, 2005) which allows them to reverse those behaviors or prevent them from increasing. This can be done through identification and action towards improving the behaviors or emotional states. Particularly for internalizing symptoms that are more frequently missed in the classroom, rating scales such as the BASC-2 can easily be administered to classes as a screening tool (Reynolds & Kamphaus, 2002). This would allow school staff to follow-up with students who reported elevated scores for the scales and proactively create intervention plans.
Due to the large caseloads and general demands of a school psychologist’s job, finding patterns and relationships between behavioral or emotional symptoms and academic skills helps expedite the evaluation process. Rating scales are an efficient and cost-effective method for collecting data and can be utilized to design not only behavioral interventions, but academic ones as well.

SUMMARY

This chapter provided an overview of the study involving the relationships between internalizing and externalizing problems and academic achievement. Internalizing and externalizing problems are reported by individuals as well as parents. The study also explored if these relationships differ whether evaluations occurred in school or private practice settings. The background of the problem was discussed, as was the nature of the study and its significance. Research questions were outlined and the assumptions detailed. Chapter 2 provides a more extensive review of the literature and Chapter 3 describes the methodology employed in significantly more depth. Chapter 4 describes the results of the study and Chapter 5 interprets the results and discusses study limitations, implications and future recommendations.
CHAPTER 2
LITERATURE REVIEW

While it would appear reasonable to assume that the externalizing and internalizing behaviors have a direct relationship with academic achievement, there is remarkably little evidence of actual correlations between these variables as measured by the Behavior Assessment System for Children, Second Edition (BASC-2) and the Woodcock-Johnson, Tests of Achievement, Third Edition (WJ-III:ACH). Furthermore, there are differing viewpoints on the severity of presenting problems that are addressed in either private or school-based practice while the actual evidence of the severity of these relationships is limited.

This chapter will begin with a general overview of internalizing and externalizing problems, the relationship these problems have on children and adolescents and the association with academic achievement. Next, how referrals for services vary will be discussed. Finally rating scales as measures of internalizing and externalizing problems are discussed.

OVERVIEW

Internalizing behaviors in children and adolescents are increasing (Kessler, Avenevoli & Merikangus, 2001; Merikangus et al., 2010) and externalizing problems have a high prevalence in children and adolescents (CDC, 2010; Nock, Kazdin, Hiripi, & Kessler, 2007). They have also been negatively associated with academic competence (Moilanen, Shaw & Maxwell). This is an issue of great importance as school performance is a predictor of graduation, higher level education, criminality and future employment. It is the responsibility of practitioners to address behaviors and emotions that may
influence academic underachievement. If internalizing and/or externalizing problems have an adverse relationship with academic achievement, these problems need to be addressed.

The study of behaviors and emotions and their impact on academic achievement is a major component of educational psychology. Behaviors and emotions are something humans experience that are not always directed at any one thing or person; however they impact thoughts and how people and things are perceived. These behaviors and emotions can sometimes be described as internalizing problems and externalizing problems. When internalizing or externalizing symptoms become severe enough to impact daily functioning they are often labeled as disorders.

Externalizing and internalizing disorders such as anxiety, depression, hyperactivity and disruptive behaviors are common in childhood and adolescence and can play a significant role in achievement. Depression is defined as a depressed mood and includes loss of interest or pleasure in activities (American Psychiatric Association, 2000). In addition, individuals may experience change in appetite or weight, sleep or energy as well as feelings of worthlessness and difficulty concentrating.

Anxiety is a state of excessive worry and may include restlessness, irritability, difficulty concentrating, fatigue, muscle tension and sleep disturbances (American Psychiatric Association, 2000) and occurs when an individual perceives a high level of threat (Derakshan & Eysenck, 2009). Anxiety disorders common among children include: separation anxiety, selective mutism, reactive attachment disorder and generalized anxiety (American Psychiatric Association, 2000); however, for this study, symptoms of anxiety will be incorporated under the general category of anxiety.
Symptoms of anxiety can vary depending on the type of disorder; however, the National Institute of Mental Health (NIMH) identified “excessive, irrational fear or dread” as the common factor.

Hyperactivity and attention problems are labeled as an Attention Deficit/Hyperactivity Disorder (ADHD) which is a pattern of inattention and/or hyperactivity/impulsivity that persists and occurs more frequently or is more severe than others of a similar developmental level (American Psychiatric Association, 2000). ADHD is categorized in three ways: combined type, predominantly inattentive and predominantly hyperactive-impulsive type. Although ADHD is best identified as a neurodevelopmental disorder (Thaler et al., 2012), the symptoms measured by rating scales of ADHD are typically consistent with those identified as disruptive externalizing problems (Reynolds & Kaufman, 2004). ADHD is also often referred to as “under-controlled”, consistent with the way Achenbach and Edelbrock (1978) define externalizing problems. Disruptive behaviors will include conduct problems and aggression for the sake of this study. Conduct problems can be described as engaging in rule-breaking and antisocial behaviors. This can also include destroying property (Reynolds & Kamphaus, 2004).

Aggression is the act of behaving in a threatening way towards others either verbally or physically (Reynolds & Kamphaus, 2004). When conduct or aggressive symptoms are severe, these are often diagnosed as conduct disorders (CD) or oppositional defiant disorder (ODD). According to the American Psychiatric Association (2000), conduct disorder (CD) includes behaviors in which the basic rights of others or major age-appropriate societal norms or rules are violated, and include: aggression to
people and animals, destruction of property, deceitfulness or theft and serious violations of rules. Oppositional defiant disorder (ODD) is a pattern of negativistic, hostile, and defiant behavior lasting at least six months that includes: often losing temper, arguing with adults, actively defying or refusing to comply with adults’ requests or rules, deliberately annoying others, blaming others for mistakes or behaviors, being touchy or easily annoyed by others, often being angry or resentful, or spiteful or vindictive (American Psychiatric Association, 2000). Individuals with internalizing or externalizing disorders often struggle with a variety of behaviors and emotions that correspond with the disability.

This review of literature explored internalizing and externalizing disorders and symptoms, specifically anxiety, depression, somatization, hyperactivity and disruptive behavior problems among children and adolescents and any relationship they may have with academic achievement. Research comparing clinical and school-referred populations was also examined in addition to research surrounding the Behavior Assessment System for Children, Second Edition (BASC-2) as a rating scale for identifying internalizing or externalizing symptoms in youth. With the increase in internalizing and externalizing problems in school-aged children and the seemingly adverse impact these problems may have on academics, rating scales may be a quick and efficient method to identify areas of academic achievement deficits. Several of these problems or disorders are often co-occurring, but initially will be described independently.

INTERNALIZING PROBLEMS
Mood and anxiety disorders are some of the most prevalent mental health issues in adults and the research has shown an increase in these disorders in children (Kessler et al., 2001; Merikangus et al., 2010). Mood and anxiety disorders have been identified in children and adolescents from eight to 15 years of age and are experienced more frequently by females, while males are more likely to exhibit externalizing disorders (Costello et al., 1996; Rescorla et al., 2007). A prevalence study conducted by Merikangus et al., (2010) on the topic of mental health disorders in children and adolescents found anxiety disorders are the most common at 31.9 percent, behavior disorders occur in 19.1 percent and mood and substance abuse disorders occur in 14.3 and 11.4 percent respectively. In addition, the median age of onset for anxiety is six years old, age of onset for behavior is at 11 years old and the median age for mood disorder onset is 13 (Merikangus et al., 2010).

Learning disabilities (LD) often exacerbate the situation by leading to greater negative affect and depression than found in nondisabled peers. Those students with LD are also more likely to experience somatic complaints, anxiety, stress and depression (Bryan, Mathur & Sullivan, 1996). When children and adolescents are dealing with mood disturbances, the way the symptoms are experienced and managed can impact healthy adjustment or can contribute to a full blown mood related episode (Reid et al., 2009). According to Reid et al. (2009), internalizing disorders occur from an inability to decrease negative emotions and/or to increase positive emotions. As more school-aged children are dealing with internalizing problems, professionals will need to be aware of the risk-factors and warning signs.
Research has shown that many students with internalizing problems such as depression or anxiety often go unnoticed (Chavira, Stein, Bailey & Stein, 2004). Particularly in the school setting, those children engaging in disruptive behaviors are identified for interventions or services while those quietly seated in the back of the classroom are often over-looked. Actually, those children and adolescents with externalizing symptoms, who are more easily identified, are often dealing with internalizing symptoms as well but their behaviors are manifested differently (White & Renk, 2012). Many times, youth’s behaviors change when they experience different feelings which can signal to parents and teachers there is something wrong. However, simply because a student is quiet in a class, does not mean he or she may not be struggling with internalizing symptoms.

According to Fox et al. (2008) a significant amount of the general population have depressive symptoms and are never referred for treatment. Research indicates adolescents are also more inclined to experience frequent changes in mood that range from one extreme to another and experience depressed mood more frequently than children (Arnett, 1999). Adolescents in general, are less likely to seek help for themselves (Walcott & Music, 2012). Furthermore, gender contributes to prevalence of internalizing problems. Females are more likely than males to experience depression and anxiety (De Bolle, De Clerq, Decuyper & De Fruyt, 2011; Friedrich, Raffaele Mendez & Mihalas, 2010). Depression and anxiety symptoms can also adversely affect a youth’s cognitive abilities, academic performance and social skills. Emotions impact thoughts and performance in daily life.
Depression is one of the most prevalent disorders experienced by children and adolescents. In fact, 11.2 percent of adolescents age 13 to 18 will be diagnosed with major depressive disorder or dysthymic disorder (Merikangus et al., 2010). This disorder can depress one’s mood and activity level over a period of time. Some of the symptoms of depression in children and adolescents include: loss of interest in previously preferred activities, restlessness or irritability, lower energy, continuous feelings of sadness or emptiness, changes in sleeping/eating patterns, difficulty concentrating, feelings of hopelessness and thoughts of suicide (NIMH, 2011). When children have depression, symptoms can present in a slightly different way by appearing as externalizing behaviors like aggression or anger (Aluja & Blanch, 2004). Symptoms of depression can present in a variety of ways especially in children. Other times it is presented as anger and angst, which some parents may write-off as typical adolescent behavior. The important factor to remember is that these issues can manifest in different ways and it is imperative to get a student’s self-report because the warning signs can be missed by parents and teachers. Mojtabai and Olfson (2008) found that only about 25 percent of parents are aware of self-harm behavior or suicidal ideation in their children. Particularly in adolescents, self-reports that are in a paper-pencil format are much more likely to produce honest responses (Malone, Szanto, Corbitt & Mann, 1995) supporting the use of a self-report method to measure behavioral and emotional symptoms.

Depressive symptoms can affect a student’s academic performance but some researchers have found no impact. Hodges and Plow (1990) identified underachievement in math for children with depression. Masi et al. (2000) confirmed that self-reported depression correlated highly with difficulty concentrating, school anxiety and negative
attitude towards school, all of which can impact academic achievement. The researchers also found that poor school performance contributed to negative affect. On the other hand, depression was not significant for achievement in a study conducted by Barriga et al. (2002) however; characteristics of depression such as withdrawal and somatic complaints did significantly affect achievement. Fite, Wimsatt, Vitulano, Rathert, and Schwartz (2012) determined depression was also not significantly associated with academic achievement. Research done by Mayes and Calhoun (2007) found children with depression did not perform significantly different from the control group on attention, writing or processing tasks. The variation in results suggested the need for further research exploring the relationship of depressive symptoms on academic achievement.

Anxiety is another highly prevalent disorder that plagues children and adolescents. Current statistics show 15 to 24 percent of children/adolescents have anxiety disorders (Fox et al., 2008). Anxiety can take different forms ranging from test anxiety to subject-specific anxiety to generalized anxiety. Symptoms of anxiety are: difficulty concentrating, racing thoughts, restlessness and excessive worry. Regardless of the shape it takes, anxiety can be debilitating to a student. Anxiety can lead to impaired cognitive function (Wood, 2006), trouble with recall of academic information and difficulty concentrating (Ma, 1999). Anxious individuals will also struggle with problem solving, engage in rigid thinking and are less responsive to stimuli around them (Phillips, Martin & Meyers, 1972).

Research studies involving anxiety and its relationship with academic achievement have varied results. Some researchers have identified anxiety as a hindrance
to academic performance (Levine, 2008; Ma, 1999; Wood, 2006) while other studies found performance of individuals with anxiety to be the same as the control group. Johnson, Mellor and Brann (2009) found children with anxiety were less likely to dropout of school despite lower academic scores; however, Rogers et al. (2001) identified anxiety as the second most common disorder for referred and detained youth in the juvenile justice system. Levine (2008) explains that anxiety directly and indirectly interferes with learning due to rigid thinking and limited intellectual processing. Levine argues that these limitations reduce an individual’s ability to reorganize and process new information necessary for learning. When anxiety is reduced in a child, school performance and social adjustment improve (Wood, 2006) suggesting the adverse effect of anxiety.

Hodges and Plow (1990) studied intellectual ability and achievement in children admitted to a psychiatric hospital. The children with anxiety had lower intelligence scores than expected but yielded mean standard scores in the average range on the Woodcock-Johnson Psychoeducational Battery. The researchers noted that levels of anxiety may have impacted performance on the intelligence test, but academic performance was not affected. Yoo et al. (2009) also found individuals with anxiety only did not have a statistically significant difference on achievement from the control group; however, individuals with co-occurring anxiety and externalizing problems did show academic deficits. The authors suggest the combination of two disabilities can interfere with reasoning and problem solving. Mychailyszyn, Mendez and Kendall (2010) found similar results as did Mathewson et al. (2012). Adolescents of affluence with internalizing disorders were also studied and results yielded academic achievement scores
similar to the control group (Ansary & Luthar, 2009). The research implies that low achievement may be a contributor to internalizing and/or externalizing problems and vice versa.

Somatization is another component of internalizing problems. Somatization is the complaint of physical problems without any apparent cause, typically in response to psychological difficulties (Reynolds & Kaufman, 2004). According to Hughes, Lourea-Waddell and Kendall (2008) somatic complaints in children predict poorer academic achievement as rated by classroom teachers. Barriga et al. (2002) found somatic complaints were significantly related to underachievement as measured by the Wide Range Achievement Test, Third Edition (WRAT3). Bryan et al. (1996) identified a reverse relationship, finding students with learning disabilities were more likely to have somatic complaints in response to the academic difficulties.

EXTERNALIZING PROBLEMS

Hyperactivity and other externalizing problems such as conduct problems and aggression are frequently diagnosed in children and adolescents. According to the Centers for Disease Control and Prevention (CDC) in December of 2010, five million children between the ages of three and 17 years old have ADHD. Boys are also more than twice as likely as girls to have ADHD. It is much more common than CD or ODD. The prevalence of conduct disorders (CD) in childhood is 9.5 percent with 12 percent of these individuals being male and 7.1 percent female (Nock et al., 2007). The lifetime prevalence of oppositional defiant disorder is 10.2 percent with 11.2 percent of these individuals being male and 9.2 percent female (Nock et al., 2007).
These externalizing problems often co-occur. The most prevalent co-occurring disorder with the neurodevelopment ADHD disorder is ODD. 40.6 percent of children with ADHD also have ODD. 21.6 percent of children have co-occurring minor depression/dysthymia (MDDD) and 15.2 percent have generalized anxiety disorder (GAD) (Elia, Ambrosini & Berrettini, 2008). Depending on the type of ADHD, inattentive, hyperactive or combined type, co-occurring disorders vary. MDDD is the most commonly co-occurring disorder with inattentive type by 20.8 percent. For those individuals with hyperactive type ADHD, ODD is the most common disorder that co-occurs in 41.9 percent of cases. 50.7 percent of individuals with combined type ADHD have co-occurring diagnoses of ODD (Elia et al., 2008). With the large percentage of co-occurring externalizing problems, professionals need to know if there are academic repercussions caused by these disorders.

Externalizing behaviors such as hyperactivity and conduct problems have significant ramifications for children and adolescents in school as well as into adulthood. These are the types of disruptive behaviors that are usually identified more often in boys (one and a half times) than girls and typically lead to referrals to mental health clinics (Piko et al., 2005). These are also problems that are relatively stable and can be difficult to treat and prevent (Arnold, 1997). Externalizing problem behaviors are also associated with internalizing disorders such as anxiety as well as substance abuse and juvenile delinquency (Rogers et al., 2001). Of particular interest to this study is the association externalizing problems have with academic achievement. The research surrounding this association is inconsistent as it is for depression, anxiety and somatization. Piko et al. (2005) identified low academics as a risk factor for externalizing problems as opposed to
the reverse. A study conducted with high school students determined externalizing and internalizing symptoms had no impact on academic underachievement (Breslau et al., 2009). Richards, Symons, Green and Szuszkiewicz (1995) explored the bidirectional relationship between achievement and externalizing behaviors. Their data supports the hypothesis that externalizing problem behaviors predict underachievement, not that academic achievement predicts externalizing behavior problems. Moving into specific externalizing problems, below are the studies focused on hyperactivity and conduct problems and their impact on academics.

Children and adolescents with attention deficit disorders can be disruptive in class, struggle to remain focused and can have significant academic deficits as a product of the symptoms of the disorder. The symptoms of Attention Deficit/Hyperactivity Disorder (ADHD) have a history of interfering with academic performance and also is often found co-occurring with other disorders. ADHD has three forms: inattentive, hyperactive/impulsive and combined; although much of the research indicates inattention is the primary factor that affects academic achievement (Breslau et al., 2009; Tymms & Merrell, 2011; Willcutt et al., 2007). Tymms and Merrell (2011) report hyperactivity as unrelated to academic attainment. When ADHD is comorbid with another disability, a student’s academic performance is even more adversely impacted. Children with reading disabilities (RD) and ADHD had higher academic deficits than either ADHD or RD alone (Willcutt et al., 2007). Gresham, Lane and Beebe-Frankenberger (2005) gained similar results that students with co-occurring hyperactive-impulsive-inattention and conduct problems had poorer academic achievement in reading and math than the control group.
The research clearly shows the inverse relationship between attention and academic performance.

When considering externalizing problems such as symptoms of ADHD, hyperactivity is the area of focus for this study. Defoe, Farrington and Loeber (2013) identified hyperactivity as a cause of low achievement which then causes delinquency to then cause depression. The researchers found a specific causative order with hyperactivity as one of the initiating factors. A diagnosis of ADHD was found to predict lower school functioning, but inattention predicted areas of dysfunction more consistently (Wu & Gau, 2013). Demaray and Jenkins (2011) found that children with high levels of inattentive, impulsive and hyperactive symptoms scored significantly lower than the control group on measures of academic achievement. Although inattention is often a primary contributor to academic underachievement, some studies have found hyperactivity alone to have an adverse relationship with academic achievement.

Under the same umbrella of externalizing problems, sensation-seeking and attitude to teachers are specific to children and adolescents and are traits evaluated with the Behavior Assessment System for Children, Second Edition (BASC-2). Sensation seeking is the desire to take risks and engaging in risky behaviors (Zuckerman, 1979). This can include potential drug and alcohol use and is found more frequently in males in late adolescence and early adulthood (Eysenck & Eysenck, 1985; Zuckerman, 1979). Baker, Beer and Beer (1991) conducted a study that identified a significant direct relationship between sensation seeking and alcoholism in adolescents. Sensation seeking and reports of school performance were not significantly related (Baker et al., 1991). Attitude to teachers is defined by Reynolds and Kamphaus (2004) as resentment or
dislike of teachers and the feeling or belief that teachers are uncaring or unfair. This trait could be a reflection of personality differences between a student and teacher, but it could also indicate a potential risk of dropping out of school (Kaufman & Reynolds, 2004).

Conduct problems and aggressive symptoms are often called disruptive behavior disorders. These are the types of disorders that are most commonly associated with juvenile delinquency (Zhang, Hsu, Katsiyannis, Barrett & Ju, 2011) and future success in life. Disruptive behaviors also frequently co-occur with attention deficit disorders as well as internalizing problems (Piko et al., 2005). Cognitively, individuals with conduct disorders (CD) have been linked to lower verbal abilities while those with oppositional defiant disorder (ODD) have no cognitive deficits (Hodges & Plow, 1990). In fact, ODD is so commonly co-occurring with ADHD, approximately 80 to 90 percent (Mayes, Calhoun, & Lane, 2002) that when the symptoms of ADHD are controlled for, those students with ODD exhibit no deficits in executive functioning (Klorman et al., 1999), attention or learning (Mayes & Calhoun, 2006b). Williams and McGee (1994) identified an inverse relationship between aggression and other antisocial behaviors, common in CD and ODD, and academic achievement. Furthermore, Frick et al. (1991) suggest that externalizing behaviors have a negative impact on academics because of the attention component that frequently co-occurs.

Barriga et al. (2002) sought to determine if attention problems mediated the relationship between problem behaviors and academic underachievement. An association between delinquent and aggressive behaviors and academic underachievement was found although the greatest association came from attentional problems. However, delinquent behavior in adolescents has been identified as a significant predictor for
underachievement even when attention has been controlled for (Hinshaw, 1992b).

Hinshaw (1992b) concluded that attention is a significant factor when looking at the relationships externalizing symptoms have on academic underachievement in children, but the same results cannot be transferred to adolescents.

ADHD symptoms such as hyperactivity, impulsivity and inattention have an adverse impact on academic achievement (Demaray & Jenkins, 2011). If an individual is unable to attend to a lesson, the information being conveyed is not going to be received by the student resulting in lower academic achievement (Levine, 2008). Much research supports the cognitive deficits related to internalizing and externalizing problems; however, the research surrounding academic achievement deficits related to these disorders is inconsistent. In the area of cognitive processes, working memory is affected by mood (Aoki et al., 2011; Mitchell & Phillips, 2007). In addition to working memory, mood can change perception and reasoning (Bryan et al., 1996; DeLancey, 2006).

Specifically for depression, concentration and decisiveness are reduced and general cognitive dysfunctions and distortions occur. Distractibility and poor decision-making are problems that occur in adolescents with mania (Chamberlain & Sahakian, 2005). In contrast, positive affect can increase memory, improve task discrimination, altruism and child compliance (Bryan et al., 1996). It also promotes cognitive flexibility and integration including word associations and problem-solving (Bryan et al., 1996).

Research conducted by Bryan and Bryan (1991a) found that students with learning disabilities performed better on memorizing vocabulary words, math computation, short-term memory and listening comprehension tasks when in a positive mood. On the other hand, research of students with a learning disability (LD) shows that
the experience of school failure lends itself to internalizing problems (Cohen, 1986; Guay, Boivin & Hodeges, 1999; Hatzichristou & Hopf, 1993; Martinez & Semrud-Clikeman, 2004). Some researchers have found that anxiety, depression, hyperactivity and disruptive behaviors had little to no impact on student’s academic achievement while others have found the opposite. Due to these inconsistencies, further research on this topic was warranted.

REFERRAL AND EVALUATION SOURCE

When suspicion of a mental health problem arises for a child or an adolescent, there are several options for referral assistance. One option is to speak with the school psychologist at the student’s school to pursue a psycho-educational evaluation. A second option would be to seek out a private clinician to conduct an evaluation and a third option is to talk with a family doctor about the present concerns.

Depending on availability of financial resources and knowledge of community resources, many students will be referred to their schools. According to Burns et al. (1995) the majority of youth who require mental health evaluations receive them from school-based programs as opposed to community-based practitioners. Angold et al. (1998) and Cohen et al. (1991) found the severity of symptoms and their impact on parents are what spur referrals for evaluations. Southam-Gerow et al. (2008) reported private evaluations are more commonly initiated by parents while evaluations done in the schools are typically initiated by educational professionals. Beyond this, little research has been done that evaluates the difference between school and private practice referrals. Individuals referred to a private practitioner may exhibit more severe behavioral or emotional problems or there could be other factors at play.
Reason for referral is another avenue to explore when comparing school versus private evaluation referrals. Within the schools, teachers are often making referrals to the school psychologist for children with externalizing symptoms. The students who are most disruptive to the classroom environment are the ones at the forefront of a teacher’s mind. These are also the students teachers have the hardest time dealing with through classroom discipline. Reigstad et al. (2004) conducted a study on changes in referrals in Norway and reported teachers and social service workers are more likely to refer students for internalizing symptoms. They explained that professionals are trained to identify internalizing disorders. Parents who seek out private evaluations often request the evaluation due to externalizing symptoms (Reigstad et al., 2004). Private referrals are also often restricted to higher income families, as evaluations can be rather expensive which limits the population demographics.

**RATING SCALE**

The Behavior Assessment System for Children, Second Edition (BASC-2) is a comprehensive rating scale that measures behaviors and emotions in children and adolescence. This rating scale was designed to help with differential diagnosis among DSM-IV-TR categories and special education categories (Rescorla, 2009). It consists of parent, teacher and self-report forms as well as a developmental history and a classroom observation form. The present study focused on the parent report and the student self-report. The parent rating scale (PRS) includes four composite scales of: Externalizing Problems, Internalizing Problems, Behavior Index and Adaptive Skills. The self-report of personality (SRP) yields five composite scales: Emotional Symptoms Index,
Inattention/Hyperactivity, Internalizing Problems, Personal Adjustment and School Problems.

The BASC-2 is a widely used measure that provides valid and reliable data. The BASC-2 test-retest reliability ranges from .76 to .84 for the PRS and .73 to .83 for the SRP (Reynolds & Kamphaus, 2004) signifying acceptable reliability. Cronbach’s alpha coefficient measures the internal consistency, or reliability, of a test score. The BASC-2 composite scales have alphas of ≥ .90. The PRS has mean alphas of .87 for problem scales and .83 for adaptive skills. The SRP has mean alphas of .82 for problem scales and .80 for adaptive skills (Rescorla, 2009). Considering the strength of the alpha coefficients for the parent and self-report scales, the BASC-2 can be considered a reliable measure. The scale also includes validity scales to address bias from the raters. The validity scales incorporate: an F Index, a Consistency Index (CI) and a Response Pattern Index (RPI) for the PRS and SRP. The SRP also has a Lie Index and a Validity Index. These indices are another way to ensure that the information being provided by the raters is accurate and valid.

One advantage of the BASC-2 rating scale is the inclusion of a clinical and a general sample of children and adolescents. Individuals in the clinical sample had lower scores on adaptive scales and higher scores on problem scales than the general sample but some demographic differences were not accounted for (Rescorla, 2009). Had the samples been matched, better comparisons between clinical and general populations could have been made.

The BASC-2 is a measure that has been used for many years by practitioners and continues to be used regularly today. Beyond the research conducted by the creators of
the BASC-2, Cecil Reynolds and Randy Kamphaus, there is a significant amount of research supporting the reliability and validity of the measure. One particular study by Weis and Smenner (2007) examined the construct validity of the self-report form and identified the Clinical Maladjustment composite as the best evidence of convergent validity. The study also found the anxiety, depression, somatization and sense of inadequacy scales to be the best evidence for convergent and discriminant validity. Essentially, the research determined these scales to be “pure indicators of psychological distress, depressed mood, somatic complaints, and negative affect” (Weis & Smenner, 2007, p.123). The Interpersonal Relations, Self-esteem and Self-reliance scales are adequate measures of the absence of depression, anxiety and social impairment (Weis & Smenner, 2007). The BASC-2 has much research supporting its use as a scale to identify behavioral and emotional problems in children and adolescents. However, the use of the BASC-2 scale as a predictor for academic under-achievement has not been studied in depth. Reynolds and Kamphaus (2004) acknowledge academic consequences of symptoms of ADHD and depression and report the association of low self-concept or anxiety with learning disabilities and mental retardation. When the norms were established for the BASC-2, the authors included both general and clinical groups of children and adolescents. The general norms group was derived of general education classrooms but included students diagnosed with emotional, behavioral or physical problems. Students with emotional and behavioral disturbances as well as speech and language impairments were slightly overrepresented in the general norms group. The clinical norm group was comprised of students from special education classrooms and clinics and treatment centers for students with emotional and behavioral problems.
The interpretation of the BASC-2 norming data identified different patterns of behavioral strengths and deficits from the parent rating scale. Students with ADHD had higher scores on the Hyperactivity and Attention Problems subtests. Those with emotional and behavioral disturbances (EBD) had more elevated scores than individuals with ADHD with elevated scores on the following subtests: Hyperactivity, Aggression, Conduct Problems, Depression, Atypicality, Adaptability, Leadership, Activities of Daily Living and Functional Communication (Reynolds & Kamphaus, 2004). Children and adolescents with learning disabilities had similar profiles with subtests measured in the average range. Attention Problems measured just below the At-Risk range (Reynolds & Kamphaus, 2004). The most elevated profiles were identified in children with bipolar or depression disorders. All clinical scales were in the significantly elevated range (Reynolds & Kamphaus, 2004) but the authors advise caution due to the small sample size for this particular group.

The clinical group profiles of the BASC-2 self-report scales resulted in slightly different behavioral strengths and weaknesses. Students with ADHD and EBD had higher scores for Attention Problems and Hyperactivity. Those with ADHD also reported higher levels of depression. Students with learning disabilities had rather flat profiles with subtests in the average range. Individuals with depressive disorders had elevated scores for Depression and Somatization, but caution is advised due to the small sample size. The BASC-2 identifies patterns of strengths and weaknesses in certain behavioral or emotional problems within norming groups. It would be interesting to know if these patterns exist using real data from students referred for services.
The BASC-2 has a statistically significant correlation with another popular rating scale, the Achenbach System of Empirically Based Assessment (ASEBA). According to the BASC-2 Manual (Reynolds & Kamphaus, 2004) the Self-Report of Personality for adolescents (SRP-A) had a statistically significant correlation with the ASEBA Youth Self-Report (YSR) on several composites and scales. The Internalizing Problems composite of the BASC-2 correlated with the Internalizing Syndrome Scale of the YSR at .80. The BASC-2 Emotional Symptoms Index correlated with the ASEBA Total Problems composite at .75. The BASC-2 Anxiety and Depression scales were significantly correlated with the ASEBA Anxious/Depressed scale at .83 and .67 respectively. The ASEBA Withdrawn-Depressed scales also significantly correlated with the BASC-2 Depression scale (.72). Somatization had a statistically significant correlation at .65 as was the BASC-2 Inattention/Hyperactivity composite with the ASEBA ADHD DSM-Oriented Scales (.75). Externalizing Syndrome Scales on the ASEBA YSR did not have a significant correlation with the scales on the BASC-2 SRP-A.

The BASC-2 Parent Rating Scale (PRS) and the ASEBA Child Behavior Checklist (CBCL) were also significantly correlated on several scales. Internalizing Problems had a statistically significant correlation at a level of .69 for children and .67 for adolescents. Externalizing Problems had a statistically significant correlation of .82 for children and .74 for adolescents. Anxiety, depression, withdrawal, somatization, aggression, hyperactivity and attention problems were all correlated at statistically significant levels.
Published correlational data studies including the BASC-2 and academic achievement measures are almost nonexistent. A study by Kwon et al. (2012) explored correlations between the BASC-2 and the WJ-III Achievement in early elementary aged children with externalizing problems. When child disability and parent education were accounted for, externalizing problems were not related to reading achievement. After child disability, parent education, externalizing problems and adaptive skills were accounted for, externalizing problems and reading achievement were positively associated. Externalizing problems were not associated with math achievement. After an extensive review of the literature, no other studies were found that reported the relationship between BASC-2 ratings and scores on the WJ-III:ACH.

While studies reporting correlations between the BASC-2 and standardized academic achievement tests are limited, the ASEBA Youth-Self Report (YSR) has been included in studies exploring the relationships between academic achievement measures and children’s perceptions. Mee Yee Chan (2012) studied the self-reported perceptions of the severity of ADHD symptoms and how it correlated with the Wide Range Achievement Test, Fourth Edition (WRAT-4). The researcher found perceptions of ADHD symptoms reported on the YSR were not significantly correlated with the WRAT-4 ($r = -.13, p = .330$). The researcher also found that parent perceptions of ADHD symptoms were significantly correlated with academic achievement as measured by the WRAT-4 ($r = -.51, p \leq .05$). A study conducted by Blackburn (2006) examined externalizing and internalizing scores on the ASEBA Child Behavior Checklist (CBCL) and correlations with the Woodcock Reading Mastery Test, Revised (WRMT-R). Externalizing scores on the CBCL were negatively correlated with phonological
processing and reading measures. Externalizing scores were significantly correlated at an alpha level of .01 with WRMT-R Word Identification \((r = -.58)\) and WRMT-R Passage Comprehension \((r = -.59)\). The Comprehensive Test of Phonological Processing (CTOPP) Phonological Awareness \((r = -.43)\) and WRMT-R Word Attack \((r = -.51)\) were significantly correlated at an alpha level of .05. Internalizing scores were not significantly correlated with the reading measures.

**SUMMARY**

This chapter provided a review of internalizing and externalizing symptoms as well as the relationship with academic achievement. Co-occurring internalizing and externalizing disorders and different referral processes were also discussed. The rating scale as a measure of behavioral and emotional problems with focus on the BASC-2 was reviewed in addition to the clinical profiles found during the norming procedures of the BASC-2.

While there was a dearth of studies reporting the correlations between the BASC-2 and standardized academic achievement measures, there are some that evaluate the correlations between the Achenbach scales and standardized measures of achievement. Many of the studies measure academic performance through a variety of methods such as standardized assessment, teacher report or questionnaire, or researcher made assessment. According to a meta-analysis by Ma (1999) those studies that used formal academic achievement tests reported much smaller magnitude than studies that used teacher report or researcher made academic tests. Although there are several studies that found significant relationships between internalizing and externalizing problems and academic performance, not all used a formal standardized test to measure academic performance.
The next chapter, Chapter 3, will provide the methodology to be used to address the research questions.
CHAPTER 3

METHODOLOGY

The prevalence of internalizing and externalizing disorders has increased for our school-aged youth resulting in the need for continued improvement with identification and treatment of these problems (Twenge et al., 2010). With anxiety, depression, hyperactivity and conduct problems, academic achievement may be adversely affected although the current research has shown inconsistent results. Both psychologists who practice in the schools and psychologists in private practice can benefit from a rating scale that helps predict academic deficits. Because of the ease and efficiency of the BASC-2, this rating scale can be used to gather behavioral and emotional data to determine the presence of any internalizing or externalizing symptoms. While it would appear reasonable to assume that the relationship between behavioral and emotional conditions and academic achievement would be reflected in the relationship between BASC-2 scores and measures of academic achievement, there is remarkably little evidence for that relationship in the literature. This study began to address that deficit. Contingent on the relationship found between BASC-2 scores and academic achievement measures, a practitioner could find it advantageous to concurrently address both cognitive and affective issues, not just one at a time.

The purpose of this study was twofold. The extent of relationship between BASC-2 scores and academic achievement measures was explored with combined data from participants in school and private practice settings. The study also explored possible differences in the relationship of the scores in the two settings, and possible
differences in the severity of the self-reported and parent-reported BASC-2 scores in the two referral settings.

RESEARCH QUESTIONS

The review of the literature leads to the following research questions:

- Is there a relationship between the extent of internalizing problems and scores on measures of academic achievement?
- Is there a relationship between the extent of externalizing problems and scores on measures of academic achievement?
- Is the extent of relationship between internalizing problems and academic achievement different for measures of reading and math?
- Is the extent of relationship between externalizing problems and academic achievement different for measures of reading and math?
- Is there a difference in parent ratings of severity of internalizing problems between referrals in the private practice setting and school referrals?
- Is there a difference in self-reported ratings of severity of internalizing problems based on private or school referral?
- Is there a difference in parent ratings of severity of externalizing problems between referrals in the private practice setting and school referrals?
- Is there a difference in self-reported ratings of severity of externalizing problems based on private or school referral?
- Will cluster analysis of the patterns among BASC-2 scores generate a cluster solution typology that differentiates the private practice setting and school referrals?
HYPOTHESES

Thirteen null hypotheses were tested to address the nine research questions:

1. There is not a statistically significant correlation between student ratings of internalizing problems on the BASC-2 and total achievement test scores.
2. There is not a statistically significant correlation between parent ratings of internalizing problems on the BASC-2 and total achievement test scores.
3. There is not a statistically significant correlation between student ratings of externalizing problems on the BASC-2 and total achievement test scores.
4. There is not a statistically significant correlation between parent ratings of externalizing problems on the BASC-2 and total achievement test scores.
5. Differences in the relationship between self-reported internalizing problems and scores on measures of reading and math are not statistically significant.
6. Differences in the relationship between parent-reported internalizing problems and scores on measures of reading and math are not statistically significant.
7. There is not a statistically significant difference in the relationship between self-reported externalizing problems and scores on measures of reading and math.
8. Difference in the relationship between parent-reported externalizing problems and scores on measures of reading and math are not statistically significant.
9. The differences in severity of self-reported internalizing problems among referrals from private practice and school settings are not statistically significant.
10. The differences in severity of parent-reported internalizing problems among referrals from private practice and school settings are not statistically significant.

11. The differences in severity of self-reported externalizing problems among referrals from private practice and school settings are not statistically significant.

12. The differences in severity of parent-reported externalizing problems among referrals from private practice and school settings are not statistically significant.

13. Cluster analysis of the BASC-2 scores associated with internalizing and externalizing problems will not identify a pattern differentiating private practice and school referrals.

PARTICIPANTS

Participants included 313 children and adolescents aged, eight to 18 from a private practice and a school district in a large metropolitan city. The data spanned ten years from 2003 to 2013. The two participant groups were essentially comparable in age, grade and gender. With concern about fidelity of self-ratings on the BASC-2, those participants with levels of intelligence below a standard score of 80, as measured by standardized assessment, were excluded from the dataset. After receiving approval from the Institutional Review Board (IRB) and the CCSD Research Review Committee, archived evaluation data were analyzed from a private practice psychologist and from district school psychologists. The secondary data was free of any identifying information to ensure confidentiality of the children and adolescents.
MEASURES

The Behavior Assessment System for Children, Second Edition (BASC-2) parent and student rating scales rate behaviors and emotions for children and adolescents ages two to 21. The parent rating scale (PRS) consists of 160 questions for the child report and 150 questions for the adolescent report. The self-report scale (SRP) has 139 questions for children aged eight to 11 and 176 questions for adolescents aged 12 to 21. Response format is a Likert scale with four options: 0 = Never, 1 = Sometimes, 2 = Often or 3 = Almost Always. The SRP also includes some True/False items. Reynolds and Kamphaus (2004) use a 4-level scale because it “can improve measurement at the extremes of the behavior dimension being measured because Never and Almost Always are extreme ratings” (p. 94). Score reports yield T-scores with a mean of 50 and a standard deviation of 10. Problem Scale T-scores of 70 and above are labeled as Clinically Significant, scores of 60 to 69 are At-Risk, scores of 40 to 59 are Average and scores ≤ 39 are in the Low range. Adaptive Skill T-score labels are the opposite of the Problem Scale.

The BASC-2 rating scales used in this study were the Internalizing and Externalizing Problems composite scales. The Internalizing Problems composite is comprised of scales for Anxiety and Depression rated by children, age eight to 11, adolescents and parents and Somatization that is rated by adolescents and parents. Externalizing Problems are comprised of scales for Aggression, Conduct Problems and Hyperactivity. The self-report form examines Attitude to Teacher and Hyperactivity rated by the child and adolescent and Sensation Seeking rated by adolescents only.
When scoring the scales, the General Combined-Sex Norms were used as they are preferred norms for general use (Reynolds & Kamphaus, 2004). Because of the frequency that boys typically score higher on externalizing scales such as aggression and girls score higher on certain scales such as social skills, the combined norms are preferred as they indicate the frequency of obtained scores depending on age rather than gender (Rescorla, 2009).

In the event that a student had two parent rating scales, the rating scale completed by the mother was used. Achenbach and Edelbrock (1983) and Hulbert, Gdowski and Lochar (1986) reported that mothers reported more significant symptoms than fathers did; however, Graham and Stevenson (1985) reported bias in fathers’ reports of daughters’ symptoms. Jenson, Traylor, Xenakis and Davis (1988) found mothers and fathers differed on ratings for sons’ behavioral problems although ratings were not different for girls. According to Gomez (2010), mother and father ratings of ADHD symptoms on the Disruptive Behavior Rating Scale were identical. However, Langberg et al. (2010) found a clinically significant difference between parent ratings of externalizing behaviors that include symptoms of ADHD and oppositional defiance. The datasets in this study consist primarily of rating scales completed by mothers. For consistency, when a child has two ratings scales, the scale completed by the student’s mother was used.

The self-report form does not include an Externalizing Problems composite scale; however, three subtests were defined for use in this study as Externalizing Problems subtests. The subtests included were: Attitude to Teachers, Hyperactivity and Sensation Seeking. These three subtests were chosen to represent externalizing problems on the
basis of the strong correlations with other externalizing problems subtests found in other rating scales. For example, Attitude to Teachers, while not significantly correlated with the Achenbach System of Empirically Based Assessment (ASEBA) Youth Self-Report (YSR), had a correlation of .61 (Reynolds & Kamphaus, 2004). Hyperactivity and Sensation Seeking also did not have a statistically significant correlation with the ASEBA YSR Externalizing Problems scale; however, they had a correlation of .59 and .44 respectively indicating solid correlations.

The Woodcock-Johnson Tests of Achievement, Third Edition (WJ-III:ACH) is a norm-referenced, standardized academic achievement test. The academic areas of interest that are assessed by this tool are: Broad Reading, Letter-Word Identification, Reading Fluency, Passage Comprehension, Broad Math, Calculation, Math Fluency and Applied Problems. Total achievement will be assessed by the Academic Skills composite that is comprised of the following subtests: Letter-Word Identification, Math Calculation and Spelling. This composite scale was used as an indicator of total achievement as it provides a score of the basic academic skills: reading decoding, math calculation and spelling (Woodcock et al., 2007). Raw scores are translated into standard scores that have a mean of 100 and a standard deviation of 15.

DATA COLLECTION

Two de-identified datasets were used in this analysis. The dataset identified as private practitioner was drawn from a group of 564 consecutive cases referred to a private practice psychologist in Las Vegas for psychological evaluation. The cases from that dataset used in this study include children and adolescents from whom a BASC-2 self-report, a BASC-2 parent report, and scores on the WJ-III:ACH were available. The
second dataset used in this study was comprised of de-identified cases in which the evaluation was conducted by a school psychologist in the Clark County School District (CCSD) that included a BASC-2 self-report, a BASC-2 parent report, and achievement test scores from the WJ-III:ACH. Cases selected from the CCSD data set were comparable in age, grade and gender to the first set.

The school district dataset was created from a review of approximately 9,600 archived multidisciplinary reports. Cases for this study were chosen to be comparable to the private practice data set based on student age and grade as well as the presence of mother and self-reported BASC-2 scores and WJ-III:ACH scores. Those individuals with cognitive ability scores below a standard score of 80 were excluded.

DATA ANALYSIS

The data were analyzed with descriptive statistics, correlation analysis, ANOVA, moderator analysis, and cluster analysis. SPSS (IBM SPSS, Armonk, New York) provides several tools for conducting cluster analysis, including the k-Means method, the hierarchical method, and a relatively new tool identified as TwoStep. Advantages of using the TwoStep clustering algorithm include that the method permits use with both categorical and continuous data, allows automatic noise handling for outliers, and automates the process of determining the optimal number of clusters (Cross, 2013).

A TwoStep cluster analysis begins with grouping cases into preclusters with assignment of individual cases based on a distance from current preclusters using either log-likelihood or Euclidean criteria. Log-likelihood is the default, a model in which the distance between two clusters is equivalent to the decrease in log-likelihood function as a result of merging. The second step uses an agglomerative algorithm to identify the
optimal number of clusters (Okazaki, 2006) using either Bayesian Information Criterion (BIC) or Akaike Information Criterion (AIC). The Bayesian approach (Schwartz, 1978) is the default to automatically determine the optimal number of clusters.

Output of the SPSS TwoStep cluster analysis begins with identification of the optimal number of clusters and an overall rating of the cluster quality reflecting cluster cohesion and separation on a scale of poor, fair, and good. Also included is an ‘importance’ rating on a scale of 0 to 1 indicating the predictive importance of each variable for cluster membership.

Typical for secondary data analysis, there were instances in which a composite WJ-III:ACH score was not provided even though scores on the subtests that contribute to the composite were available and instances where a composite was provided but the score on one of the contributing subtests was not. The proprietary nature of WJ-III:ACH scoring did not allow looking up the missing score on a norms conversion table. In those instances, to adjust for the missing values, regression analysis was used to predict the 46 missing values found in the two datasets. Preliminary statistical analyses identified outliers in both the private practice and school district datasets which were removed prior to any further analyses. Statistical analyses were conducted using SPSS Version 20.

SUMMARY

The purpose of the present study was to investigate the relationship between parent and self-reported BASC-2 ratings and measures of academic achievement as well as to compare the severity of the behavior ratings dependent of the location of services (school or private). The chapter describes the participants and how data were acquired. Next, the specific instruments used were described. The specific research questions and
hypotheses were also discussed. Finally, the statistical analyses conducted, and the reason for selecting the specific analyses, were discussed.
CHAPTER 4

RESULTS

The primary purpose of this study was to determine the extent of the relationship between internalizing and externalizing symptoms, as rated by the individual student and his or her mother on the BASC-2, and academic achievement. This study also investigated the difference in parent reported ratings and self-reports of internalizing and externalizing symptoms, comparing private practice and school referrals.

PARTICIPANTS

Participants included 313 children and adolescents aged, eight to 18, from both private practice and school district datasets. The private practice dataset included 196 participants while the remaining 117 participants came from the school district. The school district data were selected to match the private practice data according to the demographic variables of age, gender, and grade level. Descriptive information is summarized in Table 1. There was not a statistically significant difference in the referral sources between age and source ($F(1,310) = 1.411, p = .236$). There was also not a statistically significant difference between grade and private practice or school referrals ($F(1,311) = 2.889, p = .090$). A chi-square test of independence was performed to examine the relation between gender and referral source. The relation between these variables was not significant, $\chi^2 (1, N = 313) = .001, p = .972$. With concern about fidelity of self-ratings on the BASC-2, those participants with levels of intelligence below a standard score of 80, as measured by standardized assessment, were excluded from the dataset.
Table 1

Descriptive Statistics for Children and Adolescent Participants

<table>
<thead>
<tr>
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<th>n</th>
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<th>Maximum</th>
<th>Mean</th>
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<td></td>
</tr>
<tr>
<td>Age (years)</td>
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<td>12</td>
<td>5.94</td>
</tr>
</tbody>
</table>

**INSTRUMENTS**

The instruments used for this study included an academic measure and a social-emotional rating scale. Academic achievement was measured by the Woodcock-Johnson, Tests of Achievement, Third Edition (WJ-III:ACH). Total achievement was assessed with the Academic Skills Composite on the WJ-III:ACH which includes Letter-Word Identification, Calculation and Spelling. Reading was assessed using the Broad Reading Composite comprised of Letter-Word Identification, Reading Fluency and Passage Comprehension. Mathematics was assessed using the Broad Math Composite of Calculation, Math Fluency and Applied Problems.

The Behavior Assessment System for Children, Second Edition (BASC-2) rating scale was completed by both the participant and the participant’s mother. The self-report BASC-2 has both a child (ages eight to 11) and an adolescent (ages 12 to 21) form.
The Internalizing Problems scale includes separate scales for Anxiety and Depression for both children and adolescents. The Somatization scale is specific to the adolescent forms.

The Externalizing Problems scale on the parent form includes hyperactivity, aggression and conduct problems. Externalizing problems on the self-report include hyperactivity, attitude to teachers and sensation seeking which is a scale specific to the adolescent forms. A composite Externalizing problems scale is not available on the self-report BASC-2.

DATASETS

This study used datasets from a private practice and from a large public school district over the past ten years from 2003 to 2013. The private practice dataset was the initial dataset available and a matched sample was created with the school district data.

All available relevant data were used in the analyses testing the hypotheses in this study, but, as displayed in Table 2, there is variation in the number of participants with scores on the individual WJ-III:ACH scales. Table 2 shows the number of participants for each of the WJ-III:ACH and BASC-2 comparisons.

One possible explanation for this variation is the large variety of subtest options provided within the test. The WJ-III:ACH offers 12 subtests within the standard battery and an additional 10 subtests in the extended battery (Woodcock et al., 2007). The data in this study came from actual practice in the two settings, and practitioners have the option of using only those subtests they find most appropriate for an individual referral.
Moreover, when using secondary data, it is possible that some of the missing scores were on tests that were administered, but the scores were not entered in the data set.
Table 2

Summary of n for BASC-2 and WJ-III:ACH Comparisons

<table>
<thead>
<tr>
<th></th>
<th>SRP Int</th>
<th>SRP Anx</th>
<th>SRP Dep</th>
<th>SRP Soma</th>
<th>PRS Int</th>
<th>PRS Anx</th>
<th>PRS Dep</th>
<th>PRS Soma</th>
<th>SRP Attitu</th>
<th>SRP Hyp</th>
<th>SRP Sens</th>
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<th>PRS Hyp</th>
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<td>Spell</td>
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<td>216</td>
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<td>252</td>
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<td>L-W</td>
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<td>277</td>
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<td>131</td>
<td>292</td>
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<td>276</td>
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<td>R. Flu</td>
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<td>255</td>
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<td>254</td>
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<tr>
<td>Pass Comp</td>
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<td>264</td>
<td>125</td>
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<td>Br. Math</td>
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<td>M. Flu</td>
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<td>238</td>
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</table>

Note. BASC-2 variables are presented in the horizontal row while WJ-III:ACH variables are presented in the vertical columns. SRP Int = self-reported Internalizing problems; SRP Anx = self-reported Anxiety; SRP Dep = self-reported Depression; SRP Soma = self-reported Somatization; PRS Int = parent-reported Internalizing problems; PRS Anx = parent-reported Anxiety; PRS Dep = parent-reported Depression; PRS Soma = parent-reported Somatization; SRP Attitu = self-reported Attitude to Teachers; SRP Hyp = self-reported Hyperactivity; SRP Sens = self-reported Sensation Seeking; PRS Ext = parent-reported Externalizing problems; PRS Hyp = parent-reported Hyperactivity; PRS Agg = parent-reported Aggression; PRS CondPr = parent-reported Conduct Problems. Acad Skills = Academic Skills composite; Spell = Spelling subtest; Br. Read = Broad Reading composite; L-W = Letter-Word Identification subtest; R. Flu = Reading Fluency subtest; Pass Comp = Passage Comprehension subtest; Br. Math = Broad Math composite; Calc = Calculation subtest; M. Flu = Math Fluency subtest; App Prob = Applied Problems subtest.
RESEARCH QUESTIONS

The questions guiding this research study were:

1. Is there a relationship between the extent of internalizing problems and scores on measures of academic achievement?
2. Is there a relationship between the extent of externalizing problems and scores on measures of academic achievement?
3. Is the extent of relationship between internalizing problems and academic achievement different for measures of reading and math?
4. Is the extent of relationship between externalizing problems and academic achievement different for measures of reading and math?
5. Is there a difference in parent ratings of severity of internalizing problems between referrals in the private practice setting and school referrals?
6. Is there a difference in self-reported ratings of severity of internalizing problems based on private or school referral?
7. Is there a difference in parent ratings of severity of externalizing problems between referrals in the private practice setting and school evaluations?
8. Is there a difference in self-reported ratings of severity of externalizing problems based on private or school evaluations?
9. Will cluster analysis of the patterns among BASC-2 scores generate a cluster solution typology that differentiates the private practice setting and school evaluations?
The following hypotheses seek to answer the research questions listed above. Hypotheses one through eight used the combined data set while differences between the private practice and school data are addressed in hypotheses nine through 13.

**Hypothesis 1**

*There is not a statistically significant correlation between student ratings of internalizing problems on the BASC-2 and total achievement test scores.*

The “total achievement” variable was operationally defined for this study as the Academic Skills composite score on the WJ-III:ACH. This composite is comprised of WJ-III:ACH subtest scores in Letter-Word Identification, Calculation, and Spelling. Student ratings on the BASC-2 Internalizing Problems scale and the WJ-III:ACH Academic Skills composite were available for 217 participants, sixty-five were female; 152 were male. The age range was 8 to 18 with a mean of 11.9.

Table 3 displays the correlation matrix for the related WJ-III:ACH and BASC-2 student ratings. The Pearson product-moment correlation, \( r = -0.146, p = .032 \), between the BASC-2 Internalizing Problems score and the WJ-III:ACH Academic Skills composite score indicated that higher ratings on the Internalizing Problems scale were associated with lower scores on the Academic Skills Composite. The correlation coefficient was statistically significant at an alpha level of .05.

The WJ-III:ACH Academic Skills composite is comprised of subtests for Letter-Word Identification, Calculation, and Spelling. Correlation coefficients between the BASC-2 Internalizing Problems scale and each of the Academic Skills subtests were: Letter-Word Identification, \( n = 293, r = -.120, p = .039 \); Calculation, \( n = 288, r = -.158, p = .007 \); and Spelling, \( n = 217, r = -.113, p = .097 \).
The BASC-2 Internalizing Problems scale is comprised of subtests for Anxiety, Depression, and Somatization. Correlation coefficients between the subtests and the Academic Skills composite score were: Anxiety, $n = 212, r = -0.099, p = 0.152$; Depression, $n = 212, r = -0.217, p = 0.002$; Somatization, $n = 92, r = -0.225, p = 0.031$.

Correlations between the subtests comprising the BASC-2 Internalizing Problems scale and the subtests comprising the WJ-III:ACH Academic Skills scale indicated a similar pattern. The correlations between Anxiety and the Academic Skills subtests were: $r = -0.108, p = 0.073$; $r = -0.175, p = 0.004$; and $r = -0.097, p = 0.159$, for Letter-Word Identification ($n = 277$), Calculation ($n = 273$), and Spelling ($n = 212$), respectively.

With the same $n$ for each variable, the corresponding correlations between Depression and the Academic Skills subtests were: $r = -0.110, p = 0.068$; $r = -0.257, p = 0.000$; and $r = -0.191, p = 0.005$, for Letter-Word Identification, Calculation, and Spelling, respectively.

The Somatization subtest was available only for the older participants. All of the correlation coefficients were in the direction of higher problems corresponding to lower achievement but only the correlation with Calculation reached statistical significance. The Somatization score correlations were: Letter-Word Identification, $n = 131, r = -0.105, p = 0.235$; Calculation, $n = 131, r = -0.178, p = 0.042$, and Spelling, $n = 92, r = -0.167, p = 0.112$.

To summarize, when comparing the Internalizing Problems composite with the subtests of the Academic Skills composite, correlations with Letter-Word Identification and Calculation were statistically significant, while Spelling was not. The correlations between Depression and Somatization and the Academic Skills composite were
statistically significant while Anxiety was not significantly correlated to academic skills. Considering each of the subtests, Anxiety had a statistically significant correlation with Calculation, Depression had a statistically significant correlation with Calculation and Spelling, and Somatization had a statistically significant correlation with Calculation. The overall pattern in these data indicates a statistically significant relationship between Internalizing Problems and total achievement with the relationships most clearly evident in correlations of the academic skills scales and the Internalizing Problems subtest for Depression and with the correlations of the Internalizing Problems scales and the Academic Skills subtest for Math Calculation. The null hypothesis is rejected.

**Hypothesis 2**

*There is not a statistically significant correlation between parent ratings of internalizing problems on the BASC-2 and total achievement test scores.*

Parent ratings on the BASC-2 Internalizing Problems scale and the WJ-III:ACH Academic Skills composite were available for 216 participants, sixty-five were female; 151 were male. The age range was 8 to 18 with a mean of 11.9.

Table 3 displays the correlation matrix for the related WJ-III:ACH and BASC-2 parent ratings. The Pearson product-moment correlation, \(r = -.106, p = .120\), between the BASC-2 Internalizing Problems score and the WJ-III:ACH Academic Skills composite score was not statistically significant.

Correlation coefficients between the parent-rated BASC-2 Internalizing Problems scale and each of the Academic Skills subtests were: Letter-Word Identification, \(n = 292, r = -.136, p = .020\); Calculation, \(n = 287, r = -.170, p = .004\), and Spelling, \(n = 216, r = -.054, p = .431\).
Correlation coefficients between the Internalizing Problems subtests and the Academic Skills composite score were: Anxiety, \( n = 210, r = -.014, p = .841 \); Depression, \( n = 210, r = -.113, p = .101 \); Somatization, \( n = 210, r = -.008, p = .906 \).

Correlations between the subtests comprising the BASC-2 Internalizing Problems scale and the subtests comprising the WJ-III:ACH Academic Skills scale indicated a similar pattern. The correlations between Anxiety and the Academic Skills subtests were: \( r = -.095, p = .114 \); \( r = -.101, p = .097 \); and \( r = .010, p = .880 \), for Letter-Word Identification (\( n = 276 \)), Calculation (\( n = 272 \)), and Spelling (\( n = 210 \)), respectively.

With the same \( n \) for each variable, the corresponding correlations between Depression and the Academic Skills subtests were: \( r = -.077, p = .200 \); \( r = -.263, p = .000 \); and \( r = -.062, p = .371 \), for Letter-Word Identification, Calculation, and Spelling, respectively. Only depression and Calculation were found to have a statistically significant relationship, \( p < .01 \).

Calculation was also the only Academic Skills subtest with a statistically significant relationship with the Somatization scale. The Somatization score correlations were: Letter-Word Identification, \( r = -.079, p = .188 \); Calculation, \( r = -.125, p = .040 \), and Spelling, \( r = .027, p = .694 \).

The parent-reported Internalizing Problems scale did not have a statistically significant correlation with the Academic Skills Composite, but statistically significant correlations were found with the Academic Skills Composite subtests for Letter-Word Identification and Calculation. The parent rating of Anxiety did not have a statistically significant relationship with the Academic Skills Composite or any of the Academic Skills subtest scales. The parent ratings of Depression and Somatization had a
statistically significant relationship only with the Academic Skills Calculation subtest. The relationship of several parent ratings of Internalizing Problems and achievement approached statistical significance, and there was a statistically significant relationship between the overall parent rating of Internalizing Problems and two of the three Academic Skills subtests. While only four of the analyzed relationships reached the level of statistical significance, these results, with caution, appear sufficient to support rejecting the null hypotheses.
### Table 3

*Summary of Intercorrelations, Means, and Standard Deviations for Scores on the BASC-2 Internalizing Problems and WJ-III:ACH Total Achievement Scales as a Function of Student or Parent Report*

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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>M</th>
<th>SD</th>
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<td>.40**</td>
<td>.36**</td>
<td>-.15*</td>
<td>-.12*</td>
<td>-.16**</td>
<td>-.11</td>
<td>54.05</td>
<td>11.11</td>
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<td>-</td>
<td>.63**</td>
<td>.52**</td>
<td>-.10</td>
<td>-.11</td>
<td>-.18**</td>
<td>-.10</td>
<td>52.42</td>
<td>10.78</td>
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<td>3. BASC_Dep</td>
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<td>.53**</td>
<td>-</td>
<td>.45**</td>
<td>-.22**</td>
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<td>4. BASC_Soma</td>
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<td>.46**</td>
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<td>-.23*</td>
<td>-.11</td>
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</tr>
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<td>5. WJ_AcadSk</td>
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<td>.69**</td>
<td>.90**</td>
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<td>6. WJ_LW</td>
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<td>-.08</td>
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<td>7. WJ_Calc</td>
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</table>

*Note.* Intercorrelations for children and adolescent self-reports are presented above the diagonal, and the intercorrelations for parent reports are presented below the diagonal. Means and standard deviations for student BASC-2 reports are presented in the vertical columns, and means and standard deviations for parent BASC-2 reports are presented in the horizontal rows. BASC_Int = Behavior Assessment System for Children, Second Edition (BASC-2) Internalizing Problems; BASC_Anx = BASC-2 Anxiety Scale; BASC_Dep = BASC-2 Depression Scale; BASC_Soma = BASC-2 Somatization Scale; WJ_AcadSk = WJ-III:ACH Academic Skills Composite; WJ_LW = WJ-III:ACH Letter-Word Identification subtest; WJ_Calc = WJ-III:ACH Calculation subtest; WJ_Spell = WJ-III:ACH Spelling subtest. The number of data points used for calculation of the correlation coefficients varied and is presented in a separate table.

**p < .01
*p < .05
Hypothesis 3

There is not a statistically significant correlation between student ratings of externalizing problems on the BASC-2 and total achievement test scores.

A composite Externalizing Problems scale is not available in the self-report form of the BASC-2. The “externalizing problems” variable for the self-ratings of externalizing problems was operationally defined for this study as the Attitude to Teachers, Hyperactivity and Sensation Seeking subscales of the BASC-2. These three subscales are substantially related to the Externalizing Scale on the Youth Self-Report of the Achenbach System of Empirically Based Assessment (Reynolds & Kamphaus, 2004).

Table 4 displays the correlation matrix for the related WJ-III:ACH and BASC-2 self-report ratings. Correlation coefficients between the related BASC-2 subtests and the Academic Skills composite score were: Attitude to Teachers, \( n = 212, r = -.107, p = .121 \); Hyperactivity, \( n = 212, r = -.142, p = .039 \); Sensation Seeking, \( n = 91, r = -.087, p = .412 \).

The correlations between Attitude to Teachers and the Academic Skills subtests were: \( r = .012, p = .837 \); \( r = -.094, p = .123 \); and \( r = -.134, p = .052 \), for Letter-Word Identification (\( n = 276 \)), Calculation (\( n = 272 \)), and Spelling (\( n = 212 \)), respectively.

The corresponding correlations between Hyperactivity and the Academic Skills subtests were: \( r = -.030, p = .625 \); \( r = -.164, p = .007 \); and \( r = -.140 p = .042 \), for Letter-Word Identification (\( n = 277 \)), Calculation (\( n = 273 \)), and Spelling (\( n = 212 \)), respectively.

The Sensation Seeking subtest is only available on the adolescent form. It did not yield statistically significant relationships with any of the subtests of the Academic Skills.
composite. The Sensation Seeking score correlations were: Letter-Word Identification, \( r = -0.026, p = 0.765 \); Calculation, \( r = -0.028, p = 0.751 \), and Spelling, \( r = -0.114, p = 0.280 \).

Of the three scales defined as the self-report of Externalizing Problems, the Hyperactivity scale had statistically significant correlation with the Academic Skills composite, the Calculation scale and the Spelling scale. None of the other self-reported relationships of Externalizing Problems scales and achievement were statistically significant. The null hypothesis is not rejected.

**Hypothesis 4**

*There is not a statistically significant correlation between parent ratings of externalizing problems on the BASC-2 and total achievement test scores.*

Parent ratings on the BASC-2 Externalizing Problems scale and the WJ-III:ACH Academic Skills composite were available for 216 participants, sixty-five were female; 151 were male. The age range was 8 to 18 with a mean of 11.9.

Table 4 displays the correlation matrix for the related WJ-III:ACH and BASC-2 parent ratings. The Pearson product-moment correlation, \( r = -0.182, p = 0.007 \), between the BASC-2 Externalizing Problems score and the WJ-III:ACH Academic Skills composite score indicated that higher ratings on the Externalizing Problems scale were significantly associated with lower scores on the Academic Skills Composite at an alpha level of .01. Correlation coefficients between the BASC-2 Externalizing Problems scale and each of the Academic Skills subtests were: Letter-Word Identification, \( n = 293, r = -0.136, p = 0.020 \); Calculation, \( n = 288, r = -0.256, p = 0.000 \), and Spelling, \( n = 216, r = -0.133, p = 0.052 \).

The BASC-2 Externalizing Problems scale for parent rating is comprised of subtests for Hyperactivity, Aggression, and Conduct Problems. Correlation coefficients
between the subtests and the Academic Skills composite score were: Hyperactivity, \( n = 210, r = -.079, p = .256 \); Aggression, \( n = 210, r = -.171, p = .013 \); Conduct Problems, \( n = 209, r = -.236, p = .001 \).

Correlations between the subtests comprising the BASC-2 Externalizing Problems scale and the subtests comprising the WJ-III:ACH Academic Skills scale indicated a similar pattern. The correlations between Hyperactivity and the Academic Skills subtests were: \( r = -.080, p = .185 \); \( r = -.205, p = .001 \); and \( r = -.029, p = .675 \), for Letter-Word Identification \( n = 277 \), Calculation \( n = 273 \), and Spelling \( n = 210 \), respectively. The relationship between the academic skills subscale of Calculation and the BASC-2 subscale of Hyperactivity was statistically significant, \( p < .01 \).

With the same \( n \) for each variable, the corresponding correlations between Aggression and the Academic Skills subtests were: \( r = -.144, p = .016 \); \( r = -.241, p = .000 \); and \( r = -.125 p = .072 \), for Letter-Word Identification, Calculation, and Spelling, respectively.

The Conduct Problems subtest yielded statistically significant relationships with all the subtests of the Academic Skills composite. The Conduct Problems score correlations were: Letter-Word Identification, \( r = -.147, p = .014 \); Calculation, \( r = -.239, p = .000 \), and Spelling, \( r = -.133, p = .006 \).

Unlike the self-ratings of the relationships among Externalizing Problems scales, the parent ratings of Hyperactivity had a statistically significant correlation with only one of the measures of achievement, the Calculation subtest. In contrast, the parent rating of Conduct Problems had a statistically significant relationship with the Academic Skills composite and each of the three subtests. The parent rating of Aggression had a
statistically significant relationship with the Academic Skills composite and both the Letter-Word Identification and the Calculation subtests. The overall Externalizing Problems scale in the parent report had a statistically significant relationship with the Academic Skills composite and two of the scales had a relationship with Spelling near statistical significance ($p = .052$). The null hypothesis is rejected.
### Table 4

*Summary of Intercorrelations, Means, and Standard Deviations for Scores on the BASC-2 Externalizing Problems and WJ-III:ACH Total Achievement Scales as a Function of Student or Parent Report*

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<td>97.92</td>
<td>14.46</td>
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</tbody>
</table>

**Note.** Intercorrelations for children and adolescent self-reports are presented above the diagonal, and the intercorrelations for parent reports are presented below the diagonal. Means and standard deviations for student BASC-2 reports are presented in the vertical columns, and means and standard deviations for parent BASC-2 reports are presented in the horizontal rows. BASC_Int = Behavior Assessment System for Children, Second Edition (BASC-2) Externalizing Problems; BASC_Hyp = BASC-2 Hyperactivity Scale; BASC_Agg = BASC-2 Aggression Scale; BASC_ConPr = BASC-2 Conduct Problems Scale; BASC_Attitu = BASC-2 Attitude to Teachers; BASC_Sens = BASC-2 Sensation Seeking; WJ_AcadSk = WJ-III:ACH Academic Skills Composite; WJ_LW = WJ-III:ACH Letter-Word Identification subtest; WJ_Calc = WJ-III:ACH Calculation subtest; WJ_Spell = WJ-III:ACH Spelling subtest. The number of data points used for calculation of the correlation coefficients varied and is presented in a separate table. The blank spaces for BASC_Ext, BASC_Agg and BASC_ConPr indicate the absence of correlational data because the scales do not exist for the self report. The blank spaces for BASC_Attitu and BASC_Sens indicate the absence of correlational data because these scales do not exist for the parent report.

**p < .01
*p < .05.
Hypothesis 5

*Differences in the relationship between self-reported internalizing problems and scores on measures of reading and math are not statistically significant.*

The “measures of reading” variable was operationally defined for this study as the Broad Reading composite score on the WJ-III:ACH. This composite is comprised of WJ-III:ACH subtest scores in Letter-Word Identification, Reading Fluency, and Passage Comprehension.

Student ratings on the BASC-2 Internalizing Problems scale and the WJ-III:ACH Broad Reading composite were available for 239 participants, seventy-five were female; 164 were male. The age range was 8 to 18 with a mean of 11.9.

Table 5 displays the correlation matrix for the related WJ-III:ACH and BASC-2 student ratings. The Pearson product-moment correlation, $r = -.117, p = .065$, between the BASC-2 Internalizing Problems score and the WJ-III:ACH Broad Reading composite score indicated that higher ratings on the Internalizing Problems scale may be associated with lower scores on the Broad Reading Composite, but the correlation coefficient was not statistically significant. There was a statistically significant relationship between the self-reported Internalizing Problems score and one of the subtests, Letter-Word Identification, that comprise the Broad Reading composite score, $n = 293, r = -.120, p = .039$.

The Internalizing Problems scale for Depression had a statistically significant relationship with the Broad Reading scale, $n = 240, r = -.183, p = .005$ and with the Broad Reading subtest for Paragraph Comprehension, $n = 240, r = -.210, p = .001$. The
Internalizing Problems scale for Anxiety also had a statistically significant correlation with the Paragraph Comprehension subtest, $n = 264$, $r = - .131$, $p = .034$.

The “measures of math” variable was operationally defined for this study as the Broad Math composite score on the WJ-III:ACH. This composite is comprised of WJ-III:ACH subtest scores in Calculation, Math Fluency, and Applied Problems.

Student ratings on the BASC-2 Internalizing Problems scale and the WJ-III:ACH Broad Math composite were available for 190 participants, sixty-three were female; 127 were male. The age range was 8 to 18 with a mean of 11.9.

Table 5 displays the correlation matrix for the related WJ-III:ACH and BASC-2 student ratings. The Pearson product-moment correlation, $r = - .161$, $p = .026$, between the BASC-2 Internalizing Problems score and the WJ-III:ACH Broad Math composite score indicated that higher ratings on the Internalizing Problems scale were associated with lower scores on the Broad Math Composite. The correlation coefficient is statistically significant at an alpha level of .05.

A statistically significant correlation was evident between the self-reported Internalizing Problems scale and each of the subtests that comprise the Broad Math composite with correlations of: Calculation, $n = 288$, $r = - .158$, $p = .007$; Math Fluency, $n = 249$, $r = - .141$, $p = .026$, and Applied Problems, $n = 230$, $r = - .195$, $p = .003$.

The Depression scale had a statistically significant relationship with the Broad Math composite score, $n = 181$, $r = - .295$, $p = .000$ and with each of the Broad Math subtests: $r = - .257$, $p = .000$; $r = - .162$, $p = .012$; and $r = - .283$, $p = .000$, for Calculation, Math Fluency, and Applied Problems, respectively.
The Anxiety scale also had a statistically significant relationship with the Broad Math composite score, \( n = 181, r = -0.198, p = 0.008 \) and with each of the Broad Math subtests. The correlations between Anxiety and the Broad Math subtests were: \( r = -0.175, p = 0.004 \); \( r = -0.136, p = 0.035 \); and \( r = -0.245, p = 0.000 \), for Calculation (\( n = 273 \)), Math Fluency (\( n = 239 \)), and Applied Problems (\( n = 216 \)), respectively.

The self-reported Somatization scores did not have a statistically significant relationship with the Broad Math composite scores. Somatization scores, however, did have a statistically significant relationship with Broad Math subtests for Calculation, \( n = 131, r = -0.178, p = 0.042 \) and Math Fluency, \( n = 106, r = -0.206, p = 0.034 \).

This hypothesis focuses on whether there are evident differences in the relationship of the self-reported Internalizing Problems scale and measures of reading and mathematics. The correlation coefficient between the self-reported Internalizing Problems scale and the Broad Reading composite score was -0.117. The comparable correlation with the Broad Math composite was -0.161. Using the Fisher r-to-z transformation, the difference between the correlation coefficients is not statistically significant, \( z = 0.46, p = 0.645 \).

Correlation coefficients between the Depression scale and the Broad Reading and Broad Math scores were -0.183 and -0.295, respectively. The difference was not statistically significant, \( z = 1.2, p = 0.230 \). Correlation coefficients between the Anxiety scale and the Broad Reading and Broad Math scores were -0.112 and -0.198, respectively. The difference was not statistically significant, \( z = 0.89, p = 0.374 \). On the Somatization scale, the correlations with Broad Reading and Broad Math were 0.069 and 0.155,
respectively. Again, the difference was not statistically significant, \( z = .58, p = .562 \). The null hypothesis is not rejected.

**Hypothesis 6**

*Differences in the relationship between parent-reported internalizing problems and scores on measures of reading and math are not statistically significant.*

Parent ratings on the BASC-2 Internalizing Problems scale and the WJ-III:ACH Broad Reading composite were available for 250 participants, seventy-nine were female; 171 were male. The age range was 8 to 18 with a mean of 11.9.

Table 5 displays the correlation matrix for the related WJ-III:ACH and BASC-2 parent ratings. The Pearson product-moment correlation, \( r = -.114, p = .072 \), between the BASC-2 Internalizing Problems score and the WJ-III:ACH Broad Reading composite score indicated that higher ratings on the Internalizing Problems scale were associated with lower scores on the Broad Reading Composite. The correlation coefficient approached but did not reach statistical significance.

The Internalizing Problems composite scale had a statistically significant correlation with Letter-Word Identification, \( n = 292, r = -.136, p = .020 \). The correlations between Internalizing Problems and the remaining Broad Reading scales were \( n = 266, r = -.112, p = .067 \) for Reading Fluency and \( n = 279, r = -.071, p = .279 \) for Passage Comprehension.

The correlation coefficients between the Internalizing Problems subtests and the Broad Reading composite score were not statistically significant. The Anxiety, Depression and Somatization scales did not have statistically significant relationships with the Broad Reading Composite or any of the Broad Reading subtests.
The Internalizing Problems scale has a statistically significant relationship with the Broad Reading subtest of Letter-Word Identification; however, no other relationships were significant. Parent reported internalizing problems are not significantly correlated with Broad Reading skills resulting in failure to reject the null hypothesis.

Parent ratings on the BASC-2 Internalizing Problems scale and the WJ-III:ACH Broad Math composite were available for 189 participants, sixty-three were female; 126 were male. The age range was 8 to 18 with a mean of 11.9.

Table 5 displays the correlation matrix for the related WJ-III:ACH and BASC-2 parent ratings. The Pearson product-moment correlation, \( r = -0.142, p = .051 \), between the BASC-2 Internalizing Problems score and the WJ-III:ACH Broad Math composite score indicated that higher ratings on the Internalizing Problems scale were associated with lower scores on the Broad Math Composite. While the correlation coefficient approaches significance, it does not meet statistical significance.

The BASC-2 Internalizing Problems scale had a statistically significant correlation with the Broad Math subtests of Calculation, \( n = 287, r = -0.170, p = .004 \) and Applied Problems, \( n = 229, r = -0.173, p = .009 \). The correlation between Internalizing Problems and Math Fluency was not statistically significant.

The Anxiety scale did not have a statistically significant relationship with the Broad Math Composite, \( n = 179, r = -0.074, p = .328 \). It also did not have a statistically significant relationship with the Broad Math subtests.

The Depression scale and the Broad Math composite had a statistically significant relationship. With the same \( n \) for each variable, the corresponding correlations between Depression and the Broad Math subtests had a statistically significant relationship: \( r = - \)
.263, \( p = .000 \); \( r = -.147, p = .023 \); and \( r = -.191, p = .005 \), for Calculation, Math Fluency, and Applied Problems, respectively. The Somatization scale did not have a significant relationship with the Broad Math composite or the individual subtests.

This hypothesis focuses on whether there are differences in the relationship of the parent-reported Internalizing Problems scale and measures of reading and mathematics. The correlation coefficient between the parent-reported Internalizing Problems scale and the Broad Reading composite score was -.114. The comparable correlation with the Broad Math composite was -.142. Using the Fisher \( r \)-to-\( z \) transformation, the difference between the correlation coefficients is not statistically significant, \( z = .29, p = .772 \).

Correlation coefficients between the Anxiety scale and the Broad Reading and Broad Math scores were -.062 and -.198, respectively. The difference was not statistically significant, \( z = .12, p = .905 \). Correlation coefficients between the Depression scale and the Broad Reading and Math composite scores were -.087 and -.190, respectively. The difference was not statistically significant, \( z = 1.05, p = .294 \). On the Somatization scale, the correlations with Broad Reading and Broad Math were -.018 and -.090, respectively. The difference was not statistically significant, \( z = .73, p = .465 \). The null hypothesis is not rejected.
Table 5

Summary of Intercorrelations, Means, and Standard Deviations for Scores on the BASC-2 Internalizing Problems and WJ-III:ACH Broad Reading and Math Scales as a Function of Student or Parent Report

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Note. Intercorrelations for children and adolescent self-reports (n = 239) are presented above the diagonal, and the intercorrelations for parent report (n = 250) are presented below the diagonal. Means and standard deviations for student BASC-2 reports are presented in the vertical columns, and means and standard deviations for parent BASC-2 reports are presented in the horizontal rows. BASC_Int = Behavior Assessment System for Children, Second Edition (BASC-2) Internalizing Problems; BASC_Anx = BASC-2 Anxiety Scale; BASC_Dep = BASC-2 Depression Scale; BASC_Soma = BASC-2 Somatization Scale; WJ_BrRead = WJ-III:ACH Broad Reading Composite; WJ_LW = WJ-III:ACH Letter-Word Identification subtest; WJ_RFlu = WJ-III:ACH Reading Fluency subtest; WJ_PasComp = WJ-III:ACH Passage Comprehension subtest; WJ_BrMath = WJ-III:ACH Broad Math Composite; WJ_Calc = WJ-III:ACH Calculation subtest; WJ_MFlu = WJ-III:ACH Math Fluency subtest; WJ_ApProb = WJ-III:ACH Applied Problems subtest. The number of data points used for calculation of the correlation coefficients varied and is presented in a separate table. The blank spaces indicate correlations that were not run in this study.

**p < .01
*p < .05.
Hypothesis 7

There is not a statistically significant difference in the relationship between self-reported externalizing problems and scores on measures of reading and math.

Student ratings on the BASC-2 externalizing problems subtests and the WJ-III:ACH Broad Reading composite were available for 239 participants, seventy-five were female; 164 were male. The age range was 8 to 18 with a mean of 11.9.

Table 6 displays the correlation matrix for the related WJ-III:ACH and BASC-2 student ratings. Correlation coefficients between the subtests and the Broad Reading composite score were: Attitude to Teachers, \( n = 239, r = .010, p = .882 \); Hyperactivity, \( n = 240, r = -.057, p = .383 \); Sensation Seeking, \( n = 112, r = -.065, p = .494 \).

The correlation coefficients between the subtests comprising the BASC-2 Externalizing Problems scale and the subtests comprising the WJ-III:ACH Broad Reading scale were not statistically significant. The Attitude to Teachers, Hyperactivity and Sensation Seeking scales did not have statistically significant relationships with the Broad Reading Composite or the Broad Reading subtests. Table 6 displays the correlation matrix for the related WJ-III:ACH and BASC-2 student ratings. Correlation coefficients between the Externalizing Problems subtests and the Broad Math composite score did not have a statistically significant relationship.

The Hyperactivity scale had a statistically significant relationship with Calculation, \( n = 273, r = -.164, p = .007 \) and Applied Problems, \( n = 216, r = -.159, p = .019 \). Hyperactivity and Math Fluency did not have a statistically significant correlation. The Attitude to Teachers and Sensation Seeking subtests did not have statistically significant correlations with the Broad Math subtests.
This hypothesis explored possible differences in the relationship of the self-reported Externalizing Problems scale and measures of reading and mathematics. The correlation coefficient between the self-reported Attitude to Teachers scale and the Broad Reading and Broad Math scores were .010 and -.059, respectively. Using the Fisher r-to-z transformation, the difference was not statistically significant, $z = .69$, $p = .49$. The correlation coefficient between the Hyperactivity scale and the Broad Reading and Broad Math scores were -.057 and -.056, respectively. The difference is not statistically significant, $z = -.01$, $p = .992$. The correlation coefficient between the Sensation Seeking scale and the Broad Reading and Broad Math scores were -.065 and -.007, respectively. The difference is not statistically significant, $z = -.39$, $p = .697$. The null hypothesis is not rejected.

**Hypothesis 8**

*Difference in the relationship between parent-reported externalizing problems and scores on measures of reading and math are not statistically significant.*

Parent ratings on the BASC-2 Externalizing Problems scale and the WJ-III:ACH Broad Reading composite were available for 252 participants, seventy-nine were female; 173 were male. The age range was 8 to 18 with a mean of 11.9.

Table 6 displays the correlation matrix for the related WJ-III:ACH and BASC-2 parent ratings. The Pearson product-moment correlation, $r = -.112$, $p = .076$, between the BASC-2 Externalizing Problems score and the WJ-III:ACH Broad Reading composite score indicated that higher ratings on the Externalizing Problems scale were associated with lower scores on the Broad Reading Composite. The correlation coefficient approached but did not reach statistical significance.
The correlation coefficient between the BASC-2 Externalizing Problems scale and the Letter-Word Identification subtest was statistically significant, $n = 293$, $r = -.136$, $p = .020$. The Externalizing Problems scale and the Passage Comprehension subtest also had a statistically significant relationship, $n = 280$, $r = -.120$, $p = .044$. The correlation for Externalizing Problems and Reading Fluency was $n = 267$, $r = -.096$, $p = .119$.

Correlation coefficients between the Externalizing Problems subtests and the Broad Reading composite score were: Hyperactivity, $n = 239$, $r = -.021$, $p = .751$; Aggression, $n = 239$, $r = -.136$, $p = .036$; Conduct Problems, $n = 238$, $r = -.159$, $p = .014$. Parent ratings of Aggression and Conduct Problems were significantly correlated with Broad Reading at an alpha level of .05. The Hyperactivity scale did not have a statistically significant relationship with the Broad Reading Composite or subtests.

The Aggression scale had a statistically significant relationship with the Broad Reading Composite, $n = 239$, $r = -.136$, $p = .036$. The Aggression scale was also statistically significant correlated with Letter-Word Identification, $n = 277$, $r = -.144$, $p = .016$ and Passage Comprehension, $n = 264$, $r = -.153$, $p = .013$. Aggression did not have a statistically significant relationship with the Broad Reading subtest of Reading Fluency.

The Conduct Problems scale had a statistically significant relationship with the Broad Reading Composite scores, $n = 238$, $r = -.159$, $p = .014$. This scale also had a statistically significant relationship with each of the Broad Reading subtests. The correlations were: Letter-Word Identification, $r = -.147$, $p = .014$; Reading Fluency, $r = -.143$, $p = .023$, and Passage Comprehension, $r = -.153$, $p = .013$.  

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Parent ratings on the BASC-2 Externalizing Problems scale and the WJ-III:ACH Broad Math composite were available for 189 participants, sixty-three were female; 126 were male. The age range was 8 to 18 with a mean of 11.9.

Table 6 displays the correlation matrix for the related WJ-III:ACH and BASC-2 parent ratings. The Pearson product-moment correlation, $r = -0.139$, $p = .056$, between the BASC-2 Externalizing Problems score and the WJ-III:ACH Broad Math composite score indicated that higher ratings on the Externalizing Problems scale were associated with lower scores on the Broad Math Composite.

A statistically significant correlation was evident between the parent-reported Externalizing Problems scale and each of the subtests that comprise the Broad Math composite with correlations of: Calculation, $n = 288$, $r = -0.256$, $p = .000$; Math Fluency, $n = 249$, $r = -0.132$, $p = .038$, and Applied Problems, $n = 230$, $r = -0.150$, $p = .023$.

The Hyperactivity scale did not have a statistically significant relationship with the Broad Math composite score; however it did have a statistically significant relationship with the Calculation and Applied Problems subtests of the Broad Math composite. The correlations were: Calculation $n = 273$, $r = -0.205$, $p = .001$ and Applied Problems $n = 216$, $r = -0.146$, $p = .031$. Hyperactivity did not have a statistically significant correlation with Math Fluency.

The Conduct Problems scale had a statistically significant relationship with the Broad Math composite score, $n = 178$, $r = -0.201$, $p = .007$. This scale also had a statistically significant relationship with each of the Broad Math subtests. The correlations were: Calculation, $r = -0.239$, $p = .000$; Math Fluency, $r = -0.170$, $p = .009$, and Applied Problems, $r = -0.169$, $p = .013$. 

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This hypothesis focuses on whether there are evident differences in the relationship of the parent-reported Externalizing Problems scale and measures of reading and mathematics. The correlation coefficient between the parent-reported Externalizing Problems scale and the Broad Reading score was -.112. The comparable correlation with the Broad Math composite was -.139. Using the Fisher r-to-z transformation, the difference between the correlation coefficients is not statistically significant, \( z = .28, p = 780. \)

Correlation coefficients between the Hyperactivity scale and the Broad Reading and Broad Math scores were -.021 and -.107, respectively. The difference was not statistically significant, \( z = .87, p = .384. \) Correlation coefficients between the Aggression scale and the Broad Reading and Broad Math scores were -.136 and -.143, respectively. The difference was not statistically significant, \( z = .07, p = .944. \)

Correlation coefficients between the Conduct Problems scale and the Broad Reading and Broad Math scores were -.159 and -.201, respectively. The difference was not statistically significant, \( z = .43, p = .667. \) The null hypothesis is not rejected.
Table 6

Summary of Intercorrelations, Means, and Standard Deviations for Scores on the BASC-2 Externalizing Problems and WJ-III:ACH Broad Reading and Math Scales as a Function of Student or Parent Report

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<th>13</th>
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</table>

Note. Intercorrelations for children and adolescent self-reports are presented above the diagonal, and the intercorrelations for parent reports are presented below the diagonal. Means and standard deviations for student BASC-2 reports are presented in the vertical columns, and means and standard deviations for parent BASC-2 reports are presented in the horizontal rows. BASC_Int = Behavior Assessment System for Children, Second Edition (BASC-2) Externalizing Problems; BASC_Hyp = BASC-2 Hyperactivity Scale; BASC_Agg = BASC-2 Aggression Scale; BASC_ConPr = BASC-2 Conduct Problems Scale; BASC_Attitu = BASC-2 Attitude to Teachers; BASC_Sens = BASC-2 Sensation Seeking; WJ_BrRead = Woodcock-Johnson Tests of Achievement, Third Edition (WJ-III:ACH) Broad Reading Composite; WJ_LW = WJ-III:ACH Letter-Word Identification subtest; WJ_RFlu = WJ-III:ACH Reading Fluency subtest; WJ_PasComp = WJ-III:ACH Passage Comprehension subtest; WJ_BrMath = WJ-III:ACH Broad Math Composite; WJ_Calc = WJ-III:ACH Calculation subtest; WJ_MFlu = WJ-III:ACH Math Fluency subtest; WJ_ApProb = WJ-III:ACH Applied Problems subtest. The number of data points used for calculation of the correlation coefficients varied and is presented in a separate table. The blank spaces for BASC_Ext, BASC_Agg and BASC_ConPr indicate the absence of correlational data because the scales do not exist for the self report. The blank spaces for BASC_Attitu and BASC_Sens indicate the absence of correlational data because these scales do not exist for the parent report. 

**p < .01
*p < .05.
Hypothesis 9

The differences in severity of self-reported internalizing problems among referrals from private practice and school settings are not statistically significant.

A one-way between subjects ANOVA was conducted with self-reported internalizing problems to determine if a difference in severity of ratings existed between private practice and school setting referrals. The difference in mean Internalizing Problems scores for private practice (52.14) and school setting (57.29) was statistically significant, $F(1,310) = 16.473, p = .000, \eta_p^2 = .050$. The difference in mean self-reported Anxiety in private practice (51.06) and school setting (55.08) were also statistically significant for self-reported anxiety, $F(1,294) = 9.491, p = .002, \eta_p^2 = .031$. Mean scores of self-reported Depression in private practice (50.28) and school settings (55.86) were statistically significant, $F(1, 294) = 19.386, p = .000, \eta_p^2 = .062$. The difference in mean Somatization scores for private practice (48.92) and school setting (55.60) was also statistically significant, $F(1,134) = 9.472, p = .003, \eta_p^2 = .066$.

The self-reported Internalizing Problems scores were higher in the school setting referrals. The difference was statistically significant on the overall Internalizing Problems score and on each of the Internalizing Problem subtests. Effect sizes ranged from .03 to .066 with a median of .055, suggesting a medium level of effect of the setting. The null hypothesis is rejected.

Hypothesis 10

The difference in severity of parent-reported internalizing problems among referrals from private practice and school settings are not statistically significant.
A one-way between subjects ANOVA was conducted with parent reported internalizing problems to determine if a difference in severity of ratings existed between private practice and school setting referrals. The difference in mean Internalizing Problems scores for private practice (52.75) and school setting (63.28) were statistically significant, $F(1,308) = 50.219, p = .000, \eta^2_p = .140$. The difference in mean parent-reported Anxiety scores for private practice (53.86) and school setting (60.01) were statistically significant, $F(1,293) = 15.954, p = .000, \eta^2_p = .052$. The difference in mean Depression scores for private (53.54) and school (67.38) settings was also statistically significant, $F(1,292) = 64.068, p = .000, \eta^2_p = .180$. Mean scores of parent-reported Somatization in private (49.12) and school (54.78) settings were statistically significant as well, $F(1,293) = 12.831, p = .000, \eta^2_p = .042$.

The Internalizing Problems reported by the parents, consistent with the self-reported ratings, were also higher in the school setting referrals. The difference was statistically significant on the overall Internalizing Problems score and on each of the Internalizing Problem subtests. Effect sizes ranged from .04 to .18 with a median of .095, suggesting a medium level of effect of the setting. The null hypothesis is rejected.

**Hypothesis 11**

*The differences in severity of self-reported externalizing problems among referrals from private practice and school settings are not statistically significant.*

A one-way between subjects ANOVA was conducted with self-reported externalizing problems to determine if a difference in severity of ratings existed between private practice and school setting referrals. The difference in mean Attitude to Teachers scores for private practice (54.29) and school setting (54.05) were not statistically
significant, $F(1,293) = 3.799, p = .874$. The mean difference of self-reported Hyperactivity scores for private (52.86) and school (55.30) settings was also not statistically significant, $F(1,294) = 2.804, p = .095$. The difference in mean Sensation Seeking scores for private practice (50.64) and school (51.78) settings was not statistically significant, $F(1,134) = .367, p = .546$. The self-reported Externalizing Problems were not significantly higher in the schools than in the private practice resulting in the failure to reject the null hypothesis.

**Hypothesis 12**

*The difference in severity of parent-reported externalizing problems among referrals from private practice and school settings are not statistically significant.*

A one-way between subjects ANOVA was conducted with parent reported externalizing problems to determine if a difference in severity of ratings existed between private practice and school setting referrals. The difference in mean Externalizing Problems scores for private practice (52.57) and school setting (64.84) were statistically significant, $F(1,310) = 74.196, p = .000, \eta^2_p = .193$. The difference in mean Hyperactivity scores for private (54.64) and school (66.51) settings were also statistically significant, $F(1,294) = 56.295, p = .000, \eta^2_p = .161$. Mean difference in parent-reported Aggression scores for private practice (50.38) and school (59.65) settings were statistically significant, $F(1,294) = 42.238, p = .000, \eta^2_p = .126$. The mean difference in Conduct Problem scores in private (51.91) and school (63.04) settings were statistically significant, $F(1,293) = 47.880, p = .000, \eta^2_p = .140$.

Parent reported Externalizing Problems were higher in the school setting than in the private practice setting. The difference was statistically significant on the overall
Externalizing Problems score and on each of the Externalizing Problems subtests. Effect sizes ranged from .126 to .193 with a median of .151 suggesting a large level of effect of the setting. The null hypothesis is rejected.

**Hypothesis 13**

*Cluster analysis of the BASC-2 scores associated with internalizing and externalizing problems will not identify a pattern differentiating private practice and school referrals.*

The SPSS TwoStep method was used in this study to address hypothesis 13. The program default, log-likelihood, was used for the preclustering step; the program default, Bayesian Information Criteria, was used to identify the optimal number of clusters for the BASC-2 primary scales used in this study.

Twelve variables were used in the cluster analysis, all BASC-2 subtests used in this study to identify internalizing and externalizing problems. These were the parent ratings of Conduct Problems, Aggression, Hyperactivity, Anxiety, Depression, and Somatization, and the ratings by the children and adolescents on the BASC-2 subtests for Attitude To Teachers, Hyperactivity, Sensation Seeking, Anxiety, Depression, and Somatization.

The cluster analysis of these twelve variables revealed two distinct clusters. The overall quality of the cluster rating was in the fair category at 0.4 with 0.5 being the threshold for good quality. This rating was sufficient to continue inspection of the characteristics of the individual clusters.

Following the pattern in Bulger, Matthews, and Hoffman (2007), results are presented in both subtest score patterns and demographic differences associated with the
two clusters. Table 7 displays the centered variable means for the cluster assignment of each subtest, the results of a series of one-way analyses of variance, and the importance of each subtest as a predictor of cluster membership.

The two clusters that emerged from the analysis were differentiated by the score level on each of the BASC-2 scales. Cluster 1 is comprised of BASC-2 means that are lower than cluster 2 means for each of the BASC-2 subtests. For example, self-reported Somatization for cluster 1 has a mean of 44.08 (SD = 5.53) and for cluster 2 has a mean of 61.35 (SD = 12.92). The ANOVA results yielded statistically significant differences between mean scores in the clusters for all of the subtests, with the exception of self-reported Sensation Seeking.

The primary predictor of cluster membership was self-reported Somatization with a predictor value of 1.00. Self-reported Hyperactivity, Anxiety and Depression were the next three most important predictors with values of .75, .68 and .65, respectively. Parent-reported Depression, Somatization and Hyperactivity were less important in the predictions of cluster membership with predictor values of .47, .45 and .45, respectively. Parent-reported Anxiety, Aggression, Conduct Problems and self-reported Attitude to Teachers and Sensation Seeking had the lowest predictor values ranging from .38 to .07.

Table 8 displays the demographic variables associated with the two clusters. Membership in each cluster was explored in terms of referral site, gender, age and grade. Most of the private practice referrals, 71%, were members of cluster 1 (lower mean scores on the BASC-2 scales). Most of the school district referrals, 63%, were in cluster 2 (higher mean scores on the BASC-2 scales. Female participants were almost equally distributed between the two clusters, 46% in cluster 1, 54% in cluster 2. Male
participants were more often found in cluster 1, 63%. For cluster 1, the age mean was 14.36 (SD = 1.51), and the age mean for cluster 2 was 14.25 (SD = 1.91). Grade level mean for cluster 1 was 8.4 (SD = 1.67) and for cluster 2 the grade level mean was 8.26 (SD = 2.6).

The focus in this hypothesis was on whether cluster analysis would identify a pattern differentiating between private practice and school referrals. The Chi Square analysis indicated a significant difference in referral source between clusters 1 and 2, \( \chi^2(1, N = 130) = 13.77, p < .01 \). The null hypothesis is rejected.
Table 7  
*BASC-2 Cluster Membership Means, Standard Deviation, ANOVA Results, and Cluster Predictor Importance Score*

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>F</th>
<th>Predictor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>SRP Soma</td>
<td>44.08</td>
<td>5.53</td>
<td>61.35</td>
<td>12.92</td>
</tr>
<tr>
<td>SRP Hyp</td>
<td>46.57</td>
<td>9.57</td>
<td>62.61</td>
<td>11.85</td>
</tr>
<tr>
<td>SRP Anx</td>
<td>46.11</td>
<td>8.39</td>
<td>59.78</td>
<td>11.09</td>
</tr>
<tr>
<td>SRP Dep</td>
<td>46.49</td>
<td>8.24</td>
<td>59.44</td>
<td>10.65</td>
</tr>
<tr>
<td>PRS Dep</td>
<td>52.25</td>
<td>12.49</td>
<td>70.09</td>
<td>19.41</td>
</tr>
<tr>
<td>PRS Soma</td>
<td>47.05</td>
<td>8.31</td>
<td>61.65</td>
<td>18.02</td>
</tr>
<tr>
<td>PRS Hyp</td>
<td>54.58</td>
<td>11.85</td>
<td>69.17</td>
<td>15.09</td>
</tr>
<tr>
<td>PRS Anx</td>
<td>50.92</td>
<td>10.59</td>
<td>63.85</td>
<td>15.81</td>
</tr>
<tr>
<td>PRS Agg</td>
<td>49.09</td>
<td>9.74</td>
<td>59.67</td>
<td>14.46</td>
</tr>
<tr>
<td>PRS ConPr</td>
<td>52.54</td>
<td>10.87</td>
<td>63.70</td>
<td>16.63</td>
</tr>
<tr>
<td>SRP Attitu</td>
<td>50.71</td>
<td>9.17</td>
<td>57.78</td>
<td>10.62</td>
</tr>
<tr>
<td>SRP Sens</td>
<td>49.39</td>
<td>10.37</td>
<td>52.89</td>
<td>10.33</td>
</tr>
</tbody>
</table>

*Note.* All means reported are centered based on the scale midpoint.  
df are 1, 128 for all analyses.  
**p < .01.
Table 8

*Cluster Member Demographics*

<table>
<thead>
<tr>
<th></th>
<th>Cluster 1 (n = 76)</th>
<th>Cluster 2 (n = 54)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of private practice referrals</td>
<td>71</td>
<td>29</td>
</tr>
<tr>
<td>Percentage of school referrals</td>
<td>38</td>
<td>63</td>
</tr>
<tr>
<td>Percentage of females</td>
<td>46</td>
<td>54</td>
</tr>
<tr>
<td>Percentage of males</td>
<td>63</td>
<td>37</td>
</tr>
<tr>
<td>Age Mean and (Standard Deviation)</td>
<td>M = 14.36</td>
<td>M = 14.25</td>
</tr>
<tr>
<td></td>
<td>SD = 1.51</td>
<td>SD = 1.91</td>
</tr>
<tr>
<td>Grade Level Mean and (Standard Deviation)</td>
<td>M = 8.4 SD = 1.67</td>
<td>M = 8.26 SD = 2.6</td>
</tr>
</tbody>
</table>

**SUMMARY**

This chapter described how the data were collected, how the data were analyzed and what the results of the study were. Overall, this study examined whether self and parent reported internalizing and externalizing problems were related to academic achievement in the areas of reading, mathematics and spelling. The study also examined the difference in severity of internalizing and externalizing symptoms based on location of the referral, private practice or a school. The relationships between the BASC-2 ratings and the WJ-III:ACH scores were evaluated through Pearson product moment correlation coefficients while the difference between the means from the private practice and the school district data were examined with one-way ANOVAs. Identifying cluster membership was accomplished with TwoStep cluster analysis and the difference between the cluster means was determined with one-way ANOVAs.

In contrast to the hypothesis, the overall pattern in the data related to self-reported internalizing problems showed a statistically significant correlation with academic skills. As hypothesized, the majority of scales associated with self-reported internalizing
problems did not have statistically significant relationships with the scales identified as direct measures of reading and mathematics. Also as hypothesized, self-reported externalizing problems did not in general have statistically significant correlations with academic skill composite, reading or mathematics.

Consistent with the self reports, the relationship between academic skills and the parent-reported internalizing problems indicated enough statistically significant correlations to reject the null hypothesis while the relationships with reading and mathematics were not statistically significant. Externalizing problems, as rated by the parents, had a statistically significant correlation with academic skills. Also consistent with the self reports, the overall pattern of correlations between reading and mathematics and the parent-reported externalizing problems did not suggest a statistically significant relationship.

Additionally, cluster analysis resulted in identifying two clusters that were consistent with hypotheses nine through 12. The clusters differed based on low and high scores on the BASC-2 rating scales which is consistent with the significant differences between the means for private practice and school district data. Those students evaluated in the schools were reported to have higher scores on the BASC-2, indicating more severe symptoms, than those students referred and evaluated in the private practice setting.

Related to the overall objective of the study, though not addressed in the specific hypotheses, is a broader question about the general influence of affective dimensions on achievement test performance. The results differentiating the relationships between internalizing problems and externalizing problems as correlates of academic achievement
identified many statistically significant correlations. However, essentially all were remarkably small, leaving open the possibility that there is only a negligible relationship between affective considerations and academic achievement.

To further examine the overall relationship between affective distress and scores on tests of academic achievement, multiple linear regressions were conducted using the combination of the three internalizing scales and the three externalizing scales as predictors of performance on the Academic Skills Composite and on the Broad Reading and Broad Math subtests. Six multiple linear regressions were conducted with results suggesting that affective distress has more than a negligible impact on academic achievement test scores when internalizing and externalizing problems are simultaneously considered.

For the BASC-2 self-reports of internalizing and externalizing problems, the multiple R’s for predicting the Academic Skills Composite, Broad Reading, and Broad Math were .385, .417, and .371, respectively. The corresponding multiple R’s for the parent reports were .275, .236, and .251, respectively. Together these suggest that behavioral and emotional symptoms may have a greater impact on academic achievement than the individual subtest correlations may have identified.

Also explored with a series of regression analyses was the possibility of a moderating effect of referral source on the relationship between BASC-2 internalizing and externalizing scores and scores on the standardized achievement test. A separate moderator regression analysis was conducted for each academic composite scale and the internalizing and externalizing composite scales for parent and self-reports. The individual subtests for self-reported externalizing problems were used in place of the
unavailable composite externalizing score. Of the 18 analyses, only one suggested a statistically significant moderator effect.

The one analysis that suggested a statistically significant moderator effect of the referral source was for self-reported internalizing problems and scores on the Broad Math composite, $\beta = .163, p = .014$. Further analysis identified greater range of standard scores on the Broad Math composite for participants referred from the public school district. A scatter plot showed higher Broad Math composite scores declined with higher self-reports of internalizing symptoms for those students referred to the private practice. Broad Math scores for students from the public school increased with reports of more significant internalizing symptoms. The scatter plot also shows greater variability of Broad Math composite scores from the school district referrals.

Although the moderator was statistically significant, the $R^2$ Linear scores indicated very little variance was explained by either private practice referrals (4.7%) or school district referrals (1.9%). Additionally, the strength of the relationship between self-reported internalizing problems and Broad Math scores are weak as a function of referral source.

There was no evidence of moderating influence for parent-reported internalizing scores for the Academic Skills composite, Broad Reading or Broad Math. The standardized beta coefficients and p-values were: $\beta = .024, p = .722; \beta = -.060, p = .350; \beta = .055, p = .427$, respectively. There was also no evidence of moderating influence of referral source on parent-reported externalizing scores: $\beta = .043, p = .521, \beta = .016, p = .798$ and $\beta = .098, p = .168$ for Academic Skills, Broad Reading and Broad Math, respectively.
Self-reported externalizing scores did not show evidence of influence by a moderating variable. The standardized beta coefficients and p-values for the moderator variable and Hyperactivity for each academic composite, in the same order as previously described, were: $\beta = .020, p = .788$; $\beta = .105, p = .092$ and $\beta = .106, p = .113$. The values for the moderator variable for Attitude to Teachers and the academic composites were: $\beta = -.045, p = .506$; $\beta = .042, p = .504$ and $\beta = .082, p = .226$. The values for the moderator variable for Sensation Seeking and the academic composites also showed no evidence of moderating influence: $\beta = -.113, p = .284$; $\beta = -.046, p = .603$, $\beta = -.052, p = .589$. There was also no evidence of moderating influence of referral source on self-reported internalizing problems for Academic Skills or Broad Reading: $\beta = .101, p = .115$ and $\beta = .073, p = .237$, respectively.
CHAPTER FIVE

DISCUSSION

The literature surrounding the relationship of emotional and behavioral symptoms on the academics of children and adolescents is inconclusive. The Behavior Assessment System for Children, Second Edition (BASC-2) and the Woodcock-Johnson, Tests of Achievement, Third Edition (WJ-III:ACH) are two of the most widely used tests to assess behavioral and emotional symptoms and academic achievement, respectively, but the research literature is almost completely silent in regard to studies indicating the relationship between these two measures. Only one study was found that directly examined correlations between the BASC-2 and WJ-III:ACH (Kwon, Kim and Sheridan, 2012), and it was limited to externalizing problems reported by teachers for early elementary school children. Correlations between these two widely used measures is not reported in the manuals for either of them.

The present study thus filled a gap in the current literature, examining whether self and parent reports of internalizing and externalizing symptoms on the BASC-2 had a relationship with academic achievement as measured by the WJ-III:ACH. The study also examined the level of severity in behavioral and emotional ratings dependent on the referral and evaluation source. Additionally, cluster analysis of the BASC-2 internalizing and externalizing scores was used to identify a pattern differentiating private practice and school referrals. As a follow-up to the hypotheses, multiple regressions and moderator analysis further examined the overall question of the general influence of behavioral and emotional symptoms on achievement test performance.
RESEARCH QUESTIONS

This study explored the relationship between self and parent reported internalizing and externalizing problems and any relationship with academic achievement. In order to accomplish this, the databases included information from the Behavior Assessment System for Children, Second Edition (BASC-2) as a measure of internalizing and externalizing symptoms and the Woodcock-Johnson, Tests of Achievement, Third Edition (WJ-III:ACH) as a measure of academic achievement. Pearson product-moment correlation coefficients were used to evaluate the relationships among the BASC-2 and the WJ-III:ACH scores. In addition to correlational data, one-way ANOVA’s were conducted with the data to determine any significant differences between the means of internalizing or externalizing symptoms dependent on the location of referral (private or school). Two-step cluster analysis grouped cases into pre-clusters with the individual case assignments based on distance from current pre-clusters using log-likelihood. The second step of the cluster analysis was an agglomerative algorithm used to identify the optimal number of clusters using Bayesian Information Criteria (BIC).

The research questions examined the correlations between self reported internalizing and externalizing symptoms with overall academic skills, reading and mathematics. Correlation coefficients were also examined for parent reports of internalizing and externalizing symptoms with overall academic skills, reading and mathematics.

SUMMARY OF FINDINGS

Based on the research questions, 13 null hypotheses were specified and tested. The findings from this study are similar to those found throughout the literature that used
assessment tools other than the BASC-2 and WJ-III:ACH. Some relationships were statistically significant while others were not. While some correlation coefficients were statistically significant, neither internalizing nor externalizing scores appeared to have a substantive correlation with scores on the standardized achievement test.

Hypotheses one through eight examined the correlations between behaviors and emotions and academic achievement which includes general academic skills, reading and mathematics. Hypotheses nine through 12 explored the severity of behavioral and emotional ratings based on referral source and hypothesis 13 explored the association of internalizing and externalizing problems and the identification of a pattern to differentiate private practice and school referrals.

**Child and Adolescent Self-Reports**

The child and adolescent self-reports consist of an Internalizing Problems composite that is comprised of the following subtests: Anxiety, Depression and Somatization. Academic achievement was evaluated with the WJ-III:ACH Academic Skills Composite, Broad Reading and Broad Math composites. The Academic Skills subtests are: Letter-Word Identification, Calculation and Spelling. The Broad Reading composite includes: Letter-Word Identification, Reading Fluency and Passage Comprehension and the Broad Math composite consists of: Calculation, Math Fluency and Applied Problems.

Self-reported internalizing problems had statistically significant correlations with the Academic Skill composite subtests Letter-Word Identification and Calculation. The internalizing problems subtests all had statistically significant relationships with
calculation. As the students rated themselves with higher internalizing symptoms, the calculation subtest scores would decline.

Consistent with the null hypotheses, self-reported internalizing problems did not have a statistically significant correlation with reading, although they did have a significant correlation with mathematics. Passage comprehension was affected by higher ratings of anxiety and depression; however no other areas of reading were impacted by the internalizing problems subtests. Internalizing problems were found to have a statistically significant relationship with all areas of mathematics measured on the WJ-III:ACH. The Anxiety and Depression subtests had statistically significant correlations with all the math subtests, Calculation, Math Fluency and Applied Problems, while Somatization had a statistically significant correlation with Calculation and Math Fluency.

Self-reported externalizing problems consisted of three subtests: Attitude to Teacher, Hyperactivity and Sensation Seeking. These subtests were chosen based on the strong correlations with the Achenbach System of Empirically Based Assessment (ASEBA) Youth Self Report Externalizing Problems scale. An externalizing problems composite score was not available for the BASC-2 child and adolescent reports. Externalizing problems were primarily not related to academic skills with the exception of Hyperactivity. Self-reported Hyperactivity had a statistically significant inverse relationship with Calculation and Spelling. These academic tasks require executive functioning skills and the presence of hyperactive symptoms can adversely affect these skills (Sattler & Hoges, 2006). Externalizing problems, as reported by the students, did not have a statistically significant correlation with reading or mathematic composites or
subtests. The Hyperactivity subtest did have a statistically significant correlation with Calculation and Applied Problems although no other subtests had significant relationships with the mathematics subtests.

When the difference in severity of ratings based on the location of the referral and evaluation was examined, the results yielded an interesting finding. The ratings of behaviors and emotions in the school referrals were more severe than the ratings for the private practice referrals. Self-reported internalizing symptoms were significantly different with the BASC-2 means gathered in the public school being significantly higher than the BASC-2 means collected in the private practice. Externalizing problems, as hypothesized, did not have a statistically significant difference between referral sources.

**Parent Reports**

Parent-reported internalizing problems consisted of an Internalizing Problems composite and three subtests: Anxiety, Depression and Somatization. As hypothesized, parent-report of internalizing problems did not have a statistically significant correlation with composite academic skills which combines Letter-Word Identification, Calculation and Spelling. These parent-reported emotional symptoms had a statistically significant correlation with the Letter-Word Identification and Calculation subtests. The Somatization subtest also had a statistically significant correlation with Calculation.

Internalizing problems, as reported by mothers, were also not significantly correlated with either reading or mathematics. Overall Internalizing Problems had a statistically significant correlation with Letter-Word Identification but no other combinations were statistically significant. Internalizing problems and mathematics correlations approached significance; however, they did not meet statistical significance.
Externalizing Problems, as reported by parents, consisted of a composite Externalizing Problems score and three subtests: Hyperactivity, Aggression and Conduct Problems. Parent report of externalizing problems was significantly correlated with academic skills. Reports provided by parents had several significant inverse relationships, primarily Calculation and the externalizing subtests as well as the composite. Aggression and Conduct Problems were also found to have significant inverse relationships with academic skills. As parents reported more behavioral symptoms, child and adolescent academic skills scores declined.

Parent reported externalizing symptoms were also not significantly correlated with reading achievement, but were significantly correlated with mathematic achievement. For the reading subtests, Aggression and Conduct Problems appear to be greater contributors to reading difficulties than Hyperactivity. Letter-Word Identification and Passage Comprehension had a statistically significant correlation with Aggression as well as with Conduct Problems. However, the Conduct Problems subtests also had a statistically significant relationship with Reading Fluency. The behaviors associated with externalizing problems showed a greater inverse relationship with academic achievement as measured by a standardized assessment.

One-way ANOVAs examined the severity of ratings between private practice and school district data. Parent-reported internalizing problems were significantly different. The means for BASC-2 scores gathered in the schools were significantly higher than the means for BASC-2 scores gathered in the private practice setting. Parent reports of externalizing problems in the school setting were also higher than in the private practice data set. Additionally there was a statistically significant difference in externalizing
problems between the referral sources and parent reports but not with self reports. With a large effect size, this indicates much of the variance is explained by where the referral/evaluation took place. The literature indicated parent referral to specialty mental health clinics stemmed from the effect of the symptoms on the parents (Angold et al., 1998) or when the problems were more disruptive and defiant (Cohen et al., 1991); however, the present study found the children and adolescents referred and evaluated in the schools present with more severe symptoms.

**Cluster Analysis**

The final hypothesis utilized cluster analysis to identify whether there was an identifiable pattern within internalizing and externalizing symptoms related to the referral and evaluation source. Two distinct clusters were identified based on high and low scores on the BASC-2. Cluster one was comprised of lower scores while cluster two was comprised of higher scores. The main predictor for cluster identification was self-reported somatization. These results align with the ANOVA data that found a significant difference in the reports of behavioral and emotional symptoms based on where the referrals and evaluations were conducted. The data associated with the cluster analysis is consistent with the other hypotheses.

**Multiple Regression and Moderator Analysis**

Many of the relationships between internalizing and externalizing problems and academic achievement had statistically significant correlations; however the correlations were rather small. While not included as hypotheses in the study, additional statistical analyses were conducted to follow-up on some of the initial findings. Multiple linear regressions further examined these relationships. These analyses suggested that
emotional and behavioral symptoms may have a greater impact on academic achievement test scores when internalizing and externalizing problems are considered together.

Additionally, moderation analysis was done to determine if referral source exhibited a moderating effect on the relationship between BASC-2 internalizing and externalizing scores and scores on the academic achievement assessment. Referral source was found to have a statistically significant moderator effect on self-reported internalizing problems and Broad Math scores. Although the moderator was found to be statistically significant, very little variance was actually explained by referral source and the correlations between emotional symptoms and mathematics as a function of referral source are weak. There was no evidence of a moderating influence on parent reported internalizing and externalizing problems and academic scores.

No evidence of a moderating variable influence was found on self-reported internalizing problems for Academic Skills or Broad Reading. Self-reported externalizing problems also did not show evidence of influence by a moderating variable.

IMPLICATIONS

The inconsistent statistically significant relationships and generally low correlation coefficients between parent and self-reported internalizing and externalizing problems with academic achievement have several implications. The range of correlation coefficients between BASC-2 ratings and WJ-III:ACH scores was the lowest at .00 to the highest -.30 with a median of -.11. While some of these correlations were statistically significant, most are in the category typically identified as low or weak. The median correlation coefficient, -.11, indicates a relationship in which barely 1% of the variance in the achievement test scores could be accounted for by the rating of emotional or
behavioral symptoms. When the internalizing and externalizing scores were combined and analyzed through multiple regression, the overall effect of emotional and behavioral problems on academic achievement was greater than the individual subtests indicated.

The results could suggest emotional and behavioral problems do not have as much of an impact on certain areas of academic achievement as initially believed. For example, Levine (2008), Ma (1999) and Wood (2006) found an inverse relationship between anxiety and academic achievement as measured by a combination of teacher reports, researcher made tests and standardized assessments. In contrast to those findings, Grills-Taquechel, Fletcher, Vaughn and Stuebing (2012) found anxiety and reading fluency were positively related while the present study found there were no statistically significant relationships between anxiety and reading fluency.

Although the correlations between the WJ-III:ACH and the BASC-2 are not strong, they do indicate an inverse relationship which is the desired direction of the relationships. Also, considering these two assessment tools measure different constructs one would not want the correlations to be too strong as this would mean the tools are measuring the same construct.

Additionally, the difference between academic achievement and academic performance may need to be considered if these students struggle in the classroom and the underachievement does not reflect on formal standardized tests. There may also be other factors that interfere with student learning or overall classroom performance that are not measured with the academic achievement tests.

These factors may include race or ethnicity, socio-economic status, parental involvement or classroom management. Without additional demographic variables there
were several factors that could not be examined. Socio-economic status can be directly linked to race and ethnicity as well as parental involvement. In a lower income family, parents often work longer hours or multiple jobs to support their families and may be unable to provide as much time and attention to their children’s academic and emotional needs. Other times, teachers report more behavioral problems due to limited classroom management skills and inconsistent discipline. Furthermore, there may be personal problems that impacted a student’s performance during testing. By using secondary data, the emotional or behavioral state each child or adolescent was in cannot be known.

Self-reported hyperactivity had a statistically significant correlation with many of the academic areas; however, the other self-reported externalizing symptoms did not have a significant relationship with academic achievement. This difference could be due purely to hyperactivity or inattention may be a confounding variable. Many children and adolescents with hyperactivity often have impulsivity and/or inattention symptoms and research has shown inattention is the primary factor affecting academic achievement (Breslau et al., 2009; Tymms & Merrell, 2011; Willcutt et al., 2007). Furthermore, students with more hyperactive symptoms fidget, struggle to sit still and often talk excessively. These are all behaviors that could adversely affect performance on a standardized assessment. In response to the inverse relationship between Hyperactivity and Calculation, students who struggle to remain focused and calm often miss mathematical operational signs while completing calculation problems. For example, the student may add when the problem calls for subtraction which cannot be prompted during the administration of a formal standardized test.
The parent reported externalizing problems had significant inverse correlations with most areas of mathematics. When children and adolescents have greater behavioral symptoms, test scores may have been adversely affected by the student’s behavior during the testing sessions. This could potentially present as an academic skill deficit when in actuality is it a performance issue.

The statistically significant correlations found among aggression and conduct problems and academic achievement are not surprising. Though much of the literature reported externalizing problems, such as aggression and conduct problems, had an adverse impact on achievement, the patterns of behavior accompanying these symptoms could likely lead to academic problems. When children or adolescents engage in defiant and/or disruptive behaviors rejection from peers and poor relationships with teachers are common consequences. Parents then engage in negative interactions with teachers and school staff adding an additional strain to an already potentially unrewarding relationship with the student. The student, who now has very little support, begins to do poorly in school and may begin engaging in even riskier behaviors. Identifying the problematic symptoms and creating a plan to improve them is imperative to protect the student and to help the student achieve academically.

The literature reported parents may be more likely to request services from a professional because of the effect the behavioral symptoms had on the parents as well as the more disruptive and defiant the behaviors were (Cohen et al., 1991). The findings from this study identified more severe ratings for those children and adolescents referred and evaluated in the school district than the private practice. Within the schools, this could necessitate additional professional development for school employees to be better
equipped to handle more severe emotional and behavioral symptoms. This also presents a need for parent education in regard to behavioral and emotional problems including how to handle symptoms in the home as well as learning to collaborate with the school personnel.

Elevated parent reports in the school setting could be a product of potential secondary gains. Parents whose children are evaluated through the schools may report greater behavioral or emotional concerns in the hopes of gaining special education services. Oftentimes, eligibility for special education services leads to an Individualized Education Program (IEP) which can also include transportation and/or monetary benefits from the government.

Parent and student reports resulted in rather noticeable differences. Self-reported internalizing problems were found to have an inverse relationship with calculation while the parent reports of internalizing problems had limited relationships with academic skills. The majority of the self-reported means were higher than the parent-reported means. Children and adolescents are reporting more intense emotional and behavioral symptoms than mothers are reporting. Particularly for Hyperactivity, the self-reported symptoms had more statistically significant correlations with academic achievement. Students are identifying behavioral symptoms in themselves and performing more poorly on academic achievement tests. By being able to identify behavioral difficulties, the students can be trained to self-monitor and regulate their behaviors in an attempt to improve the hyperactive symptoms.

LIMITATIONS AND ALTERNATIVE EXPLANATIONS
With any study, there are inherently limitations. It was assumed that the academic achievement tests were administered following standardization procedures and were scored correctly. It was assumed the parent and student rating scales were true and accurate reports of the student’s behavioral and emotional symptoms. It was assumed that the data was correctly entered into the databases.

In response to the assumption that the data were entered into the databases correctly, there were gaps in the datasets. A regression equation was used to substitute the missing values when either the composite academic achievement score was not available or when the composite and two of the three subtest scores were known.

The sample sizes were also not evenly distributed between the private practice and the school datasets. While the samples were matched by age, grade and gender, had the total population of each been equivalent, the results may have been different. Many of the correlation results were found to be statistically significant; however, the correlations were not very strong. The statistically significant results are due in large part to the relatively large n. The samples also did not include race or ethnicity data which could affect the generalizability of the results.

In terms of comparing the private practice and school district population samples, the limited demographic data restricts the generalizability of the comparisons. Age, gender and grade were matched between the samples; however, other demographics such as race, ethnicity or socio-economic status were unknown. Without this information, one cannot claim differences in private and school referrals are strictly due to difference in referral source. Differences may be due to other factors related to demographics.

RECOMMENDATIONS FOR FUTURE RESEARCH
The current study provides information and also areas of need for future research. These results would challenge the generally held assumption that there is a strong relationship between emotional and behavioral symptoms and academic achievement as measured by standardized achievement tests. Additional correlation studies with the BASC-2 and the WJ-III:ACH would be helpful in further determining the relationship between behavioral and emotional symptoms and academic achievement, and also studies with other measures of emotional and behavioral problems and other standardized tests of academic achievement. Studies with other samples of school district and private practice referrals are needed to confirm the finding here that severity of problems was more evident with evaluations conducted in the schools. With the inclusion of additional factors such as ethnic or racial differences, socio-economic status and parental involvement, a more comprehensive list of variables and their relationship with academic achievement could be evaluated. Future studies may also wish to include writing as an academic area. Including information from teachers and observational data of classroom performance could help differentiate the academic achievement versus academic performance query.

While the present study tested the differences between internalizing and externalizing symptoms based on private practice and school data, a future study could compare differences between other referral and evaluation sites such as foster care agencies or other government run institutions.

**IMPLICATIONS FOR SCHOOL PSYCHOLOGY**

School psychologists are the primary mental health professionals on a school campus tasked with both evaluating students and providing interventions to help
remediate behavioral and/or emotional symptoms. The BASC-2 is one of the most popular ratings scales used by school psychologists to identify these symptoms and can be helpful in designing an appropriate intervention plan for individual students. The comparison of the BASC-2 means for internalizing and externalizing symptoms were greater from the school data than from the private practice data. School psychologists must be prepared to handle more severe behavioral and emotional symptoms in the schools and need to be equipped to assist teachers and parents in coping and intervening on these as well.

While the present study identified statistically significant relationships between several of the internalizing and externalizing scales and academic achievement, the correlations were not very strong. School psychologists need to be aware of the impact other variables may have on a student’s performance in school beyond merely standardized academic achievement data. Performance appears to encompass much more than academic achievement which school practitioners need to keep in mind when working with students with behavioral and/or emotional symptoms.

In terms of test administration, school psychologists must acknowledge the potential behaviors students may engage in during testing. If a student is extremely fidgety and off-task this could potentially lead to lower academic scores. Additionally, if a student does not persevere on more difficult tasks or gives up easily, the test score may not be the most valid indicator of the student’s true academic achievement. School psychologists frequently report any pertinent testing behaviors in the psycho-educational report. Through the inclusion of this information, the school psychologist can better
assist in Individualized Education Program (IEP) development and goal setting for the student.

When dealing with students with more aggressive and defiant behaviors, the school psychologist may need to step in and help create a support system for the student. As previously stated students with the externalizing problems are often rejected by peers and develop strained relationships with teachers and parents. School psychologists can assist in intervention planning and may also need to work with families to teach parents and students how to have more rewarding relationships.

In addition to helping the families of the students, school psychologists can use the student reports of behaviors and emotions as teaching tools. Children and adolescents may not understand the feelings or behaviors they experience. By taking the information gained from the BASC-2 self-reports, school psychologists can assist students in understanding their minds and bodies and can teach the students how to deal with them on a daily basis.

Although the results of this study do not support an expectation of meaningful correlations between internalizing or externalizing problems as measured by the BASC-2 and performance on the WJ-III:ACH, these results alone would not suggest limitations in either of the two instruments. There is more than sufficient evidence in the literature supporting the measurement quality of both scales, and when both internalizing and externalizing scales were combined in regression analysis, creating an overall estimate of emotional and behavioral problems, the resulting relationship with the achievement test scores was more typical of expectations in a validity coefficient, particularly in the self ratings.
School psychologists need to know, based on the present study that behavioral and emotional symptoms may not conform to the most popular beliefs shared by many. Assumed relationships must be confirmed with actual data. Finally, beyond the scope of this study, these results may suggest a need for extensive reflection within the profession about the relationship between academic achievement as determined by classroom performance and academic achievement as determined by scores on individual standardized achievement tests.
APPENDIX A

UNLV
UNIVERSITY OF NEVADA LAS VEGAS

Social/Behavioral IRB – Review
Notice of Excluded Activity

DATE: January 11, 2013
TO: Dr. Paul Jones, Educational Psychology & Higher Education
FROM: Office of Research Integrity – Human Subjects
RE: Notification of IRB Action
Protocol Title: Client Characteristics-Private Practice: De-identified Database
Protocol# 1212-4334

This memorandum is notification that the project referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46.

The protocol has been reviewed and deemed excluded from IRB review. It is not in need of further review or approval by the IRB.

Any changes to the excluded activity may cause this project to require a different level of IRB review. Should any changes need to be made, please submit a Modification Form.

If you have questions or require any assistance, please contact the Office of Research Integrity – Human Subjects at IRB@unlv.edu or call 895-2794.
APPENDIX B

UNLV
UNIVERSITY OF NEVADA LAS VEGAS

Social/Behavioral IRB – Review
Notice of Excluded Activity

DATE: April 29, 2013
TO: Dr. Paul Jones, Educational Psychology & Higher Education
FROM: Office of Research Integrity – Human Subjects
RE: Notification of IRB Action
Protocol Title: Client Characteristics—Public School: De-identified Database
Protocol# 1304-4447

This memorandum is notification that the project referenced above has been reviewed as indicated in Federal regulatory statutes 45CFR46.

The protocol has been reviewed and deemed excluded from IRB review. It is not in need of further review or approval by the IRB.

Any changes to the excluded activity may cause this project to require a different level of IRB review. Should any changes need to be made, please submit a Modification Form.

If you have questions or require any assistance, please contact the Office of Research Integrity – Human Subjects at IRB@unlv.edu or call 895-2794.
May 9, 2013

Lara Conrad
10550 W. Alexander Rd., Unit 2125
Las Vegas, NV 89129

Dear Lara:

The Research Review Committee office of the Clark County School District has received your request entitled: Examining the Relationships Between Self and Parent Reports of Internalizing and Externalizing Problems and Academic Achievement in Different Referral Populations. We are pleased to inform you that your sponsored proposal has been approved with the following provisos:

1. Participation is strictly and solely on a voluntary basis,
2. Provide letter of acceptance from any additional principals who agree to be involved with the study.

This research protocol is approved for a period of one year from the approval date. The expiration of this protocol is . If the use of human subjects described in the referenced protocol will continue beyond the expiration date, you must provide a letter requesting an extension one month prior to the date of expiration. The letter must indicate whether there will be any modifications to the original protocol. If there is any change to the protocol it will be necessary to request additional approval for such change(s) in writing to the Research Review Committee.

Please provide a copy of your research findings to this office upon completion. We look forward to the results. If you have any questions or require assistance please do not hesitate to contact Brett Campbell at (702) 799-5195 or e-mail at bdcampbell@interact.ccsd.net.

Sincerely,

Jeffrey N. Hatrell, Ed.D.
Coordinator IV
Department of Accountability & Research
Chair, Research Review Committee

cc:
Brett Campbell
Robert Weires – SPONSOR
Pat Skorkowsky
Research Review Committee

RRC-70-2013
REFERENCES


Barriga, A. Q., Doran, J. W., Newell, S. B., Morrison, E. M., Barbetti, V., & Dean


Lara E. Conrad, PhD, NCSP
10550 W. Alexander Rd. Unit 2125
Las Vegas, NV 89129
conradl@unlv.nevada.edu
702-426-7653

Education

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Professional Organizations

American Psychological Association
National Association of School Psychologists
Nevada Association of School Psychologists

Professional Presentations


**Professional History**

**Position:** Psychology Associate  
**Date:** Present  
**Where:** Behavioral & Educational Solutions, PC  
**Duties:** Conducting comprehensive psychological and psycho-educational evaluations, consulting with families and schools with social-emotional, behavioral or academic concerns for preschool and school-aged students. Providing brief, solution-focused therapy, as needed, for parents and children/adolescents and evaluating in-home services to determine effectiveness of those services.

**Position:** School Psychologist  
**Date:** 2009 - 2013  
**Where:** Clark County School District, Las Vegas, NV  
**Duties:** Implemented Response to Instruction in the schools and provided training for other schools. Conducted initial, three-year, out-of-state and transfer evaluations for special education services as well as counseled students. Made the most appropriate educational decisions for children by consulting with parents, teachers and other multidisciplinary team members. Consulted with school psychologists regarding autism spectrum disorders, in addition to the administration and interpretation of the Autism Diagnostic Observation Scale.

**Position:** Advanced Clinical Practicum Student  
**Date:** 2011 – 2013  
**Where:** Dr. W. Paul Jones, Ltd. – private practice, Las Vegas, NV  
**Duties:** Conducted mental status evaluations

**Position:** School Psychologist Intern  
**Date:** 2008 - 2009  
**Where:** Clark County School District, Las Vegas, NV  
**Duties:** Implementing Response to Instruction in the schools. Conducting initial, three-year, out-of-state and transfer evaluations for special education services as well as counseling students. Making the most appropriate educational decisions for children by consulting with parents, teachers and other multidisciplinary team members.

**Position:** Kindergarten Teacher  
**Date:** 2007 - 2008
Where: Mountain View Christian School, Las Vegas, NV
Duties: Taught 5 and 6 year old students math, phonics, science and social studies. Staff meetings, parent-teacher conferences, behavior management and individual student evaluations were also teacher responsibilities.

Position: Foster Support Specialist
Date: 2005 - 2006
Where: Orange County Child Abuse Prevention Center, Orange, CA
Duties: Interacted with foster children and their families to ensure adequate physical, emotional, and educational well-being.

Awards

University of Nevada, Las Vegas School Psychology Student of the Year, June 2009

References

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