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# Accuracy of Educators in Identifying Middle School Students with Elevated Levels of Anxiety or Depression

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Accuracy of Educators in Identifying Middle School Students with  
Elevated Levels of Anxiety or Depression

by

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A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
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## Abstract

Schools need accurate and efficient ways to identify youth with mental health problems, in part to provide services to such students whose mental health concerns pose barriers to learning. The present study involved an investigation of the accuracy of one method—relying on educators (teachers, a team of school-based mental health professionals, and a school nurse) to identify early adolescents who self-report elevated levels of anxiety or depression. With respect to teachers as screening agents, the possible variability in rates of accurate identification as a function of number of teachers involved in the process (i.e., pooling nominations from multiple subject area teachers for a single student rather than from a single subject area teacher) was examined. The present study also included an examination of the demographic and psychological features of students who are more likely to be missed (i.e., self-report elevated symptoms but are not detected) or misidentified (i.e., self-reported symptoms in the typical range but were incorrectly identified as symptomatic) by educators. Participants included 233 middle school students in grades 7 to 8, 19 teachers, and 6 school-based mental health professionals. Approximately 15.5% and 12% of student participants twice-reported at-risk levels of anxiety and depression, respectively. At-risk was defined as *T*-scores more than one standard deviation from the norm group mean on psychometrically sound narrowband measures of anxiety and depression. Teachers correctly identified 58.33% of these anxious students and 32.14% of the students with elevated depression, but misidentified 34.52% of non-symptomatic students for anxiety and 23.41% for depression. The school-based mental health staff was largely less accurate than the teachers. The team of school-based mental health professionals accurately

identified 12.50% of students for anxiety and 26.32% for depression, and falsely identified 10.31% for anxiety and 25.49% for depression. The school nurse correctly identified 14.81% of students for anxiety and 14.29% for depression, and misidentified 16.26% for anxiety and 17.83% for depression. Taken together, the use of educator nominations in identification of internalizing middle school students appears most defensible when relying on teacher judgments to identify youth with elevated anxiety. The combined group of core subject area teachers (language arts, math, and social studies) was more accurate than teachers from a single subject area, suggesting that teacher nominations should be elicited from multiple groups of core subject area teachers, particularly math and language arts. Rather than nominating students themselves, school-based mental health professionals may be better situated to deliver professional development to teachers regarding the identification of anxiety and depression. Additionally, although several demographic (i.e., gender, race/ethnicity, socioeconomic status) and psychological features (i.e., symptom severity, symptom type; also socially desirable responding and life satisfaction) were examined for students who were missed and misidentified, few differences emerged between the pairs of groups with similar self-reported levels of symptoms. Exceptions included that students who were misidentified reported higher levels of depressive symptoms (albeit still in the typical range) and less satisfaction with their lives than students who were not nominated by teachers. Thus, teachers may detect some mild mood or quality of life differences among students that do not align with students' self-report of symptoms. The practical implications of all study findings, as well as directions for future research, are discussed.

## Chapter I: Introduction

### Statement of the Problem

Early adolescence (i.e., ages 11 to 14) is characterized by major developmental and social changes, including the “the biological transformations of puberty, the educational transition from elementary to secondary school, and the psychological shifts that accompany the emergence of sexuality” (Eccles, 1999, p. 36-37). Because of the importance of social comparison in this age group, physical changes resulting from puberty can be problematic, especially for early developing girls (Summers-Effler, 2004). The middle school environment may not be appropriate for the developmental needs of early adolescents due to its structure and the norms for relationships with both teachers and peers (Eccles & Roeser, 2009). Threats to early adolescents’ psychological well-being include shifting cognitive processes and increased stressful events, such as changes in relationships with family members, the peer group, and romantic relationships (Graber, 2004). As a result of these changes, early adolescents may experience declines in self-worth, difficulties assimilating with the peer group, reductions in academic motivation and achievement, and in extreme cases school dropout (Eccles & Roeser, 2003; Fenzel, 2000; Reynolds & Juvonen, 2012; Summers-Effler, 2004).

Approximately 20% of youth experience severe impairment from a mental disorder (Merikangas et al., 2010), with the highest prevalence rates for anxiety disorders, followed by behavior disorders, and then mood disorders. The risk of developing a mood or behavior disorder increases during early adolescence (Kaltiala-Heino, Marttunen, Rantanen, & Rimpela, 2003; Merikangas et al., 2010). Likely because the symptoms of externalizing disorders are more

observable, educators are sufficiently accurate in identifying these youth (e.g., Papandrea & Winefield, 2011). However, youth with internalizing disorders such as anxiety and depression are often overlooked.

The Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition, Text Revision (DSM-IV-TR; APA, 2000) describes several anxiety and depressive disorders that are diagnosable in youth. Anxiety disorders have a lifetime prevalence of 15% to 20% among children and adolescents (Beesdo, Knappe, & Pine, 2009), with a median age of onset around six years of age (Merikangas et al., 2010). The most common anxiety disorders among youth include separation anxiety disorder, social phobia, and generalized anxiety disorder (Beesdo et al., 2009; Klein, 2009). Depressive disorders have a lifetime prevalence of approximately 12% among adolescents (Beesdo et al., 2009), with an average age of onset between 11 and 14 years old (Lewinsohn, Rohde, & Seeley, 1998). Major depressive disorder is the most common depressive disorder among children and adolescents.

Several psychosocial and academic outcomes are associated with elevated levels of anxiety and/or depression. Negative outcomes include concurrent and future internalizing disorders and suicidal ideation, substance abuse, declines in self-esteem, problems developing and maintaining social relationships, diminished academic engagement and performance, and school dropout (Humensky et al., 2010; Jonsson et al., 2011; King, Iacono, & McGue, 2004; Merrell, 2008a; Pine, Cohen, Gurley, Brook, & Ma, 1998; Van Ameringen, Mancini, & Farvolden, 2003; Wood, 2006).

Despite the prevalence of mental health problems and the associated outcomes, only about 30% of youth in need of mental health services receive them (Farmer, Burns, Philip, Angold, & Costello, 2003; U.S. Department of Health and Human Services [US DHHS], 1999).



In part due to challenges with securing community-based mental health services (e.g., decreased funding, insurance issues; President's New Freedom Commission on Mental Health, 2003; US DHHS, 1999), schools have emerged as a major provider of psychosocial services to youth (Committee on School Health, 2004; Farmer et al., 2003; Merikangas et al., 2011).

School-based mental health services are advantageous for a number of reasons. These advantages include (a) the employment of professionals with mental health training (Council for Accreditation of Counseling and Related Educational Programs [CACREP], 2009; National Association of School Nurses [NASN], 2008; National Association of School Psychologists [NASP], 2008; National Association of Social Workers [NASW], 2002), (b) greater convenience for children and their families to access mental health services (President's New Freedom Commission on Mental Health, 2003), (c) a less stigmatizing experience (President's New Freedom Commission on Mental Health, 2003), (d) more opportunities for collaboration with other professionals, including children's classroom teachers, and (e) alignment with federal legislation (e.g., Individuals with Disabilities Education Improvement Act of 2004, Section 504 of the Rehabilitation Act of 1973).

Students exhibiting externalizing behaviors are more likely to be referred for school-based mental health services than youth experiencing internalizing forms of psychopathology (Foster et al., 2005; Little & McLennan, 2010; Reddy, Newman, De Thomas, & Chun, 2009). Referred school-age youth exhibited hyperactivity most commonly, followed by prosocial deficits, peer problems, and emotional problems (Little & McLennan, 2010). The most common types of mental health services provided to these referred youth include assessment, consultation for behavior management, crisis intervention, and referral to specialized programs (Foster et al., 2005). In middle schools, these services are commonly provided by social workers, counselors,

school psychologists, and school nurses. Findings in the literature support that school-based mental health services are effective in ameliorating a broad range of academic and mental health problems, including anger, conduct problems, learning problems, social skills, anxiety, and depression (Baskin et al., 2010; Bernstein, Layne, Egan, & Tennison, 2005; Flanagan, Allen, & Henry, 2010; Hoagwood et al., 2007; Mufson et al., 2004; Rones & Hoagwood, 2000).

Common methods of identifying youth with mental health problems include (a) universal screening, via completion of behavior rating scales by one or more informants, (b) review of archival records like office discipline referrals (ODRs), (c) student self-referral or referrals made by parents, (d) referrals made by professionals who provide school-based mental health services, and (e) teacher nominations. Some of these methods, such as ODRs and non-systematic referrals by educators, are more suitable for detecting youth with externalizing than internalizing issues. Universal screenings are quite appropriate for identifying youth who have internalizing disorders, but may not be a viable method for use in schools because of the extensive time and resources needed and ethical concerns (Chafouleas, Kilgus, & Wallach, 2010; Glover & Albers, 2007). The use of systematic teacher nominations may be more practical for detecting youth with mental health issues because it is an efficient and cost-effective method (Ollendick, Oswald, & Francis, 1989). Additionally, teachers are more familiar with students than other school personnel and may have a greater understanding of typical behavior for that age group (Auger, 2004).

Although research supports that teachers are accurate in identifying youth exhibiting externalizing behavior (e.g., Richardson, Caldarella, Young, Young, & Young, 2009), few published studies have examined teachers' accuracy in identifying youth with internalizing issues (exceptions include Auger, 2004; Cunningham & Suldo, 2014; Dadds, Spence, Holland, Barrett, & Laurens, 1997; Moor et al., 2007). These initial studies indicate that teacher

nominations detect approximately 20% to 40% of students with elevated anxiety levels, and 27% to 52% of students with elevated depressive symptoms. Limitations in this small collection of studies include that the two studies conducted with students in secondary schools (Auger, 2004; Moor et al, 2007) did not examine the accuracy of teacher nominations in detecting *anxiety* symptoms or sub-diagnostic levels of depression (i.e., clinically elevated levels of depressive symptoms that may not yet result in a complete depression diagnosis), so it is unknown if the conclusions extend to early adolescents who are most likely to be the targeted recipients of preventative school-based mental health services. Further, the studies of middle school students did not investigate the extent to which using nominations from one teacher or multiple teachers resulted in greater accuracy (i.e., improved sensitivity, reduced specificity). The literature is also inconclusive regarding distinctive features of symptomatic students who are particularly likely to be missed by teachers (e.g., differences in demographic characteristics, severity of symptoms, or type of symptoms) as well as unique features of adolescents who report typical levels of emotions who are more likely to be misidentified by teachers (e.g., differences in students' tendency towards socially desirable responding, or in their global appraisals of the overall quality of their lives—life satisfaction).

### **Purpose of the Study**

The primary purpose of the current study was to address the limitations in the literature by investigating the accuracy (sensitivity, specificity) of teacher nominations in identifying early adolescents who experience elevated levels of anxiety or depression. This study examined the differences in accuracy associated with eliciting nominations from a group of multiple subject area teachers rather than a single subject area teacher. Additionally, this study provided preliminary information regarding the accuracy of nominations made by a middle school team of

school-based mental health professionals and a school nurse. Finally, the current study supplemented prior research by providing further detail regarding early adolescents who were missed or misidentified.

### **Definition of Key Terms**

**Anxiety.** Anxiety is a term that describes multiple anxiety disorders in the DSM-IV-TR (APA, 2000). Commonly diagnosed anxiety disorders among youth include separation anxiety disorder, social phobia, and generalized anxiety disorder (Beesdo et al., 2009), which were under investigation in the current study and defined more fully in Chapter 2.

**Depression.** Depression is a term that refers to a disturbance in mood, characterized by sadness or irritable mood (APA, 2000). The most common depressive disorder among children and adolescents is major depressive disorder (Costello, Egger, & Angold, 2005), which was examined in the present study and defined more fully in Chapter 2.

**School-based mental health services.** School-based mental health services describe, “the broad array of services designed to prevent and treat behavioral and emotional difficulties that may or may not be symptoms of specific mental disorders” (Christner, Mennuti, & Whitaker, 2009, p. 5) that are offered to students across multiple intervention levels (i.e., universal, targeted, intensive, crisis) within the context of a supportive learning environment.

**School-based mental health professional team.** Many individuals with similar but distinct professional training in student guidance, physical health, social work, and psychology contribute to the provision of mental health services in schools. In the current study, the school employees who were considered school-based mental health professionals included: social workers, school counselors, school psychologists, and school nurses (Foster et al., 2005).

**Accuracy.** As depicted in Table 1, the accuracy of a given assessment instrument in commonly judged according to its: sensitivity (and corresponding miss rate) and specificity (and corresponding misidentified rate; Glover & Albers, 2007)

Table 1

*Matrix of Key Terms Used in Describing Accuracy*

	Student self-reported symptoms in the elevated range	Student did not self-report symptoms in the elevated range
Student Nominated by Teacher or School-Based Mental Health Professional	<b>Sensitivity</b> (True Positive)	<b>Misidentified Rate</b> (False Positive)
Student Not Nominated by Teacher or School-Based Mental Health Professional	<b>Miss Rate</b> (False Negative)	<b>Specificity</b> (True Negative)

*Note.* Adapted from Green & Zar (1989)

**Sensitivity.** Sensitivity (i.e., true positives) refers to “the percentage of individuals with the disorder, as measured by a criterion measure, who are correctly identified by the screening or assessment instrument” (Levitt, Saka, Romanelli, & Hoagwood, 2007; p. 168).

**Specificity.** Specificity (i.e., true negatives) refers to “the proportion of individuals without the disorder, as measured by a criterion measure, who are correctly identified by the instrument as being disorder-free” (Levitt et al., 2007; p. 168).

**Miss rate.** The miss rate (i.e., false negatives) refers to the proportion of students that self-reported elevated symptomatology who are not detected by teachers, a team of school-based mental health professionals, and a school nurse, separately. This proportion is the converse of sensitivity (i.e., true positive), in that the miss rate is calculated by subtracting the sensitivity from the total number of students who self-reported symptoms in at least the Slightly Elevated range (i.e.,  $100\% - \text{sensitivity}\% = \text{miss rate}$ ).

**Misidentified rate.** The misidentified rate (i.e., false positive) refers to the proportion of students who do not self-report elevated symptomatology but are incorrectly identified by teachers, a team of school-based mental health professionals, and a school nurse, separately. This proportion is the converse of specificity (i.e., true negative), in that the misidentified rate is calculated by subtracting the specificity from the total number of students who did not self-report symptoms above the High Average range (i.e.,  $100\% - \text{specificity}\% = \text{misidentified rate}$ ).

**Socially desirable responding.** The term social desirability refers to a tendency for individuals to respond in a way that portrays themselves favorably to others (Paulhus, 1991).

**Life satisfaction.** The term life satisfaction is the cognitive and more stable component of subjective well-being (i.e., a scientific framework for operationalizing happiness) and refers to the cognitive appraisal of one's quality of life as a whole (Diener, Suh, Lucas, & Smith, 1999).

## Research Questions

1. What is the accuracy of combined teacher nominations to identify early adolescents who report elevated levels of anxiety, in regards to:
  - a. Sensitivity
  - b. Specificity
  - c. Miss rate

- d. Misidentified rate?
2. What is the accuracy of combined teacher nominations to identify early adolescents who report elevated levels of depression, in regards to:
- a. Sensitivity
  - b. Specificity
  - c. Miss rate
  - d. Misidentified rate?
3. What is the accuracy of school-based mental health professional nominations in identifying early adolescents who report elevated levels of anxiety, in regards to:
- a. Sensitivity
  - b. Specificity
  - c. Miss rate
  - d. Misidentified rate?
4. What is the accuracy of school-based mental health professional nominations in identifying early adolescents who report elevated levels of depression, in regards to:
- a. Sensitivity
  - b. Specificity
  - c. Miss rate
  - d. Misidentified rate?
5. What is the accuracy of multiple teachers (i.e., combined across subject areas) compared to the accuracy of a single teacher (i.e., all teachers of a single subject area) in identifying early adolescents who report elevated levels of anxiety or depression, in regards to:
- a. Sensitivity

- b. Specificity
  - c. Miss rate
  - d. Misidentified rate?
6. Regarding children who are missed (i.e., self-report levels of symptoms but teachers do not perceive them as symptomatic), do these children differ from their peers who were correctly identified as symptomatic in terms of:
- a. Demographic characteristics?
  - b. Symptom severity or symptom type?
7. Regarding children who are misidentified (i.e., deny high levels of symptoms but teachers perceive them as symptomatic), do these children differ from their peers who were correctly not nominated in terms of:
- a. Demographic characteristics?
  - b. Symptom severity or symptom type?
  - c. Level of socially desirable responding on surveys?
  - d. Level of life satisfaction?

### **Contributions to the Literature**

The current study contributed to both research and practice in many ways. For one, researchers have not established that teachers are accurate in identifying youth with symptoms of internalizing disorders, such as anxiety or depression, as there are only a handful of published studies on the topic. However, this method of identification has been established as an accurate way of identifying youth with symptoms of externalizing disorders and is more efficient and cost-effective than other methods, such as universal screening. Thus, the present study contributed to practice by providing further information on whether or not it is a viable method



of identifying youth experiencing symptoms of anxiety or depression. Additionally, the only published study with middle school students did not examine teacher's accuracy in identifying anxiety and only one published study has examined the accuracy of school-based mental health professionals, who often have the most clinical training in schools, in identifying these youth. However, that study did not include school nurses, who are common providers of mental health services in schools. Thus, the findings from the present study contributed to this small literature base by providing a preliminary examination of the accuracy of nominations from teachers, a team of school-based mental health professionals, and a school nurse in identifying middle school students with elevated levels of depression or anxiety. In addition, because middle school students are taught by multiple teachers throughout the day, this study informed differences in teacher accuracy when asking a single subject area teacher versus multiple teachers to rate students' internalizing symptoms. Such findings can inform practices in schools and school districts that plan to employ teacher nomination procedures. Finally, the current study shed light on students potentially at greater risk of being missed or misidentified within schools using teacher nomination procedures.

## **Chapter II: Review of Relevant Literature**

This chapter reviews literature that builds a rationale for the importance of the present study. The review begins with contextual information on early adolescence as a stage of development that includes unique growth-related challenges. Subsequent sections discuss common mental health concerns within this target population, with a particular focus on internalizing disorders, namely anxiety and depression. Next, literature is reviewed that provides a rationale for the provision of school-based mental health services, including findings regarding the effectiveness of such efforts. Then, common methods of identifying students with mental health problems are presented. Finally, a discussion of the current gaps in the literature will demonstrate the need for particular research on the accuracy of teacher nominations as a means to identify middle school students with anxiety and depression.

### **Early Adolescence**

An introduction to early adolescence, including background information on this developmental stage and the associated challenges, is appropriate because middle school students are the target population in the current study. The term “early adolescence” describes youth between the ages of 11 and 14 and is characterized by major developmental and social changes, including pubertal development, a greater capacity for abstract thinking, a desire for greater autonomy, and an increasing focus on social acceptance and peer relationships (Eccles, 1999). Issues of self-consciousness and self-identity are also particularly salient to these youth (Eccles, 1999).

In the U.S., over 10 million early adolescents are educated in over 13,000 middle schools (U.S. Department of Education, National Center for Education Statistics, 2011). Given that youth spend a substantial amount of their time in schools, it is important to consider the unique features of schools that affect adolescent development. Eccles and Roeser (2011) summarize these contextual influences that occur through schools as occurring on three levels. The first level pertains to teacher influence, and includes factors such as the impact of teacher qualifications, the curricular content, instructional design, teachers' professional self-efficacy, teachers' expectations for student success, teacher strategies linked to goal orientation (i.e., performance vs. mastery), the quality of teacher-student relationships, and the supportiveness of the classroom environment. Broader school-wide features on the second level that influence adolescents include the school culture, students' sense of safety, the composition of the student body, and peer groups. The third level entails district-wide policies that can also influence adolescents' development, including decisions regarding how grade levels are grouped into separate schools and the grade levels at which transitions occur, school size, school start and end times, policies for tracking ability and curricula, the availability of extracurricular activities, and opportunities for service learning. Due to these changes in multiple domains of early adolescents' lives, they are likely to face many unique challenges.

### **Challenges in Early Adolescence**

Students in the stage of early adolescence face multiple developmental tasks that can impact their well-being. These challenges include the "biological transformations of puberty, the educational transition from elementary to secondary school, and the psychological shifts that accompany the emergence of sexuality" (Eccles, 1999, p. 36-37).

**Puberty.** Although individuals undergo several changes throughout the life span, puberty has been described as “one of the most profound biological and social transitions” (Susman & Rogol, 2004, p. 15). Following the activation of hormones that occurs with puberty, early adolescents’ physical development is impacted, with most youth experiencing a growth spurt (e.g., height and weight increases), changes in body composition (e.g., changes in proportions of muscle and fat), and the development of secondary sexual characteristics (Susman & Rogol, 2004).

These rapid physical changes can be problematic for early adolescents because they occur at a developmental stage when social comparison is particularly important, which can make youth even more self-conscious. While the timing of puberty differs for each individual, it typically occurs about 18 months earlier in girls than in boys (Eccles, 1999). Although boys typically benefit from early puberty through increased participation in sports and social status, early developing girls do not fare as well. Because of the emphasis on peer conformity, early adolescent girls are more likely to socialize with peers who are similar to them. Thus, the physical changes that girls experience with early puberty (i.e., breast and hip development, increased body fat) may make it more difficult for them to fit in with their same-age peers (Summers-Effler, 2004).

Early puberty has also been linked with later internalizing (e.g., depression, anxiety) and externalizing (e.g., substance use, bullying) behavior symptoms for girls and later externalizing behavior symptoms for boys (Kaltiala-Heino, Marttunen, Rantanen, & Rimpela, 2003; Reynolds & Juvonen, 2012). Early puberty has also been associated with later sexual activity (Negriff, Susman, & Trickett, 2011) among both boys and girls. Reynolds and Juvonen (2012) also found early puberty in girls was related to lower self-worth at the beginning of middle school, while

late puberty was related to social anxiety towards the end of middle school. These findings suggest that pubertal timing that deviates from the norm can be problematic for early adolescents, and manifest in mental health problems.

**Educational challenges.** Another challenge that early adolescents experience is managing the transition from elementary to middle school. However, the stage-environment fit model (Eccles & Midgley, 1989) suggests that middle schools do not provide educational environments that are developmentally appropriate for early adolescents. According to this model, individuals' personal goals, as well as their emotional, cognitive, and social needs, change as they mature. Thus, schools must adapt to these changes in order to provide students with a supportive social context. If schools do not adapt, students' interest in and engagement with school declines, which inevitably leads to negative outcomes.

Ways in which middle schools do not currently support early adolescents' development pertain to structure and relationships with both teachers and peers (Eccles & Roeser, 2009). Structurally, middle schools are often larger in size than elementary schools. Additionally, instruction is organized departmentally, whereas it is organized by grade-level in elementary schools. Thus, students are expected to navigate to multiple classrooms throughout the day in a much larger school.

Relationships with teachers also change in the transition from elementary to middle school. Middle schools are characterized by high teacher control and discipline with few opportunities for student autonomy and decision-making, at a time when youth have a strong desire to be more independent. Because students have multiple teachers throughout the day, it is often more difficult for these youth to form close relationships with teachers and other adults in the school. This is problematic because early adolescents need increased guidance and support

from parents and adults outside of their family. Because of limited teacher-student interactions, with most interactions concerning academic content and/or disciplinary issues, youth experience less positive teacher-student relationships and teachers report feeling less confident in their teaching efficacy (Eccles & Midgley, 1989). At the secondary level, teachers are also less likely to report feeling that students' mental health concerns are their responsibility than elementary school teachers (Roeser & Midgley, 1997). Peer relationships are also impacted, as competition, social comparison, and self-assessment are emphasized, which makes it more difficult to foster a sense of community and trust. As a result of these emphases, students become more likely to develop performance-oriented goals (vs. task-oriented goals), which diminishes students' intrinsic motivation for learning.

As a result of the mismatch between middle schools and early adolescents' needs, these youth often experience declines in academic motivation and achievement, in some cases leading to school dropout (Eccles & Roeser, 2003). In middle school, youth also appear to value more negative behaviors than in elementary school. For instance, Galván, Spatzier, and Juvonen (2011) asked over 600 students in grades four through eight across three schools (i.e., two elementary, one middle) to provide information on perceived peer group norms (i.e., how many peers in same grade were academically engaged, disengaged, and antisocial) and social values (i.e., value of engaging in each behavior). While academic engagement was socially valued in elementary school, negative social and academic behaviors were socially valued by middle school students. When compared to early adolescents in 11 other industrialized countries, early adolescents in the U.S. ranked 6<sup>th</sup> in positive perceptions of teacher support, but expressed feeling more socially isolated than their counterparts in 8 of the other 11 countries, ranked 10<sup>th</sup> in perceptions of a supportive peer culture, and reported the worst school climate (Juvonen, Le,

Kaganoff, Augustine, and Constant, 2004). Such social challenges faced by early adolescents at school can negatively impact other aspects of their development, such as psychological well-being.

**Psychological challenges.** Additional factors in early adolescents' lives, including shifts in cognitions and increased stressful events (e.g., changes in family, peer group, and romantic relationships), may also serve as threats to their psychological well-being (Graber, 2004). In addition to reflecting more on the self, the future, and the world (Graber, 2004), early adolescents' cognitive processes begin to evolve in ways that are more complex and abstract (Eccles, 1999). Kaslow, Adamson, and Collins (2000) identified three cognitive factors (i.e., negative self-schemas, faulty information processing, negative expectancies) that are related to depression. Regarding stressful events, family instability (i.e., disruptive changes) has been linked to higher levels of behavior problems among adolescents (Marcynyszyn, Evans, & Eckenrode, 2003). Close friendships and membership in peer groups also change more frequently among early adolescents than in older adolescents (Cairns & Cairns, 2004). The stress associated with these changes is related to diminished feelings of self-worth (Fenzel, 2000) and greater distrust of peers (Way, 1996) among adolescents. Girls are particularly likely to experience negative emotions regarding these changes (Rudolf, 2002). In relation to romantic relationships, a greater number of romantic relationships and instability within these relationships is also associated with increases in depressive symptoms, with girls being impacted more by these changes than boys (Graber, 2004).

In sum, early adolescence is a period of rapid change, with youth experiencing challenges related to puberty, school, and their psychological well-being. The next section describes the common mental health problems that many early adolescents experience during these transitions.

## **Mental Health Issues Salient to Early Adolescents**

Mental health problems are often grouped along two dimensions, externalizing disorders and internalizing disorders (Merrell, 2008a). Characteristics of externalizing disorders include disruptive behavior, aggression, acting-out behavior, defiant and/or oppositional behavior, delinquency, and hyperactivity. Internalizing symptoms include dysphoric or depressive mood states, social withdrawal, anxiety, inhibited reactions, and somatic complaints.

The literature presented in the preceding section suggests that the challenges of early adolescence can negatively impact middle school students' mental health. The National Comorbidity Survey—Adolescent Supplement (NCS-A; Merikangas, Avenevoli, Costello, Koretz, & Kessler, 2009) was used to collect data from a nationally representative sample of over 10,000 adolescents ranging in age from 13 to 18 years old on their lifetime prevalence of mental disorders, as defined in the Diagnostic and Statistical Manual of Mental Disorders, 4<sup>th</sup> Edition (DSM-IV; APA, 1994). Findings indicated that one out of every four to five youth meet criteria for a mental disorder and experience severe impairment (Merikangas et al., 2010), with the highest prevalence rates for mood disorders (over 11%), followed by behavior disorders (nearly 10%), and then anxiety disorders (8.3%).

The risk of experiencing a mood or behavior disorder increases around early adolescence, as the age of onset for each of these types of disorders is 13 and 11 years old, respectively (Merikangas et al., 2010). Lewinsohn, Clarke, Seeley, and Rohde (1994) similarly found that depression symptoms begin to rise during the middle to late pubertal years. Due to the aforementioned physical, social, and academic challenges they face, early adolescents may be particularly susceptible to symptoms of internalizing disorders (e.g., anxiety, depression), which are among the most commonly diagnosed mental health disorders in childhood and adolescence



(Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; National Institute of Mental Health [NIMH], 2011).

Because of the nature of externalizing behaviors (i.e., more easily observable), it is often more difficult to identify symptoms of internalizing disorders among youth. Researchers have established that educators are reasonably accurate in identifying symptoms of externalizing disorders (e.g., Dwyer, Nicholson, & Battistutta, 2006; Mollins & Clopton, 2002; Percy, Clopton, & Pope, 1993). Because educators' ability to identify youth with internalizing disorders is less clear, the focus of the present study was on symptoms indicative of specific internalizing disorders.

### **Internalizing Disorders**

In the Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition, Text Revision (DSM-IV-TR; APA, 2000), internalizing disorders are found within the following four major diagnostic categories: anxiety disorders; mood disorders; other disorders of infancy, childhood, or adolescence; and somatoform disorders. Because the focus of the current study is on anxiety and depression, disorders falling within these categories are discussed further.

**Anxiety disorders.** Based on research with children and adolescents, the lifetime prevalence of any anxiety disorder ranges from 15% to 20% (Beesdo, Knappe, & Pine, 2009). The median age of onset for an anxiety disorder is six years old (Merikangas et al., 2010). Within early adolescents, approximately 8% of middle school students have any anxiety disorder (Mazzone et al., 2007). Anxiety disorders described in the DSM-IV-TR (APA, 2000) that are diagnosable in youth include panic disorder, agoraphobia, specific phobia, social phobia, obsessive-compulsive disorder, posttraumatic stress disorder, acute stress disorder, generalized anxiety disorder, separation anxiety disorder, and anxiety disorder, not otherwise specified. The

most common anxiety disorders in children and adolescents are separation anxiety, social phobia, specific phobia, and generalized anxiety disorder (Beesdo et al., 2009; Klein, 2009). Because specific phobia is a less reliable diagnosis in children (Klein, 2009), the diagnostic criteria for separation anxiety disorder, social phobia, and generalized anxiety disorder are presented, as these three disorders are planned to be examined in the student participants in the current study.

***Separation anxiety disorder (SAD).*** The lifetime prevalence of separation anxiety disorder (SAD) among adolescents is approximately 8% (Merikangas et al., 2010). In the DSM-IV-TR (APA, 2000, p. 125), SAD is classified as a disorder of infancy, childhood, or adolescence and is described as developmentally inappropriate and excessive anxiety concerning separation from home or from those to whom the individual is attached, as evidenced by three or more of the following criteria: (1) recurrent excessive distress when separation from home or major attachment figures occurs or is anticipated, (2) persistent and excessive worry about losing, or about possible harm befalling, major attachment figures, (3) persistent and excessive worry that an untoward event will lead to separation from a major attachment figure, (4) persistent reluctance or refusal to go to school or elsewhere because of fear of separation, (5) persistently and excessively fearful or reluctant to be alone or without major attachment figures at home or without significant adults in other settings, (6) persistent reluctance or refusal to go to sleep without being near a major attachment figure or to sleep away from home, (7) repeated nightmares involving the theme of separation, or (8) repeated complaints of physical symptoms (e.g., headaches, nausea) when separation from major attachment figures occurs or is anticipated. Additionally, the duration of the disturbance must be at least four weeks and the onset must be before 18 years of age. Finally, the disturbance must also cause clinically significant distress or impairment in social, academic (occupational), or other important areas of functioning.

***Social phobia.*** The lifetime prevalence of social phobia among adolescents is 7% to 8% (Beesdo et al., 2009; Merikangas et al., 2010). In the DSM-IV-TR (APA, 2000, p. 456), social phobia is classified as an anxiety disorder and is described as a marked and persistent fear of one or more social or performance situations in which the person is exposed to unfamiliar people or to possible scrutiny by others. Additionally, the individual fears that he or she will act in a way (or show anxiety symptoms) that will be humiliating or embarrassing. In children, there must be evidence of the capacity for age-appropriate social relationships with familiar people and the anxiety must occur in peer settings, not just in interactions with adults. Exposure to the feared social situation almost invariably provokes anxiety, which may take the form of a situationally bound or situationally predisposed panic attack. In children, the anxiety may be expressed by crying, tantrums, freezing, or shrinking from social situations with unfamiliar people. The person also recognizes that the fear is excessive or unreasonable, although this feature may be absent in children, and the feared social or performance situations are avoided or else are endured with intense anxiety or distress. The avoidance, anxious anticipation, or distress in the feared social or performance situation(s) interferes significantly with the person's normal routine, occupational (academic) functioning, or social activities or relationships, or there is marked distress about having the phobia. In individuals under the age of 18, the duration of symptoms must be at least six months. Also, the fear or avoidance is not due to the direct physiological effects of a substance or general medical condition and is not better accounted for by another mental disorder.

***Generalized anxiety disorder (GAD).*** The lifetime prevalence of generalized anxiety disorder (GAD) among adolescents is around 1% to 3% (Chavira, Stein, Bailey, & Stein, 2004; Merikangas et al., 2010; Wittchen, Nelson, & Lachner, 1998). In the DSM-IV-TR (APA, 2000, p. 476), GAD is classified as an anxiety disorder and is described as excessive anxiety and worry

(apprehensive expectation), occurring more days than not for at least six months, about a number of events or activities (such as work or school performance). Additionally, the person finds it difficult to control the worry. Among children, the anxiety and worry are also associated with one of the following six symptoms, with at least some symptoms present for more days than not for the past six months): (1) restlessness or feeling keyed up or on edge, (2) being easily fatigued, (3) difficulty concentrating or mind going blank, (4) irritability, (5) muscle tension, or (6) sleep disturbance (difficulty falling or staying asleep, or restless unsatisfying sleep). The anxiety, worry, or physical symptoms must also cause clinically significant distress or impairment in social, occupational, or other important areas of functioning. The focus of the anxiety and worry is also not confined to features of an Axis I disorder and do not occur exclusively during posttraumatic stress disorder. The disturbance is also not due to the direct physiological effects of a substance or general medical condition.

**Depressive disorders.** Among adolescents, the lifetime prevalence of a depressive disorder is approximately 12% (Merikangas et al., 2010). The median age of onset for mood disorders is 13 years old (Merikangas et al., 2010) and the average age of onset for a depressive disorder is between 11 and 14 years old (Lewinsohn, Rohde, & Seeley, 1998). Depressive disorders described in the DSM-IV-TR (APA, 2000) that are diagnosable in youth include major depressive disorder, dysthymic disorder, and depressive disorder, not otherwise specified. Additionally, youth can be diagnosed with a major depressive episode. The most common depressive disorder in children and adolescents is major depressive disorder (Costello, Egger, & Angold, 2005). Because major depressive disorder is characterized by one or more major depressive episodes, the diagnostic criteria for both of these disorders will be detailed.

**Major depressive episode (MDE).** In the DSM-IV-TR (APA, 2000, p. 356), major depressive episode (MDE) is classified as a mood disorder and is described as five or more of the following symptoms having been present during the same two-week period and represent a change from previous functioning, with at least one of the symptoms being either depressed mood or loss of interest or pleasure: (1) depressed mood most of the days, nearly every day; in youth, can present as irritable mood, (2) markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day, (3) significant weight loss when not dieting or significant weight gain; in youth, consider failure to make expected gains, (4) insomnia or hypersomnia nearly every day, (5) psychomotor agitation or retardation nearly every day that is observable by others, (6) fatigue or loss of energy nearly every day, (7) feelings of worthlessness or excessive or inappropriate guilt nearly every day, (8) diminished ability to think or concentrate, or indecisiveness, nearly every day, or (9) recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide. The symptoms must cause clinically significant distress or impairment in social, occupational, or other areas of functioning. The symptoms also do not meet criteria for a mixed episode, are not due to the direct physiological effects of a substance or general medical condition, and are not better accounted for by bereavement.

**Major depressive disorder (MDD).** Estimate of the lifetime prevalence of major depressive disorder (MDD) among adolescents are as high as 20% (Costello et al., 2005; Lewinsohn et al., 1998). In the DSM-IV-TR (APA, 2000, p. 375), MDD is classified as a mood disorder and is described as the presence of a single major depressive episode, the criteria of which is described in the prior section. Additionally, the criteria for MDD specify that the MDE is not better accounted for by schizoaffective disorder and is not superimposed on schizophrenia,

schizophreniform disorder, delusional disorder, or psychotic disorder, not otherwise specified. These can also never have been a manic episode, mixed episode, or hypomanic episode.

In the subsequent section, the negative consequences associated with at-risk levels of anxiety and depression among youth are summarized. The studies cited provide a rationale for further investigating these types of psychopathology in youth, largely to identify and intervene with youth with the intent to prevent deleterious outcomes.

### Impact of Elevated Levels of Anxiety and Depression in Youth

**Psychosocial outcomes.** Youth who experience symptoms consistent with depressive and anxiety disorders often experience decreased self-esteem, as they tend to have cognitive distortions that cause them to focus on negative aspects of the self, while ignoring the more positive aspects (Merrell, 2008a). These youth also experience impaired social relationships and thwarted social development (Huberty, 2008; Merrell, 2008b). Children and adolescents with anxiety experience greater difficulty initiating social interactions, socializing with peers, and sustaining friendships with peers (Huberty, 2008). They may become socially withdrawn because they lack some social skills and fear being rejected by their peers. As a result, they have even fewer opportunities to develop social skills and interact with peers. In a well-designed, multi-informant study investigating the impact of a cognitive-behavioral intervention for youth with high levels of anxiety, all raters (i.e., child, parent, researcher) observed reductions in anxiety that predicted improved social functioning (Wood, 2006). Such findings suggest that youth's psychosocial functioning is impacted by anxiety. Depressed youth also often experience negative psychosocial outcomes associated with a loss of interest in activities that were once enjoyable and subsequent withdrawal from their peers. Additionally, the irritability that is characteristic of depression in youth may lead to peer rejection. As these youth become more

isolated, they receive less social reinforcement, which may eventually lead to further depressive symptoms (Lewinsohn & Graf, 1973).

Children and adolescents with anxiety and depression also experience chronic mental health problems (Merrell, 2008b). Depression and anxiety in adolescence are associated with depressive (e.g., major depression) and anxiety (e.g., GAD, social phobia) disorders in adulthood (Pine, Cohen, Gurley, Brook, & Ma, 1998). Adolescents who experienced long-term major depression are more likely to report experiencing mental health disorders (e.g., major depression, anxiety disorders) in adulthood and suicidal ideation than adolescents who are not depressed (Jonsson et al., 2011).

Substance abuse is also an unfortunately common outcome of anxiety and depression in youth (Merrell, 2008b). Prescription medications, such as benzodiazepines, in particular put youth at risk for developing substance abuse problems because of their potentially addictive nature (Merrell, 2008b). Youth may use alcohol to reduce their anxiety, and the combination of benzodiazepines and alcohol can be deadly. Children and adolescents with depression may experiment with substances in order to reduce their depressed mood and be accepted by their peers (King, Iacono, & McGue, 2004). Early adolescents diagnosed with major depression at age 11 are more likely to have tried alcohol and nicotine and regularly use alcohol by age 14 (King et al., 2004). Jonsson and colleagues (2011) also found that adolescents with major depression engaged in alcohol abuse and substance abuse in adulthood.

**Academic outcomes.** Youth who experience elevated levels of anxiety and depression also often experience difficulties in school, such as declines in academic performance and sometimes school drop out (Merrell, 2008b). Van Ameringen, Mancini, and Farvolden (2003) collected data from adults with a diagnosis of a primary anxiety disorder, who reflected on their

childhood school experiences. These researchers found that the most commonly reported reasons for leaving school prematurely and not enjoying school were related to anxiety (i.e., nervousness in school and in class, problems speaking in front of the class). High levels of anxiety can lead to difficulties with staying engaged in academic tasks (e.g., loss of concentration and memory; Huberty, 2008). As these youth experience greater declines in their academic performance, they may experience even more anxiety, further exacerbating their difficulties with academic engagement. Over time, this cyclical process can lead to avoidance of and withdrawal from academic tasks. In the previously mentioned study investigating the effectiveness of a cognitive-behavioral intervention for anxiety, Wood (2006) also found that, across all raters, decreases in observed anxiety led to improved school performance. These findings provide support that high levels of anxiety may impact children's academic performance via their academic engagement.

Depressed youth also experience difficulty staying focused and motivated to complete academic tasks (Merrell, 2008a). Interviews conducted with depressed adolescents and their mothers revealed that these difficulties are linked with depression as early as fourth grade (Hammen & Rudolph, 2003). Among adolescents who were at risk for depression, Humensky and colleagues (2010) examined the relationship between their depressive symptoms and school performance. Although significant relationships between depressive symptoms and objective indicators of school performance (i.e., school attendance, grades) did not emerge, depressed mood affected factors related to academic engagement, such as the ability to do well in school, concentrate on or complete homework, concentrate in class, attend class, and interact with peers. When interviewed, participating adolescents further discussed their difficulty completing assignments and concentrating in class, and described a common cycle in which their negative thoughts resulted in procrastination of academic tasks, which negatively impacted their academic



performance, and further maintained negative thoughts. Depressed youth also often experience sleep issues and are lethargic, leading to a lack of energy to complete school assignments (Merrell, 2008a).

In sum, experiencing symptoms of mental disorders such as anxiety and depression can be detrimental for youth with regard to their social and academic functioning. The provision of school-based mental health services is in part justified by the fact that internalizing disorders can negatively impact students' academic performance and psychosocial wellness.

### **Overview of Mental Health Services Provided in Schools**

There is a great need for additional and expanded mental health services directed towards youth in the United States. Approximately 17% to 27% of youth experience mental health problems (Brown, Riley, & Wissow, 2007; Costello et al., 2005; Roberts, Roberts, & Xing, 2007; U.S. Department of Health and Human Services [US DHHS], 1999), but only 30% of such individuals receive mental health services (Farmer, Burns, Philip, Angold, & Costello, 2003; US DHHS, 1999). Challenges with community-based mental health services that may contribute to this discrepancy include: (1) a lack of available specialists, (2) insurance issues (i.e., restrictions, inconsistent reimbursement for children's mental health services), (3) appointment delays, (4) social stigma associated with mental health, and (5) dwindling funding for community mental health centers (President's New Freedom Commission on Mental Health, 2003; US DHHS, 1999).

In part a response to these barriers, schools have become a major provider of mental health services, serving a large proportion of psychosocial services to youth in need (Committee on School Health, 2004; Farmer et al., 2003; Merikangas et al., 2011). The provision of mental health services in schools is logical and advantageous for a number of reasons. First, schools

already employ professionals (i.e., school psychologists, school social workers, school counselors, school nurses) whose training prepares them for providing mental health services (Council for Accreditation of Counseling and Related Educational Programs [CACREP], 2009; National Association of School Nurses [NASN], 2008; National Association of School Psychologists [NASP], 2010; National Association of Social Workers [NASW], 2002). A national survey of school mental health services uncovered that the most successful strategy for improving youth's mental health is the availability of school-based mental health providers who are employed by the school or district (Foster et al., 2005). The majority of these school-based mental health professionals are licensed in their field (Foster et al., 2005). In middle schools, 92% of school psychologists were licensed, as were most school counselors (87%), social workers (84%), and school nurses (84%).

Second, youth are quite accessible to mental health providers in schools, which serve over 53 million students in over 100,000 schools (Duchnowski & Kutash, 2009). School-based mental health professionals may be most convenient for students and their families to access, as parents do not have to arrange transportation for their children to and from appointments for mental health services since they take place on the campus during the school day. Thus, “no shows” are less likely to occur in schools and if they do, the mental health professional has ready access to another student who is in need of mental health services (President's New Freedom Commission on Mental Health, 2003). Additionally, students appear to be more likely to seek mental health services in a school than in a clinic (Adelman & Taylor, 1999). Catron, Harris, and Weiss (1998) found that 96% of students followed-up after an initial referral to the schools, while only 13% of students followed-up after an initial referral to community mental health centers. A greater number of students may continue with referrals in schools because the

experience is less stigmatizing than seeing a professional in the community (President's New Freedom Commission on Mental Health, 2003). Shaffer and Gould (2000) report that youth perceive their school as a supportive environment where they can express themselves.

Regarding the provision of comprehensive care, it is also more feasible for school-based mental health professionals to collaborate with other significant individuals (e.g., parents, teachers) in the student's life in order to provide ecological interventions and promote generalization. The provision of mental health services in the schools is also consistent with federal legislation (e.g., Individuals with Disabilities Education Improvement Act of 2004, Section 504 of the Rehabilitation Act of 1973) that protects youth by requiring schools to appropriately accommodate youth whose mental health issues interfere with their learning. Such services to youth with disabilities that have a psychological component are collaborative by definition (i.e., legislation requires input from families, regular education teachers, special education teachers, and relevant student support service providers).

In conclusion, schools are in a unique position to provide much-needed mental health services to youth. Many barriers inherent to community-based services are overcome through the provision of school-based services.

### **Students Typically Referred to School-Based Mental Health Service Providers**

In order to gain a better understanding of the provision of mental health services in schools, a discussion regarding common referral concerns is warranted. Although students who experience internalizing forms of psychopathology (e.g., depression, anxiety) are more likely to access school-based services than community-based services (Stephan, Weist, Kataoka, Adelsheim, & Mills, 2007), they are not referred for services as frequently as students with externalizing behaviors (Merrell, 2008a; Reddy, Newman, De Thomas, & Chun, 2009). Children

with externalizing behavior problems tend to be referred more because their behaviors are easily observable and more disruptive to the classroom environment, thus gaining the attention of the teacher or other school staff. In contrast, children with internalizing behavior problems may be overlooked because of the covert nature of their behaviors. These trends were exemplified by a recent study that examined the characteristics of children and adolescents in Kindergarten through 10<sup>th</sup> grade who were referred for mental health services (Little & McLennan, 2010). The most common mental health problem among these referred youth was hyperactivity (77%), followed by conduct problems (63%), prosocial deficits (59%), peer problems (53%), and emotional problems (27%). A closer look at referral trends in middle school students is possible in Foster and colleagues' (2005) study of the prevalence and allocation of school mental health services, which collected data from a nationally representative sample of 1,147 public schools from 1,064 districts. At the middle-school level (391 schools), the most commonly reported mental health problems for males were social/interpersonal or family problems (71%), followed by aggression or disruptive behavior (69%), and behavior problems associated with neurological disorders (35%). The most commonly reported mental health problems for females were social/interpersonal or family problems (83%), anxiety (45%), and adjustment issues (37%). In sum, although referrals for mental health services in school encompass a variety of problems, the majority of referrals appear to be for externalizing rather than internalizing forms of psychopathology. Such findings suggest it may not be adequate to rely on referrals from educators to identify the full range of students in need of mental health services.

### **Types and Providers of School-Based Mental Health Services**

A broad range of mental health services is provided in schools to students with the aforementioned concerns. The most commonly provided mental health services reported by

middle schools that participated in Foster and colleagues' (2005) national study included: assessment (87%), consultation for behavior management (86%), crisis intervention (86%), and referral to specialized programs (83%). Other common services included individual counseling/therapy (79%), case management (70%), group counseling/therapy (67%), family support services (56%), and counseling for substance abuse (53%).

These mental health services can be provided by several different professionals in the school. At the middle-school level, there are typically between two to six employees who provide mental health services, with the most common types of staff including school psychologists, school counselors, social workers, and school nurses (Foster et al., 2005). School personnel who spend the highest percent of time delivering mental health services in middle schools include social workers (60%), followed by counselors (52%), school psychologists (47%), and school nurses (31%). Additionally, these researchers found that the most common method of arranging mental health services in middle schools was for one person or team to arrange mental health services for all students. Thus, these school-based mental health professionals may work together as a team to coordinate mental health services.

### **Effectiveness of School-Based Mental Health Services**

A multitude of empirical studies provide support for the effectiveness of school-based mental health services in the treatment of a range of referral concerns, such as anger (e.g., Flanagan, Allen, & Henry, 2010), anxiety (e.g., Bernstein, Layne, Egan, & Tennison, 2005), and depression (e.g., Mufson et al., 2004). Several researchers have conducted meta-analyses and research syntheses in order to examine the effectiveness of school-based mental health services. In an effort to determine the characteristics of effective school-based mental health programs, Rones and Hoagwood (2000) examined studies published between 1985 and 1999. Out of over

5,000 studies, 47 met their requirements for a rigorous research design. These 47 studies investigated the effectiveness of 37 strategies and interventions targeted towards a range of issues, including emotional or behavioral problems, depression, conduct problems, stress, and substance abuse problems. Although 19 of the studies (40%) found that the strategy or intervention was effective for the target problem, 19 other studies found mixed results, and the strategy or intervention was not effective in 9 studies (19%). Roness and Hoagwood (2000) concluded that the following five characteristics were present in effective school-based mental health programs: (1) consistent program implementation, (2) inclusion of parents, teachers, or peers, (3) use of multiple modalities, (4) integration of program content into the general classroom curriculum, and (5) program components were developmentally appropriate.

Baskin and colleagues (2010) identified 107 studies (published between 1983 and 2008) that examined the effectiveness of school-based counseling interventions. These studies described 132 treatment interventions (e.g., cognitive-behavioral therapy, psychoeducational interventions, interpersonal therapy, behavioral therapy), targeting a range of problems (e.g., acting out, anger management, learning problems, social skills, anxiety, depression). This review included 51 interventions in which only adolescents were targeted and 7 interventions in which both children and adolescents were targeted. The remaining 74 interventions targeted only children ages 12 and younger. The effect sizes for the interventions including adolescents were medium to large, indicating that they were typically effective. Hoagwood and colleagues (2007) examined 24 methodologically-rigorous studies (published between 1990 and 2006) that included both academic and mental health outcomes. While only 15 studies (63%) were effective with respect to improving both academic and mental health outcomes, the majority of reviewed studies (i.e., 17) were conducted with elementary-age children. Of the seven studies with middle

or high school populations, four had a positive impact on academic outcomes and all seven had a positive impact on mental health outcomes, which included conduct problems and social-emotional problems.

Taken together, the literature provides ample support for the effectiveness of school-based mental health services, particularly for adolescents, although some exceptions exist. Because mental health problems, particularly anxiety and depression, are so prevalent among early adolescents, it is imperative that these students receive the quality mental health services that can be effectively provided in schools. In order to facilitate access to these services, schools need accurate methods of identifying youth who are in need of mental health services.

### **Methods of Identifying Youth with Mental Health Problems in Schools**

Schools may use one or more of a variety of methods to identify youth who are in need of mental health services. Common methods include universal screening using behavior rating scales completed by one or multiple informants, reviewing archival school records such as office discipline referrals, student self-referral or referrals made by concerned parents, referrals by a school-based mental health professional to a colleague or team, and teacher nominations. These methods are described further next, including the benefits and limitations of each method and empirical support for the accuracy of each method.

**Universal screening.** A commonly used method of identifying youth with mental health issues in schools is universal screening, which involves assessing all students within a classroom, school, or district with the purpose of identifying students who are at risk of developing or who currently experience behavioral or social-emotional difficulties. Typically, universal screenings for mental health issues involve the use of brief behavior rating scales that are completed by

student self-report or teachers (Doll & Cummings, 2008; Dowdy, Ritchey, & Kamphaus, 2010; Ikeda, Neessen, & Witt, 2008).

One advantage of a universal screening is that it is a proactive approach to identifying students. Thus, students can be provided with early intervention services instead of waiting until their problems become more severe. Another advantage of conducting a universal screening is that it provides a more comprehensive assessment of students' mental health needs since all students are screened. Scott and colleagues (2009) compared the identification of emotionally troubled high school students through a school-based screening to identification by clinical employees (i.e., psychologists, social workers, guidance counselors, nurses, special education coordinators, specialty counselors) and administrative school professionals (i.e., deans, principals, and assistant principals). All participating clinical and administrative employees were mailed a researcher-developed questionnaire that included the names of each student in the school that participated in the school-based screening. They were asked, "Are you currently concerned about this student's emotional status?", "Do you have plans to see this student again?", and "Have you referred or do you plan to refer this student to an outside agency?" with possible response options as "yes/definitely", "possibly/somewhat", and "no/definitely not". Responses of "yes/definitely" or "possibly/somewhat" were considered positive responses. Approximately 41% of students who emerged as at-risk for suicide in the school-based screening (via student self-report on the Columbia Suicide Screen [CSS]) were identified by the aforementioned school employees, whereas 59% of at-risk students were missed. The Diagnostic Intervention Schedule for Children, version 2.3 (DISC-2.3; Shaffer, Fisher, Dulcan, & Davies, 1996) was administered to most students with positive CSS screening results and about one-fourth of students with negative CSS results. Particularly relevant to the current study, 29% of students with a diagnosed



mood disorder and 36% of students with an anxiety disorder were identified only through the school-based screening (thus missed by educators). Additional support for a school-wide self-report approach was provided in a voluntary school-based mental health screening among ninth-graders (Husky, Sheridan, McGuire, & Olfson, 2011). All students completed the Diagnostic Predictive Scales—8 (DPS-8; Lucas et al., 2001), a shortened and computerized self-report version of the Diagnostic Interview Scale for Children—IV (DISC-IV; Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000). The DPS-8 is a 56-item measure of mental health difficulties (i.e., suicidal ideation, prior suicide attempts, social phobia, panic attacks, GAD, obsessive-compulsive disorder, depression, and substance use) and the level of impairment related to these difficulties. The DPS-8 identified about 20% of youth as being at risk for mental health problems, which approximates an estimate of the prevalence of youth meeting criteria for a mental disorder as reported by Merikangas and colleagues (2010). Thus, universal screenings appear to be a comprehensive method of identifying youth in need of mental health services.

However, there are also several limitations to the use of universal mental health screenings in schools. One limitation is the associated cost. Administering a rating scale to every child or every teacher, as well as scoring the rating scales and analyzing the data, can be expensive and require extensive time and resources (Glover & Albers, 2007). Due to the cost, it may not be feasible for some schools to conduct a school-wide screening. Another limitation of universal screenings is that collecting data at one time point may miss students who have problems that arise after the screening (Cohen & Angeles, 2006) or over-identify students who are experiencing transient distress. Chafouleas, Kilgus, and Wallach (2010) describe additional limitations in four categories: community acceptance, family rights, misidentification, and service delivery provision. Regarding the degree to which the community accepts the use of

mental health screenings, behavioral and social-emotional difficulties are often stigmatized which causes parents to be concerned that their children will be identified. This stigma may also influence if parents view schools as an appropriate venue to address mental health concerns. Regarding family's rights, according to the Individuals with Disabilities Education Improvement Act of 2004, "parental consent is not required before administering a test...that is administered to all children..." (§ 34 C.F.R. 300.300[d][1][ii]). However, a mental health screening may fall under the category of protected information in the Protection of Pupil Rights Amendment of 2002, which specifies that parental consent must be obtained when students are surveyed for protected information, such as mental or psychological problems of the student or student's family. With respect to potential misidentification, Essex and colleagues (2009) found that nearly half of first-grade students identified as high-risk through a school-wide mental health screening were inaccurately identified (i.e., false positives), suggesting that universal screenings may result in an unacceptably high number of false positives. A final limitation of universal screenings is the concern that schools and districts may not have the resources to provide supports and services to students identified as needing mental health services (Chafouleas et al., 2010).

**Review of archival school records.** Another common method of identifying youth involves monitoring data collected on all students in a given school and recorded in their student file, such as the number of days absent or students' office discipline referrals (ODRs). When reviewing and analyzing existing data sources, ODRs are useful because they contain more detailed information (e.g., frequency, type, location, referring staff member) than other data sources such as attendance records. Thus, ODRs are the focus of this section. An ODR is documentation by school personnel that a student has violated a school rule, which is provided to administrative leadership, who then deliver consequences (Irvin et al., 2006). Schools may

examine ODRs to track students' behavior problems, identify areas of intervention, and monitor the progress of interventions (Pas, Bradshaw, & Mitchell, 2011).

One major advantage of using ODRs to identify students with mental health problems is that these data already exist in students' school records. Since schools already have these data, this method of identification is cost-efficient, in that it does not require a lot of additional time or resources. Another advantage of examining ODRs is that they are moderately valid and reliable indicators of disruptive behavior problems (Pas et al., 2011). For these reasons, ODRs are commonly used to flag students in need of intervention for externalizing forms of psychopathology. For example, Spaulding and colleagues (2010) found that, among middle school students, the most common reasons documented in ODRs were defiance (31%), followed by disruption (18%), and fighting (12%). However, a major disadvantage of using ODRs as a means of identifying youth in need of mental health services is that it may not capture students who experience more internalizing forms of psychopathology. Case in point, more ODRs were received for youth nominated by teachers as experiencing externalizing issues ( $M = 2.29$ ) than youth experiencing internalizing problems ( $M = 0.58$ ), who were more similar to students who were not nominated ( $M = 0.15$ ; Richardson, Calderella, Young, Young, & Young, 2009). These findings suggest that ODRs may not be the best indicator of internalizing mental health issues. Thus, this method of identification may miss anxious and depressed youth.

**Reactive referrals made by help-seeking students or parents.** Youth with substantial impairment may also self-refer for treatment. As mentioned previously, as youth enter early adolescence, they develop greater self-awareness. Thus, youth with mental health issues, especially anxiety and depression, are likely the most accurate reporters of their own thoughts and feelings. However, youth may not refer themselves for mental health treatment for a variety

of reasons. Barriers to self-referral include believing that the problem can be managed without the help of a therapist, concerns with the session content being kept confidential, and the stigma associated with mental health (Dubow, Lovko, & Kausch, 1990). Additionally, youth who experience anxiety or depression often experience symptoms that would prevent them from asking for help, such as fear of interacting with unfamiliar people, social withdrawal, or a loss of interest or pleasure in almost all activities. Because of these barriers, it may not be enough for educators to depend on youth to refer themselves for mental health services.

Concerned parents may also refer their children for mental health services. However, more parents initially contact physicians (42%) for help with their child's mental health problems than schools (22%; Shanley, Reid, & Evans, 2008). The preference for parents to seek help for their children's mental health problems from physicians likely leads to referrals to community-based mental health agencies. Notably, Shanley and colleagues (2008) found that the most commonly identified problem areas were aggression/defiance (75%), followed by family functioning (40%), and anxiety/depression (22%). These data suggest that parents also report externalizing behavior problems more frequently than internalizing mental health issues, meaning that children experiencing anxiety and/or depression may still be missed with sole dependence on parents as referral agents.

**Referrals made by school-based mental health professionals.** School psychologists, school counselors, social workers, and school nurses may also identify students in need of mental health services, to be provided either by themselves or by a colleague. In schools, the aforementioned professionals often have the most knowledge and training regarding mental health disorders (CACREP, 2009; NASN, 2008; NASP, 2010; NASW, 2002). Thus, one could reason that school-based mental health professionals are fairly accurate in identifying students in

likely need of mental health services. However, these professionals also do not spend a lot of time with all students in a given school. Because of being based in multiple schools and/or having other responsibilities, school-based mental health professionals often only spend short periods of time with students with whom they are not already working. A review of the literature found no published peer-reviewed studies to date that investigated the accuracy or comprehensiveness of identification by school-based mental health professionals (of note, Scott et al., 2009, collected such information in the previously described study but combined the nominations from clinical professionals with those from administrators, thus precluding a look at the accuracy of specially-trained educators).

Cunningham's (2012) dissertation research provided a preliminary examination of this topic by investigating the accuracy of school-based mental health professionals (i.e., school psychologists, social workers, school counselors) in identifying fourth- and fifth-grade students who reported twice that they experienced symptoms of anxiety and depression. Cunningham (2012) analyzed these nominations two ways (i.e., by individual and nominations as a team) and found that these school-based mental health professionals were more accurate in identifying children who self-reported anxiety and depressive symptoms as a team (i.e., when their nominations were collapsed). The team of school-based mental health professionals accurately identified approximately 67% of fourth- and fifth-graders with elevated levels of anxiety and 45% of children with elevated levels of depression. However, the team misidentified 35% of students as anxious and 31% as depressed. Notably, Cunningham did not include nominations from school nurses, who are often major providers of mental health services in schools (see Foster et al., 2005), and may be in a better position to recognize the associated somatic symptoms (e.g., headache, stomachache). Thus, further research is needed to investigate the

accuracy of a team of school-based mental health professionals that includes nurses to determine the proportion of students in need of mental health services who would be accurately identified (sensitivity) as well as misidentified (specificity) by school-based mental health professionals.

**Teacher nominations.** Teachers may be asked by school-based mental health professionals to identify one or more students who exhibit symptoms indicative of psychopathology, with the purpose of determining if they are in need of mental health services. When done in a systematic manner, such as in each classroom in a given grade level, this process is often termed teacher nominations. Although there are few studies examining teacher nominations as a stand-alone method of identifying youth with mental health concerns, teacher nomination procedures are also used as part of validated school-wide multiple-gating screening efforts, such as the Systematic Screening for Behavior Disorders (SSBD; Walker & Severson, 1992).

The use of teacher nominations offers many advantages. Teachers have been described as a vital link between students and access to school-based mental health services (Eklund et al., 2009). Because teachers spend more time with youth in schools than other school personnel, they are often more familiar with students and their concerns. Additionally, teachers may have a better understanding of how youth's behavior may be atypical in relation to their peer group (Auger, 2004). Teacher nomination procedures are also efficient and cost-effective (Ollendick, Oswald, & Francis, 1989).

Disadvantages include that teachers are more likely to refer students for academic than behavioral concerns (Walker, Nishioka, Zeller, Severson, & Feil, 2000). These lower referral rates may be due in part to some teachers not perceiving students' mental health concerns as their responsibility (Roeser & Midgley, 1997; Severson, Walker, Hope-Doolittle, Kratochwill, &

Gresham, 2007). Even teachers who perceived that the identification of students' mental health concerns were part of their role, particularly internalizing problems, did not feel fully confident in their ability to identify these students (Papandrea & Winefield, 2011). Additionally, teacher nominations are biased towards identifying more students who experience externalizing than internalizing concerns (e.g., Lane & Menzies, 2005; Richardson et al., 2009; Soles, Bloom, Heath, & Karagiannakis, 2008). Although the literature is clear that teacher nominations are an accurate method of identifying students with externalizing concerns (see Dwyer et al., 2006, Mollins & Clopton, 2002, or Pearcy et al., 1993), less research exists regarding the accuracy of teacher nominations in identifying students with internalizing concerns, such as anxiety or depression. The handful of relevant studies conducted to date is reviewed in detail next.

***Comparison to non-nominated youth.*** A few studies have compared students identified through teacher nominations to students who were not nominated as problematic in order to examine teachers' accuracy in differentiating students with and without internalizing concerns. Roeser and Midgley (1997) asked fifth-grade teachers to complete a survey for each participating student in their classroom on their perceptions of the students' academic and social-emotional adjustment. The items on this survey concerned students' academic motivation, creativity, prosociability, disruptive behavior, and anxiety. Teachers were also asked to respond with "yes", "no", or "I don't know" to a question asking if the student had "emotional or behavioral difficulties serious enough that s/he could benefit from seeing a psychologist" (p. 120). The 106 nominated students (i.e., teacher answered yes) were rated by teachers as exhibiting more anxiety than their 690 non-nominated peers (i.e., students for whom teacher answered no). Additionally, nominated students reported lower self-esteem and more depressive symptoms than their peers who were not nominated by teachers. Using a more formal teacher nomination procedure,

Ollendick, Oswald, and Francis (1989) provided fourth-grade teachers with general descriptions of aggressive, withdrawn, and popular children and asked them to nominate up to three children in their classes who fit these descriptions. Teachers nominated 52 children as popular, 60 children as aggressive, and 43 children as socially withdrawn, for a total of 152 children. Students who were nominated by teachers as being withdrawn (i.e., shy, submissive, isolated, sad) also self-reported diminished assertiveness, self-efficacy, and outcome expectancies, were less liked by peers, and were observed playing alone more and engaging in fewer positive social interactions than children who were nominated by teachers as popular (i.e., well-adjusted, outgoing, friendly). With a focus on anxiety disorders, Layne, Bernstein, and March (2006) also compared students nominated by teachers to non-nominated students. The sample consisted of 453 second- to fifth-grade students across three elementary schools. Students completed the Multidimensional Anxiety Scale for Children (MASC; March, Parker, Sullivan, Stallings, & Conners, 1997), a 39-item measure of anxiety symptoms, and each teacher was asked to nominate the three most anxious children in his or her classroom. On average, the group of students who was nominated by their teacher reported more anxiety symptoms, specifically in the areas of physical symptoms, social anxiety, and separation anxiety. Taken together, these three studies suggest that teachers are able to differentiate students who experience higher levels of distress, manifested as symptoms of internalizing disorders. However, these studies did not examine teachers' accuracy in relation to criteria for determining clinical levels of internalizing psychopathology.

***Comparison to established measures and/or criteria.*** In a search for literature relevant to the focus of the present study, four studies were found that examined teachers' accuracy in nominating students who self-reported anxiety symptoms in the clinically elevated range



(Cunningham & Suldo, 2014; Dadds, Spence, Holland, Barrett, & Laurens, 1997), depressive symptoms in the clinically elevated range (Cunningham & Suldo, 2014), or who met criteria for a diagnosis of a depressive disorder (Auger, 2004; Moor et al., 2007). Typically, sensitivity and specificity proportions are used in order to evaluate the accuracy of mental health screening and assessment instruments (Levitt, Saka, Romanelli, & Hoagwood, 2007). Sensitivity describes the proportion of individuals who meet criteria for a particular disorder on a specific measure and are correctly identified by a screening or assessment instrument. Sensitivity refers to the proportion of individuals who do not meet criteria for a particular disorder on a specific measure and are correctly not identified by a screening or assessment instrument. Particularly when evaluating the accuracy of methods to identify youth with mental health problems, it is imperative that these methods have high sensitivity so that students who need mental health services are not missed. Additionally, high specificity is important because of the costs (i.e., misallocated resources, stigma) associated with misidentification.

In a large sample of children and early adolescents (ages 7 to 14, in grades 3 to 7 in eight primary schools), the sensitivity of teacher nominations was low when detecting anxious youth (Dadds et al., 1997). As part of the Queensland Early Intervention and Prevention of Anxiety Project, these researchers used a screening procedure that involved teacher nominations and youth self-report to identify youth with anxiety disorders for participation in a school-based anxiety intervention. Nearly 1,800 students completed the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1978), a youth self-report measure of anxiety symptoms. Teachers nominated up to three children in their classrooms who exhibited the most anxiety and up to three children who exhibited the most disruptive behaviors (the latter to exclude disruptive children from the group intervention). Results indicate that approximately 11% of youth self-

reported clinical levels of anxiety and 10% of youth were identified as anxious by teachers. However, teachers only identified around one-fifth of the students who self-reported clinically elevated anxiety symptoms. Thus, the remaining 80% of students in this group were missed by teachers. Additionally, approximately 9% of youth who reported typical levels of anxiety were incorrectly nominated by their teachers as anxious (i.e., misidentified). These findings suggest that teacher nominations may not be an accurate method of identification for anxiety, at least with younger populations. However, design limitations in the study may reduce confidence in the conclusions drawn from the findings. First, because the RCMAS was only administered at one time point, the study could have captured youth who were experiencing only transient distress (and thus not considered anxious by teachers). Second, researchers used the same raw cut score on the RCMAS to deem students in the clinical range, regardless of student gender and age. A higher sensitivity rate was uncovered by Cunningham and Suldo (2014), in a study that addressed these limitations by administering the MASC a second time (1-week later) to children whose raw scores corresponded to a *T*-score of 60 during the initial screening of 238 elementary school students (grades 4 and 5). Teachers correctly identified 40.7% of the subgroup of 27 students who repeatedly reported clinically elevated levels of anxiety. Regarding specificity, teachers falsely identified as symptomatic 17.5% of students with typical levels of anxiety ( $MASC < 60$ ).

Teacher nomination procedures appeared to be more sensitive when used to identify students with depressive symptoms in elementary schools (Cunningham & Suldo, 2014) or secondary schools (Auger, 2004; Moor et al., 2007). With regard to younger children, elementary school teachers correctly nominated 50% of the 22 4<sup>th</sup> and 5<sup>th</sup> grade students who twice-reported elevated levels of depression on the Children's Depression Inventory (CDI; Kovacs, 2003), but

misidentified 16.2% of non-symptomatic students as depressed (Cunningham & Suldo, 2014). Moor and colleagues (2007) investigated the effectiveness of a teacher training on recognizing symptoms of clinical depression among Scottish adolescents (ages 12 to 15). Participating teachers (e.g., guidance teachers, class registration teachers, specialized subject teachers, learning support teachers) across eight high schools were randomly assigned to either the experimental ( $n = 76$ ) or control ( $n = 75$ ) group. Teachers were provided with class rosters of participating youth and asked to indicate the students they thought were “possibly/probably depressed” (p. 84). All teachers received the training provided by these researchers but teachers in the experimental group completed this nomination procedure before and after the training, while teachers in the control group nominated students at two points before any training. Approximately 1,900 students in these same schools were screened using the Mood and Feelings Questionnaire (MFQ; Angold et al., 1995), a 32-item self-report measure of depression symptoms, which are rated on a three-point scale (2 = true, 1 = sometimes true, 0 = not true). In the second stage of screening, clinical interviews were conducted with youth who obtained MFQ raw scores of 31 or higher using the Schedule for Affective Disorders and Schizophrenia for School-Age Children—Present and Lifetime version (K-SADS-PL; Kaufman et al., 1997). Teachers nominated approximately 5% of youth as exhibiting depressive symptoms, whereas approximately 8% of youth met criteria for a diagnosis of clinical depression via a clinical interview. There were no significant differences between teachers who received training and those who did not in terms of sensitivity rates. Instead, the two groups of teachers correctly identified 41% to 52% of students diagnosed with depression. Although this study was conducted in Scotland, the sensitivity rates obtained are similar to the 50% rate found in the aforementioned study of younger children with clinically elevated symptoms. Interestingly,

nearly half of the teachers in Moor and colleagues' study were "guidance teachers", meaning it was their responsibility to provide support for students' personal and social success, in addition to academic support. Thus, teachers with these defined responsibilities may differ from general education, secondary teachers without this role in their identification of mental health issues.

Case in point, among 356 middle school students (grades 6 through 8; Auger, 2004), a sample of consisting mostly of general education teachers were not as accurate in identifying symptoms of depression. Out of the 52 teachers at one middle school who participated in the study, 44 taught general education and eight taught special education. Teachers were provided with a questionnaire that included class rosters of participating students and asked to provide ratings on the severity of depression for each student (scale of 1 to 5; 1 = student did not appear at all depressed, 5 = student appeared extremely depressed), rate how familiar they were with each student on a five-point scale, and list the students in their class that they believed would benefit from an intervention targeting depression (i.e., nomination). To determine the existence of student depression, a three-stage screening process was used: (1) Reynolds Adolescent Depression Scale (RADS; Reynolds, 1987) administered to all participants ( $n = 356$ ), (2) RADS re-administered one week later to participants who obtained a score of 70 or above on the first administration ( $n = 62$ ), (3) individual clinical interviews conducted with the students who scored above the cutoff on both administrations using a computerized version of the DISC-IV. This assessment process indicated five middle school students (1% of sample) met criteria for clinical depression. At least one teacher for four out of the five students with depression correctly nominated him or her to be in need of an intervention targeting depression. However, only 27% of the 26 teachers who provided ratings for these five students correctly nominated them, meaning that 73% of teachers missed these students. In regards to specificity, only 9% of

teachers incorrectly nominated non-depressed students (i.e., false positives), meaning that 91% of teachers correctly did not nominate the 351 students who were not depressed. One limitation of this study is that they did not compare teacher nominations in relation to students who were at-risk for depression (e.g., RADS scores in the clinical range, even though these students may not have met full diagnostic criteria for depression in the DISC-IV interview). From an early intervention standpoint, students who are at-risk for depression (i.e., manifest elevated levels of symptoms including the absence of a depression diagnosis) would likely benefit from targeted interventions.

Taken together, the findings from these studies suggest that teacher nomination procedures may be more sensitive with older populations, and perhaps with respect to identifying students with depression (vs. anxiety). Even though teacher nomination procedures are potentially efficient and cost-effective, less than five studies investigating the accuracy (sensitivity and specificity) of this method of identification in relation to students' internalizing problems were located, uncovering a need for replication of initial findings as well as for completion of studies with improved designs that address the gaps in the literature delineated below.

### **Gaps in the Literature**

**Accuracy for different forms of internalizing psychopathology.** Taken together, specificity rates of teacher nominations for identifying anxious youth are somewhat lower (20% to 41%) than those obtained for depressed youth (27% to 52%, with two of three studies in the 40% to 50% range). However, the only published studies investigating the accuracy of teacher nominations with students in secondary schools did not examine anxiety, so it is unknown if that conclusion extends to early adolescents. Additionally, youth with particular types of symptoms

may be nominated more than students with other types. Layne and colleagues (2006) found that youth with symptoms of social anxiety and separation anxiety were more likely to be nominated than youth with symptoms of generalized anxiety (e.g., perfectionism, safety concerns, striving to please others), as these symptoms are not as easily observable. Symptoms of anxiety and depression also manifest differently in youth than adults, which may make it more difficult for teachers to detect. Youth with anxiety also tend to present with somatic complaints (e.g., stomachache, headache). Layne and colleagues (2006) found that nominated students obtained higher scores on a scale measuring physical symptoms. However, teachers may not associate these somatic complaints with anxiety, similar to how they may be unaware that depression in youth often presents as irritability (APA, 2000).

**Identification of students with clinically elevated symptoms.** The only studies conducted with early adolescents only examined the accuracy of teachers in identifying those with diagnosed depressive disorders, rather than students who experienced elevated levels of symptomatology (defined as *T*-scores more than one standard deviation from the norm group mean on psychometrically sound narrowband measures of anxiety and depression). This is problematic because only youth with impairments severe enough to warrant a clinical diagnosis are identified for intervention. Meanwhile, early adolescents who experience elevated levels are overlooked and, without intervention, may continue to experience declines in their mental health. Providing interventions to students who are at-risk is also aligned with models of multi-tiered systems of support (see Christner et al., 2009), in that all students' social-emotional well-being is fostered. Additionally, school resources are used more efficiently because preventative (e.g., school-wide efforts) and/or early intervention efforts, which often require less time and resources,

are likely to be sufficient for improving the mental health of students who are detected at an early stage.

**Number of teachers' nominations needed to optimize sensitivity.** In middle schools, the structure of instruction is different from elementary school in that students have multiple class periods where they transition between different teachers' classrooms. Thus, a decision must be made on whether to collect data from a single teacher or multiple teachers when conducting a study in a secondary school. The benefit of asking multiple teachers may be increased sensitivity, in that there is a greater chance that a student exhibiting symptoms of anxiety or depression will be nominated by a teacher. Additionally, because middle school students do not spend as much time with a single teacher, each teacher may not have as many opportunities to observe if students are experiencing symptoms of anxiety or depressive disorders; a combined knowledge approach may therefore be necessary. However, a disadvantage of gathering data from multiple teachers is increased misidentification, in that there may be a greater likelihood for teachers to incorrectly nominate students who do not exhibit symptoms of anxiety or depression. Findings from a previously summarized study (Moor et al., 2007) may inform a strategy to reduce the risk of obtaining a high proportion of misidentified youth. After attending a training workshop on identification of adolescent depression, teachers nominated fewer students as depressed than before the training. Although it is unknown whether or not these adolescents were misidentified, providing teachers with information regarding the symptoms of depression may have resulted in more thoughtful consideration of their nominations. In any event, it is currently unknown whether teacher nomination procedures among secondary students are substantially more accurate (in terms of sensitivity) when data is gathered from multiple teachers or one teacher, and what the cost is with respect to specificity rates.

**Missed youth.** Another limitation of the current literature is that it is not clear why teachers miss (i.e., do not nominate) children who self-report elevated levels of internalizing symptoms. Students' demographic characteristics may play a role in why some children are missed by teachers. One study that examined both externalizing and internalizing symptoms found that boys were more likely to be nominated by teachers than girls for additional services (Roeser & Midgley, 1997). Similarly, Cunningham and Suldo (2014) identified a trend for a higher proportion of anxious boys to be identified as such by teachers (in the true positive group, 64% of students were male and 36% were female), but the difference in proportions was not statistically significant ( $p = .096$ ). Other studies investigating internalizing symptoms found no gender differences (Auger, 2004; Dadds et al., 1997; Layne et al., 2006; Soles et al., 2008). Thus, further research is needed to clarify if student gender contributes to the high number of students who are missed by teachers. Roeser and Midgley (1997) also found that African American youth are more likely to be nominated by teachers as having "emotional or behavioral difficulties serious enough that s/he could benefit from seeing a psychologist..." (p. 120), while Asian American youth are less likely to be nominated; in contrast, Cunningham and Suldo found the distribution of race and ethnicity groups across identification groups was relatively equal. Further research is needed to see if there are racial differences in teacher nominations for internalizing disorders. Because of these mixed findings, further research is needed on teachers' background. Other demographic characteristics may also play a role in the proportion of missed students (e.g., students' socioeconomic status, teachers' training in youth mental health) but have not been fully investigated in prior studies.

Students may also be missed depending on the severity of symptoms they experience.

Although it would be logical for teachers to be more aware of students with either more frequent



or severe symptoms, Cunningham and Suldo (2014) compared the MASC and CDI scores from “true positives” (i.e., students correctly identified by teachers as anxious and depressed, respectively) to missed students and did not find significant between-group differences, suggesting that the missed students were not more likely to be a sub-clinical (i.e., less symptomatic) group. Similar studies with older samples are needed to determine if teachers are more accurate in detecting adolescents who are the most depressed and anxious.

**Misidentified youth.** Even less research has investigated why students are misidentified (i.e., teachers incorrectly nominate students who do not report elevated symptoms). One potential explanation for the misidentification of youth is the reliance on student self-report as the criterion. Although students with internalizing disorders are often the most accurate informants of their own thoughts and feelings, they may respond on a self-report measure in a socially desirable manner. Dadds and colleagues (1997) examined their participants’ scores on the RCMAS Lie scale, which is used to determine if youth are responding in socially desirable ways, because there was little overlap between students identified through teacher nominations and those identified through self-report (i.e., missed). Children who reported low levels of anxiety but were nominated by teachers (i.e., akin to a “misidentified” group) had higher scores on the Lie scale than children who reported elevated levels of anxiety but were not nominated by teachers (i.e., missed students), suggesting that some students may not have been completely honest on the self-report measure. Although other studies of teacher nominations did not examine the role of socially desirable responding, DiBartolo, Albano, Barlow, and Heimberg (1998) also found that children’s self-reported ratings of low Social Avoidance were associated with high Lie scores on the RCMAS, suggesting that they were presenting themselves in a socially desirable way. Given

the reliance on youth self-report for internalizing symptoms, additional research is needed to evaluate the validity of these methods by examining role of socially desirable responding.

Another explanation may be found in the literature on the dual-factor model of mental health (Greenspoon & Saklofske, 2001; Suldo & Shaffer, 2008). Under this model, four groups of youth emerged (i.e., complete mental health, vulnerable, troubled, and symptomatic but content) based on if they experienced high or low psychopathology and high or low subjective well-being (SWB; high life satisfaction, more experiences of positive affect relative to negative affect). Youth who are misidentified by teacher nomination procedures may be symptomatic but content, in that they experience high levels of psychopathology and SWB. Because these youth experience such high levels of SWB (i.e., happiness), they may not be sensitive/aware of elevated symptoms even if they are exhibiting them. Their high levels of SWB may protect youth from experiencing any recognizable distress from these symptoms. Thus, future research on teacher nomination procedures may want to investigate the role of student subjective well-being in contributing to students' possible under-reports of emotional distress.

## **Conclusions**

Early adolescence is a time of major developmental and social changes (Eccles, 1999), which places students in this developmental stage at greater risk of developing mood and behavior disorders (Kaltiala-Heino et al., 2003; Merikangas et al., 2010). Internalizing disorders such as anxiety and depression affect 12 – 20% of adolescents (Beesdo et al., 2009), which is problematic in part due to the negative psychosocial and academic outcomes associated with concurrent and future internalizing disorders (Humensky et al., 2010; Jonsson et al., 2011; King et al., 2004; Merrell, 2008a; Pine et al., 1998; Van Ameringen et al., 2003; Wood, 2006).

Only about 30% of youth with mental health problems receive clinical services (Farmer et al., 2003; US DHHS, 1999). In part due to the barriers associated with community-based care, a large proportion of youth in need receive mental health services through their schools (Committee on School Health, 2004; Farmer et al., 2003; Merikangas et al., 2011). However, students who experience internalizing problems are at risk for being overlooked; they are less likely to be referred for mental health services than students with externalizing issues (Foster et al., 2005; Little & McLennan, 2010; Reddy et al., 2009).

The method that is chosen to identify students with mental health problems may influence who is identified to receive additional services. Common methods of identification include universal screening, reviewing archival school records such as office discipline referrals, student self-referral or referrals made by parents, referrals made by school-based mental health professionals, and teacher nominations. Although there are advantages and disadvantages for each method of identification, some are better suited to identify youth with externalizing rather than internalizing issues. While universal screenings may most accurately detect youth with internalizing disorders, they may not be a feasible method of identification in schools because of ethical concerns and the strain on time and resources (Chafouleas et al., 2010; Glover & Albers, 2007). Teacher nominations may be a more feasible alternative for identifying youth in need of mental health services, as it is efficient and cost-effective (Ollendick et al., 1989). Teachers are able to accurately identify students experiencing externalizing problems (e.g., Richardson et al., 2009), but fewer studies have examined the accuracy of teacher nominations in identifying students with internalizing symptoms. The few studies that exist have limitations (e.g., no examination of anxiety among middle school students; existing studies of depression identified middle school students with solely clinically diagnostic levels of depression) that warrant further

research in this area. Additional limitations include a lack of literature on the ideal number of nominating teachers and the characteristics of students who are missed or misidentified.

The purpose of the current study was to address the gaps in the literature by examining the accuracy of teacher nominations in identifying early adolescents with elevated levels of anxiety and depression. Additionally, this study provided a preliminary examination of the accuracy of nominations from a school nurse and a school-based mental health professional team that consists of: a school psychologist, school counselors, and a social worker. This study also investigated the gains in sensitivity and declines in specificity associated with gathering data from multiple teachers rather than a single subject area teacher when using teacher nomination procedures. Finally, the current study supplements extant and current findings with additional information regarding students who are missed or misidentified.

### **Chapter III: Methods**

The present study sought to examine the accuracy of teacher nominations, as well as nominations from a school-based mental health professional team and a school nurse, in identifying early adolescents who report elevated levels of anxiety or depression. Additionally, the features of students missed and misidentified through this process were examined. This chapter describes the study's research design, participants, and measures, including the participation rates and procedures that were used to recruit and collect data from participants. Finally, an overview of the data analytic strategy for each research question is provided.

#### **Research Design**

A non-experimental, descriptive research design was employed in the study to determine the sensitivity and specificity of nominations from teachers and a team of school-based mental health professionals (and a school nurse) in identifying students experiencing elevated levels of anxiety or depression. This type of design was deemed appropriate for the study because the researcher sought to describe and examine how these variables exist without any manipulation (Johnson & Christensen, 2006).

#### **Participants**

This study gathered data from students, teachers, and school-based mental health professionals in a single middle school within a large, urban school district in the Southeastern United States. This school was selected because the principal expressed a strong interest in improving the mental health of his students, and ultimately used the findings from the study to assist the school mental health team to identify students with symptoms of anxiety and

depression that might benefit from school-based mental health interventions. These interventions were provided by a collaboration between the school staff and this researcher's colleagues in the School Psychology Program after the identification process that is the focus of the current study.

The school district in which this school is located is comprised of 266 schools serving grades Kindergarten through 12. According to the district website, there are 142 elementary schools, 44 middle schools, 2 schools that serve grades Kindergarten through 8, 27 high schools, 8 career centers/technical schools, and 43 charter schools. In the 2012-2013 school year, a total of 200,533 students were enrolled in this district. The racial/ethnic composition of the students in this district during that year is as follows: 38.4% White, 31.1% Hispanic, 21.5% Black, 3.6% Asian/Pacific Islander, 0.2% American Indian/Alaskan Native, and 5.3% Multiracial.

The most recent, detailed school-level data available from the National Center for Education Statistics' Common Core of Data (<http://nces.ed.gov/ccd/schoolsearch/>) is from the 2011-2012 school year. Data for the 2012-2013 school year was obtained from the school district's website. The participating school is located in a suburban area of the city and is a Title I school, indicating that the school receives supplemental federal funding because it serves a large proportion of students from low-income families. This school has obtained a school grade of "D" for the past two school year (2012-2013 and 2011-2012). School grades are based on a variety of indicators, mainly student performance and learning gains on statewide assessments and end-of-course (EOC) assessments. For middle schools, additional points may be earned for participation in and performance on EOC assessments at the high-school level. In the 2012-2013 school year, a total of 957 students were enrolled in this school, in grades 6 ( $n = 332$ ), 7 ( $n = 292$ ), and 8 ( $n = 333$ ). Table 2 presents the demographic information for the school's total student population in

the 2012-2013 school year. The demographic features of each set of study participants (i.e., students, teachers, school-based mental health professionals) is shown in Tables 2 and 3.

Table 2

*Demographic Characteristics of Student Participants*

Variable	Student Sample ( <i>n</i> =233)		Total School ( <i>N</i> =957)	
	<i>n</i>	%	<i>N</i>	%
Grade				
6	--	--	332	34.70
7	102	43.78	292	30.50
8	131	56.22	333	34.80
Gender				
Male	111	47.64	511	53.40
Female	122	52.36	446	46.60
Ethnicity				
Hispanic or Latino	63	27.04	--	--
Not Hispanic or Latino	170	72.96	--	--
Race				
American Indian or Alaska Native	3	1.29	1	0.10
Asian, Native Hawaiian, Pacific Islander	4	1.72	14	1.50
Black or African American	121	51.93	579	60.50
White, Non-Hispanic	26	11.16	149	15.60
Multiracial	43	18.45	55	5.70
Other, Hispanic White	30	12.71	--	--
Other, all ethnic groups but Hispanic	6	2.54	--	--
Hispanic	--	--	159	16.60
Lunch Status				
Free or Reduced-Price School Lunch	198	84.98	832	87.0
Not Free or Reduced-Price School Lunch	35	15.02	125	13.0

In regards to teacher participants, the mean age was 39.3 years old ( $SD=11.3$ ; range: 23 to 57) and the average number of years teaching was 9.42 years ( $SD=10.16$ ; range: 1 to 36).

School-based mental health professionals' mean age was 38.8 years old ( $SD=8.9$ ; range: 26 to 50), with an average number of 7.3 years working as a school-based mental health professional ( $SD=2.6$ ; range: 2.5 to 9). Each school-based mental health professional was assigned full-time to this school site (i.e., worked five days per week).

Table 3

*Demographic Characteristics of Educator Participants*

Variable	Teachers ( <i>n</i> =19)		SBMH Professionals ( <i>n</i> =6)	
	<i>n</i>	%	<i>n</i>	%
<b>Grades Taught</b>				
7 <sup>th</sup>	6	31.58	--	--
8 <sup>th</sup>	7	36.84	--	--
Both	6	31.58	--	--
<b>Gender</b>				
Male	9	47.37	1	16.67
Female	10	52.63	5	83.33
<b>Ethnicity</b>				
Hispanic or Latino	0	0	0	0
Not Hispanic or Latino	19	100	6	100
<b>Race</b>				
American Indian or Alaskan Native	0	0	0	0
Asian, Native Hawaiian, Pacific Islander	1	5.26	0	0
Black or African American	8	42.11	3	50
White, Non-Hispanic	10	52.63	3	50
Multiracial	0	0	0	0
Other	0	0	0	0
<b>Highest Education Level</b>				
Bachelors/College Degree	11	57.89	0	0
Master's Degree	5	26.32	4	66.67
M.A. + 30 (or equivalent)	3	15.79	0	0
Ed.S./Specialist Level Degree	0	0	1	16.67
Ph.D. or Psy.D.	0	0	0	0
Other	0	0	1	16.67
<b>Professional Development in Mental Health</b>				
Yes	1	5.26	4	66.67
No	18	94.74	2	33.33
<b>Graduate Training in Mental Health Issues</b>				
Yes	--	--	5	83.33
No	--	--	1	16.67

*Note.* SBMH=School-Based Mental Health

School-based mental health professionals in this study were also asked to provide information regarding the professional practices in which they were engaged. Data regarding the amount of time spent per week in various professional activities are displayed in Table 4.



Table 4

*Mean, Standard Deviation, and Range for Hours Engaged per Week in Professional Activities*

Activity	<i>M</i>	<i>SD</i>	Range
Consultation with teachers	14.17	18.20	2 - 50
Classroom programming	2.65	2.79	0 - 7
Counseling	9.62	10.44	0 - 25

### **Participation Rates**

Student participation was sought from all students in grades 7 and 8 ( $N = 657$ ), with the exception of students served in self-contained classrooms for an Intellectual Disability because of difficulties with comprehending written material to complete rating scales. Signed parental consent forms were returned for 284 students, resulting in a 43% response rate. Out of these 284 returned consent forms, 243 indicated positive consent, yielding a 37% participation rate. The other 41 consent forms that were returned indicated that parents did not want their children to participate in the study; these students were still eligible to receive recruitment incentives because they brought the consent form home to their parent(s) or guardian(s) to review. During the data collection process, four students were eliminated from the sample; three of these students were habitually absent and one had limited proficiency with the English language, precluding valid completion of the self-report measures. In sum, student self-report data were collected from 239 participants. Data from three of these students were excluded from analyses due to extensive missing data that precluded the scoring of key constructs. Specifically, for two students an anxiety or depression T-score could not be calculated. For a third student, no teachers could provide nomination data due to a recent schedule change. An additional three participants (all of whom were identified as symptomatic at Time 1) were unavailable to

complete the measures of anxiety and/or depression administered at Time 2. Thus, data from a final sample of 233 students (35% of the targeted population) were retained for use in all statistical analyses.

In the recruitment of educators, 19 teachers and six school-based mental health professionals were asked to participate by providing nominations. All 25 educators who were asked to participate in the study provided positive consent, yielding a 100% response and participation rate. In sum, the final dataset retained for analyses consisted of reports from 233 students, 19 teachers, and six school-based mental health professionals.

## **Measures**

**Demographic information form.** All participants (i.e., students, teachers, and school-based mental health professionals) completed a demographic form that has been successfully used in prior research (Cunningham & Suldo, 2014). These forms requested information such as age, gender, ethnicity, socioeconomic status (SES), and grade level enrolled in or taught. Each version of this demographic information form is included in Appendices A, B, and C.

**The Multidimensional Anxiety Scale for Children 2<sup>nd</sup> Edition (MASC 2; March, 2013).** The MASC 2 is a 50-item measure of anxiety symptoms among children and adolescents aged 8 to 19. The MASC 2 yields six subscales, Physical Symptoms (12 items), Harm Avoidance (8 items), Social Anxiety (9 items), Separation Anxiety/Phobias (9 items), Generalized Anxiety Disorder (GAD) Index (10 items), and Obsessions and Compulsions (10 items) and three composite scores, Total Anxiety (sum of all subscales except the GAD Index and two items from the GAD Index), Anxiety Probability Score (determined by totaling the number of elevated T-scores on three subscales—Social Anxiety, Separation Anxiety/Phobias, & GAD Index), and Inconsistency Index (8 pairs of items). Responses on the MASC 2 are measured on a four-point

Likert scale (0=Never true about you, 1=Rarely true about you, 2=Sometimes true about you, and 3=Often true about you). Higher scores on each subscale and composite score, with the exception of the Inconsistency Index, indicate greater risk for anxiety symptoms. On the Inconsistency Index, low scores indicate valid responding. In the present study, the average score on the Inconsistency Index was 5.58 ( $SD=2.58$ ; range from 0 to 15) for Time 1 and 5.60 ( $SD=2.39$ ; range from 1 to 12) for Time 2, which is below the threshold of a raw score of 8 points. At Time 1, 33 students obtained a total score over 8 (i.e., indicative of some inconsistency)—12 of these students also obtained a *T*-score over 60. At Time 2, seven students obtained a total score over 8. Only one student obtained a score greater than eight on the inconsistency index at both time points. The manual advises that scores greater than eight on the inconsistency index represent some inconsistency and should be interpreted with caution.

In the development of the MASC 2, the normative sample consisted of 1,800 North American youths, who ranged in age from 8 to 19. To ensure that the normative sample was representative of North American children and adolescents, the data were weighted to match Census data in regards to gender, age, race/ethnicity, parental educational level, and geographic region. Although the MASC 2 was standardized on a fairly diverse group of children and adolescents in the U.S. (3.9% Asian, 14.2% Black, 21.5% Hispanic/Latino, 55.9% White, 4.5% Other), the student participants in the present sample represent even more diversity (e.g., 52% of student sample was Black vs. 14.2% of normative sample). However, the MASC 2 does not provide separate norms for race/ethnicity. Thus, *T*-scores were calculated according to students' gender and age (i.e., 8 to 11, 12 to 15, 16 to 19) without consideration of possible mean differences in anxiety by race/ethnicity group.

Regarding interpretation on clinical scales, *T*-scores (raw scores converted to standard scores using age and gender norms) that fall within the range of 60 to 64 are considered Slightly Elevated (slightly more concerns than are typically reported), 65 to 69 are Elevated (more concerns than are typically reported), and 70 and above are Very Elevated (many more concerns than are typically reported). *T*-scores below 60 are considered average. Scores within the range of 55 to 59 are considered in the High Average range (borderline levels of concern), scores within the range of 40 to 54 are considered in the Average range (typical levels of concern), and scores below 40 are in the Low range (fewer concerns than typical). According to the MASC 2 manual, the average internal consistency is acceptable to excellent for the Total Anxiety Scale ( $\alpha = .92$ ) and each subscale (Physical Symptoms  $\alpha = .88$ ; Harm Avoidance  $\alpha = .75$ ; Social Anxiety  $\alpha = .85$ ; Separation Anxiety/Phobias  $\alpha = .77$ ; GAD Index  $\alpha = .72$ ; Obsessions & Compulsions  $\alpha = .86$ ). One- to four-week test-retest reliabilities were also strong ( $r = .80$  to  $r = .94$ ). In the current study, the internal consistency of all items included in the total score is excellent ( $\alpha = .91$ ).

The developers of the MASC 2 also reported that the Total Anxiety scores on the MASC 2 demonstrated moderate convergent validity with the Beck Youth Inventory—Anxiety Total Score (Beck, Beck, & Jolly, 2001;  $r=.73$ ). They also reported that the MASC 2 demonstrated moderate convergent validity with the Conners Comprehensive Behavior Rating Scales (Conners, 2008) on relevant subscales ( $r=.42$  to  $r=.64$ ). Finally, the MASC 2 demonstrated moderate to strong discriminative validity, as the effect sizes for comparisons between the target group and the general population group ranged from  $d=.34$  to  $d=.94$  for the Total score and each subscale, except for Harm Avoidance. Small to large differences were also found between each target group and other non-anxious clinical groups ( $d=.25$  to  $d=.81$ ), as well as between each target

group and other anxiety subscales on the MASC 2 ( $d=.31$  to  $d=.70$ ). The MASC 2 is not included as an appendix because of copyright restrictions.

**Children's Depression Inventory 2<sup>nd</sup> Edition (CDI 2; Kovacs, 2011).** The CDI 2 is a measure of depressive symptoms in children and adolescents ages 7 to 17. The CDI 2 is a 28-item measure that includes two scales, Emotional Problems (15 items) and Functional Problems (13 items). The Emotional Problems scale is comprised of two subscales, Negative Mood/Physical Symptoms (9 items) and Negative Self-Esteem (6 items). The Functional Problems scale is comprised of the Interpersonal Problems (5 items) and Ineffectiveness (8 items) subscales. The items from these four subscales, or two scales, yield a Total Score (28 items). Responses on the CDI 2 are measured on a three-point Likert scale (0 = absence of symptoms, 1 = mild or probably symptom, 2 = definite symptom). Higher scores indicate higher risk for depressive symptoms.

In the development of the CDI-2, the normative sample consisted of 1,100 U.S. youths from 28 states, ages 7 to 17. To ensure that the normative sample was representative of U.S. children and adolescents, the test developers used a stratified sampling method to match Census data in regards to race/ethnicity and geographic region. Similarly to the MASC 2, the CDI 2 was standardized on a diverse group of children and adolescents (3.3% Asian, 16.1% Black, 14.5% Hispanic, 62% White, 4.1% Multiracial/ Other). Because the CDI 2 also does not provide separate norms for race/ethnicity group, *T*-scores were calculated according to students' gender and age (i.e., 7 to 12, 13 to 17).

Regarding interpretation, a *T*-score that falls within the range of 60-64 is High Average (somewhat more concerns than typical), 65-69 is Elevated (more concerns than typical), and 70 and above is Very Elevated (many more concerns than typical). Scores within the range of 40 to

59 are considered in the Average range (typical levels of concern) and scores below 40 are in the Low range (fewer concerns than typical). According to the CDI 2 manual, the internal consistency is acceptable to excellent ( $\alpha = .73$  to  $\alpha = .91$ ). Two- to four-week test-retest reliability estimates were also moderate to strong ( $r = .76$  to  $r = .92$ ). In the current study, the internal consistency of all items included in the total score is good ( $\alpha = .82$ ).

The Total Score on the CDI 2 has also demonstrated high percentages of sensitivity (83%) and specificity (73%), meaning that it is fairly accurate in correctly classifying youth who are and are not depressed. Regarding convergent validity, the CDI-2 yields large associations with similar scales on the Beck Depression Inventory—Youth Version (Beck, Beck, Beck, Jolly, & Steer, 2001). This rating scale is not included as an appendix because of copyright restrictions.

**Children’s Social Desirability Questionnaire (CSDQ; Carifio, 1994).** The CSDQ is a measure of socially desirable response styles among adolescents in grades 3 through 12. Items represent attitudes and behaviors that are culturally acceptable but unlikely. This self-report measure is based on the Marlowe-Crowne Social Desirability Scale (MCSDS; Crowne & Marlowe, 1960), which has been used extensively to measure socially desirable responding among adults. Crandall and colleagues (1965) rephrased twenty items from the adult scale and adapted the remaining items to reflect a wide range of common social experiences encountered by school-age children for a total of 48 items with response choices of true or false. On the 48-item CSDQ, 26 items are phrased so that “true” is a socially desirable response and 22 items are phrased so that “false” is the socially desirable response. Two 12-item short forms, developed by Carifio (1994), were created through factor analyzing the full, 48-item measure using a principal components analysis. From this analysis, three factors were found that, together, accounted for 62% of the total variance. Short Form A was constructed by including the four items that loaded

most highly on each of the three factors, while Short Form B was created by including the next three items that loaded most highly for each factor, as well as the item that loaded highest on each factor. On each 12-item CSDQ, six items are phrased so that “true” is a socially desirable response and six items are phrased so that “false” is the socially desirable response. The current study used Short Form A of the CSDQ. Higher scores on the CSDQ for children in grades 6 through 12 indicate a greater likelihood that an individual is responding in socially desirable ways. To ensure that the total score on the CSDQ was appropriate to use in the present study, an exploratory factor analysis was conducted. An examination of the eigenvalues (first eigenvalue [2.25] > 1 and large difference [1.66] between first and second eigen value), factor loadings from a one-factor solution (ranged from .27 to .55), and Cronbach’s coefficient alpha ( $\alpha = .72$ ) provides support for analyzing the total score on the CSDQ.

Carifio (1994) found that the CSDQ demonstrated acceptable internal consistency ( $\alpha = .73$ ). Additionally, Carifio found that Short Form A demonstrated strong concurrent validity with the full 48-item measure ( $r = .89$ ) and found that the four-day test-retest reliability for this short form was also strong ( $r = .87$ ) among middle school students. The CSDQ also demonstrated expected relationships with theoretically related constructs, including self-acceptance, social presence, approval seeking behaviors, and a desire to make a good impression (Crandall, 1966), the inability to express dislike for peers among youth aged 7 to 14 (Klein, Gould, & Corey, 1969), and agreement with myths about alcohol and drinking among middle school students (Carifio, 1994). Regarding convergent validity, Hagborg (1991) found that the MCSDS, which correlates strongly with the full version of the CSDQ ( $r = .78$ ; Paulhus, 1991), demonstrated strong correlations with the Lie Scale from the RCMAS among male and female high school students ( $r = .64$  to  $r = .65$ , respectively). The CSDQ is included in Appendix D.

**Students' Life Satisfaction Scale (SLSS; Huebner, 1991).** The SLSS (Huebner, 1991) is a seven-item, self-report measure of global life satisfaction for youth in grades 3 through 12. Items on the SLSS ask respondents to indicate the extent to which they agree or disagree with statements regarding their satisfaction with overall life and are rated on a six-point Likert scale from (1) *strongly disagree* to (6) *strongly agree*. After reverse-scoring two items, the scores from each item are averaged to obtain an overall score of global life satisfaction, with higher scores indicating higher levels of life satisfaction.

This often-used measure is widely considered the gold standard measure of life satisfaction, the more stable component of subjective well-being (Huebner, Gilman, & Suldo, 2007). The SLSS has demonstrated good internal consistency among middle school students ( $\alpha = .89$ ; Suldo et al., 2009) and strong one-week ( $r = .74$ ) and two-week ( $r = .68$ ) test-retest reliabilities among a sample of children in grades three through eight (Huebner, 1991). In the current study, the internal consistency of all items is good ( $\alpha = .84$ ). The SLSS also demonstrated moderate convergent validity with other youth self-report measures of life satisfaction ( $r = .53$  to  $r = .62$ ; Huebner, 1991). The SLSS is included in Appendix D.

### **Recruitment Procedures**

**School.** After the principal expressed an interest in participating in the current study, this researcher created a handout (Appendix E) that was provided to relevant school personnel (i.e., administrators, school-based mental health professionals) for the purposes of securing buy-in from the school mental health staff. The handout summarized research on the prevalence of anxiety and depression and subsequent outcomes. Additionally, an overview of the study was provided, along with a rationale for eliciting teacher nominations as a method of identifying youth for participation in school-based mental health interventions. A discussion was also



facilitated regarding proposed methodology and school personnel were provided with the opportunity to advise researchers on methods that might work well for their school. For instance, a member of the school mental health team notified this researcher that the school already has a mental health program in place for sixth-grade students in their school. Thus, it was agreed to limit the project to only seventh- and eighth-grade students at this middle school. After reviewing the handout, all relevant school personnel verbally expressed interest in participating in the study with the purpose of identifying students who were invited to participate in group-based targeted mental health services shortly thereafter.

**Teachers.** All teachers who (a) taught a core academic subject area (i.e., Math, Language Arts, Science or Social Studies), (b) taught seventh and eighth grade students, and (c) had at least five hours of face-to-face weekly contact with these students (i.e., saw the 7<sup>th</sup> and 8<sup>th</sup> grade class approximately one class period per day, each day of the week) were invited to participate in this study. Teachers received a consent form (Appendix F) that described the study as well as incentives. Specifically, all participating teachers were entered into a drawing for one of several \$25 gift cards to local stores.

**School-based mental health professional participants.** All school-based mental health professionals who (a) were employed as a school psychologist, school counselor, social worker, or school nurse and (b) worked at the school at least one day a week were invited to participate in this study. School-based mental health professionals received a consent form (Appendix G) that described the study as well as incentives. Specifically, all participating school-based mental health professionals were entered into a drawing for a \$25 gift card to a local store.

**Student participants.** All students in grades seven and eight who were (a) in at least one eligible class (i.e., at least one of their teachers consented to participate in the study), and (b)

proficient in English, were invited to participate in the study using a standardized approach (i.e., through their social studies teacher). Parent consent forms were sent home with all of these students, with the exception of students who are served in self-contained classrooms because of an Intellectual Disability (because of difficulties comprehending written material at grade level). Past research has demonstrated positive consent return rates of 50% to 60% (Layne et al., 2006; Stark, Streusand, Krumholz, & Patel, 2010). To increase the return rate of consent forms, small incentives were provided to students who returned consent forms, whether consent was positive or negative. Based on recommendations from school personnel, each student who returned a consent form was provided with a full size candy bar. Additionally, an interdependency group contingency reward (i.e., party with donuts) was offered for the five classrooms during the specified recruiting period (i.e., each class period of the social studies teacher) that had the highest return rate of their consent forms. The total number of students recruited and the total number of students who returned parent consent forms (whether positive or negative) were systematically recorded in order to calculate the response rate.

### **Data Collection**

Data were collected in February (third nine-week grading period) of the 2012-2013 school year. By this time, teachers were relatively familiar with their students as a result of teaching them for several months (some of August, September through January, and some of February). Thus, they should have been able to provide informed judgments of students' behavior in comparison to grade-level peers. Teachers were recruited at departmental meetings towards the end of the fall semester, during which time an overview of the study was provided, including a brief statement of purpose and rationale (i.e., prevalence rates of anxiety and depression, empirical links between psychological wellness and psychosocial and academic

success, identification of students who might benefit from school-based interventions to be provided in the spring). School-based mental health professionals were also recruited through similar meetings. After obtaining teacher consent, letters were sent home to the parents of students who were in eligible classrooms. This letter described the study and requested parent permission (consent) for child participation (see Appendix H) in the study, described as a universal screening of social-emotional wellness.

**Teacher data collection.** Teachers were provided with a roster of students within the grade level that they taught who had parent permission to participate in the study. They were provided with a handout detailing behavioral descriptors of childhood anxiety and depression. Prior studies using teacher nominations in secondary schools have allowed teachers to freely nominate as many students as they desired (see Auger, 2004 or Moor et al., 2007). When limits were not placed on the number of nominated students, teachers nominated approximately 5% of their high school students, on average (Moor et al., 2007) and approximately 13% of fifth-graders (Roeser & Midgley, 1997). These data suggest that permitting teachers to nominate as many students as they would like would not result in an exorbitant number of students. Thus, teachers in the current study were allowed to nominate as many students as they would like for anxiety and depression, separately, who they felt met the behavioral criteria provided (please see Appendix I). To be consistent with how teacher nominations are handled in schools, a nomination from at least one teacher was sufficient for a positive identification.

**School-based mental health professionals data collection.** After consultation with the school-based mental health (SBMH) professionals at the school where data were collected, it was decided that the school psychologist, school social worker, and school counselors would meet and nominate as a team and that the school nurse would nominate individually since this process

is more authentic to how students are identified for services in the participating school. They received the same handout that was provided to teachers and were given grade-level rosters of the students within each grade who had parent permission for participation in the study (i.e., the school nurse was provided with one set of grade-level rosters and the SBMH professional team were provided with one set of grade-level rosters to complete together). The SBMH professionals were also provided with an option on the roster to indicate if none of them were familiar with a particular student. A prior study conducted in an elementary school limited school-based mental health professionals to individually nominating up to 21 students per grade (Cunningham, 2012). Because teachers were not limited in the number of nominations they could make for depression and for anxiety, the team of school-based mental health professionals and the school nurse were also not limited in the number of nominations in the present study. See Appendix J for a copy of the form that was used to collect nominations from the team of SBMH professionals and Appendix K for a copy of the form that was used to collect nominations from the school nurse. The school-based mental health professional team was not provided with a standardized method of collaborating as a team to nominate students but instead used their own teaming process to ensure that the nomination process was authentic.

**Student data collection.** During the same week that data were collected from school personnel, students who had parental consent to participate were gathered in small groups in a confidential area on the school campus. This researcher explained the purpose of the study, and read aloud the student assent form (Appendix L). Students who provided written assent to participate completed the aforementioned paper-and-pencil measures of anxiety, depression, social desirability, and life satisfaction. This researcher and graduate student colleagues who volunteer as members of the University of South Florida's (USF) School-Based Mental Health

Research Group and are approved members on the Institutional Review Board (IRB) protocol associated with this study ensured that students were seated in a way that prevented others from viewing their responses and allowed privacy. Several members of the research team were available to assist any students experiencing difficulties reading or concentrating in completion of the measures (i.e., individualized assistance of a research team member). Additionally, researchers were prepared to respond in a standardized manner to any questions that may arise. Researchers also monitored students' distress when completing these measures and were available to accommodate student participants' requests to withdraw from the study. Critical items pertinent to suicidality were checked immediately upon survey completion to ensure that students who endorsed any such items were immediately referred to a school-based mental health professional for further assessment of their safety.

The raw rating scale responses were totaled for each measure of psychopathology. For the MASC 2, raw scores were converted to the appropriate *T*-score for the participant age and gender and the students who obtained scores at or above the Slightly Elevated cutoff range ( $T \geq 60$ ) were be asked to complete a second rating scale one week later to ensure that the first score was not a false positive or due to a transient state of distress. For the CDI 2, raw scores were also converted to the appropriate *T*-score for participant age and gender and the students who obtained scores at or above the Slightly Elevated cutoff range ( $T \geq 60$ ) were also asked to complete a second rating scale one week later. Students obtaining scores at or above the cutoff on the second administration were considered as having symptoms of anxiety or depression severe enough that they could benefit from intervention. These cutoffs were chosen because they indicate an at-risk level of symptoms. At-risk was defined as *T*-scores more than one standard deviation from the norm group mean on the MASC 2 and CDI 2. Parents of students who self-

report high levels of anxiety or depressive symptoms at any point during the screening process were immediately sent a letter of notification. This letter informed parents that school-based mental health professionals planned to provide group counseling services for students identified during the screening process, and also contained contact information for community mental health agencies so that parents could seek services sooner if they desire. In the spring of the 2012-2013 school year, school-based mental health professionals organized the provision of mental health interventions for students who were identified through this study and had parental consent to participate in these interventions.

### **Data Analyses**

**Descriptive statistics.** Descriptive statistics were used to summarize the demographic characteristics of the sample (i.e., students, teachers, school-based mental health professionals) based on information gleaned from the demographic information form. The demographic characteristics of the obtained sample (i.e., students who returned consent forms) were compared to the demographic features of the larger population at the school (i.e., all 7<sup>th</sup> and 8<sup>th</sup> grade students). Descriptive statistics (e.g., means, standard deviations, ranges) were calculated for participants' total *T*-scores on the MASC 2 and CDI 2, at both test administrations, as well as their total raw score on the CSDQ and average raw score on the SLSS. These latter descriptive statistics shed light on the distribution of scores on the various self-report instruments.

**Accuracy rates.** The first five research questions posed in the current study were developed in order to investigate the accuracy (i.e., sensitivity, specificity, miss and misidentified rates) of nominations made by teachers and school-based mental health professionals. The specific questions include:

**Research question one.** What is the accuracy of combined teacher nominations to identify early adolescents who report elevated levels of anxiety, in regards to:

- a. *Sensitivity*
- b. *Miss rate*
- c. *Specificity*
- d. *Misidentified rate?*

**Research question two.** What is the accuracy of combined teacher nominations to identify early adolescents who report elevated levels of depression, in regards to:

- a. *Sensitivity*
- b. *Miss rate*
- c. *Specificity*
- d. *Misidentified rate?*

**Research question three.** What is the accuracy of school-based mental health professional nominations in identifying early adolescents who report elevated levels of anxiety, in regards to:

- a. *Sensitivity*
- b. *Miss rate*
- c. *Specificity*
- d. *Misidentified rate?*

**Research question four.** What is the accuracy of school-based mental health professional nominations in identifying early adolescents who report elevated levels of depression, in regards to:

- a. *Sensitivity*

- b. *Miss rate*
- c. *Specificity*
- d. *Misidentified rate?*

**Research question five.** What is the accuracy of multiple teachers (i.e., combined across subject areas) compared to the accuracy of a single teacher (i.e., all teachers of a single subject area) in identifying early adolescents who report elevated levels of anxiety or depression, in regards to:

- a. *Sensitivity*
- b. *Miss rate*
- c. *Specificity*
- d. *Misidentified rate?*

Accuracy rates and confidence intervals were calculated to address these five questions. For the first four research questions, students' nomination status (yes, nominated by at least one teacher vs. no, not nominated by any teacher) were compared to their scores on self-report measures of anxiety and depression (yes, in the elevated range of *T*-scores at both time points vs. no, not in the elevated range at the initial screening). Following recommendations from prior research, the accuracy was determined by examining the sensitivity and specificity proportions (Levitt et al., 2007). The other figures (missed and misidentified students) provided supplemental information regarding the proportion of students who were not picked up or were wrongly labeled, respectively, by teachers and/or the school-based mental health professional team. Table 5 provides more detailed information regarding the formulas used to calculate each proportion (adapted from Green & Zar, 1989).



Table 5

*Formulas for Accuracy Proportions*

	Student self-reported symptoms in the elevated range ( <i>T</i> -score of $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( <i>T</i> -score of $< 60$ on the MASC 2 or CDI 2)
Student Nominated by Teacher or School-Based Mental Health Professional	<b>Sensitivity</b> (True Positive) $= \# \text{ true positives} / (\# \text{ true positives} + \# \text{ false negatives})$	<b>Misidentified Rate</b> (False Positive) $= \# \text{ false positives} / (\# \text{ false positives} + \# \text{ true negatives})$
Student Not Nominated by Teacher or School-Based Mental Health Professional	<b>Miss Rate</b> (False Negative) $= \# \text{ false negatives} / (\# \text{ false negatives} + \# \text{ true positives})$	<b>Specificity</b> (True Negative) $= \# \text{ true negatives} / (\# \text{ true negatives} + \# \text{ false positives})$

*Note.* Adapted from Green & Zar (1989)

Research questions one and two were addressed by examining the percentage of teachers who accurately identified/nominated students who self-reported elevated ratings of either anxiety and/or depression. Proportions were calculated for (a) the percentage of students correctly identified by teachers (i.e., sensitivity; teacher nominated students who have a total *T*-score of  $\geq 60$  on the MASC 2 and/or CDI 2), (b) the percentage of students that teachers correctly did not identify (i.e., specificity; teacher did not nominate students who did not self-report elevated levels of anxiety and/or depression), (c) the percentage of students that teachers incorrectly did not identify (i.e., miss rate; teacher did not nominate students who have a total *T*-score of  $\geq 60$  on the MASC 2 and/or CDI 2), and (d) the percentage of students incorrectly identified by teachers (i.e., misidentified rate; teachers nominated students who did not self-report elevated levels of anxiety and/or depression). Proportions were calculated for each individual teacher (results presented in appendices) and the group of teachers as a whole (results reported in text).

Research questions three and four were addressed by calculating the same proportions from the nominations made by the school-based mental health professional team.

Research question five was addressed by comparing the proportions obtained in research questions 1 and 2 to a re-analysis in which students' nomination status was based on only the nominations for a single teacher of a class taken by each student (e.g., Language Arts, Math, Social Studies). Additionally, a series of McNemar tests were conducted to determine the statistical significance of the differences between nominations obtained from multiple teachers (i.e., combined across subject areas) to those made by a single teacher (i.e., all teachers of a single subject area).

**Confidence intervals.** Confidence intervals were also calculated to examine the extent to which the obtained sample accurately represents the larger population (Johnson & Christensen, 2006). Using the exact or Clopper-Pearson method (Clopper & Pearson, 1934), 95% confidence intervals were constructed around the calculated proportions (i.e., sensitivity, specificity, miss rate, misidentified rate). The exact method was used to construct confidence intervals because the sample size was relatively large. Additionally, the exact method is conservative, as it uses a minimum coverage criterion ( $1-\alpha$ ), which results in relatively wide confidence intervals. By using a 95% confidence interval, researchers can say they are 95% confident that the population proportion falls within the constructed interval. Thus, using this method increases the likelihood that the population proportion does fall within the constructed interval.

Confidence intervals were calculated for each proportion in several ways. To determine the overall accuracy of teachers and school-based mental health professionals, confidence intervals were constructed around each proportion (i.e., sensitivity, specificity, miss rate, misidentified rate) for the overall sample of teachers (nominating the total student sample), the

school-based mental health professional team, and the school nurse for anxiety and depression, separately. For research question 5, confidence intervals were also calculated for the combined nominations from three core subject area teachers (nominating a reduced student sample) and each subject area (i.e., Language Arts, Math, Social Studies), and each individual teacher for anxiety and for depression.

**Statistical analyses.** To address research questions six and seven, SAS 9.3 statistical software (SAS Institute, 2008) was used to conduct chi-square tests of independence, independent means t-tests, and one-way analyses of variance (ANOVAs).

**Research question six.** Regarding children who are missed (i.e., self-report high levels of symptoms but teachers do not perceive them as symptomatic), do these children differ from their peers who were correctly identified as symptomatic in terms of:

- a. *Demographic characteristics?*
- b. *Symptom severity or symptom type?*

**Research question seven.** Regarding children who are misidentified (i.e., deny high levels of symptoms but teachers perceive them as symptomatic), do these children differ from their peers who were correctly not nominated in terms of:

- a. *Demographic characteristics?*
- b. *Symptom severity or symptom type?*
- c. *Level of socially desirable responding on surveys?*
- d. *Level of life satisfaction?*

**Fisher's exact test.** Chi-square tests of independence ( $\alpha = .05$ ) were originally planned to address research question 6(a). However, the sample size for this comparison was too small (i.e., most comparisons would have at least one cell with less than five observations). Thus, Fisher's

exact tests were used instead to compare students who were missed to students who were accurately identified (i.e., sensitivity) with regard to the following demographic characteristics: gender (boy vs. girl), race/ethnicity (Black vs. White vs. other race/ethnicity), and SES (i.e., yes vs. no receipt of free or reduced-price school lunch).

**Independent means t-tests.** Independent means t-tests ( $\alpha = .05$ ) were used to answer research questions 6(b) and 7(b). Three assumptions are made when using independent means t-tests. First, it was assumed that observations were independent because students were only a part of one proportion (i.e., miss rate vs. sensitivity; misidentified rate vs. specificity). Descriptive statistics were obtained to address the remaining assumptions, which are that the variances for the two groups were equal and the sample was normally distributed. Before conducting independent means t-tests, the data were screened in order to detect the presence of outliers. In addition to the previously collected descriptive statistics, normality data (i.e., skewness, kurtosis) were obtained for the severity and type of anxiety symptoms (MASC 2) and the severity and type of depressive symptoms (CDI 2).

To address research question 6(b), independent means t-tests were conducted to compare the group of students who were missed to the group of students who were accurately identified (i.e., sensitivity) with respect to: severity of anxiety and depressive symptoms (as indexed by the total *T*-score on the MASC 2 and the CDI 2), and type of anxiety and depressive symptoms, as measured by the scores on each subscale of the MASC 2 (i.e., Physical Symptoms, Harm Avoidance, Social Anxiety, Separation Anxiety/Phobias, Generalized Anxiety Disorder, Obsessions & Compulsions) and CDI 2 (i.e., Negative Mood/Physical Symptoms, Negative Self-Esteem, Interpersonal Problems, Ineffectiveness).

To address research question 7(b), independent means t-tests were conducted to compare the group of students who were misidentified to the group of students who were accurately not identified (i.e., specificity) with respect to: severity of anxiety and depressive symptoms (as indexed by the total *T*-score on the MASC 2 and the CDI 2), and type of anxiety and depressive symptoms, as measured by the scores on each subscale of the MASC 2 (i.e., Physical Symptoms, Harm Avoidance, Social Anxiety, Separation Anxiety/Phobias, Generalized Anxiety Disorder, Obsessions & Compulsions) and CDI 2 (i.e., Negative Mood/Physical Symptoms, Negative Self-Esteem, Interpersonal Problems, Ineffectiveness).

**Chi-square test of independence.** Chi-square tests of independence ( $\alpha = .05$ ) were used to answer research question 7(a). Assumptions that must be met when conducting a chi-square tests include independence of observations and a sufficiently large sample size (i.e., at least five observations in each cell). It was assumed that observations are independent because each student participant was not able to contribute to more than one cell (e.g., misidentified and female, misidentified and male). Due to low numbers (i.e., fewer than 20) of a few race/ethnicity categories at the selected school in the 2012-2013 school year, the obtained sample was examined to determine which categories of race/ethnicity could be included in the analysis and which students from ethnic groups with low representation should be excluded from this analysis. The resulting race/ethnicity categories are described in detail in Chapter 4. After ensuring inclusion of only cells with sufficiently large sample size (i.e., five or more cases), chi-square tests of independence were used.

**One-way analyses of variance (ANOVAs).** To determine if the missed or misidentified students were unique in regards to socially desirable responding or life satisfaction, ANOVAs ( $\alpha = .05$ ) with planned contrast comparisons (i.e., missed vs. correctly identified and misidentified

vs. correctly not identified) were used to answer research questions 7(c) and 7(d). ANOVAs were used for these analyses (instead of independent means t-tests) because the variance for all four groups is considered (vs. only using the variance for the two groups compared in an independent means t-test). Before conducting ANOVAs, the data were screened in order to detect the presence of outliers. In addition to the previously collected descriptive statistics, normality data (i.e., skewness, kurtosis) were obtained for social desirability (CSDQ) and life satisfaction (SLSS). Three assumptions are made when using ANOVAs. First, it was assumed that observations are independent because students can only be included in one proportion (i.e., sensitivity, specificity, miss rate, misidentified rate). To address the assumption of normality of population distributions, results from the Shapiro-Wilk test and descriptive normality data (i.e., skewness, kurtosis) were reviewed. In evaluating the last assumption, which is homogeneity of variance, either Levene's Tests (if the sample is normally distributed) or the Brown-Forsythe Tests (if the sample distribution is skewed) were used for each comparison. To examine comparisons between specific groups of interest (correctly identified vs. missed; misidentified vs. correctly not identified), contrast comparisons were conducted. To control for Type I error rates, the alpha level was adjusted ( $\alpha = .025$ ).

To address research question 7(c), an ANOVA and contrast comparisons were conducted to compare the group of students who were misidentified to the groups of students who were missed, accurately identified (i.e., sensitivity), and accurately not identified (i.e., specificity). Students from the four groups were compared on their degree of socially desirable responding, as measured by the total score on the CSDQ. Further, contrast comparisons were conducted to compare missed students to those students who were correctly identified (both groups who reported elevated symptoms of anxiety or depression) and misidentified students were compared

to students who were correctly not identified (both groups who did not report elevated levels of anxiety or depression).

To address research questions 7(d), an ANOVA and contrast comparisons were conducted to compare the group of students who were misidentified to the groups of students who were missed, accurately identified (i.e., sensitivity), and accurately not identified (i.e., specificity). Students from the four groups were compared on their levels of life satisfaction, as measured by the mean score on the SLSS. Further, contrast comparisons were conducted to compare missed students to those students who were correctly identified (both groups who reported elevated symptoms of anxiety or depression) and misidentified students were compared to students who were correctly not identified (both groups who did not report elevated levels of anxiety or depression).

### **Additional Ethical Considerations**

Additional precautions were taken to ensure that the participants in this study are protected. Before collecting data, this researcher obtained approval to conduct research from USF's IRB and the participating school district. Additionally, the information gathered from all participants (i.e., students, teachers, school-based mental health professionals) are kept in a confidential database. All participants were assigned code numbers, and no identifying information was included on the raw survey data. The completed measures and the only documents that link the code numbers to identifying participant information are stored in a locked file cabinet. Only the current researcher and approved members of the research team have access to the confidential database and locked file cabinet.

## Chapter IV: Results

The results presented in this chapter address the following seven research questions:

1. What is the accuracy of combined teacher nominations to identify early adolescents who report elevated levels of anxiety, in regards to:
  - a. Sensitivity
  - b. Miss rate
  - c. Specificity
  - d. Misidentified rate?
  
2. What is the accuracy of combined teacher nominations to identify early adolescents who report elevated levels of depression, in regards to:
  - a. Sensitivity
  - b. Miss rate
  - c. Specificity
  - d. Misidentified rate?
  
3. What is the accuracy of school-based mental health professional nominations in identifying early adolescents who report elevated levels of anxiety, in regards to:
  - a. Sensitivity
  - b. Miss rate
  - c. Specificity
  - d. Misidentified rate?



4. What is the accuracy of the school-based mental health professional nominations in identifying early adolescents who report elevated levels of depression, in regards to:
  - a. Sensitivity
  - b. Miss rate
  - c. Specificity
  - d. Misidentified rate?
  
5. What is the accuracy of multiple teachers (i.e., combined across subject areas) compared to the accuracy of a single teacher (i.e., all teachers of a single subject area) in identifying early adolescents who report elevated levels of anxiety or depression, in regards to:
  - a. Sensitivity
  - b. Miss rate
  - c. Specificity
  - d. Misidentified rate?
  
6. Regarding children who are missed (i.e., self-report levels of symptoms but teachers do not perceive them as symptomatic), do these children differ from their peers who were correctly identified as symptomatic in terms of:
  - a. Demographic characteristics?
  - b. Symptom severity or symptom type?
  
7. Regarding children who are misidentified (i.e., deny high levels of symptoms but teachers perceive them as symptomatic), do these children differ from their peers who were correctly not nominated in terms of:
  - a. Demographic characteristics?
  - b. Symptom severity or symptom type?

- c. Level of socially desirable responding on surveys?
- d. Level of life satisfaction?

This chapter first summarizes results of preliminary analyses conducted to ensure the accuracy and trustworthiness of the dataset, and normality of all variables of interest. Then, calculated accuracy rates and confidence intervals to address the first five research questions are presented. Finally, the statistical analyses (i.e., chi-square tests of independence, independent means t-tests, one-way analysis of variance) used to address research questions six and seven are presented.

### **Data Screening**

Descriptive analyses were conducted to screen the data in order to (a) ensure that the values fell within expected ranges, (b) assess the normality of distributions by examining skewness and kurtosis, and (c) examine outliers.

**Accuracy of data entry.** The minimum and maximum values for all items were examined to ensure that the values fell within expected ranges. No values outside of the expected ranges were obtained. Additionally, the accuracy of data entry was verified by manually checking a representative sample (i.e., 10%) of student surveys and 100% of educator nominations. If an error was detected, it was changed to the correct value in the database. Additionally, the surveys that were entered into the database immediately before and after the survey with the error were checked for accuracy. For the student self-report data, the data entry error rate was 0.01%, which corresponds to an accuracy rate of 99.99%. For educator nominations, the error rate for data entry was 0.1%, which corresponds to an accuracy rate of 99.9%.

**Normality of variables.** The normality of distributions was evaluated by examining the skewness and kurtosis values for each variable of interest. Using the Shapiro-Wilk test, the following variables violated the assumption of an approximately normal distribution at Time 1: total anxiety, anxiety subscales, total depression, depression subscales, life satisfaction, and socially desirable responding. At Time 2, the total anxiety and total depression scores did not violate this assumption. To further investigate the distributions of these variables, a criterion of  $\pm 3$  was used, which was proposed by Tabachnick and Fidell (2006) as an acceptable range for skewness and kurtosis values in studies with larger sample sizes. Using this criterion, all variables fell within the acceptable range (with the exception of the kurtosis value of 3.60 for the negative self-esteem subscale from the CDI 2 at Time 1), suggesting that the departure from normality was not too severe for most variables. Kline (2011) further proposes that kurtosis values less than a criterion of  $\pm 10$  are likely not problematic. Even the negative self-esteem subscale falls well within the range proposed by Kline. Thus, all variables were used in their original form in statistical analyses.

**Outlier analysis.** The “plot” option was added to the univariate statement in SAS 9.3 to detect univariate outliers. In SAS 9.3, this option provides a stem-and-leaf plot, a box plot, and normal probability plot, which were examined for univariate outliers. No univariate outliers were observed for the variables of interest in the present study.

### **Descriptive Statistics**

Descriptive statistics (i.e., mean, standard deviation, range) were calculated for student participants' total *T*-scores on the MASC 2 and CDI 2 at both time points, the total raw score on the CSDQ, and the average raw score on the SLSS in order to examine the sample distributions of these variables. These results are presented in the Table 6.

Table 6

*Means, Standard Deviations, and Ranges for Key Measures*

Measure	<i>N</i>	<i>M</i>	<i>SD</i>	Range	Participants with <i>T</i> -scores $\geq 60$
Time 1					
MASC 2	233	51.24	9.37	40 - 79	51
CDI 2	233	51.21	8.84	40 - 77	45
CSDQ	233	6.91	2.85	0 - 12	--
SLSS	233	4.61	1.01	1.14 - 6	--
Time 2					
MASC 2	49*	62.40	8.28	45 - 83	36
CDI 2	43*	61.67	9.25	42 - 90	28

*Note.* MASC 2=Multidimensional Anxiety Scale for Children, Second Edition; CDI 2=Children's Depression Inventory, Second Edition; CSDQ=Children's Social Desirability Questionnaire; SLSS=Students' Life Satisfaction Scale.

\*Sample sizes at Time 2 do not exactly match the number of students whose CDI 2 or MASC 2 scores were  $\geq 60$  at Time 1 because two students whose scores exceeded the threshold on one measure, and one student whose scores exceeded the threshold on both measures, did not participate at Time 2.

### Prevalence of Elevated Symptoms of Anxiety and Depression

**Student self-report.** The total sample of student participants completed measures at the initial test administration (Time 1). Those students who obtained a score in the elevated range ( $T$ -score  $\geq 60$ ) at Time 1 on the MASC 2 and/or CDI 2 were asked to complete one or both of these measures again (depending on their obtained scores) the following school week, specifically three to six days later. All but three students who had elevated scores at Time 1 were re-tested at Time 2, resulting in a 1.3% attrition rate. The MASC 2 was re-administered to a total of 49

students (21% of sample) and the CDI 2 was re-administered to a total of 43 students (18.5%). Of note, 20 students completed both measures at Time 2. For the second administration of the MASC 2 and CDI 2, 36 students (15.5% of total sample; 73.5% of students who initially reported elevated anxiety) again reported symptoms of anxiety in the elevated range and 28 students (12.0% of total sample; 65.1% of students who initially reported elevated depression) reported symptoms of depression in the elevated range again. At Time 2, 14 students (6.0% of total sample) had twice-reported elevated scores on both measures.

**Teacher ratings of student symptoms.** For both anxiety and depression, 233 students were rated by one to six teachers ( $M = 3.19$ ,  $SD = .79$ ; mode = 3). Specifically, 5 students (2.2% of sample) were rated by 1 teacher, 25 students (10.7%) by 2 teachers, 137 students (58.8%) by 3 teachers, 55 students (23.6%) by 4 teachers, 9 students (3.9%) by 5 teachers, and 2 students (0.9%) by 6 teachers.

### **Teacher Accuracy Rates**

The first two research questions were addressed by comparing nominations from teachers to students' self-report of anxiety and depression symptoms. Specifically, the percentage of students self-reporting symptoms of anxiety and/or depression in the elevated range who were correctly identified as symptomatic by at least one teacher was examined. Proportions were calculated for (a) the percentage of students correctly identified by teachers (i.e., sensitivity; teacher nominated students who have a total  $T$ -score  $\geq 60$  on the MASC 2 and/or CDI 2), (b) the percentage of students that teachers incorrectly did not identify (i.e., miss rate; teacher did not nominate students who have a total  $T$ -score  $\geq 60$  on the MASC 2 and/or CDI 2), (c) the percentage of students that teachers correctly did not identify (i.e., specificity; teacher did not nominate students who did not self-report elevated levels of anxiety and/or depression), and (d)

the percentage of students incorrectly identified by teachers (i.e., misidentified rate; teachers nominated students who did not self-report elevated levels of anxiety and/or depression). Table 7 presents how these terms were defined in the present study, as well as the values that were found for anxiety and depression in this sample of teachers.

Table 7

*Number of Students Identified as Anxious or Depressed Compared to Teacher Nominations*

	Student self-reported symptoms in the elevated range ( $T$ -score $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( $T$ -score $< 60$ on the MASC 2 or CDI 2)
Student Nominated by Teacher	<b>Sensitivity</b> (True Positive)  Anxiety ( $n = 21$ ) Depression ( $n = 9$ )	<b>Misidentified Rate</b> (False Positive)  Anxiety ( $n = 68$ ) Depression ( $n = 48$ )
Student Not Nominated by Teacher	<b>Miss Rate</b> (False Negative)  Anxiety ( $n = 15$ ) Depression ( $n = 19$ )	<b>Specificity</b> (True Negative)  Anxiety ( $n = 129$ ) Depression ( $n = 157$ )

The overall proportions for anxiety and depression accuracy rates were determined by inserting the numerical values presented in Table 7 into the formulas presented by Green and Zar (1989). The term “true positive” refers to the proportion of students in the sample who were nominated by a teacher and self-reported symptoms in the elevated range, while “false negative” refers to those students who were not nominated by a teacher but did report symptoms in the elevated range. The values for these two proportions sum to 100%. Conversely, the term “false positive” refers to the number of students in the sample who were nominated by a teacher but did not report symptoms in the elevated range, while “true negative” refers to those students who

were not nominated by a teacher and did not self-report symptoms in the elevated range. The values for these two proportions also sum to 100%.

To calculate the overall proportions, subsamples were created within the larger dataset. For each symptom type (anxiety vs. depression), student participants were dichotomized into two groups, (1) those who obtained a *T*-score at or above 60 at both time points and (2) those who obtained a *T*-score below 60 at either time point. Subsamples were created for anxiety based on participants' scores on the MASC 2 and subsamples were also created for depression based on participants' scores on the CDI 2. Each of these subsamples was compared to the corresponding teacher nomination (i.e., yes or no) for anxiety or depression.

The proportion of interest (i.e., sensitivity, miss rate, specificity, misidentified rate) for the overall/combined rate (i.e., accuracy across teachers) was calculated for anxiety and depression, separately, by inserting the values presented in Table 7 into the formula adapted from Green and Zar (1989) for the corresponding anxiety subsample and then for the depression subsample.

Confidence intervals were also constructed around each proportion to further examine the accuracy of teachers in identifying students with elevated levels of anxiety and/or depression. In SAS 9.3, the "binomial" option was added to the "tables" statement when conducting the "FREQ" procedure in order to use the exact or Clopper-Pearson method (Clopper & Pearson, 1934) when constructing the confidence intervals for the proportion:  $p = n_1 / n$ . The following formulae are used by SAS to construct the lower confidence limit

$$p_L = \left( 1 + \frac{n - n_1 + 1}{n_1 F(1 - \alpha/2, 2n_1, 2(n - n_1 + 1))} \right)^{-1}$$

and upper confidence limit

$$p_U = \left( 1 + \frac{n - n_1}{(n_1 + 1) F(\alpha/2, 2(n_1 + 1), 2(n - n_1))} \right)^{-1}$$

where  $F(\alpha, b, c)$  is the  $\alpha$ th percentile of the  $F$  distribution with  $b$  and  $c$  degrees of freedom.

For the interested reader, each individual teacher's accuracy rates for anxiety and depression, as well the corresponding confidence intervals, are summarized in tables presented in Appendices N, O, and P.

**Research question one.** What is the accuracy of combined teacher nominations to identify early adolescents who report elevated levels of anxiety, in regards to: (a) sensitivity, (b) miss rate, (c) specificity, and (d) misidentified rate?

**Sensitivity.** To calculate this sensitivity proportion, a subsample was created for students who reported anxiety symptoms in the elevated range. In this subsample, 21 students obtained MASC 2  $T$ -scores at or above 60 at Time 2 and were nominated by teachers as exhibiting symptoms of anxiety. An additional 15 students scored at or above 60 on the MASC 2 ( $T$ -score) but were not nominated by any of their teachers for anxiety. The following formula, adapted from Green and Zar (1989), was used to calculate the sensitivity proportion:

$$\frac{\text{\# of true positives}}{\text{\# of true positives} + \text{\# of false negatives}}$$

Thus, the overall sensitivity rate for teachers identifying anxiety was calculated as follows:

$$21 / (21+15) = 58.33\%$$

These results suggest that the overall sensitivity rate for using teacher nominations to identify youth with elevated levels of anxiety is 58.33%, meaning that the combined sample of teachers accurately nominated more than one-half of participants who reliably reported elevated anxiety



symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 40.76% and an upper limit of 74.49%. In other words, there is a 95% chance that the true sensitivity of using teacher nominations to identify children with elevated levels of anxiety falls within the range of 40.76% to 74.49%.

**Miss rate.** The overall miss rate for anxiety was calculated from the same subsample that was used to calculate the overall sensitivity rate. The following formula was used (Green & Zar, 1989):

$$\frac{\text{\# of false negatives}}{\text{\# of false negatives} + \text{\# of true positives}}$$

Thus, the overall anxiety miss rate for teachers is:

$$15 / (15+21) = 41.67\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that none of the teachers in the present study nominated nearly one-half of students who self-reported symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 25.51% and an upper limit of 59.24%. In other words, there is a 95% chance that the true miss rate of using teacher nominations to identify children with elevated levels of anxiety falls within the range of 25.51% to 59.24%.

**Specificity.** To calculate this specificity proportion, a different subsample was created for students who did not report anxiety symptoms in the elevated range. In this subsample, 129 of the students who obtained MASC 2 *T*-scores below 60 (i.e., below the elevated range) were correctly not nominated by teachers as exhibiting symptoms of anxiety. An additional 68 students also scored below 60 on the MASC 2 (*T*-score) but were incorrectly nominated by one

or more of their teachers as anxious. The following formula, adapted from Green and Zar (1989), was used to calculate the specificity proportion:

$$\frac{\text{\# of true negatives}}{\text{\# of true negatives + \# of false positives}}$$

Thus, the overall specificity rate for teachers identifying anxiety was calculated as follows:

$$129 / (129+68) = 65.48\%$$

These results suggest that the overall specificity rate for using teacher nominations to identify youth with elevated levels of anxiety is 65.48%, meaning that teachers accurately did not nominate nearly two-thirds of participants who did not report elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 58.39% and an upper limit of 72.10%. In other words, there is a 95% chance that the true specificity of using teacher nominations to identify children with elevated levels of anxiety falls within the range of 58.39% to 72.10%.

**Misidentified rate.** The overall misidentified rate for anxiety was calculated from the same subsample that was used to calculate the overall specificity rate. The following formula was used (Green & Zar, 1989):

$$\frac{\text{\# of false positives}}{\text{\# of false positives + \# of true negatives}}$$

Thus, the overall anxiety misidentified rate for teachers is:

$$68 / (68+129) = 34.52\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that over one-third of students

who did not self-report symptoms of anxiety in the elevated range were incorrectly nominated as anxious by at least one teacher. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 27.90% and an upper limit of 41.61%. In other words, there is a 95% chance that the true misidentified rate of using teacher nominations to identify children with elevated levels of anxiety falls within the range of 27.90% to 41.61%.

**Research question two.** What is the accuracy of combined teacher nominations to identify early adolescents who report elevated levels of depression, in regards to: (a) sensitivity, (b) miss rate, (c) specificity, and (d) misidentified rate?

**Sensitivity.** To calculate this sensitivity proportion, a subsample was created for students who reported depression symptoms in the elevated range. In this subsample, 9 students obtained CDI 2 *T*-scores at or above 60 at Time 2 and were nominated by teachers as exhibiting symptoms of depression. An additional 19 students scored at or above 60 on the CDI 2 (*T*-score) but were not nominated by any of their teachers for depression. The following formula, adapted from Green and Zar (1989), was used to calculate the sensitivity proportion:

$$\frac{\text{\# of true positives}}{\text{\# of true positives} + \text{\# of false negatives}}$$

Thus, the overall sensitivity rate for teachers identifying depression was calculated as follows:

$$9 / (9+19) = 32.14\%$$

These results suggest that the overall sensitivity rate for using teacher nominations to identify youth with elevated levels of depression is 32.14%, meaning that teachers accurately nominated almost one-third of participants who repeatedly reported elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 15.88% and an upper limit of 52.35%. In other words, there is a 95% chance that the true sensitivity of

using teacher nominations to identify children with elevated levels of depression falls within the range of 15.88% to 52.35%.

**Miss rate.** The overall miss rate for depression was calculated from the same subsample that was used to calculate the overall sensitivity rate. The following formula was used (Green & Zar, 1989):

$$\frac{\text{\# of false negatives}}{\text{\# of false negatives} + \text{\# of true positives}}$$

Thus, the overall depression miss rate for teachers is:

$$19 / (19+9) = 67.86\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that teachers in the present study did not nominate nearly two-thirds of students who self-reported symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 47.65% and an upper limit of 84.12%. In other words, there is a 95% chance that the true miss rate of using teacher nominations to identify children with elevated levels of depression falls within the range of 47.65% to 84.12%.

**Specificity.** To calculate this specificity proportion, a different subsample was created for students who did not report depression symptoms in the elevated range. In this subsample, 159 of the students who obtained CDI 2 *T*-scores below 60 (i.e., below the elevated range) were correctly not nominated by teachers as exhibiting symptoms of depression. An additional 49 students also scored below 60 on the CDI 2 (*T*-score) but were incorrectly nominated by one or more of their teachers for depression. The following formula, adapted from Green and Zar

(1989), was used to calculate the specificity proportion:

$$\frac{\text{\# of true negatives}}{\text{\# of true negatives + \# of false positives}}$$

Thus, the overall specificity rate for teachers identifying depression was calculated as follows:

$$157 / (157+48) = 76.59\%$$

These results suggest that the overall specificity rate for using teacher nominations to identify youth with elevated levels of depression is 76.59%, meaning that teachers accurately did not nominate over three-fourths of participants who did not report elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 70.18% and an upper limit of 82.20%. In other words, there is a 95% chance that the true specificity of using teacher nominations to identify children with elevated levels of depression falls within the range of 70.18% to 82.20%.

**Misidentified rate.** The overall misidentified rate for depression was calculated from the same subsample that was used to calculate the overall specificity rate. The following formula was used (Green & Zar, 1989):

$$\frac{\text{\# of false positives}}{\text{\# of false positives + \# of true negatives}}$$

Thus, the overall depression misidentified rate for teachers is:

$$48 / (48+157) = 23.41\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that almost a quarter of students who did not

self-report symptoms of depression in the elevated range were incorrectly nominated as depressed by at least one of their teacher. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 17.80% and an upper limit of 29.82%. In other words, there is a 95% chance that the true misidentified rate of using teacher nominations to identify children with elevated levels of depression falls within the range of 17.80% to 29.82%.

### **School-Based Mental Health Professional Accuracy Rates**

Research questions three and four were addressed by comparing nominations from school-based mental health professionals to students' self-report of anxiety and depression symptoms. Specifically, the percentage of students who were correctly identified (i.e., also self-reported elevated levels of anxiety and/or depression) by a school-based mental health professional was examined. Proportions were calculated for (a) the percentage of students correctly identified by school-based mental health professionals (i.e., sensitivity; mental health professionals nominated students who have a total  $T$ -score  $\geq 60$  on the MASC 2 and/or CDI 2), (b) the percentage of students that school-based mental health professionals incorrectly did not identify (i.e., miss rate; mental health professionals did not nominate students who have a total  $T$ -score  $\geq 60$  on the MASC 2 and/or CDI 2), (c) the percentage of students that school-based mental health professionals correctly did not identify (i.e., specificity; mental health professionals did not nominate students who did not self-report elevated levels of anxiety and/or depression), and (d) the percentage of students incorrectly identified by school-based mental health professionals (i.e., misidentified rate; mental health professionals nominated students who did not self-report elevated levels of anxiety and/or depression).

Five of the six school-based mental health professionals nominated students as a team comprised of the school's one psychologist, three guidance counselors, and one social worker.

The sixth school-based mental health professional (the school nurse) nominated students independently, which reflects the actual practice of the school during universal assessments/considerations of issues pertinent to student mental health. All the school-based mental health professionals were given the option to indicate if they did not know a student by making a checkmark under column titled “I do not know this student”. The team of school-based mental health professionals was instructed to put a checkmark if no one on the team was familiar with a particular student. Collecting these data from school-based mental health professionals allowed the primary investigator to discern between students who were intentionally not nominated by the school-based mental health professionals and those students who the school-based mental health professionals did not know by name (and thus could not appropriately provide their input).

First, the proportions of interest (i.e., sensitivity, miss rate, specificity, misidentified rate) were calculated for anxiety and depression by using nominations from the team of school-based mental health professionals. Then, these same proportions were calculated using nominations from the school nurse. Confidence intervals were also constructed around each proportion to further examine the accuracy of school-based mental health professionals in identifying students with elevated levels of anxiety or depression. In SAS 9.3, the “binomial” option was added to the “tables” statement when conducting the “FREQ” procedure in order to use the exact or Clopper-Pearson method (Clopper & Pearson, 1934) when constructing the confidence intervals for the proportion:  $p = n_1 / n$ . The following formulae are used to construct the lower confidence limit

$$p_L = \left( 1 + \frac{n - n_1 + 1}{n_1 F(1 - \alpha/2, 2n_1, 2(n - n_1 + 1))} \right)^{-1}$$

and upper confidence limit

$$p_U = \left( 1 + \frac{n - n_1}{(n_1 + 1) F(\alpha/2, 2(n_1 + 1), 2(n - n_1))} \right)^{-1}$$

where  $F(\alpha, b, c)$  is the  $\alpha$ th percentile of the  $F$  distribution with  $b$  and  $c$  degrees of freedom.

Table 8 reviews how key terms were defined in the present study, as well as the values that were found for anxiety and depression in this sample of a team of school-based mental health professionals. Note that the total sample of students considered is reduced to 121 (no members of the school mental health team were familiar with the 112 remaining student participants).

Table 8

*Number of Students Identified as Anxious or Depressed Compared to Nominations From Team of School-Based Mental Health Professionals*

	Student self-reported symptoms in the elevated range ( $T$ -score $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( $T$ -score $< 60$ on the MASC 2 or CDI 2)
Student Nominated by Team of School-Based Mental Health Professionals	<b>Sensitivity</b> (True Positive)  Anxiety ( $n = 3$ ) Depression ( $n = 5$ )	<b>Misidentified Rate</b> (False Positive)  Anxiety ( $n = 10$ ) Depression ( $n = 26$ )
Student Not Nominated by Team of School-Based Mental Health Professionals	<b>Miss Rate</b> (False Negative)  Anxiety ( $n = 21$ ) Depression ( $n = 14$ )	<b>Specificity</b> (True Negative)  Anxiety ( $n = 87$ ) Depression ( $n = 76$ )

The overall proportions for anxiety and depression accuracy rates were determined by inserting the numerical values presented in Tables 8 and 9 into the formulas presented by Green and Zar (1989). The term “true positive” refers to the proportion of students in the sample who were nominated by school-based mental health professionals and self-reported symptoms in the



elevated range, while “false negative” refers to those students who were not nominated by school-based mental health professionals but did report symptoms in the elevated range. The values for these two proportions sum to 100%. Conversely, the term “false positive” refers to the number of students in the sample who were nominated by school-based mental health professionals but did not report symptoms in the elevated range, while “true negative” refers to those students who were not nominated by school-based mental health professionals and did not self-report symptoms in the elevated range. The values for these two proportions also sum to 100%.

Table 9 summarizes this information in regards to nominations from the school nurse. Note that the total sample of students considered is reduced to 150 (the nurse was not familiar with the 83 remaining student participants).

Table 9

*Number of Students Identified as Anxious or Depressed Compared to Nominations From School Nurse*

	Student self-reported symptoms in the elevated range ( $T$ -score $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( $T$ -score $< 60$ on the MASC 2 or CDI 2)
Student Nominated by School Nurse	<b>Sensitivity</b> (True Positive)  Anxiety ( $n = 4$ ) Depression ( $n = 3$ )	<b>Misidentified Rate</b> (False Positive)  Anxiety ( $n = 20$ ) Depression ( $n = 23$ )
Student Not Nominated by School Nurse	<b>Miss Rate</b> (False Negative)  Anxiety ( $n = 23$ ) Depression ( $n = 18$ )	<b>Specificity</b> (True Negative)  Anxiety ( $n = 103$ ) Depression ( $n = 106$ )

To calculate the proportions, subsamples were created within the larger dataset. For anxiety and depression, separately, student participants were dichotomized into two groups, (1) those who obtained a *T*-score at or above 60 at both time points and (2) those who obtained a *T*-score below 60 at either time point. Specifically, subsamples were created for anxiety based on participants' scores on the MASC 2 and subsamples were also created for depression based on participants' scores on the CDI 2. Each of these subsamples was compared to the corresponding school-based mental health professional nomination (i.e., yes or no) for anxiety or depression.

**Research question three.** What is the accuracy of the school-based mental health professional team in identifying early adolescents who report elevated levels of anxiety, in regards to: (a) sensitivity, (b) miss rate, (c) specificity, and (d) misidentified rate?

**Sensitivity.** To calculate this sensitivity proportion, the dataset was first reduced to exclude the 112 students who were unknown to the mental health team. Of the remaining 121 student participants, a subsample was then created for students who reported anxiety symptoms in the elevated range. In this subsample, three students obtained MASC 2 *T*-scores at or above 60 at Time 2 and were nominated by the team of school-based mental health (SBMH) professionals as exhibiting symptoms of anxiety. An additional 21 students scored at or above 60 on the MASC 2 (*T*-score) but were not nominated by the team of SBMH professionals for anxiety. The overall sensitivity rate for the team of SBMH professionals identifying anxiety was calculated as follows:

$$3 / (3+21) = 12.5\%$$

These results suggest that the overall sensitivity rate for using nominations from a team of SBMH professionals to identify youth with elevated levels of anxiety is 12.5%, meaning that the team of SBMH professionals accurately nominated one eighth of participants who reliably

reported elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 2.66% and an upper limit of 32.36%. In other words, there is a 95% chance that the true sensitivity of using SBMH professional team nominations to identify children with elevated levels of anxiety falls within the range of 2.66% to 32.36%.

**Miss rate.** The overall miss rate for anxiety was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall anxiety miss rate for the SBMH professional team is:

$$21 / (21+3) = 87.5\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that the team of SBMH professionals in the present study did not nominate over seven-eighths of students who self-reported symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 67.64% and an upper limit of 97.34%. In other words, there is a 95% chance that the true miss rate of using SBMH team nominations to identify children with elevated levels of anxiety falls within the range of 67.64% to 97.34%.

**Specificity.** To calculate this specificity proportion, the subsample of students known to the SBMH team but who did not report anxiety symptoms in the elevated range was considered. In this subsample, 87 of the students who obtained MASC 2 *T*-scores below 60 (i.e., below the elevated range) were correctly not nominated by the team of SBMH professionals as exhibiting symptoms of anxiety. Ten students also scored below 60 on the MASC 2 (*T*-score) were incorrectly nominated by the SBMH professional team for anxiety. The overall specificity rate for the SBMH professional team in identifying anxiety was calculated as follows:

$$87 / (87+10) = 89.69\%$$

These results suggest that the overall specificity rate for using SBMH professional team nominations to identify youth with elevated levels of anxiety is 89.69%, meaning that teachers accurately did not nominate most participants who did not report elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 81.86% and an upper limit of 94.94%. In other words, there is a 95% chance that the true specificity of using SBMH professional team nominations to identify children with elevated levels of anxiety falls within the range of 81.86% to 94.94%.

**Misidentified rate.** The overall misidentified rate for anxiety was calculated from the same subsample that was used to calculate the overall specificity rate. The overall anxiety misidentified rate for the SBMH professional team is:

$$10 / (10+87) = 10.31\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the SBMH professional team in the present study incorrectly nominated around one-tenth of students who did not self-report symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 5.06% and an upper limit of 18.14%. In other words, there is a 95% chance that the true misidentified rate of using SBMH professional team nominations to identify children with elevated levels of anxiety falls within the range of 5.06% to 18.14%.

**Anxiety accuracy rates of school nurse.** The dataset was first reduced to exclude the 83 students who were unknown to the nurse. Of the remaining 150 student participants, a separate subsample was created for students who reported anxiety symptoms in the elevated range. In this subsample, four students obtained MASC 2 *T*-scores at or above 60 at Time 2 and were nominated by the school nurse as exhibiting symptoms of anxiety. An additional 23 students

scored at or above 60 on the MASC 2 (*T*-score) but were not nominated by the school nurse for anxiety.

**Sensitivity.** The school nurse's sensitivity rate was calculated as follows:

$$4 / (4+23) = 14.81\%$$

These results suggest that the sensitivity rate for using nominations from the school nurse to identify youth with elevated levels of anxiety is 14.81%, meaning that the school nurse accurately nominated less than one-sixth of participants who reliably reported elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 4.19% and an upper limit of 33.73%. In other words, there is a 95% chance that the true sensitivity of using school nurse nominations to identify children with elevated levels of anxiety falls within the range of 4.19% to 33.73%.

**Miss rate.** The overall miss rate for anxiety was calculated from the same subsample that was used to calculate the overall sensitivity rate. The miss rate for the school nurse is:

$$23 / (23+4) = 85.19\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that school nurse in the present study did not nominate the majority of students who self-reported symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 66.27% and an upper limit of 95.81%. In other words, there is a 95% chance that the true miss rate of using school nurse nominations to identify children with elevated levels of anxiety falls within the range of 66.27% to 95.81%.

**Specificity.** A different subsample was created for students who did not report anxiety symptoms in the elevated range. In this subsample, 103 of the students who obtained MASC 2 *T*-

scores below 60 (i.e., below the elevated range) were correctly not nominated by the school nurse as exhibiting symptoms of anxiety. Twenty students also scored below 60 on the MASC 2 (T-score) but were incorrectly nominated by the school nurse for anxiety. The specificity rate for the nurse in identifying anxiety was calculated as follows:

$$103 / (103+20) = 83.74\%$$

These results suggest that the specificity rate for using school nurse nominations to identify youth with elevated levels of anxiety is 83.74%, meaning that teachers accurately did not nominate about five-sixths of participants who did not report elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 76.01% and an upper limit of 89.78%. In other words, there is a 95% chance that the true specificity of using school nurse nominations to identify children with elevated levels of anxiety falls within the range of 76.01% to 89.78%.

**Misidentified rate.** The overall misidentified rate for anxiety was calculated from the same subsample that was used to calculate the overall specificity rate. The anxiety misidentified rate for the school nurse is:

$$20 / (20+103) = 16.26\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the school nurse in the present study incorrectly nominated approximately one-sixth of students who did not self-report symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 10.22% and an upper limit of 23.99%. In other words, there is a 95% chance that the true misidentified rate of using school nurse nominations to identify children with elevated levels of anxiety falls within the range of 10.22% to 23.99%.

Table 10 summarizes the proportion of students who reported elevated levels of anxiety, as rated by the team of school-based mental health professionals and by the school nurse, separately. Specifically, school-based mental health professionals' frequency (and percentage) of true positives, false negatives, true negatives, and false positives is provided. This table also presents the number of students that school-based mental health professionals knew, as well as the number of students that were nominated for anxiety.

Table 10

*Comparison of Student and School-Based Mental Health Professional Report of Elevated Anxiety Symptoms*

SBMH Professional	# of Participants with MASC 2 T-Score $\geq$ 60 at Time 2	# of Participants Known by SBMH Professional	# of Participants Nominated by SBMH Professional for Anxiety	# of True Positives (Sensitivity)	# of False Negatives (Missed)	# of True Negatives (Specificity)	# of False Positives (Misidentified)
Standing School Mental Health Team	36	121	13	3 (12.50%)	21 (87.50%)	87 (89.69%)	10 (10.31%)
School Nurse	36	150	24	4 (14.81%)	23 (85.19%)	103 (83.74%)	20 (16.26%)

*Note.* SBMH=School-Based Mental Health Professional; MASC 2=Multidimensional Anxiety Scale for Children, Second Edition.

**Research question four.** What is the accuracy of the school-based mental health professional team in identifying early adolescents who report elevated levels of depression, in regards to: (a) sensitivity, (b) miss rate, (c) specificity, and (d) misidentified rate?

**Sensitivity.** To calculate this sensitivity proportion, a dataset was first reduced to exclude the 112 students who were unknown to the school-based mental health team. Of the remaining 121 student participants, a subsample was then created for students who reported depression symptoms in the elevated range. In this subsample, five students obtained CDI 2 T-scores at or above 60 at Time 2 and were nominated by the team of school-based mental health (SBMH)

professionals as exhibiting symptoms of depression. An additional 14 students scored at or above 60 on the CDI 2 (*T*-score) but were not nominated by the team of SBMH professionals for depression. The overall sensitivity rate for the team of SBMH professionals identifying depression was calculated as follows:

$$5 / (5+14) = 26.32\%$$

These results suggest that the overall sensitivity rate for using nominations from a team of SBMH professionals to identify youth with elevated levels of depression is 26.32%, meaning that the team of SBMH professionals accurately nominated over one-fourth of participants who reliably reported elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 9.15% and an upper limit of 51.20%. In other words, there is a 95% chance that the true sensitivity of using nominations from a SBMH professional team to identify children with elevated levels of depression falls within the range of 9.15% to 51.20%.

**Miss rate.** The overall miss rate for depression was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall depression miss rate for the SBMH professional team is:

$$14 / (14+5) = 73.68\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that the team of SBMH professionals in the present study did not nominate nearly three-fourths of students who self-reported symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 48.80% and an upper limit of 90.85%. In other words, there is a 95% chance that



the true miss rate of using SBMH team nominations to identify children with elevated levels of depression falls within the range of 48.80% to 90.85%.

**Specificity.** To calculate this specificity proportion, a different subsample was created for students who did not report depression symptoms in the elevated range. In this subsample, 76 of the students who obtained CDI 2 *T*-scores below 60 (i.e., low to high average range) were correctly not nominated by the team of SBMH professionals as exhibiting symptoms of depression. Twenty-six students also scored below 60 on the CDI 2 (*T*-score) but were incorrectly nominated by the SBMH professional team for depression. The overall specificity rate for the SBMH professional team in identifying depression was calculated as follows:

$$76 / (76+26) = 74.51\%$$

These results suggest that the overall specificity rate for using SBMH professional team nominations to identify youth with elevated levels of depression is 74.51%, meaning that teachers accurately did not nominate approximately three-fourths of participants who did not report elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 64.92% and an upper limit of 82.62%. In other words, there is a 95% chance that the true specificity of using SBMH professional team nominations to identify children with elevated levels of depression falls within the range of 64.92% to 82.62%.

**Misidentified rate.** The overall misidentified rate for depression was calculated from the same subsample that was used to calculate the overall specificity rate. The overall depression misidentified rate for the SBMH professional team is:

$$26 / (26+76) = 25.49\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the SBMH professional team in the present

study incorrectly nominated approximately a quarter of students who did not self-report symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 17.38% and an upper limit of 35.08%. In other words, there is a 95% chance that the true misidentified rate of using SBMH professional team nominations to identify children with elevated levels of depression falls within the range of 17.38% to 35.08%.

**Depression accuracy rates of school nurse.** The dataset was first reduced to exclude the 83 students who were not known to the school nurse. Of the remaining 150 student participants, a separate subsample was created for students who reported depression symptoms in the elevated range. In this subsample, three students obtained CDI 2 *T*-scores at or above 60 at Time 2 and were nominated by the school nurse as exhibiting symptoms of depression. An additional 18 students scored at or above 60 on the CDI 2 (*T*-score) but were not nominated by the school nurse for depression.

**Sensitivity.** The school nurse's sensitivity rate was calculated as follows:

$$3 / (3+18) = 14.29\%$$

These results suggest that the sensitivity rate for using nominations from the school nurse to identify youth with elevated levels of depression is 14.29%, meaning that the school nurse accurately nominated less than one-sixth of participants who reliably reported elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 3.05% and an upper limit of 36.34%. In other words, there is a 95% chance that the true sensitivity of using school nurse nominations to identify children with elevated levels of depression falls within the range of 3.05% to 36.34%.

**Miss rate.** The overall miss rate for depression was calculated from the same subsample that was used to calculate the overall sensitivity rate. The miss rate for the school nurse is:

$$18 / (18+3) = 85.71\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that school nurse in the present study did not nominate over five-sixths of students who self-reported symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 63.66% and an upper limit of 96.95%. In other words, there is a 95% chance that the true miss rate of using school nurse nominations to identify children with elevated levels of depression falls within the range of 63.66% to 96.95%.

**Specificity.** To calculate this specificity proportion, a different subsample was created for students who did not report depression symptoms in the elevated range. In this subsample, 106 of the students who obtained CDI 2 *T*-scores below 60 (i.e., low to high average range) were correctly not nominated by the school nurse as exhibiting symptoms of depression. An additional 23 students also scored below 60 on the CDI 2 (*T*-score) but were incorrectly nominated by the school nurse for depression. The specificity rate for the school nurse in identifying depression was calculated as follows:

$$106 / (106+23) = 82.17\%$$

These results suggest that the specificity rate for using school nurse nominations to identify youth with elevated levels of depression is 82.17%, meaning that the school nurse at this particular school accurately did not nominate over the majority participants who did not report elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 74.46% and an upper limit of 88.35%. In other words, there

is a 95% chance that the true specificity of using school nurse nominations to identify children with elevated levels of depression falls within the range of 74.46% to 88.35%.

**Misidentified rate.** The overall misidentified rate for depression was calculated from the same subsample that was used to calculate the overall specificity rate. The depression misidentified rate for the school nurse is:

$$23 / (23 + 106) = 17.83\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the school nurse in the present study incorrectly nominated approximately one-fifth of students who did not self-report symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 11.65% and an upper limit of 25.54%. In other words, there is a 95% chance that the true misidentified rate of using school nurse nominations to identify children with elevated levels of depression falls within the range of 11.65% to 25.54%.

Table 11 summarizes the proportion of students who reported elevated levels of depression, as rated by the team of school mental health professionals and by the nurse, separately. Specifically, school-based mental health professionals' frequency (and percentage) of true positives, false negatives, true negatives, and false positives is provided. This table also presents the number of students that school-based mental health professionals knew, as well as the number of students that were nominated for depression.

### **Teacher Accuracy Rates by a Single Rater (Teachers within a Subject Area)**

The fifth research question was addressed by comparing nominations from specific teacher groups (i.e., language arts, math, social studies teacher) to students' self-report of anxiety and depression symptoms. Specifically, the percentage of teachers in each subject area that

accurately identified students who self-reported symptoms of anxiety or depression in the elevated range was examined. Teachers were examined by subject in line with how an authentic education setting may proceed. For example, all language arts teachers may be asked to nominate students in order to ensure that all students within a grade are considered. Thus, all students in a grade level would be considered by a teacher of a core subject area. Typically, multiple teachers in a school have responsibility for a single core subject, thus the ratings of this small group of teachers would be pooled in order to permit reflection on all students in different sections of that academic area.

Table 11

*Comparison of Student and School-Based Mental Health Professional Report of Elevated Depression Symptoms*

SBMH Professional	# of Participants with CDI 2 T-Score $\geq$ 60 at Time 2	# of Participants Known by SBMH Professional	# of Participants Nominated by SBMH Professional for Depression	# of True Positives (Sensitivity)	# of False Negatives (Missed)	# of True Negatives (Specificity)	# of False Positives (Misidentified)
Standing School Mental Health Team	28	121	31	5 (26.32%)	14 (73.68%)	76 (74.51%)	26 (25.49%)
School Nurse	28	150	26	3 (14.29%)	18 (85.71%)	106 (82.17%)	23 (17.83%)

Note. SBMH=School-Based Mental Health Professional; CDI 2=Children's Depression Inventory, Second Edition

These proportions were examined in a subset of 185 students who had been considered in the nomination procedure by teachers in all three core subjects: language arts, math, and social studies. For teachers in each subject type, pooled proportions (i.e., across the small number of teachers of that subject) were calculated for (a) the percentage of students correctly identified by teachers (i.e., sensitivity; teacher nominated students who have a total T-score  $\geq$  60 on the MASC 2 and/or CDI 2), (b) the percentage of students that teachers incorrectly did not identify

(i.e., miss rate; teacher did not nominate students who have a total  $T$ -score  $\geq 60$  on the MASC 2 and/or CDI 2), (c) the percentage of students that teachers correctly did not identify (i.e., specificity; teacher did not nominate students who did not self-report elevated levels of anxiety and/or depression), and (d) the percentage of students incorrectly identified by teachers (i.e., misidentified rate; teachers nominated students who did not self-report elevated levels of anxiety and/or depression). First, the proportions of interest (i.e., sensitivity, miss rate, specificity, misidentified rate) were calculated for anxiety and depression by using nominations from each subject area of teachers. Then, these same proportions were calculated using nominations from the overall group of teachers for this subset of students. In order to compare the accuracy from the combined nominations from three subject areas with each single subject area (i.e., Language Arts, Math, Social Studies), the values from research questions 1 and 2 could not be referenced due to the sample size differences (i.e., of the 233 students, only 185 were considered by the teachers of their Language Arts, Math, and Social Studies classes). Thus, the combined proportions had to be calculated for this research question, as the sample of interest is limited to a subset of students from the overall sample. Confidence intervals were also constructed around each proportion to further examine the accuracy of teachers in identifying students with elevated levels of anxiety or depression. In SAS 9.3, the “binomial” option was added to the “tables” statement when conducting the “FREQ” procedure in order to use the exact or Clopper-Pearson method (Clopper & Pearson, 1934) when constructing the confidence intervals for the proportion:  $p = n_1 / n$ . The following formulae are used by SAS to construct the lower confidence limit

$$p_L = \left( 1 + \frac{n - n_1 + 1}{n_1 F(1 - \alpha/2, 2n_1, 2(n - n_1 + 1))} \right)^{-1}$$

and upper confidence limit

$$p_U = \left( 1 + \frac{n - n_1}{(n_1 + 1) F(\alpha/2, 2(n_1 + 1), 2(n - n_1))} \right)^{-1}$$

where  $F(\alpha, b, c)$  is the  $\alpha$ th percentile of the  $F$  distribution with  $b$  and  $c$  degrees of freedom.

Table 12

*Number of Students Identified as Anxious or Depressed Compared to Nominations From Language Arts Teachers*

	Student self-reported symptoms in the elevated range ( $T$ -score $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( $T$ -score $< 60$ on the MASC 2 or CDI 2)
Student Nominated by Language Arts Teacher	<b>Sensitivity</b> (True Positive)  Anxiety ( $n = 13$ ) Depression ( $n = 4$ )	<b>Misidentified Rate</b> (False Positive)  Anxiety ( $n = 29$ ) Depression ( $n = 18$ )
Student Not Nominated by Language Arts Teacher	<b>Miss Rate</b> (False Negative)  Anxiety ( $n = 19$ ) Depression ( $n = 20$ )	<b>Specificity</b> (True Negative)  Anxiety ( $n = 124$ ) Depression ( $n = 143$ )

Tables 12, 13, 14, and 15 review how key terms were defined in the present study, as well as the values that were found for anxiety and depression in this sample of teachers by subject area. The total sample of 233 was reduced to 185 students for these analyses. The overall proportions for anxiety and depression accuracy rates were determined by inserting the numerical values presented in Tables 12, 13, 14, and 15 into the formulas presented by Green and Zar (1989). Cell definitions, methodology (i.e., creation of subgroups of symptomatic vs. non-symptomatic based on student participants' responses to the MASC 2 and CDI 2), and

formulas used to yield the results in this section are the same as those established in prior research questions.

Table 13

*Number of Students Identified as Anxious or Depressed Compared to Nominations From Math Teachers*

	Student self-reported symptoms in the elevated range ( $T$ -score $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( $T$ -score $< 60$ on the MASC 2 or CDI 2)
Student Nominated by Math Teacher	<b>Sensitivity</b> (True Positive)  Anxiety ( $n = 10$ ) Depression ( $n = 4$ )	<b>Misidentified Rate</b> (False Positive)  Anxiety ( $n = 28$ ) Depression ( $n = 20$ )
Student Not Nominated by Math Teacher	<b>Miss Rate</b> (False Negative)  Anxiety ( $n = 22$ ) Depression ( $n = 20$ )	<b>Specificity</b> (True Negative)  Anxiety ( $n = 125$ ) Depression ( $n = 141$ )

**Accuracy of language arts teachers in identifying anxiety.** Within the subsample of students who repeatedly reported elevated anxiety symptoms, 13 students obtained MASC 2  $T$ -scores at or above 60 at Time 2 and were nominated by the subset of teachers as exhibiting symptoms of anxiety. Nineteen students scored at or above 60 on the MASC 2 ( $T$ -score) but were not nominated by this subset of teachers for anxiety.

**Sensitivity.** The overall sensitivity rate for language arts teachers identifying anxiety was calculated as follows:

$$13 / (13+19) = 40.63\%$$

These results suggest that the sensitivity rate for using nominations from language arts teachers to identify youth with elevated levels of anxiety is 40.63%, meaning that language arts teachers



accurately nominated approximately over a third of participants who reliably reported elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 23.70% and an upper limit of 59.36%. In other words, there is a 95% chance that the true sensitivity of using language arts teachers' nominations to identify children with elevated levels of anxiety falls within the range of 23.70% to 59.36%.

Table 14

*Number of Students Identified as Anxious or Depressed Compared to Nominations From Social Studies Teachers*

	Student self-reported symptoms in the elevated range ( $T$ -score $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( $T$ -score $< 60$ on the MASC 2 or CDI 2)
Student Nominated by Social Studies Teacher	<b>Sensitivity</b> (True Positive)  Anxiety ( $n = 2$ ) Depression ( $n = 1$ )	<b>Misidentified Rate</b> (False Positive)  Anxiety ( $n = 5$ ) Depression ( $n = 6$ )
Student Not Nominated by Social Studies Teacher	<b>Miss Rate</b> (False Negative)  Anxiety ( $n = 30$ ) Depression ( $n = 23$ )	<b>Specificity</b> (True Negative)  Anxiety ( $n = 148$ ) Depression ( $n = 156$ )

**Miss rate.** The overall miss rate for anxiety was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall anxiety miss rate for language arts teachers is:

$$19 / (19+13) = 59.38\%$$

The miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that language arts teachers in the present study did not nominate over one-half of students who self-reported symptoms of anxiety in the elevated range.

A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 40.64% and an upper limit of 76.30%. In other words, there is a 95% chance that the true miss rate of using nominations from language arts teachers to identify children with elevated levels of anxiety falls within the range of 40.64% to 76.30%.

Table 15

*Number of Subset of Students Identified as Anxious or Depressed Compared to Nominations From Teachers*

	Student self-reported symptoms in the elevated range ( $T$ -score $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( $T$ -score $< 60$ on the MASC 2 or CDI 2)
Student Nominated by Teacher	<b>Sensitivity</b> (True Positive)  Anxiety ( $n = 19$ ) Depression ( $n = 7$ )	<b>Misidentified Rate</b> (False Positive)  Anxiety ( $n = 53$ ) Depression ( $n = 37$ )
Student Not Nominated by Teacher	<b>Miss Rate</b> (False Negative)  Anxiety ( $n = 13$ ) Depression ( $n = 17$ )	<b>Specificity</b> (True Negative)  Anxiety ( $n = 100$ ) Depression ( $n = 124$ )

**Specificity.** Within the subsample of students who denied elevated anxiety symptoms, 124 of the students who obtained MASC 2  $T$ -scores below 60 (i.e., below the elevated range) were correctly not nominated by language arts teachers as exhibiting symptoms of anxiety. Twenty-nine students also scored below 60 on the MASC 2 ( $T$ -score) but were incorrectly nominated by language arts teachers for anxiety. The overall specificity rate for language arts teachers in identifying anxiety was calculated as follows:

$$124 / (124+29) = 81.05\%$$

These results suggest that the overall specificity rate for using language arts teachers' nominations to identify youth with elevated levels of anxiety is 81.05%, meaning that teachers accurately did not nominate the majority of participants who did not report elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 73.93% and an upper limit of 86.92%. In other words, there is a 95% chance that the true specificity of using language arts teachers' nominations to identify children with elevated levels of anxiety falls within the range of 73.93% to 86.92%.

**Misidentified rate.** The overall misidentified rate for anxiety was calculated from the same subsample that was used to calculate the overall specificity rate. The overall anxiety misidentified rate for language arts teachers is:

$$29 / (29 + 124) = 18.95\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the language arts teachers in the present study incorrectly nominated one-fifth of students who did not self-report symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 13.08% and an upper limit of 26.07%. In other words, there is a 95% chance that the true misidentified rate of using language arts teachers' nominations to identify children with elevated levels of anxiety falls within the range of 13.08% to 26.07%.

**Accuracy of math teachers in identifying anxiety.** Within the subsample of students who repeatedly reported elevated anxiety symptoms, 10 students obtained MASC 2 *T*-scores at or above 60 at Time 2 and were nominated by the subset of teachers as exhibiting symptoms of anxiety. Twenty-two students scored at or above 60 on the MASC 2 (*T*-score) but were not nominated by this subset of teachers for anxiety.

**Sensitivity.** The overall sensitivity rate for math teachers identifying anxiety was calculated as follows:

$$10 / (10+22) = 31.25\%$$

These results suggest that the sensitivity rate for using nominations from math teachers to identify youth with elevated levels of anxiety is 31.25%, meaning math teachers accurately nominated approximately one-third of participants who reliably reported elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 16.12% and an upper limit of 50.01%. In other words, there is a 95% chance that the true sensitivity of using math teachers' nominations to identify children with elevated levels of anxiety falls within the range of 16.12% to 50.01%.

**Miss rate.** The overall miss rate for anxiety was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall anxiety miss rate for math teachers is:

$$22 / (22+10) = 68.75\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that math teachers in the present study did not nominate nearly two-thirds of students who self-reported symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 49.99% and an upper limit of 83.88%. In other words, there is a 95% chance that the true miss rate of using nominations from math teachers to identify children with elevated levels of anxiety falls within the range of 49.99% to 83.88%.

**Specificity.** Within the subsample of students who denied elevated anxiety symptoms, 125 of the students who obtained MASC 2 *T*-scores below 60 (i.e., below the elevated range)

were correctly not nominated by math teachers as exhibiting symptoms of anxiety. Twenty-eight students also scored below 60 on the MASC 2 (*T*-score) but were incorrectly nominated by math teachers for anxiety. The overall specificity rate for math teachers in identifying anxiety was calculated as follows:

$$125 / (125+28) = 81.70\%$$

These results suggest that the overall specificity rate for using math teachers' nominations to identify youth with elevated levels of anxiety is 81.70%, meaning that teachers accurately did not nominate most of the participants who did not report elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 74.65% and an upper limit of 87.48%. In other words, there is a 95% chance that the true specificity of using math teachers' nominations to identify children with elevated levels of anxiety falls within the range of 74.65% to 87.48%.

***Misidentified rate.*** The overall misidentified rate for anxiety was calculated from the same subsample that was used to calculate the overall specificity rate. The overall anxiety misidentified rate for math teachers is:

$$28 / (28+125) = 18.30\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the math teachers in the present study incorrectly nominated almost one-fifth of students who did not self-report symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 12.52% and an upper limit of 25.35%. In other words, there is a 95% chance that the true misidentified rate of using math teachers' nominations to identify children with elevated levels of anxiety falls within the range of 12.52% to 25.35%.

**Accuracy of social studies teachers in identifying anxiety.** Within the subsample of students who repeatedly reported elevated anxiety symptoms, two students obtained MASC 2 *T*-scores at or above 60 at Time 2 and were nominated by the subset of social studies teachers as exhibiting symptoms of anxiety. Thirty students scored at or above 60 on the MASC 2 (*T*-score) but were not nominated by this subset of teachers for anxiety.

**Sensitivity.** The overall sensitivity rate for social studies teachers identifying anxiety was calculated as follows:

$$2 / (2+30) = 6.25\%$$

These results suggest that the sensitivity rate for using nominations from social studies teachers to identify youth with elevated levels of anxiety is 6.25%, meaning social studies teachers accurately nominated a small number of participants who reliably reported elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 0.77% and an upper limit of 20.81%. In other words, there is a 95% chance that the true sensitivity of using social studies teachers' nominations to identify children with elevated levels of anxiety falls within the range of 0.77% to 20.81%.

**Miss rate.** The overall miss rate for anxiety was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall anxiety miss rate for social studies teachers is:

$$30 / (30+2) = 93.75\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that social studies teachers in the present study did not nominate most students who self-reported symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of

79.19% and an upper limit of 99.23%. In other words, there is a 95% chance that the true miss rate of using nominations from social studies teachers to identify children with elevated levels of anxiety falls within the range of 79.19% to 99.23%.

**Specificity.** Within the subsample of students who denied elevated anxiety symptoms, 148 of the students who obtained MASC 2 *T*-scores below 60 (i.e., below the elevated range) were correctly not nominated by social studies teachers as exhibiting symptoms of anxiety. Five students also scored below 60 on the MASC 2 (*T*-score) but were incorrectly nominated by social studies teachers for anxiety. The overall specificity rate for social studies teachers in identifying anxiety was calculated as follows:

$$148 / (148+5) = 96.73\%$$

These results suggest that the overall specificity rate for using social studies teachers' nominations to identify youth with elevated levels of anxiety is 96.73%, meaning that teachers accurately did not nominate most participants who did not report elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 92.54% and an upper limit of 98.93%. In other words, there is a 95% chance that the true sensitivity of using social studies teachers' nominations to identify children with elevated levels of anxiety falls within the range of 92.54% to 98.93%.

**Misidentified rate.** The overall misidentified rate for anxiety was calculated from the same subsample that was used to calculate the overall specificity rate. The overall anxiety misidentified rate for social studies teachers is:

$$5 / (5+148) = 3.27\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the social studies teachers in the present

study incorrectly nominated a small number of students who did not self-report symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 1.07% and an upper limit of 7.46%. In other words, there is a 95% chance that the true misidentified rate of using social studies teachers' nominations to identify children with elevated levels of anxiety falls within the range of 1.07% to 7.46%.

**Overall accuracy of teachers in identifying anxiety with subset of students.** Within the subsample of 185 eligible students (i.e., presence of corresponding nomination data from a language arts, math, and social studies teacher) who repeatedly reported elevated anxiety symptoms, 19 students obtained MASC 2 *T*-scores at or above 60 at Time 2 and were nominated by teachers as exhibiting symptoms of depression. Thirteen students scored at or above 60 on the MASC 2 (*T*-score) but were not nominated by teachers for depression. Note: in this set of analyses, only the nomination data from the three teachers of core courses were considered; nomination data from additional teachers, such as homeroom teachers and ESE specialists who co-teach in some core classes, were excluded in order to permit focus of the collective perceptions of the primary teachers of the three core subject areas.

**Sensitivity.** The overall sensitivity rate for teachers identifying anxiety was calculated as follows:

$$19 / (19+13) = 59.38\%$$

These results suggest that the overall sensitivity rate for using nominations from teachers to identify youth with elevated levels of anxiety is 59.38%, meaning that teachers accurately nominated over half of this subset of participants who reliably reported elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 40.64% and an upper limit of 76.30%. In other words, there is a 95% chance that



the true sensitivity of using these teacher nominations to identify children within this subset with elevated levels of anxiety falls within the range of 40.64% to 76.30%.

**Miss rate.** The overall miss rate for anxiety was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall anxiety miss rate for teachers is:

$$13 / (13+19) = 40.63\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that the teachers in the present study did not nominate over a third of this subset of students who self-reported symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 23.70% and an upper limit of 59.36%. In other words, there is a 95% chance that the true miss rate of using teacher nominations to identify children within this subset with elevated levels of anxiety falls within the range of 23.70% to 59.36%.

**Specificity.** Within the subsample of students who denied elevated anxiety symptoms, 100 of the students who obtained MASC 2 *T*-scores below 60 (i.e., below the elevated range) were correctly not nominated by teachers as exhibiting symptoms of anxiety. Fifty-three students also scored below 60 on the MASC 2 (*T*-score) but were incorrectly nominated by teachers for anxiety. The overall specificity rate for teachers in identifying anxiety among this subset of students was calculated as follows:

$$100 / (100+53) = 65.36\%$$

These results suggest that the overall specificity rate for using teacher nominations to identify this subset of youth with elevated levels of anxiety is 65.36%, meaning that teachers accurately did not nominate nearly two-thirds participants who did not report elevated anxiety symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of

57.25% and an upper limit of 72.86%. In other words, there is a 95% chance that the true specificity of using teacher to identify children within this subset with elevated levels of anxiety falls within the range of 57.25% to 72.86%.

**Misidentified rate.** The overall misidentified rate for anxiety was calculated from the same subsample that was used to calculate the overall specificity rate. The overall anxiety misidentified rate for teachers is:

$$53 / (53+100) = 34.64\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the teachers in the present study incorrectly nominated over one-third of this subset of students who did not self-report symptoms of anxiety in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 27.14% and an upper limit of 42.75%. In other words, there is a 95% chance that the true misidentified rate of using teacher nominations to identify children within this subset with elevated levels of anxiety falls within the range of 27.14% to 42.75%.

Data comparing the number of student participants self-reporting elevated anxiety symptoms with the number of participants nominated for anxiety by subject area teachers are presented in Table 16. The confidence intervals that were constructed around each proportion are also presented in this table.

**Accuracy of language arts teachers in identifying depression.** To calculate the accuracy rates of language arts teachers, a separate subsample was created for students who reported depression symptoms in the elevated range. In this subsample, four students obtained CDI 2 *T*-scores at or above 60 at Time 2 and were nominated by the subset of teachers as

exhibiting symptoms of depression. Twenty students also scored at or above 60 on the CDI 2 (*T*-score) but were not nominated by this subset of teachers for depression.

***Sensitivity.*** The overall sensitivity rate for language arts teachers identifying depression was calculated as follows:

$$4 / (4+20) = 16.67\%$$

These results suggest that the sensitivity rate for using nominations from language arts teachers to identify youth with elevated levels of depression is 16.67%, meaning that language arts teachers accurately nominated less than one-fifth of participants who reliably reported elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 4.74% and an upper limit of 37.38%. In other words, there is a 95% chance that the true sensitivity of using language arts teachers' nominations to identify children with elevated levels of depression falls within the range of 4.74% to 37.38%.

***Miss rate.*** The overall depression miss rate for language arts teachers is:

$$20 / (20+4) = 83.33\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that language arts teachers in the present study did not nominate most students who self-reported symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 62.62% and an upper limit of 95.26%. In other words, there is a 95% chance that the true miss rate of using nominations from language arts teachers to identify children with elevated levels of depression falls within the range of 62.62% to 95.26%.

Table 16

*Comparison of Student and Teacher Report of Elevated Anxiety Symptoms by Subject Area (N = 185 Students)*

Teacher Group	Participants	# of Participants with MASC 2 T-Score $\geq$ 60 at Time 2	# of Participants Teachers Nominated for Anxiety	# of True Positives	# of False Negatives	# of True Negatives	# of False Positives
Language Arts	185	32	42	13 (40.63%)	19 (59.38%)	124 (81.05%)	29 (18.95%)
95% CI				23.70%-59.36%	40.64%-76.30%	73.93%-86.92%	13.08%-26.07%
Math	185	32	38	10 (31.25%)	22 (68.75%)	125 (81.70%)	28 (18.30%)
95% CI				16.12%-50.01%	49.99%-83.88%	74.65%-87.48%	12.52%-25.35%
Social Studies	185	32	7	2 (6.25%)	30 (93.75%)	148 (96.73%)	5 (3.27%)
95% CI				0.77%-20.81%	79.19%-99.23%	92.54%-98.93%	1.07%-7.46%
Overall	185	32	72	19 (59.38%)	13 (40.63%)	100 (65.36%)	53 (34.64%)
95% CI				40.64%-76.30%	23.70%-59.36%	57.25%-72.86%	27.14%-42.75%

Note. MASC 2= Multidimensional Anxiety Scale for Children, Second Edition. CI=Confidence Interval.

**Specificity.** Within the subsample of students who denied elevated depression symptoms, 143 of the students who obtained CDI 2 *T*-scores below 60 (i.e., below the elevated range) were correctly not nominated by language arts teachers as exhibiting symptoms of depression. Eighteen students also scored below 60 on the CDI 2 (*T*-score) but were incorrectly nominated by language arts teachers for depression. The overall specificity rate for language arts teachers in identifying depression was calculated as follows:

$$143 / (143+18) = 88.82\%$$

These results suggest that the overall specificity rate for using language arts teachers' nominations to identify youth with elevated levels of depression is 88.82%, meaning that teachers accurately did not nominate most participants who did not report elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 82.91% and an upper limit of 93.24%. In other words, there is a 95% chance that the true specificity of using language arts teachers' nominations to identify children with elevated levels of depression falls within the range of 82.91% to 93.24%.

**Misidentified rate.** The overall misidentified rate for depression was calculated from the same subsample that was used to calculate the overall specificity rate. The overall depression misidentified rate for language arts teachers is:

$$18 / (18+143) = 11.18\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the language arts teachers in the present study incorrectly nominated approximately one-tenth of students who did not self-report symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 6.76% and an upper limit of 17.09%. In

other words, there is a 95% chance that the true misidentified rate of using language arts teachers' nominations to identify children with elevated levels of depression falls within the range of 6.76% to 17.09%.

**Accuracy of math teachers in identifying depression.** Within the subsample of students who repeatedly reported elevated depression symptoms, four students obtained CDI 2 *T*-scores at or above 60 at Time 2 and were nominated by the subset of teachers as exhibiting symptoms of depression. Twenty students also scored at or above 60 on the CDI 2 (*T*-score) but were not nominated by this subset of teachers for depression.

**Sensitivity.** The overall sensitivity rate for math teachers identifying depression was calculated as follows:

$$4 / (4+20) = 16.67\%$$

These results suggest that the sensitivity rate for using nominations from math teachers to identify youth with elevated levels of depression is 16.67%, meaning math teachers accurately nominated one-sixth of participants who reliably reported elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 4.74% and an upper limit of 37.38%. In other words, there is a 95% chance that the true sensitivity of using math teachers' nominations to identify children with elevated levels of depression falls within the range of 4.74% to 37.38%.

**Miss rate.** The overall miss rate for depression was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall depression miss rate for math teachers is:

$$20 / (20+4) = 83.33\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that math teachers in the present study did not nominate most students who self-reported symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 62.62% and an upper limit of 95.26%. In other words, there is a 95% chance that the true miss rate of using nominations from math teachers to identify children with elevated levels of depression falls within the range of 62.62% to 95.26%.

**Specificity.** Within the subsample of students who denied elevated depression symptoms, 141 of the students who obtained CDI 2 *T*-scores below 60 (i.e., below the elevated range) were correctly not nominated by math teachers as exhibiting symptoms of depression. Twenty students also scored below 60 on the CDI 2 (*T*-score) but were incorrectly nominated by math teachers for depression. The overall specificity rate for math teachers in identifying depression was calculated as follows:

$$141 / (141+20) = 87.58\%$$

These results suggest that the overall specificity rate for using math teachers' nominations to identify youth with elevated levels of depression is 87.58%, meaning that teachers accurately did not nominate most participants who did not report elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 81.47% and an upper limit of 92.24%. In other words, there is a 95% chance that the true specificity of using math teachers' nominations to identify children with elevated levels of depression falls within the range of 81.47% to 92.24%.

**Misidentified rate.** The overall misidentified rate for depression was calculated from the same subsample that was used to calculate the overall specificity rate. The overall depression misidentified rate for math teachers is:

$$20 / (20+141) = 12.42\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the math teachers in the present study incorrectly nominated approximately one-eighth of students who did not self-report symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 7.76% and an upper limit of 18.53%. In other words, there is a 95% chance that the true misidentified rate of using math teachers' nominations to identify children with elevated levels of depression falls within the range of 7.76% to 18.53%.

**Accuracy of social studies teachers in identifying depression.** Within the subsample of students who repeatedly reported elevated depression symptoms, one student obtained CDI 2 *T*-scores at or above 60 at Time 2 and were nominated by the subset of teachers as exhibiting symptoms of depression. Twenty-three students also scored at or above 60 on the CDI 2 (*T*-score) but were not nominated by this subset of teachers for depression.

**Sensitivity.** The overall sensitivity rate for social studies teachers identifying depression was calculated as follows:

$$1 / (1+23) = 4.17\%$$

These results suggest that the sensitivity rate for using nominations from social studies teachers to identify youth with elevated levels of depression is 4.17%, meaning social studies teachers accurately nominated a small number of participants who reliably reported elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a



lower limit of 0.11% and an upper limit of 21.12%. In other words, there is a 95% chance that the true sensitivity of using social studies teachers' nominations to identify children with elevated levels of depression falls within the range of 0.11% to 21.12%.

**Miss rate.** The overall miss rate for depression was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall depression miss rate for social studies teachers is:

$$23 / (23+1) = 95.83\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that social studies teachers in the present study did not nominate most students who self-reported symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 78.88% and an upper limit of 99.89%. In other words, there is a 95% chance that the true miss rate of using nominations from social studies teachers to identify children with elevated levels of depression falls within the range of 78.88% to 99.89%.

**Specificity.** Within the subsample of students who denied elevated depression symptoms, 159 of the students who obtained CDI 2 *T*-scores below 60 (i.e., below the elevated range) were correctly not nominated by social studies teachers as exhibiting symptoms of depression. Six students also scored below 60 on the CDI 2 (*T*-score) but were incorrectly nominated by social studies teachers for depression. The overall specificity rate for social studies teachers in identifying depression was calculated as follows:

$$155 / (155+6) = 96.27\%$$

These results suggest that the overall specificity rate for using social studies teachers' nominations to identify youth with elevated levels of depression is 96.27%, meaning that

teachers accurately did not nominate most participants who did not report elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 92.07% and an upper limit of 98.62%. In other words, there is a 95% chance that the true specificity of using social studies teachers' nominations to identify children with elevated levels of depression falls within the range of 92.07% to 98.62%.

**Misidentified rate.** The overall misidentified rate for depression was calculated from the same subsample that was used to calculate the overall specificity rate. The overall depression misidentified rate for social studies teachers is:

$$6 / (6+155) = 3.73\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the social studies teachers in the present study incorrectly nominated a small number of students who did not self-report symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 1.38% and an upper limit of 7.93%. In other words, there is a 95% chance that the true misidentified rate of using social studies teachers' nominations to identify children with elevated levels of depression falls within the range of 1.38% to 7.93%.

#### **Overall accuracy of teachers in identifying depression with subset of students.**

Within the subsample of eligible students (i.e., presence of corresponding nomination data from a language arts, math, and social studies teacher) who repeatedly reported elevated depression symptoms, seven students obtained CDI 2 *T*-scores at or above 60 at Time 2 and were nominated by teachers as exhibiting symptoms of depression. Seventeen students also scored at or above 60 on the CDI 2 (*T*-score) but were not nominated by teachers for depression.

Table 17

*Comparison of Student and Teacher Report of Elevated Depression Symptoms by Subject Area (N = 185 Students)*

Teacher Group	Participants	# of Participants with CDI 2 <i>T</i> -Score $\geq$ 60 at Time 2	# of Participants Nominated for Depression	# of True Positives	# of False Negatives	# of True Negatives	# of False Positives
Language Arts	185	24	22	4 (16.67%)	20 (83.33%)	143 (88.82%)	18 (11.18%)
95% CI				4.74%-37.38%	62.62%-95.26%	82.91%-93.24%	6.76%-17.09%
Math	185	24	24	4 (16.67%)	20 (83.33%)	141 (87.58%)	20 (12.42%)
95% CI				4.74%-37.38%	62.62%-95.26%	81.47%-92.24%	7.76%-18.53%
Social Studies	185	24	7	1 (4.17%)	23 (95.83%)	155 (96.27%)	6 (3.73%)
95% CI				0.11%-21.12%	78.88%-99.89%	92.07%-98.62%	1.38%-7.93%
Overall	185	24	44	7 (29.17%)	17 (70.83%)	124 (77.02%)	37 (22.98%)
95% CI				12.62%-51.09%	48.91%-87.38%	69.74%-83.27%	16.73%-30.26%

*Note.* CDI 2=Children's Depression Inventory, Second Edition. CI=Confidence Interval.

**Sensitivity.** The overall sensitivity rate for teachers identifying depression was calculated as follows:

$$7 / (7+17) = 29.17\%$$

These results suggest that the overall sensitivity rate for using nominations from teachers to identify youth with elevated levels of depression is 29.17%, meaning that teachers accurately nominated less than one-third of this subset of participants who reliably reported elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 12.62% and an upper limit of 51.09%. In other words, there is a 95% chance that the true sensitivity of using these teacher nominations to identify children within this subset with elevated levels of depression falls within the range of 12.62% to 51.09%.

**Miss rate.** The overall miss rate for depression was calculated from the same subsample that was used to calculate the overall sensitivity rate. The overall depression miss rate for teachers is:

$$17 / (17+7) = 70.83\%$$

Of note, the miss rate proportion is the converse of the sensitivity rate (i.e., miss rate = 100% - sensitivity). These results indicate that the teachers in the present study did not nominate nearly three-fourths of this subset of students who self-reported symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 48.91% and an upper limit of 87.38%. In other words, there is a 95% chance that the true miss rate of using teacher nominations to identify children within this subset with elevated levels of depression falls within the range of 48.91% to 87.38%.

**Specificity.** Within the subsample of students who denied elevated depression symptoms, 124 of the students who obtained CDI 2 *T*-scores below 60 (i.e., below the elevated range) were

correctly not nominated by teachers as exhibiting symptoms of depression. Thirty-seven students also scored below 60 on the CDI 2 (*T*-score) but were incorrectly nominated by teachers for depression. The overall specificity rate for teachers in identifying depression among this subset of students was calculated as follows:

$$124 / (124+37) = 77.02\%$$

These results suggest that the overall specificity rate for using teacher nominations to identify this subset of youth with elevated levels of depression is 77.02%, meaning that teachers accurately did not nominate over three-fourths of participants who did not report elevated depression symptoms. A 95% confidence interval was also constructed around the proportion, yielding a lower limit of 69.74% and an upper limit of 83.27%. In other words, there is a 95% chance that the true specificity of using teacher to identify children within this subset with elevated levels of depression falls within the range of 69.74% to 83.27%.

***Misidentified rate.*** The overall misidentified rate for depression was calculated from the same subsample that was used to calculate the overall specificity rate. The overall depression misidentified rate for teachers is:

$$37 / (37+124) = 22.98\%$$

Of note, the misidentified rate proportion is the converse of the specificity rate (i.e., misidentified rate = 100% - specificity). These results indicate that the teachers in the present study incorrectly nominated almost a quarter of this subset of students who did not self-report symptoms of depression in the elevated range. A 95% confidence interval was constructed around the proportion, which yielded a lower limit of 16.73% and an upper limit of 30.26%. In other words, there is a 95% chance that the true misidentified rate of using teacher nominations to identify

children within this subset with elevated levels of depression falls within the range of 16.73% to 30.26%.

Data comparing the number of student participants self-reporting elevated depression symptoms with the number of participants nominated for depression by subject area teachers are presented in Table 17. The confidence intervals that were constructed around each proportion are also presented in this table.

**Research question five.** What is the accuracy of multiple teachers (i.e., combined across subject areas) compared to the accuracy of a single teacher (i.e., all teachers of a single subject area) in identifying early adolescents who report elevated levels of anxiety or depression, in regards to: (a) sensitivity, (b) miss rate, (c) specificity, and (d) misidentified rate?

To address research question five, a series of McNemar tests for significance of change were conducted to determine the statistical significance of differences in accuracy rates between a particular subject area teacher (i.e., language arts, math, social studies) and overall teachers in the subset of participants who were considered (i.e., eligible to be nominated) by a language arts, math, and social studies teacher. Using this test statistic, categorized participants are compared in a table and particular cells of the table are examined for differences (i.e., cells A and D). The following formula was used for each comparison:

$$X^2 = \frac{(A - D)^2}{A + D}$$

The obtained  $X^2$  value was then compared to the critical value of  $X^2 = 3.841$  ( $df=1$ ,  $\alpha = .05$ ) to determine statistical significance. If the obtained  $X^2$  value exceeded the critical value, the null hypothesis (observed value = expected value) was rejected, meaning that there was a statistically significant difference. If the obtained  $X^2$  value did not exceed the critical value, then

the null hypothesis failed to be rejected, meaning that there was not a statistically significant difference. The remaining components of this equation are described in the next section.

***Combined accuracy of core teachers in identifying anxiety compared to only language arts teachers.*** To compare the accuracy of the combined ratings from three core teachers to language arts teachers in identifying anxiety in this subset of students, a table was created that compared the sensitivity and miss rate for each of these subsamples. For this comparison and subsequent comparisons of the sensitivity and miss rate, Cell A represents the number of students who were missed by the combined group of teachers but correctly identified (i.e., sensitivity) by a group of single subject area teachers and Cell D represents the number of students who were correctly identified by the combined group of teachers but missed by a group of single subject area teachers. To further explain how the frequencies for Cells A and D were calculated, Figure 1 illustrates the numbers calculated for the first comparison between the combined group of core teachers and language arts teachers.

	Missed by Combined Group of Teachers	Correctly Identified by Combined Group of Teachers
Correctly Identified by Language Arts Teachers	0	13
Missed by Language Arts Teachers	13	6
	A	B
	C	D

Figure 1. Explanation of McNemar Test for Sensitivity and Miss Rate

The values from cells A and D were then inserted into the formula:

$$(6-0)^2 / 6+0 = 6$$

Because the  $X^2$  value of 6 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from core teachers to just language arts teachers in this

subset of students. When using the combined accuracy of all three teachers, six more students were correctly identified as exhibiting elevated levels of anxiety than when just asking language arts teachers.

A table was also created that compared the specificity and misidentified rate for the combined core teachers to language arts teachers. For this comparison and subsequent comparisons of the specificity and misidentified rate, Cell A represents the number of students who were correctly not nominated (i.e., specificity) by the combined group of teachers but misidentified by a group of single subject area teachers and Cell D represents the number of students who were misidentified by the combined group of teachers but correctly not nominated by a group of single subject area teachers. To further explain how the frequencies for Cells A and D were calculated, Figure 2 illustrates the numbers calculated for the first comparison between the combined group of core teachers and language arts teachers.

	Correctly Not Nominated by Combined Group of Teachers	Misidentified by Combined Group of Teachers
Misidentified by Language Arts Teachers	0	29
	A	B
Correctly Not Nominated by Language Arts Teachers	100	24
	C	D

Figure 2. Explanation of McNemar Test for Specificity and Misidentified Rate.

The values from cells A and D were then used in the formula:

$$(24-0)^2 / 24+0 = 24$$

Because the  $X^2$  value of 24 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from all three core teachers to only language



arts teachers in this subset of students. When using the combined accuracy of three core teachers, 24 more students were misidentified for anxiety than when just asking language arts teachers.

***Combined accuracy of core teachers in identifying anxiety compared to only math teachers.*** To compare the accuracy of the combined ratings from three core teachers to math teachers in identifying anxiety in this subset of students, a table was created that compared the sensitivity and miss rate for each of these subsamples. The values from cells A and D were then inserted into the formula:

$$(9-0)^2 / 9+0 = 9$$

Because the  $X^2$  value of 9 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from core teachers to just math teachers in this subset of students. When using the combined accuracy of core teachers, nine more students were correctly identified as exhibiting elevated levels of anxiety than when just asking math teachers.

A table was also created that compared the specificity and misidentified rate for the combined core teachers to math teachers. The values from cells A and D were then used in the formula:

$$(25-0)^2 / 25+0 = 25$$

Because the  $X^2$  value of 25 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from all three core teachers to only math teachers in this subset of students. When using the combined accuracy of three core teachers, 25 more students were misidentified for anxiety than when just asking math teachers.

***Combined accuracy of core teachers in identifying anxiety compared to only social studies teachers.*** To compare the accuracy of the combined ratings from three core teachers to social studies teachers in identifying anxiety in this subset of students, a table was created that

compared the sensitivity and miss rate for each of these subsamples. The values from cells A and D were then inserted into the formula:

$$(17-0)^2 / 17+0 = 17$$

Because the  $X^2$  value of 17 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from core teachers to just social studies teachers in this subset of students. When using the combined accuracy of core teachers, 17 more students were correctly identified as exhibiting elevated levels of anxiety than when just asking social studies teachers.

A table was also created that compared the specificity and misidentified rate for the combined core teachers to social studies teachers. The values from cells A and D were then used in the formula:

$$(48-0)^2 / 48+0 = 48$$

Because the  $X^2$  value of 48 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from all three core teachers to only social studies teachers in this subset of students. When using the combined accuracy of three core teachers, 48 more students were misidentified for anxiety than when just asking social studies teachers.

These comparisons are summarized in Table 18. Also, data on the statistical significance of comparisons between subject area teachers in identifying anxiety are presented in Table 18.

***Combined accuracy of core teachers in identifying depression compared to only language arts teachers.*** To compare the accuracy of the combined ratings from three core teachers to language arts teachers in identifying depression in this subset of students, a table was

created that compared the sensitivity and miss rate for each of these subsamples. The values from cells A and D were then inserted into the formula:

$$(3-0)^2 / 3+0 = 3$$

Because the  $X^2$  value of 3 did not exceed the critical value of 3.841, there was not a statistically significant difference when comparing nominations from core teachers to just language arts teachers in this subset of students. Thus, there was no difference in the identification of depression when asking all three core teachers vs. only language arts teachers.

Table 18

*McNemar Test  $X^2$  Values for Comparison of Subject Area Teachers Accuracy Rate of Anxiety*

	Overall	Language Arts	Math
<b>Language Arts</b>			
MASC 2 $T$ -Score $\geq 60$	6*	--	--
MASC 2 $T$ -Score $< 60$	24*	--	--
<b>Math</b>			
MASC 2 $T$ -Score $\geq 60$	9*	.60	--
MASC 2 $T$ -Score $< 60$	25*	.02	--
<b>Social Studies</b>			
MASC 2 $T$ -Score $\geq 60$	17*	11*	6.40*
MASC 2 $T$ -Score $< 60$	48*	19.20*	17.06*

*Note.* All obtained values were interpreted using the critical value of  $X^2 = 3.841$  ( $df=1$ ,  $\alpha = .05$ ). \* denotes statistical significance (column identifier has a higher value than the row identifier).

A table was also created that compared the specificity and misidentified rate for the combined core teachers to language arts teachers. The values from cells A and D were then used in the formula:

$$(19-0)^2 / 19+0 = 19$$

Because the  $X^2$  value of 19 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from all three core teachers to just language arts teachers in this subset of students. When using the combined accuracy of three core teachers, 19 more students were misidentified for depression than when just asking language arts teachers.

***Combined accuracy of core teachers in identifying depression compared to only math teachers.*** To compare the accuracy of the combined ratings from three core teachers to math teachers in identifying depression in this subset of students, a table was created that compared the sensitivity and miss rate for each of these subsamples. The values from cells A and D were then inserted into the formula:

$$(3-0)^2 / 3+0 = 3$$

Because the  $X^2$  value of 3 did not exceed the critical value of 3.841, there was not a statistically significant difference when comparing nominations from core teachers to just math teachers in this subset of students. Thus, there was no difference in the identification of depression when asking the three core teachers vs. only math teachers.

A table was also created that compared the specificity and misidentified rate for all teachers to math teachers. The values from cells A and D were then used in the formula:

$$(17-0)^2 / 17+0 = 17$$

Because the  $X^2$  value of 17 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from all three core teachers to only math

teachers in this subset of students. When using the combined accuracy of three core teachers, 17 more students were misidentified for depression than when just asking math teachers.

***Combined accuracy of core teachers in identifying depression compared to only social studies teachers.*** To compare the accuracy of the combined ratings from three core teachers to social studies teachers in identifying depression in this subset of students, a table was created that compared the sensitivity and miss rate for each of these subsamples. The values from cells A and D were then inserted into the formula:

$$(6-0)^2 / 6+0 = 6$$

Because the  $X^2$  value of 6 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from core teachers to only social studies teachers in this subset of students. When using the combined accuracy of core teachers, six more students were correctly identified as exhibiting elevated levels of depression than when just asking social studies teachers.

A table was also created that compared the specificity and misidentified rate for all teachers to social studies teachers. The values from cells A and D were then used in the formula:

$$(31-0)^2 / 31+0 = 31$$

Because the  $X^2$  value of 31 exceeded the critical value of 3.841, there was a statistically significant difference when comparing nominations from all three core teachers to social studies teachers in this subset of students. When using the combined accuracy of three core teachers, 31 more students were misidentified for depression than when just asking social studies teachers.

These comparisons are summarized in Table 19. Also, data on the statistical significance of comparisons between subject area teachers in identifying depression are presented in Table 19.

Table 19

*McNemar Test  $X^2$  Values for Comparison of Subject Area Teachers Accuracy Rate of*

*Depression*

	Overall	Language Arts	Math
<b>Language Arts</b>			
CDI 2 <i>T</i> -Score $\geq$ 60	3	--	--
CDI 2 <i>T</i> -Score $<$ 60	19*	--	--
<b>Math</b>			
CDI 2 <i>T</i> -Score $\geq$ 60	3	0	--
CDI 2 <i>T</i> -Score $<$ 60	17*	.13	--
<b>Social Studies</b>			
CDI 2 <i>T</i> -Score $\geq$ 60	6*	1.80	1.80
CDI 2 <i>T</i> -Score $<$ 60	31*	6.55*	9.80*

*Note.* All obtained values were interpreted using the critical value of  $X^2 = 3.841$  ( $df=1$ ,  $\alpha = .05$ ). \* denotes statistical significance (column identifier has a higher value than the row identifier).

**Research question six.** Regarding children who are missed (i.e., self-report high levels of anxiety or depression symptoms but teachers do not perceive them as symptomatic), do these children differ from their peers who were correctly identified as symptomatic in terms of: (a) demographic characteristics and (b) symptom severity or symptom type?

Only a subset of participants completed the MASC 2 and CDI 2 data at a second time point, but data on symptom severity as experienced at Time 1 (collected the same week that teachers completed their nominations) is available for all students. The lack of Time 2 data is particularly relevant to the last research question, which examines misidentified students in

comparison to students who were correctly not identified; few student in these cells completed the MASC 2 or CDI 2 at Time 2 because the vast majority denied elevated symptoms at Time 1. Thus, Time 1 CDI 2 and MASC 2 scores (for  $N = 233$  student participants) were utilized in this and subsequent analyses when exploring features of the different groups. Table 21 recaps the accuracy proportions that were found for anxiety and depression in the total sample of teachers at Time 2.

Table 21

*Number of Students Identified as Anxious or Depressed at Time 2 Compared to Teacher Nominations*

	Student self-reported symptoms in the elevated range ( $T$ -score $\geq 60$ on the MASC 2 or CDI 2)	Student did not self-report symptoms in the elevated range ( $T$ -score $< 60$ on the MASC 2 or CDI 2)
Student Nominated by Teacher	<b>Sensitivity</b> (True Positive)  Anxiety ( $n = 21$ ) Depression ( $n = 9$ )	<b>Misidentified Rate</b> (False Positive)  Anxiety ( $n = 68$ ) Depression ( $n = 48$ )
Student Not Nominated by Teacher	<b>Miss Rate</b> (False Negative)  Anxiety ( $n = 15$ ) Depression ( $n = 19$ )	<b>Specificity</b> (True Negative)  Anxiety ( $n = 129$ ) Depression ( $n = 157$ )

**Demographic characteristics.** To address the first part of this research question, the following demographic characteristics were examined: gender, race/ethnicity, and an indicator of socioeconomic status (SES). To analyze race/ethnicity, separate items asking students to indicate their ethnicity and then their race on the student demographic information form (see items 4 and 5 in Appendix C) were combined to form an overall race/ethnicity variable with eight different categories (i.e., Non-Hispanic White [“White”], Black, American Indian or Alaska Native, Asian,

Native Hawaiian or Pacific Islander, Hispanic, multi-racial, other ethnic identify). However, due to small sample sizes for several categories, students were further collapsed into a smaller number of race/ethnicity categories (i.e., White,  $n = 22$ ; vs. Black,  $n = 119$ ; vs. other minority, which includes the 92 students who identified as American Indian or Alaska Native [ $n = 2$ ], Asian [ $n = 2$ ], Native Hawaiian or Pacific Islander [ $n = 1$ ], Hispanic [ $n = 34$ ], multi-racial [ $n = 47$ ], or other [ $n = 6$ ]). This three-category race/ethnicity variable was used in subsequent race/ethnicity analyses. Initially, chi-square tests of independence were planned to complete these analyses. However, due to an insufficient sample size (i.e., almost all comparisons using the chi-square test of independence would have at least one cell with less than five observations), Fisher's exact tests were used instead.

*Gender.* In the current study, students who were missed by teacher nominations were compared to students who were correctly identified through this method in terms of gender (i.e., male vs. female). The results from Fisher's exact tests indicate that there are no differences by gender for either anxiety ( $p = 1.00$ ) or depression ( $p = .22$ ).

*Race/ethnicity.* Students in the present study who were missed through teacher nominations were also compared to students who were correctly identified by race/ethnicity (i.e., White, Black, other). Findings from Fisher's exact tests indicate that no differences were found in terms of race/ethnicity for either anxiety ( $p = .06$ ) or depression ( $p = .59$ ). However, there is a trend in the data for teachers to correctly nominate 72% of anxious Black students and 36% of students in the Other category, which consists of mostly Hispanic and Multiracial students.

*Socioeconomic status (SES).* Students who were missed in the present study were also compared to students who were accurately identified through teacher nominations in regards to an indicator of socioeconomic status (i.e., yes,  $n = 198$ ; vs. not eligible for receipt of free or



reduced-price lunch,  $n = 35$ , per school records). Again, because of an insufficient sample size, Fisher's exact tests were used and no differences were found in terms of SES for either anxiety ( $p = 1.00$ ) or depression ( $p = 1.00$ ).

**Symptom severity.** To address this part of the research question, the students who were missed were compared to the students who were correctly identified in relation to their obtained total  $T$ -scores on the MASC 2 and CDI 2 using independent means  $t$ -tests ( $\alpha = .05$ ). In order to conduct independent means  $t$ -tests, three assumptions were made. First, it was assumed that the observations were independent, due to the fact that students could only be part of one group (i.e., correctly identified or missed). Second, it was assumed that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the total  $T$ -score on both the MASC 2 ( $p = .09$ ) and CDI 2 ( $p = .96$ ) were equal. Third, it was assumed that the sample was normally distributed. An examination of results from Shapiro-Wilk tests for the Time 1 Total  $T$ -Scores on both the MASC 2 ( $p < .0001$ ) and CDI 2 ( $p < .0001$ ) showed that this assumption was violated. However, after further investigating the skewness and kurtosis values for the Time 1 Total  $T$ -scores on the MASC 2 ( $sk = .52$ ,  $ku = -.66$ ) and CDI 2 ( $sk = .76$ ,  $ku = .03$ ), it was determined that the departure from normality was not substantial. Additionally, the independent means  $t$ -test is robust to violations of normality.

Students in the present study who teachers missed during the nomination procedures for anxiety were compared to students who were correctly identified through teacher nomination. Results suggested that missed students ( $n = 15$ ) obtained similar total  $T$ -scores on the MASC 2 ( $M = 66.60$ ,  $SD = 3.14$ ) than students who were correctly identified ( $n = 21$ ;  $M = 66.24$ ,  $SD = 4.92$ ). The results of the  $t$ -test indicated that this difference was not significant ( $t(34) = -0.25$ ,  $p = .80$ ), and thus the null hypothesis that there is no difference between these two groups of

students failed to be rejected. Thus, there is no difference between missed students and correctly identified students in their overall severity of self-reported anxiety symptomology.

Students who were missed for overall depression were compared to students who were correctly identified through teacher nomination. Results suggested that missed students ( $n = 19$ ) had lower total  $T$ -scores on the CDI 2 ( $M = 66.42$ ,  $SD = 5.67$ ) than students who were correctly identified ( $n = 9$ ;  $M = 67.11$ ,  $SD = 5.44$ ). The results of the  $t$ -test indicated that this difference was not significant ( $t(26) = 0.30$ ,  $p = .76$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These findings indicate that missed students and correctly identified students do not differ significantly in their overall depression.

**Symptom type.** To address this last part of the research question, independent means  $t$ -tests ( $\alpha = .05$ ) were used to compare the students who were missed to the students who were correctly identified in relation to their obtained  $T$ -scores on each subscale of the MASC 2 (i.e., Physical Symptoms, Harm Avoidance, Social Anxiety, Separation Anxiety/Phobias, Generalized Anxiety Disorder, Obsessions & Compulsions) and CDI 2 (i.e., Negative Mood/Physical Symptoms, Negative Self-Esteem, Interpersonal Problems, Ineffectiveness). In order to conduct independent means  $t$ -tests, three assumptions were made. First, it was assumed that the observations were independent, due to the fact that students could only be part of one group (i.e., correctly identified or missed). The results from evaluating the second and third assumptions (homogeneity of variance and normality) are described below for each comparison.

**Physical symptoms.** Students in the present study who were missed for exhibiting physical symptoms of anxiety were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means  $t$ -tests, the last two assumptions were evaluated. The second assumption was that the variances for each

group were equal. Using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Physical Symptoms subscale of the MASC 2 ( $p = .14$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the  $T$ -score on the Physical Symptoms subscale of the MASC 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = .62$ ) and kurtosis ( $ku = -.30$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 15$ ) obtained lower  $T$ -scores on the Physical Symptoms subscale of the MASC 2 ( $M = 60.93$ ,  $SD = 9.00$ ) than students who were correctly identified ( $n = 21$ ;  $M = 62.95$ ,  $SD = 6.26$ ). The results of the t-test indicated that this difference was not significant ( $t(34) = 0.79$ ,  $p = .43$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that missed students and correctly identified students do not differ significantly in their physical symptoms of anxiety.

*Harm avoidance.* Students in the present study who were missed for exhibiting anxiety symptoms of harm avoidance were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Harm Avoidance subscale of the MASC 2 ( $p = .27$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the  $T$ -score on the Harm Avoidance subscale of the MASC 2

showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = .34$ ) and kurtosis ( $ku = -.75$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 15$ ) obtained lower  $T$ -scores on the Harm Avoidance subscale of the MASC 2 ( $M = 56.20$ ,  $SD = 7.46$ ) than students who were correctly identified ( $n = 21$ ;  $M = 59.00$ ,  $SD = 5.73$ ). The results of the t-test indicated that this difference was not significant ( $t(34) = 1.28$ ,  $p = .63$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These findings suggest that missed students do not differ from correctly identified students in their anxiety symptoms of harm avoidance.

*Social anxiety.* Students in the present study who were missed for exhibiting social anxiety symptoms were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Social Anxiety subscale of the MASC 2 ( $p = .63$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the  $T$ -score on the Social Anxiety subscale of the MASC 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = 1.03$ ) and kurtosis ( $ku = .07$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 15$ ) obtained higher  $T$ -scores on the Social Anxiety subscale of the MASC 2 ( $M = 60.00$ ,  $SD = 7.52$ ) than students who were correctly identified ( $n = 21$ ;  $M = 55.05$ ,  $SD = 8.55$ ). The results of the t-test indicated that this difference was not significant ( $t(34) = -1.80$ ,  $p = .08$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that missed students and correctly identified students are not significantly different in their symptoms of social anxiety, but a trend in the data is for missed students to report more social anxiety ( $d = 0.61$ ).

*Separation anxiety/phobias.* Students in the present study who were missed for exhibiting symptoms of separation anxiety and/or phobias were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Separation Anxiety/Phobias subscale of the MASC 2 ( $p = .12$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the  $T$ -score on the Separation Anxiety/Phobias subscale of the MASC 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = .73$ ) and kurtosis ( $ku = -.05$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 15$ ) obtained higher  $T$ -scores on the Separation Anxiety/Phobias subscale of the MASC 2 ( $M = 59.07$ ,  $SD = 6.08$ ) than students who were correctly identified ( $n = 21$ ;  $M = 57.38$ ,  $SD = 9.21$ ). The results of the t-test indicated that

this difference was not significant ( $t(34) = -0.62, p = .54$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that missed students do not differ significantly from correctly identified students in their symptoms of separation anxiety/phobias.

*Generalized anxiety disorder.* Students in the present study who were missed for exhibiting symptoms of generalized anxiety disorder (GAD) were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the GAD subscale of the MASC 2 ( $p = .88$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the  $T$ -score on the GAD subscale of the MASC 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = 1.04$ ) and kurtosis ( $ku = .61$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 15$ ) obtained lower  $T$ -scores on the GAD subscale of the MASC 2 ( $M = 59.40, SD = 8.51$ ) than students who were correctly identified ( $n = 21; M = 62.14, SD = 8.26$ ). The results of the t-test indicated that this difference was not significant ( $t(34) = 0.97, p = .34$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These findings suggest that there is no difference between missed students and correctly identified students in their symptoms of GAD.

*Obsessions and compulsions.* Students in the present study who were missed for exhibiting anxiety symptoms of obsessions and compulsions were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the *T*-scores on the Obsessions and Compulsions subscale of the MASC 2 ( $p = .13$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the *T*-score on the Obsessions and Compulsions subscale of the MASC 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = .49$ ) and kurtosis ( $ku = -.62$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 15$ ) obtained lower *T*-scores on the Obsessions and Compulsions scale of the MASC 2 ( $M = 68.93$ ,  $SD = 6.86$ ) than students who were correctly identified ( $n = 21$ ;  $M = 69.67$ ,  $SD = 10.18$ ). The results of the t-test indicated that this difference was not significant ( $t(34) = 0.24$ ,  $p = .81$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results indicate that missed students do not differ from correctly identified students in their anxiety symptoms of obsessions and compulsions. Table 20 summarizes the results from the independent means t-tests for anxiety symptoms.

Table 20

*Comparison of Anxiety Symptoms Between Accurately Identified and Missed Students*

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> value
Total Anxiety					
Correctly Identified	21	66.24	4.92		
Missed	15	66.60	3.14	-0.25	.80
Physical Symptoms					
Correctly Identified	21	62.95	6.26		
Missed	15	60.93	9.00	0.79	.43
Harm Avoidance					
Correctly Identified	21	59.00	5.73		
Missed	15	56.20	7.46	1.28	.21
Social Anxiety					
Correctly Identified	21	55.05	8.55		
Missed	15	60.00	7.51	-1.80	.08
Separation Anxiety/ Phobias					
Correctly Identified	21	57.38	9.21		
Missed	15	59.07	6.08	-0.62	.54
Generalized Anxiety Disorder					
Correctly Identified	21	62.14	8.26		
Missed	15	59.40	8.51	0.97	.34
Obsessions and Compulsions					
Correctly Identified	21	69.67	10.18		
Missed	15	68.93	6.86	0.24	.81

*Note.* No statistically significant differences were observed at the  $p < .05$  level.

*Negative mood/physical symptoms.* Students in the present study who repeatedly reported elevated symptoms of depression but were not identified by teachers as possibly depressed were



compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the *T*-scores on the Negative Mood/Physical Symptoms subscale of the CDI 2 ( $p = 1.00$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the *T*-score on the Mood/Physical Symptoms subscale of the CDI 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = .73$ ) and kurtosis ( $ku = -.21$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 19$ ) obtained lower *T*-scores on the Negative Mood/Physical Symptoms subscale of the CDI 2 ( $M = 60.68, SD = 7.93$ ) than students who were correctly identified ( $n = 9; M = 63.00, SD = 7.87$ ). The results of the t-test indicated that this difference was not significant ( $t(26) = 0.72, p = .48$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. Thus, missed students and correctly identified students do not differ in their negative mood and/or physical symptoms of depression.

*Negative self-esteem.* Students in the present study who were missed for exhibiting depression symptoms of negative self-esteem were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was

determined that the variances for the  $T$ -scores on the Negative Self-Esteem subscale of the CDI 2 ( $p = .22$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the  $T$ -score on the Negative Self-Esteem subscale of the CDI 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = 1.80$ ) and kurtosis ( $ku = 3.60$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 19$ ) obtained lower  $T$ -scores on the Negative Self-Esteem subscale of the CDI 2 ( $M = 62.95$ ,  $SD = 8.76$ ) than students who were correctly identified ( $n = 9$ ;  $M = 63.89$ ,  $SD = 12.35$ ). The results of the t-test indicated that this difference was not significant ( $t(26) = 0.23$ ,  $p = .82$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These findings suggest that missed students do not differ from correctly identified students in their depression symptoms of negative self-esteem.

*Ineffectiveness.* Students in the present study who were missed for exhibiting depression symptoms of ineffectiveness were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Ineffectiveness subscale of the CDI 2 ( $p = .46$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the  $T$ -score on the Ineffectiveness subscale of the CDI 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk$

= .80) and kurtosis ( $ku = -.02$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 19$ ) obtained higher  $T$ -scores on the Ineffectiveness subscale of the CDI 2 ( $M = 64.37$ ,  $SD = 8.64$ ) than students who were correctly identified ( $n = 9$ ;  $M = 61.11$ ,  $SD = 6.64$ ). The results of the t-test indicated that this difference was not significant ( $t(26) = -1.00$ ,  $p = .33$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that there are no differences between missed students and correctly identified students in their depression symptoms of ineffectiveness.

*Interpersonal problems.* Students in the present study who were missed for exhibiting depression symptoms of interpersonal problems were compared to students who were correctly identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the variances for each group were equal. Using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Interpersonal Problems subscale of the CDI 2 ( $p = 1.00$ ) were equal. Finally, the third assumption of a normally distributed sample was evaluated. An examination of results from the Shapiro-Wilk test for the  $T$ -score on the Interpersonal Problems subscale of the CDI 2 showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = 1.47$ ) and kurtosis ( $ku = 1.58$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the independent means t-test is robust to violations of normality.

Results suggested that missed students ( $n = 19$ ) obtained lower  $T$ -scores on the Interpersonal Problems subscale of the CDI 2 ( $M = 64.32$ ,  $SD = 12.81$ ) than students who were correctly identified ( $n = 9$ ;  $M = 65.89$ ,  $SD = 12.77$ ). The results of the  $t$ -test indicated that this difference was not significant ( $t(26) = 0.30$ ,  $p = .76$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These findings suggest that missed students do not differ from correctly identified students in their depression symptoms of interpersonal problems. Table 22 summarizes the results from the independent means  $t$ -tests for depression symptoms.

Table 22

*Comparison of Depression Symptoms Between Accurately Identified and Missed Students*

	$n$	$M$	$SD$	$t$	$p$ value
Total Depression					
Correctly Identified	9	67.11	5.44		
Missed	19	66.42	5.67	0.30	.76
Negative Mood/ Physical Symptoms					
Correctly Identified	9	63.00	7.87		
Missed	19	60.68	7.93	0.72	.48
Negative Self-Esteem					
Correctly Identified	9	63.89	12.35		
Missed	19	62.95	8.76	0.23	.82
Ineffectiveness					
Correctly Identified	9	61.11	6.64		
Missed	19	64.37	8.64	-1.00	.33
Interpersonal Problems					
Correctly Identified	9	65.89	12.77		
Missed	19	64.32	12.81	0.30	.76

*Note.* No statistically significant differences were observed at the  $p < .05$  level.

**Research question seven.** Regarding children who are misidentified (i.e., deny high levels of symptoms but teachers perceive them as symptomatic), do these children differ from their peers who were correctly not nominated in terms of: (a) demographic characteristics, (b) symptom severity or symptom type, (c) level of socially desirable responding on surveys, (d) level of life satisfaction?

In this final series of analyses, the students misidentified as anxious or depressed were examined most closely in relation to their peers who also denied high levels of symptoms, and whose teachers agreed that the students did not demonstrate elevated symptoms (i.e., the correctly not identified group, students who were accurately not nominated as symptomatic by their teachers).

**Demographic characteristics.** To answer part 7(a) of this research question, the following demographic characteristics were examined: gender, race/ethnicity, and an indicator of SES. Chi-square tests of independence ( $\alpha = .05$ ) were used for these analyses. In order to conduct chi-square tests of independence, two assumptions were made. First, it was assumed that the observations were independent, as students could only be categorized into one group (i.e., misidentified or correctly not identified). Then, it was assumed that there was a sufficiently large sample size, as each cell had at least five observations.

**Gender.** In the present study, students who were misidentified through teacher nominations were compared to students who were accurately not nominated by gender (i.e., male vs. female). Using chi-square tests of independence, the null hypothesis that there is no difference in group membership by gender failed to be rejected for anxiety ( $\chi^2(1, 197) = 3.14, p = .08$ ) and depression ( $\chi^2(1, 205) = 3.62, p = .06$ ). These results indicate that there are no

statistically significant differences between these groups by gender, but that the trend is for teachers to misidentify more boys than girls for anxiety and depression.

*Race/ethnicity.* Students who were misidentified through teachers nominations were also compared to students who were correctly not identified in terms of race/ethnicity (i.e., White vs. Black vs. Other). Using chi-square tests of independence, the null hypothesis that there is no difference in group membership by race/ethnicity failed to be rejected for both anxiety ( $\chi^2(2, 197) = 0.39, p = .82$ ) and depression ( $\chi^2(2, 205) = 1.72, p = .42$ ). These results indicate that there are no differences between these groups in regards to race/ethnicity.

*SES.* Student in the current study who were misidentified by teachers were also compared to students who were accurately not identified by an indicator of SES (i.e., free or reduced-price lunch status). Chi-square tests of independence were conducted and the null hypothesis that there is no difference in group membership by SES failed to be rejected for both anxiety ( $\chi^2(1, 197) = 0.07, p = .79$ ) and depression ( $\chi^2(1, 205) = 0.01, p = .91$ ). These findings suggest that misidentified kids do not differ by SES from those students who were correctly not identified.

*Symptom severity.* To answer this part of the research question, the students who were misidentified were compared to the students who were correctly not identified for anxiety in relation to their obtained total *T*-scores on the MASC 2 (at Time 1, for reasons previously described) using independent means *t*-tests ( $\alpha = .05$ ). In order to conduct independent means *t*-tests, three assumptions were made. First, it was assumed that the observations were independent, due to the fact that students could only be part of one group (i.e., correctly not identified or misidentified). Second, it was assumed that the sample was normally distributed. Third, it was assumed that the variances were equal.

Students in the present study who were misidentified during the nomination procedures for anxiety were compared to students who were correctly not identified through teacher nomination in relation to their obtained total *T*-scores on the MASC 2. For this comparison, the assumption of normality was violated (previously discussed in greater detail in research question six). However, the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, it was determined from the findings of the Folded F test that the variances for the total *T*-score on the MASC 2 ( $p = .84$ ) were equal. Results from the independent means t-test suggest that misidentified students ( $n = 68$ ) obtained similar total *T*-scores on the MASC 2 ( $M = 48.56, SD = 7.05$ ) than students who were correctly not identified ( $n = 129; M = 48.43, SD = 7.22$ ). The results of the t-test indicated that the scores were not significantly different ( $t(195) = -0.12, p = .91$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. Thus, there is no difference between misidentified students and correctly not identified students in their overall severity of self-reported anxiety symptomology.

The students who were misidentified for depression were also compared to the students who were correctly not identified through teacher nomination in relation to their obtained total *T*-scores on the CDI 2. In order to conduct independent means t-tests, three assumptions were made. First, it was assumed that the observations were independent, due to the fact that students could only be part of one group (i.e., correctly not identified or misidentified). Second, it was assumed that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was

determined that the variances for the total  $T$ -score on the CDI 2 ( $p = .35$ ) were equal. Results suggested that misidentified students ( $n = 48$ ) had higher total  $T$ -scores on the CDI 2 ( $M = 51.77$ ,  $SD = 7.30$ ) than students who were correctly not identified ( $n = 157$ ;  $M = 48.28$ ,  $SD = 6.58$ ). The results of the  $t$ -test indicated that this difference was significant ( $t(203) = -3.13$ ,  $p = .002$ ), and thus the null hypothesis that there is no difference between these two groups of students was rejected. Additionally, the magnitude of this difference was medium ( $d = 0.52$ ). These findings indicate that misidentified students for depression reported higher levels of overall depression than students who were correctly not identified.

**Symptom type: anxiety.** To answer this part of research question 7(b), independent means  $t$ -tests ( $\alpha = .05$ ) were used to compare the students who were misidentified for anxiety to the students who were correctly not identified in relation to their obtained  $T$ -scores on each subscale of the MASC 2 (i.e., Physical Symptoms, Harm Avoidance, Social Anxiety, Separation Anxiety/Phobias, Generalized Anxiety Disorder, Obsessions & Compulsions). In order to conduct independent means  $t$ -tests, three assumptions were made. First, it was assumed that the observations were independent, due to the fact that students could only be part of one group (i.e., correctly not identified or misidentified). Second, it was assumed that the sample was normally distributed. Third, it was assumed that the variances were equal.

**Physical symptoms.** Students in the present study who were misidentified for anxiety were compared to students who were correctly not identified through teacher nomination by physical symptoms of anxiety. Before conducting these comparisons through independent means  $t$ -tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not



substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was determined that the variances for the *T*-scores on the Physical Symptoms subscale of the MASC 2 ( $p = .93$ ) were equal. Results from the independent means t-test suggest that misidentified students ( $n = 68$ ) obtained similar *T*-scores on the Physical Symptoms subscale of the MASC 2 ( $M = 48.97$ ,  $SD = 7.41$ ) than students who were correctly not identified ( $n = 129$ ;  $M = 48.85$ ,  $SD = 7.35$ ). The results of the t-test indicated that this difference was not significant ( $t(195) = -0.11$ ,  $p = .91$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that misidentified students and correctly not identified students in regards to anxiety do not differ significantly in their physical symptoms of anxiety.

*Harm avoidance.* Students in the present study who were misidentified for anxiety in exhibiting anxiety symptoms of harm avoidance were compared to students who were correctly not identified through teacher nomination. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was determined that the variances for the *T*-scores on the Harm Avoidance subscale of the MASC 2 ( $p = .82$ ) were equal. Results from the independent means t-test suggest that misidentified students ( $n = 68$ ) obtained similar *T*-scores on the Harm Avoidance subscale of the MASC 2 ( $M = 48.52$ ,  $SD = 6.51$ ) than students who were correctly not identified ( $n = 129$ ;  $M = 48.80$ ,  $SD = 6.69$ ). The results of the t-test indicated that this difference was not significant ( $t(195) = 0.29$ ,  $p$

= .78), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that misidentified students and correctly not identified students in regards to anxiety do not differ significantly in their symptoms of harm avoidance.

*Social anxiety.* Students in the present study who were misidentified for anxiety were compared to students who were correctly not identified through teacher nomination by symptoms of social anxiety. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was determined that the variances for the *T*-scores on the Social Anxiety subscale of the MASC 2 ( $p = .14$ ) were equal. Results from the independent means t-test suggest that misidentified students ( $n = 68$ ) obtained similar *T*-scores on the Social Anxiety subscale of the MASC 2 ( $M = 45.01$ ,  $SD = 6.05$ ) than students who were correctly not identified ( $n = 129$ ;  $M = 45.61$ ,  $SD = 7.12$ ). The results of the t-test indicated that this difference was not significant ( $t(195) = 0.59$ ,  $p = .56$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that misidentified students and correctly not identified students in regards to anxiety do not differ significantly in their social anxiety symptoms.

*Separation anxiety/phobias.* Students in the present study who were misidentified for anxiety were compared to students who were correctly not identified through teacher nomination by separation anxiety/phobias. Before conducting these comparisons through independent means

t-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was determined that the variances for the *T*-scores on the Separation Anxiety/Phobias subscale of the MASC 2 ( $p = .67$ ) were equal. Results from the independent means t-test suggest that misidentified students ( $n = 68$ ) obtained slightly higher *T*-scores on the Separation Anxiety/Phobias subscale of the MASC 2 ( $M = 50.13, SD = 8.10$ ) than students who were correctly not identified ( $n = 129; M = 49.16, SD = 7.75$ ). The results of the t-test indicated that this difference was not significant ( $t(195) = -0.82, p = .41$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that misidentified students and correctly not identified students in regards to anxiety do not differ significantly in their symptoms of separation anxiety/phobias.

*Generalized anxiety disorder.* Students in the present study who were misidentified for anxiety were compared to students who were correctly not identified through teacher nomination by symptoms of generalized anxiety disorder (GAD). Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was determined that the variances for the *T*-scores on the GAD subscale of the MASC 2 ( $p$

= .47) were equal. Results from the independent means t-test suggest that misidentified students ( $n = 68$ ) obtained similar  $T$ -scores on the GAD subscale of the MASC 2 ( $M = 46.85$ ,  $SD = 7.16$ ) than students who were correctly not identified ( $n = 129$ ;  $M = 46.40$ ,  $SD = 6.65$ ). The results of the t-test indicated that this difference was not significant ( $t(195) = -0.44$ ,  $p = .66$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that misidentified students and correctly not identified students in regards to anxiety do not differ significantly in their GAD symptoms.

*Obsessions and compulsions.* Students in the present study who were misidentified for anxiety were compared to students who were correctly not identified through teacher nomination by symptoms of obsessions and compulsions. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Obsessions and Compulsions subscale of the MASC 2 ( $p = .74$ ) were equal. Results from the independent means t-test suggest that misidentified students ( $n = 68$ ) obtained similar  $T$ -scores on the Obsessions and Compulsions subscale of the MASC 2 ( $M = 52.72$ ,  $SD = 9.06$ ) than students who were correctly not identified ( $n = 129$ ;  $M = 52.43$ ,  $SD = 9.42$ ). The results of the t-test indicated that this difference was not significant ( $t(195) = -0.21$ ,  $p = .84$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that

misidentified students and correctly not identified students in regards to anxiety do not differ significantly in their symptoms of obsessions and compulsions.

**Symptom type: depression.** To answer this part of research question 7(b), independent means *t*-tests ( $\alpha = .05$ ) were used to compare the students who were misidentified for depression to the students who were correctly not identified in relation to their obtained *T*-scores on each subscale of the CDI 2 (i.e., Negative Mood/Physical Symptoms, Negative Self-Esteem, Interpersonal Problems, Ineffectiveness). In order to conduct independent means *t*-tests, three assumptions were made. First, it was assumed that the observations were independent, due to the fact that students could only be part of one group (i.e., correctly not identified or misidentified). Second, it was assumed that the sample was normally distributed. Third, it was assumed that the variances were equal.

*Negative mood/physical symptoms.* Students in the present study who were misidentified for depression were compared to students who were correctly not identified through teacher nomination by negative mood/physical symptoms. Before conducting these comparisons through independent means *t*-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means *t*-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded *F* test, it was determined that the variances for the *T*-scores on the Negative Mood/Physical Symptoms subscale of the CDI 2 ( $p = .03$ ) were not equal, meaning that this assumption was violated. Due to unequal and smaller sample sizes for each group, it was predicted that the pooled variance method of calculating the *t* statistic would have been a liberal test of the differences between

missed students and those who were correctly identified. Due to this assumption being violated, Satterthwaite's method was instead used to calculate the  $t$  statistic. Results from the independent means t-test suggest that misidentified students ( $n=48$ ) obtained higher  $T$ -scores on the Negative Mood/Physical Symptoms subscale of the CDI 2 ( $M = 51.83, SD = 9.85$ ) than students who were correctly not identified ( $n = 157; M = 48.89, SD = 7.71$ ). The results of the t-test indicated that this difference was not significant ( $t(65.561) = -1.90, p = .06$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that misidentified students and correctly not identified students in regards to depression do not differ significantly in their negative mood and/or physical symptoms, but a trend in the data is for misidentified students to report a more negative mood and/or physical symptoms ( $d = .36$ ).

*Negative self-esteem.* Students in the present study who were misidentified for depression were compared to students who were correctly not identified through teacher nomination, specifically in terms of group mean levels of negative self-esteem. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Negative Self-Esteem subscale of the CDI 2 ( $p = .04$ ) were not equal, meaning that this assumption was violated. Due to unequal and smaller sample sizes for each group, it was predicted that the pooled variance method of calculating the  $t$  statistic would have been a liberal test of the differences between missed

students and those who were correctly identified. Due to this assumption being violated, Satterthwaite's method was instead used to calculate the  $t$  statistic. Results from the independent means t-test suggest that misidentified students ( $n=48$ ) obtained higher  $T$ -scores on the Negative Self-Esteem subscale of the CDI 2 ( $M = 49.94$ ,  $SD = 7.48$ ) than students who were correctly not identified ( $n = 157$ ;  $M = 47.16$ ,  $SD = 5.96$ ). The results of the t-test indicated that this difference was significant ( $t(66.247) = -2.35$ ,  $p = .02$ ), and thus the null hypothesis that there is no difference between these two groups of students was rejected. Additionally, the magnitude of this difference was small to medium ( $d = .44$ ). These results suggest that misidentified students exhibited higher levels of negative self-esteem than those students who were correctly not identified.

*Ineffectiveness.* Students in the present study who were misidentified for depression were compared to students who were correctly not identified through teacher nomination, specifically on symptoms of ineffectiveness. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality. Regarding equality of variances, using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Ineffectiveness subscale of the CDI 2 ( $p = .08$ ) were equal. Results from the independent means t-test suggest that misidentified students ( $n=48$ ) obtained higher  $T$ -scores on the Ineffectiveness subscale of the CDI 2 ( $M = 51.31$ ,  $SD = 8.96$ ) than students who were correctly not identified ( $n = 157$ ;  $M = 48.25$ ,  $SD = 7.38$ ). The results of the t-test indicated that this difference was significant ( $t(203) = -2.38$ ,  $p = .02$ ), and thus the null

hypothesis that there is no difference between these two groups of students was rejected.

Additionally, the magnitude of this difference was small to medium ( $d = 0.39$ ). These results suggest that misidentified students exhibit higher levels of symptoms of ineffectiveness than students who were correctly not identified.

*Interpersonal problems.* Students in the present study who were misidentified for depression were compared to students who were correctly not identified through teacher nomination, specifically in terms of symptoms of interpersonal problems. Before conducting these comparisons through independent means t-tests, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. Although results indicated that this assumption was violated (previously discussed in greater detail in research question six), the departure from normality was not substantial and the independent means t-test is robust to violations of normality.

Regarding homogeneity of variance, using the findings from a Folded F test, it was determined that the variances for the  $T$ -scores on the Interpersonal Problems subscale of the CDI 2 ( $p = .20$ ) were equal. Results from the independent means t-test suggest that misidentified students ( $n = 48$ ) obtained higher  $T$ -scores on the Interpersonal Problems subscale of the CDI 2 ( $M = 49.29$ ,  $SD = 10.29$ ) than students who were correctly not identified ( $n = 157$ ;  $M = 47.32$ ,  $SD = 8.92$ ). The results of the t-test indicated that this difference was not significant ( $t(203) = -1.29$ ,  $p = .20$ ), and thus the null hypothesis that there is no difference between these two groups of students failed to be rejected. These results suggest that misidentified students and correctly not identified students in regards to depression do not differ significantly in their depression symptoms of interpersonal problems. Tables 23 and 24 summarize the results from the independent means t-tests for the misidentification of anxiety and depression.



Table 23

*Comparison Between Students Accurately Not Identified and Misidentified for Anxiety*

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> value
Total Anxiety					
Correctly Not Identified	129	48.43	7.22		
Misidentified	68	48.56	7.05	-0.12	.91
Physical Symptoms					
Correctly Not Identified	129	48.85	7.35		
Misidentified	68	48.97	7.41	-0.11	.91
Harm Avoidance					
Correctly Not Identified	129	48.80	6.69		
Misidentified	68	48.51	6.51	0.29	.78
Social Anxiety					
Correctly Not Identified	129	45.61	7.12		
Misidentified	68	45.01	6.05	0.59	.56
Separation Anxiety/ Phobias					
Correctly Not Identified	129	49.16	7.75		
Misidentified	68	50.13	8.10	-0.82	.41
Generalized Anxiety Disorder					
Correctly Not Identified	129	46.40	6.65		
Misidentified	68	46.85	7.16	-0.44	.66
Obsessions and Compulsions					
Correctly Not Identified	129	52.43	9.42		
Misidentified	68	52.72	9.06	-0.21	.84

*Note.* No statistically significant differences were observed at the  $p < .05$  level.

Table 24

*Comparison Between Students Accurately Not Identified and Misidentified for Depression*

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i> value
Total Depression					
Correctly Not Identified	157	48.28	6.58		
Misidentified	48	51.77	7.30	-3.13	.002**
Negative Mood/ Physical Symptoms					
Correctly Not Identified	157	48.89	7.71		
Misidentified	48	51.83	9.85	-1.90	.06
Negative Self-Esteem					
Correctly Not Identified	157	47.16	5.96		
Misidentified	48	49.94	7.48	-2.35	.02*
Ineffectiveness					
Correctly Not Identified	157	48.25	7.38		
Misidentified	48	51.31	8.96	-2.38	.02*
Interpersonal Problems					
Correctly Not Identified	157	47.32	8.92		
Misidentified	48	49.29	10.29	-1.29	.20

\*  $p < .05$ , \*\*  $p < .01$ .

**Level of socially desirable responding.** Student participants' group membership for both anxiety and depression were compared to their level of socially desirable responding, as measured by their total score on the Children's Social Desirability Questionnaire (CSDQ). Before conducting one-way analysis of variance (ANOVA) analyses, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. An examination of results from the Shapiro-Wilk test for the total score on the CSDQ showed that

this assumption was violated ( $p = .0001$ ). However, after further investigating the skewness ( $sk = -.14$ ) and kurtosis ( $ku = -.74$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the ANOVA is robust to violations of normality. Because this assumption was violated, the Brown-Forsythe test was conducted to evaluate the last assumption (i.e., homogeneity of variance) for each analysis.

Students' group membership for anxiety was compared to their tendency towards socially desirable responding. Before conducting an ANOVA, the last assumption (i.e., homogeneity of variance) was evaluated. This null hypothesis that the variances were equal failed to be rejected ( $F(3, 229) = 0.26, p = .85$ ), meaning that this assumption was not violated. The results of the ANOVA found that the effect of group membership for anxiety was significant for social desirability ( $F(3, 229) = 4.39, p = .005$ ). However, the magnitude of the effect was small, as 5.44% of the variance in group membership for anxiety could be accounted for by socially desirable responding ( $R^2 = .05$ ). Results of contrast comparisons between the two pairs of interest (correctly identified vs. missed; misidentified vs. correctly not identified) indicate that students who were correctly identified did not differ from those who were missed ( $F(1, 36) = 0.12, p = .73$ ), nor did students who were misidentified from students who were correctly not identified ( $F(1, 197) = 0.45, p = .50$ ). Instead, the trend in group means (see Table 26) is for students with elevated anxiety (both correctly identified and missed by teachers) to report a lower level of socially desirable responding than the two groups who denied elevated anxiety.

Middle school students' group membership for depression was also compared to their social desirability. Before conducting an ANOVA, the last assumption (i.e., homogeneity of variance) was evaluated. This null hypothesis that the variances were equal failed to be rejected ( $F(3, 229) = 2.22, p = .09$ ), meaning that this assumption was not violated. The results of the

ANOVA found that the effect of group membership for depression was significant for socially desirable responding ( $F(3, 229) = 7.25, p = .0001$ ). However, the magnitude of the effect was small, as 8.68% of the variance in group membership for depression could be accounted for by social desirability ( $R^2 = .09$ ). Results of contrast comparisons indicate that students who were correctly identified did not differ from those who were missed ( $F(1, 28) = 1.25, p = .26$ ), nor did students who were misidentified from students who were correctly not identified ( $F(1, 205) = 0.12, p = .73$ ). Instead, the trend in group means (see Table 26) is for students with elevated depression (both correctly identified and missed by teachers) to report a lower level of socially desirable responding than the two groups who denied elevated depression.

Table 25

*Results of ANOVA Analyses Related to Social Desirability and Life Satisfaction*

	Group Membership by Anxiety			Group Membership by Depression		
	<i>F</i> value	<i>p</i> value	$R^2$	<i>F</i> value	<i>p</i> value	$R^2$
Socially desirable responding	4.39**	.005	.05	7.25**	.0001	.09
Life satisfaction	5.84**	.0007	.07	24.14**	< .0001	.24

\*  $p < .05$ , \*\* $p < .01$ .

**Level of life satisfaction.** Students' group membership for both anxiety and depression were compared to their life satisfaction, as indexed by their average score on the Students' Life Satisfaction Scale (SLSS). Before conducting ANOVAs, the last two assumptions were evaluated. The second assumption was that the sample was normally distributed. An examination of results from the Shapiro-Wilk test for the average score on the SLSS showed that this assumption was violated ( $p < .0001$ ). However, after further investigating the skewness ( $sk = -$

.76) and kurtosis ( $ku = .08$ ) values of this variable, it was determined that the departure from normality was not substantial. Additionally, the ANOVA is robust to violations of normality. Because this assumption was violated, the Brown-Forsythe test was conducted to evaluate the last assumption (i.e., homogeneity of variance) for each analysis.

Students' group membership for anxiety was compared to their overall life satisfaction. Before conducting an ANOVA, the last assumption (i.e., homogeneity of variance) was evaluated. This null hypothesis that the variances were equal failed to be rejected ( $F(3,229) = 0.52, p = .67$ ), meaning that this assumption was not violated. The results of the ANOVA found that the effect of group membership for anxiety was significant for life satisfaction ( $F(3,229) = 5.84, p = .0007$ ). However, the magnitude of the effect was small, as 7.11% of the variance in group membership for anxiety could be accounted for by life satisfaction ( $R^2 = .07$ ). Results of contrast comparisons indicate that students who were correctly identified did not differ from those who were missed ( $F(1, 36) = 0.01, p = .94$ ), nor did students who were misidentified from students who were correctly not identified ( $F(1, 197) = 0.06, p = .80$ ). Instead, the trend in group means (see Table 26) is for students with elevated anxiety (both correctly identified and missed by teachers) to report a lower level of life satisfaction than the two groups who denied elevated anxiety.

Students' group membership for depression was also compared to their life satisfaction. Before conducting an ANOVA, the last assumption (i.e., homogeneity of variance) was evaluated. This null hypothesis that the variances were equal failed to be rejected ( $F(3, 229) = 0.83, p = .48$ ), meaning that this assumption was not violated. The results of the ANOVA found that the effect of group membership for depression was significant for life satisfaction ( $F(3,229) = 24.14, p < .0001$ ). Also, the magnitude of the effect was moderate, as 24.03% of the variance

in group membership for depression could be accounted for by life satisfaction ( $R^2 = .24$ ). Results of contrast comparisons indicate that students who were correctly identified did not differ from those who were missed ( $F(1, 28) = 0.13, p = .72$ ). However, there was a difference between students who were misidentified and students who were correctly not identified ( $F(1, 205) = 9.60, p = .002$ ). In the present study, middle school students who were misidentified ( $M = 4.43, SD = 1.03$ ) for depression through teacher nomination were less satisfied with their lives than students who were correctly not identified ( $M = 4.88, SD = 1.03$ ). Table 25 summarizes the results of the analyses examining socially desirable responding and life satisfaction. Table 26 provides more detail regarding the group comparisons that were conducted.

### **Summary of Findings**

The present study explored the use of teacher nominations as an accurate method of identifying early adolescents in schools with symptoms of anxiety or depression. The accuracy of all teacher groups and school-based mental health (SBMH) professionals in the current study is summarized in Table 27 (anxiety) and Table 28 (depression).

In the identification of anxiety, combined ratings from teachers in three subject areas produced higher rates of identification and misidentification, when compared to each group of subject-area teachers (i.e., language arts, math, social studies). In contrast, accuracy from combined ratings from three teachers did not differ significantly from language arts and math teachers in the identification of depression. However, language arts and math teachers evidenced higher rates of identification than social studies teachers and higher misidentification rates when compared to each subject-area teacher group.

Table 26

*Comparison of Socially Desirable Responding and Life Satisfaction by Group*

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i> value
Socially Desirable Responding: Anxiety					
Correctly Identified	21	5.52	2.75		
Missed	15	5.20	3.23	0.12	.73
Correctly Not Identified	129	7.28	2.75		
Misidentified	68	7.00	2.76	0.45	.50
Socially Desirable Responding: Depression					
Correctly Identified	9	5.56	2.07		
Missed	19	4.32	2.11	1.25	.26
Correctly Not Identified	157	7.24	2.86		
Misidentified	48	7.08	2.64	0.12	.73
Life Satisfaction: Anxiety					
Correctly Identified	21	3.99	1.07		
Missed	15	3.96	1.04	0.01	.94
Correctly Not Identified	129	4.73	1.00		
Misidentified	68	4.70	.92	0.06	.80
Life Satisfaction: Depression					
Correctly Identified	9	3.27	.95		
Missed	19	3.40	.84	0.13	.72
Correctly Not Identified	157	4.88	.85		
Misidentified	48	4.43	1.03	9.60	.002*

\*  $p < .05$ .

Table 27

*Accuracy of Teachers and SBMH Professionals in Identifying Elevated Levels of Anxiety*

	Sensitivity	Miss Rate	Specificity	Misidentified
<b>Teachers</b>				
Total Student Sample ( <i>N</i> = 233)	58.33%	41.67%	65.48%	34.52%
Reduced Student Sample ( <i>N</i> = 185)	59.38%	40.63%	65.36%	34.64%
Language Arts	40.63%	59.38%	81.05%	18.95%
Math	31.25%	68.75%	81.70%	18.30%
Social Studies	6.25%	93.75%	96.73%	3.27%
<b>SBMH Professionals</b>				
Team ( <i>N</i> = 121)	12.50%	87.50%	89.69%	10.31%
School Nurse ( <i>N</i> = 150)	14.81%	85.19%	83.74%	16.26%

*Note.* Total student sample includes nomination data from all 19 teachers; reduced student sample only includes students who were considered by three teachers, specifically teachers of language arts, math, and social studies subject areas.

When comparing students who were missed to those who were correctly identified for both anxiety and depression, there were no statistically significant differences in any of the investigated variables (i.e., demographic characteristics, symptoms severity, symptom type). Additionally, in the comparison between students who were misidentified and students who were correctly not identified, there were no differences for most of the aforementioned variables and social desirability.



Table 28

*Accuracy of Teachers and SBMH Professionals in Identifying Elevated Levels of Depression*

	Sensitivity	Miss Rate	Specificity	Misidentified
<b>Teachers</b>				
Total Student Sample ( <i>N</i> = 233)	32.14%	67.86%	76.59%	23.41%
Reduced Student Sample ( <i>N</i> = 185)	29.17%	70.83%	77.02%	22.98%
Language Arts	16.67%	83.33%	88.82%	11.18%
Math	16.67%	83.33%	87.58%	12.42%
Social Studies	4.17%	95.83%	96.27%	3.73%
<b>SBMH Professionals</b>				
Team ( <i>N</i> = 121)	26.32%	73.68%	74.51%	25.49%
School Nurse ( <i>N</i> = 150)	14.29%	85.71%	82.17%	17.83%

*Note.* Total student sample includes all 19 teachers; reduced student sample only includes teachers from language arts, math, and social studies subject areas.

However, differences were observed for overall depression, in that students who were misidentified for depression reported higher overall depression symptoms than students who were correctly not identified. Additionally, there were differences for two depression subscales (i.e., negative self-esteem, ineffectiveness), in that early adolescents who were misidentified for depression endorsed more symptoms of these aspects of depression symptoms than those students who were correctly not identified. Finally, early adolescents who were misidentified for depression reported lower levels of life satisfaction than those students who were correctly not identified for depression. Taken together, these findings suggest that teachers may be attuned to some mild mood and quality of life impressions that misidentified students exhibit (compared to

students teachers do not nominate for depression), but these symptoms that are detected by teachers do not coincide with repeated student reports of clinically elevated levels of depression. The interpretation of the findings in the current study will be discussed in the next chapter.

## **Chapter V: Discussion**

The primary purpose of the current study was to examine the accuracy of nominations from educators (i.e., teachers, school-based mental health professionals) in identifying middle schools students who self-reported elevated levels of anxiety or depression. This study also aimed to investigate if there were any differences in accuracy when obtaining nominations from multiple teachers versus a single teacher. Finally, the study sought to enhance the literature by providing more information about those students who were missed or misidentified during the educator nomination process.

This chapter summarizes the findings from the present study and discusses these findings in relation to the existing literature. Then, the limitations of the current study are described. Finally, the implications for school psychologists and possible directions for future research are presented.

### **Prevalence of Anxiety and Depression**

Although the prevalence rates of anxiety and depression among early adolescents were not under direct investigation in the present study, a discussion of these data is warranted. In the current study, approximately 16% of middle school students repeatedly self-reported elevated levels of anxiety and around 12% self-reported elevated levels of depression. These obtained proportions are consistent with prior research, in that the lifetime prevalence of any anxiety disorder among children and adolescents ranges from 15% to 20% (Beesdo et al., 2009) and the lifetime prevalence of a depressive disorder among adolescents is approximately 12% (Merikangas et al., 2010). The current study demonstrated that these rates of elevated

internalizing symptomatology are also apparent in a specific population—low income, minority youth in an urban school.

### **Accuracy of Teacher Nominations for Identifying Anxiety**

One aim of the current study was to examine the accuracy of teachers in identifying middle school students with elevated levels of anxiety (Research Question 1). The sensitivity (i.e., correct identification) and specificity (i.e., correct non-identification) proportions were examined to determine teachers' overall accuracy. In the present study, teachers' sensitivity in identifying anxiety was 58%, while their specificity was 66%. These figures suggest that teachers are fairly accurate in identifying early adolescents who exhibit symptoms of anxiety, as they correctly identified over half of students who self-reported at elevated symptoms of anxiety (i.e., total symptoms more than one standard deviation higher than a normative sample of same-age youth), and accurately did not nominate nearly two-thirds of students who did not report elevated levels of anxiety. In other words, they missed less than half of symptomatic students, but also misidentified approximately a third of students who actually reported symptoms of anxiety in the normal range.

The findings in the present study are more promising than results found in prior studies, as teachers in this sample correctly identified more students than teachers in other studies. In the extant literature, only two other studies (Cunningham & Suldo, 2014; Dadds et al., 1997) have examined teachers' accuracy in the identification of anxiety in relation to an established criterion (i.e., self-report measures). Neither of those studies was conducted in a middle school setting (although Dadds and colleagues did include children ages 7 to 14). While Cunningham and Suldo (2014) found that elementary school teachers correctly identified approximately 40% of anxious students, Dadds and colleagues (1997) reported that teachers correctly identified only

20% of students in grades three through seven in primary schools. However, the increased sensitivity may have come at a cost to specificity, as teachers in the current study also had a higher misidentification rate (34%) than teachers in prior studies (9% to 18%). Although it is not ideal to have a higher misidentification rate, as a clinician, it is likely preferable to missing students who actually do experience elevated symptoms of anxiety. At the very least, the misidentification of these students will prompt referral to a school-based mental health professional, who can then further evaluate whether or not those particular students need further mental health services (as opposed to being missed and thus unlikely to receive any further support from school-based mental health providers following the screening). Of note, teachers in the present study were not asked to base their nominations on whether or not a particular student should be referred to a school-based mental health professional for further assessment.

Teachers in the current study may have been more accurate than teachers in prior research for a number of reasons. One possible reason is the additional number of teachers available to nominate a given student for anxiety (up to seven teachers as opposed to only one teacher in the elementary or primary school setting, since middle school students rotate through class periods whereas elementary school students have but one teacher). Additionally, a few teachers noted that they teach multiple grades or taught students for more than one class period. Thus, some teachers may have been more familiar with students, and thus had more opportunities to observe symptoms of anxiety (e.g., during tests or presentations). Teachers in the current study were also permitted to nominate as many students as they would like for anxiety, whereas teachers in the aforementioned studies were limited to nominating only three students; however, it is notable that teachers in Cunningham and Suldo's study rarely "used" only three nomination slots, and instead nominated an average of only two students. In the

present study, elevated anxiety was defined differently than defined by Dadds and colleagues, who used the same raw cut-off score across age groups as opposed to using a *T*-score that recognizes differences in typical number of anxious symptoms between age groups. Dadds and colleagues also used a more simplified description of anxiety when asking teachers to nominate students (i.e., shy, nervous, afraid, inhibited) than in the present study and the study by Cunningham and Suldo, which both provided teachers with a page of instructions and a lengthy list of behavioral descriptors.

### **Accuracy of Teacher Nominations for Identifying Depression**

For Research Question 2, again the sensitivity (i.e., true positive) and specificity (i.e., true negative) proportions were examined to determine teachers' overall accuracy. In the identification of depression, teachers' sensitivity rate was low—37%— and the specificity rate was 77%. These proportions suggest that middle school teachers are less accurate in identifying depression than anxiety, as they correctly identified only one-third of students who self-reported elevated symptoms of depression (compared to 58% accuracy for anxiety). Teachers missed around two-thirds of students, but misidentified less than a quarter of early adolescents who did not report symptoms of depression. Thus, although teachers were less accurate in identifying depression than anxiety, they were more accurate in the correct non-identification of depression (i.e., specificity rate).

These findings are less promising than results found in prior studies, as teachers in the present study correctly identified fewer students for depression than teachers in prior studies. In the literature, only three other studies (Auger, 2004; Cunningham & Suldo, 2014; Moor et al., 2007) have investigated the accuracy of teacher nominations for depression in relation to an established criterion (i.e., self-report measures). These prior studies found that teachers correctly

identified around 41% to 80% of students aged 9 to 15. Teachers in the current study also misidentified more students than elementary school teachers (23% vs. 16% for teachers in study conducted by Cunningham and Suldo and 9% for teachers Auger's study). However, as discussed previously, having a higher misidentification rate is preferable to possibly missing students.

Middle school teachers in the current study may have been less accurate than teachers in prior studies for several reasons. As the symptoms of depression are less observable than the symptoms of anxiety, perhaps teachers need to spend more time with these students to have an opportunity to observe the symptoms of depression. Two of the three prior studies were conducted in elementary schools (Cunningham & Suldo, 2014) and high schools in Scotland (Moor et al., 2007). Although Moor and colleagues (2007) examined teacher accuracy with students aged 12 to 15, these schools appear to be structured differently from secondary schools in the U.S., as nearly half of the teachers were described as guidance teachers, in that they provided support for students' personal and social success, in addition to their academic success. Thus, the accuracy rates found by Moor and colleagues may be inflated, as the teachers in their study may have been more familiar with their students outside of their school concerns. Due to spending less time with each student, middle school teachers in the current study may also be less confident in identifying students with elevated levels of depression. Thus, providing multiple teachers with the opportunity to nominate a given student for depression, as well as allowing each of them to nominate as many students as they would like may have contributed to the lower sensitivity rate and higher misidentification rate. Although Auger (2004) similarly investigated teacher accuracy in identifying middle school students, only five of the 356 students in that sample (1%) met criteria for clinical depression (compared to 28 students with elevated levels of

depression out of 233, or 12%, in the current study). Given that the base rate in that prior study was much lower than the rate found in the present study, those students may have stood out more compared to the rest of the sample.

### **Accuracy of Nominations from School-Based Mental Health (SBMH) Professionals for Identifying Anxiety**

The current study also sought to expand the literature by investigating the accuracy of school-based mental health (SBMH) professionals in identifying middle school students with elevated levels of anxiety (Research Question 3). In this study, the school psychologist, school social worker, and three school counselors nominated as a team to remain authentic to the mental health team collaboration used in the participating school. For the same reason, the school nurse completed her nomination from independently. For the team of SBMH professionals, their sensitivity in identifying anxiety was 12.50%, while their specificity was 89.69%. These figures suggest that the team of SBMH professionals is not accurate in identifying early adolescents who exhibit symptoms of anxiety, as they missed the vast majority of students who reported elevated levels of anxiety. On a more positive note, they only misidentified around 10% of students who did not report elevated anxiety symptoms.

The findings in the current study are less encouraging than results found in the prior study that examined the combined accuracy of SBMH professionals (Cunningham, 2012). In that study, combined nominations from SBMH professionals (i.e., school psychologist, school social worker, school counselors) correctly identified around 67% of elementary school students with elevated levels of anxiety and correctly did not identify around 65% of children who did not self-report elevated symptoms of anxiety. Thus, they only missed around 33% of students but also



misidentified around 35% of elementary school children in their sample. Of note, the school nurse was not included as a nominating party in that study.

Several hypotheses were developed as to why the team of SBMH professionals in the current study may have been less accurate than the SBMH professionals in Cunningham's (2012) prior study. One major difference is the school setting. While Cunningham conducted her research with elementary school students, the current study was conducted with middle school students. SBMH professionals in secondary settings may be less accurate than SBMH professionals in elementary settings because of differences in the structure of these schools and differences in the roles of SBMH professionals (e.g., a school counselor at the elementary level may lead classroom guidance lessons vs. a school counselor at the secondary level tends to be more responsible for organizing student schedules). Thus, SBMH professionals at the middle school level may not be as familiar with as many students as SBMH professionals working in an elementary setting. Another difference between these two studies was the process of nomination. Cunningham (2012) found that the accuracy rates of SBHM professionals were higher when combining the independent nominations from each SBMH professional. The current study allowed the SBMH professionals to nominate students as a team for anxiety and depression (i.e., they were provided with one set of roster lists and asked to collaboratively determine their nominations). As mentioned previously, this team was not provided with a standardized process of nomination to maintain the authenticity of how teams operate at schools. However, the use of a team nomination may have had a negative impact on the accuracy of SBMH professionals. For example, some SBMH professionals may have been more vocal in who should be nominated than others. Also, they may have used a procedure that negatively impacted their team accuracy (e.g., majority agreement).

The school nurse's sensitivity in identifying anxiety (14.81%) was similar to the team of SBMH professionals, and her specificity rate (83.74%) was slightly lower. These numbers indicate that the school nurse missed most students who self-reported elevated symptoms of anxiety and misidentified around 16% of students who did not report elevated anxiety. Although a review of the literature did not find any published studies examining the accuracy of school nurses with which to compare the findings from the present study, this researcher hypothesizes that the school nurse may have been able to accurately identify 15% of the symptomatic students because of the somatic symptoms associated with anxiety. For example, a student who is frequently in the school clinic with complaints of a stomachache may be detected more easily by the nurse than other SBMH professionals. As school nurses are a major provider of mental health services in middle schools (Foster et al., 2005), further research is needed regarding the accuracy of a larger sample of nurses in identifying those students with elevated levels of anxiety.

### **Accuracy of Nominations from School-Based Mental Health (SBMH) Professionals for Identifying Depression**

The present study also examined the accuracy of SBMH professionals in identifying elevated levels of depression among middle school students (Research Question 4). The team of SBMH professionals' sensitivity in identifying depression was 26.32%, while their specificity was 74.51%. These numbers suggest that SBMH professionals are more accurate in identifying middle school students who self-report elevated symptoms of depression. However, they still missed nearly three-fourths of students reporting elevated levels of depression. Although the team of SBMH professionals correctly identified more students for depression than anxiety, they also misidentified around a quarter of students.

The findings in the present study are less promising than prior research (i.e., Cunningham, 2012) examining the combined accuracy of SBMH professionals. Cunningham found the sensitivity rate for combined nominations from SBMH professionals was around 45% and the specificity rate was around 69%. Thus, they missed around 55% of children and misidentified around 31% of elementary school students in their sample. The findings from the current study are also inconsistent with the pattern of accuracy in Cunningham's study, as the team of SBMH professionals' sensitivity and misidentification rates were higher for depression than anxiety.

The hypotheses formulated to possibly explain the findings for the SBMH professional team nominations for anxiety are also applicable in their nomination of depression (i.e., differences in school setting, differences in role of SBMH professionals, nomination process). Perhaps the team of SBMH professionals was relatively more likely to identify depression than anxiety because students are more likely to self-refer to their school counselor or the school psychologist for feelings of depression than anxiety. Also, the members of the team of SBMH professionals may receive more training related to depression than anxiety. For example, trainings on conducting a suicide assessment will inherently discuss symptoms related to depression.

In the present study, the school nurse's sensitivity (14.29%) and specificity rates (82.17%) for depression were slightly lower than it was for anxiety. These figures suggest that the school nurse missed the majority of students who self-reported elevated levels of depression and misidentified 17.83% of students. In comparison to the team of SBMH professionals, her sensitivity rates were lower. Although no published studies have examined the accuracy of school nurses, these findings are consistent with the hypotheses discussed earlier related to students being more likely to self-refer to a school counselor or the school psychologist for

feelings of depression. Students may be less likely to get referred to the school nurse when exhibiting symptoms of depression. Nevertheless, similar to anxiety, some symptoms of depression are somatic in nature (e.g., fatigue, appetite suppression) which may explain why the school nurse was able to accurately identify 14% of students with elevated depression. Because school nurses are considered major providers of mental health services in middle schools, further research is warranted in this area.

### **Differences in Accuracy for Nominations from a Single Teacher**

Another aim of the present study was to examine the differences in accuracy when asking multiple teachers (i.e., ratings combined across subject areas) compared to asking a single teacher (i.e., all teachers of a single subject area; Research Question 5) for anxiety and depression. The accuracy of multiple teachers was calculated using a subsample of 185 students who had complete data from a language arts, math, and social studies teacher. The accuracy of a single teacher was calculated using data from the same subsample for each group of subject area teachers (i.e., language arts, math, social studies), separately.

In the identification of anxiety, the combined group of teachers' sensitivity was 59.38% and their specificity was 65.36%, which is fairly similar to the rates obtained for all teachers nominating the total student sample. Lower sensitivity and specificity rates were obtained for language arts (40.63% and 81.05%), math (31.25% and 81.70%), and social studies teachers (6.25% and 96.73%). When making formal comparisons between the nominations from multiple teachers and each group of subject area teachers, the combined group of teachers identified, but also misidentified, significantly more students than any single subject area teacher. These results suggest that (a) nominations can be elicited from multiple core subject area teachers (i.e., language arts, math, social studies) without a cost to accuracy when compared to nominations

from all teachers and (b) nominations from a combined teacher group results in higher accuracy in the identification of anxiety than when just asking teachers from a single subject area. As there are no published studies to date that have examined the number of teachers' nominations needed in order to optimize sensitivity rates, further research is warranted in this area. Specifically, it would be useful to collect data regarding the accuracy of teachers from other subject areas (e.g., science, electives), as well as examine the accuracy among high school teachers.

In the identification of depression, the combined group of teachers' sensitivity was 29.17% and their specificity was 77.02%, which is also pretty similar to the rates obtained for all teachers nominating in the largest student sample. However, much lower sensitivity and specificity rates appeared to have been obtained for language arts (16.67% and 88.82%), math (16.67% and 87.58%), and social studies teachers (4.17% and 96.27%). When making formal comparisons between the nominations from multiple teachers and each group of subject area teachers, the combined group of teachers did not differ significantly from language arts and math teachers in regards to their identification of depression. However, the combined group of teachers did misidentify more students for depression than language arts, math, and social studies teachers, separately, and identified more students than social studies teachers. These findings suggest that teacher nominations may not be the best method for identifying students with depression in a middle school setting. However, if teacher nominations are used, it may be best to rule out social studies teachers as a nomination group. Because high-stakes tests are typically associated with assessments of students' knowledge of language arts and math subject areas, middle school students may exhibit more distress in these classes than they might in their social studies class, permitting language arts and math teachers unique opportunities to observe atypical emotional reactions. As a result of failing to pass these exams the first time, some students may

also be enrolled in two class periods of language arts and/or math each school day. Thus, language arts and math teachers may have more observations from which to base their nominations of depression than social studies teachers.

As there are no published studies to date that have examined the number of teachers' nominations needed in order to optimize sensitivity rates for anxiety and depression, further research is warranted in this area. Specifically, it would be useful to collect data regarding the accuracy of teachers from other subject areas (e.g., science, electives), as well as examine the accuracy among high school teachers. There may also be differences in teacher characteristics (e.g., gender, race/ethnicity, years of experience, confidence in identifying anxiety and/or depression) that are contributing to the differences in accuracy.

### **Characteristics of Missed Students**

The current study also sought to investigate if there were similar features for students who may be missed for anxiety or depression. Missed students were compared to correctly identified students on demographic characteristics, specifically gender, race/ethnicity, and SES. In the comparison of missed students to correctly identified students, there were no significant differences by gender, race/ethnicity, or SES for either anxiety or depression. However, there was a trend for teachers to correctly nominate 72% of anxious Black students but only 36% of anxious students who were from another minority ethnic group, primarily Hispanic and multiracial students. Unfortunately, the sample size of White students in this study was too small for further examination (i.e., only one White student reported elevated levels of anxiety and she was correctly nominated). Of note, the current sample predominantly consisted of Black students (51%). Teachers in the present study were fairly accurate in their nominations for the majority of these students, suggesting that students' status as the majority or minority cultural group in their

school context may influence if they are more or less likely to be accurately identified as symptomatic by teachers.

In the extant literature, the findings were mixed in regards to differences by gender. Although some studies found significant effects or trends for boys to be correctly nominated at a higher rate than girls (Cunningham & Suldo, 2014; Roeser & Midgley, 1997), several studies reported no gender differences (Auger, 2004; Dadds et al., 1997; Layne et al., 2006; Soles et al., 2008). Prior studies that have found gender differences were conducted in elementary schools. Thus, gender differences may only be present for children in that stage of development. The current findings do not provide support that gender contributes to the number of students who are missed via teacher nominations for anxiety and depression, at least among a middle school population. Past research was also mixed in regards to differences by race/ethnicity. Although the findings from the current study are consistent with the results obtained by Cunningham and Suldo (2014), who did not find missed students were more likely to be from a specific ethnic group, Roeser and Midgley (1997) found differences by race/ethnicity, in that African American youth were more likely to be nominated by teachers as having “emotional or behavioral difficulties serious enough that s/he could benefit from seeing a psychologist...” (p. 120), while Asian American youth were less likely to be nominated. Further research is needed to determine if there are differences in teacher nominations for anxiety and depression by race/ethnicity. As no published studies have examined differences in SES for missed students, further research is warranted to see if the results found in the current study (i.e., no differences in SES between students who are missed and students who are correctly identified) are maintained.

Missed students were also compared to correctly identified students by symptom severity and symptom type. In the comparison of students who were missed to those who were correctly

identified, there were no significant differences by symptom severity and symptom type for both anxiety and depression, suggesting that the missed group is *not* a subclinical group with less symptom severity. However, there was a trend for missed students to report higher levels of social anxiety than those students who were correctly identified as exhibiting elevated levels of anxiety, suggesting that social anxiety may go particularly unnoticed by teachers (symptoms of other types of anxiety, such as separation anxiety and obsessive-compulsive disorder, may be more visible to teachers). There were no other trends for either anxiety or depression. These findings are consistent with Cunningham and Suldo (2014), who also found that there were no significant differences in symptom severity for either anxiety or depression when comparing missed students to correctly identified students. Taken together, these findings refute the notion that teachers recognize only the most symptomatic anxious or depressed students.

### **Characteristics of Misidentified Students**

A final goal of this study was to examine why early adolescents may be misidentified for anxiety or depression. Misidentified students were compared to the other group of students without elevated symptomology—correctly not identified students—on the same demographic variables examined in prior analyses (i.e., gender, race/ethnicity, SES). In the comparison of students who were missed to those who were accurately not nominated, there were no significant differences by gender, race/ethnicity, or SES for either anxiety or depression. However, there was a trend for teachers to misidentify more males than females for anxiety and depression, suggesting that boys may be more likely to be viewed as aberrant to teachers who observe any displays of anxious or depressive behaviors.

Misidentified and correctly not nominated students were also compared by symptom severity and type for both anxiety and depression. Although there were no significant differences



or trends for anxiety symptom severity or type, the two groups differed significantly in depression symptom severity and in two symptom types. Specifically, misidentified students reported higher mean levels of total depression, negative self-esteem (e.g., low self-esteem, self-dislike, feelings of being unloved), and ineffectiveness (e.g., self-evaluation of abilities and school performance negatively, impaired capacity to enjoy school and other activities) than students who were correctly not nominated. Additionally, there was a trend for misidentified students to report higher levels of negative mood/physical symptoms (e.g., symptoms that manifest as sadness or irritability, physical symptoms related to sleep, appetite, fatigue, and aches/pains) than those students who were accurately not nominated by teachers. As no published studies have examined the characteristics of misidentified students, further research is warranted to see if the results found in the current study are maintained. In isolation, these results suggest that teachers may have picked up on a subclinical level of depressive symptoms when nominating many of the students whose self-reports did not reach clinical levels of score elevations.

Middle school students who were misidentified were also compared to those students who were correctly not identified in terms of socially desirable responding. It was hypothesized that some students who were misidentified may actually exhibit elevated symptoms but respond to surveys in a socially desirable manner, thus under-reporting their symptoms severity. Contrary to these expectations, there were no significant between-group differences or trends for socially desirable responding between groups of students with similar teacher identification status. Instead, the trend in overall group means was for students with elevated anxiety or depression (i.e., correctly identified and missed groups) to report a lower level of socially desirable responding than the two groups who denied elevated anxiety or depression (i.e., correctly not

identified and misidentified groups). Due to the absence of significant differences between the students who were correctly not nominated and misidentified, the current findings do not provide support that youth socially desirable responding contributes to the number of students who are misidentified via teacher nominations for anxiety and depression. Instead, the misidentified students seem to be truthfully reporting (denying actually) their symptom severity.

Early adolescents who were misidentified were also compared to those students who were correctly not identified in terms of life satisfaction. It was hypothesized that some students who were misidentified may have been *more* satisfied with their lives than students who were correctly not identified, thus protecting them from fully recognizing their own symptomatic levels of anxiety or depression, again, leading them to under-report the severity of their symptoms. When comparing students correctly not identified and misidentified for depression, there was a significant difference for students who were misidentified for depression to report feeling *less* satisfied with their lives than those students who were correctly not identified. It is possible that teachers mistook low happiness for depressive symptomatology. There were no other significant differences or trends when making specific group comparisons (i.e., correctly identified vs. missed; correctly not identified vs. misidentified). However, there was a trend for students with elevated levels of anxiety (i.e., correctly identified, missed) to report feeling less satisfied with their lives than the two groups who reported typical levels of anxiety symptoms (i.e., correctly not identified, misidentified). In sum, the current findings suggest that misidentified students feel *less* satisfied with their lives than students who were correctly not nominated, but are not so unhappy as to also experience elevated depressive symptoms.

Taken together, the findings from these analyses of misidentified students provide some evidence that this group of students is truthful in self-reporting their own levels of anxiety and/or

depression. Additionally, rather than detecting clinical levels of depression symptoms, teachers may be making their nominations based on differences in quality of life and mild mood changes that do not align with students' self-report of depressive symptomatology. Unfortunately, the results did not identify reasons for the differences between students misidentified and correctly not identified for *anxiety*. As the current study provides a preliminary examination of variables that may explain why students are misidentified, further research is needed to investigate these same variables, as well as additional ones such as student behavior at school (e.g., office discipline referrals, attendance) and functioning in other domains (e.g., academic achievement).

### **Delimitations**

Delimitations describe intentional limits of the study design that may threaten the generalizability of study findings. One delimitation of the present study is the reliance on children's self-report of anxiety and depression symptoms (via the MASC 2 and CDI 2) to indicate elevated/at-risk levels of anxiety and depression. Although clinical interviews are widely used in clinical settings to diagnose mental health disorders, they are rarely used in schools because of the extensive time and resources needed to interview each child. Thus, the present study used students' self-report of anxiety and depression in order to approximate likely gold-standard procedures for determining elevated symptoms in the school setting. Another delimitation is that the findings can only be generalized to middle school students, as data were only collected from that age range in order to address a gap in the literature. Moreover, the participants in this study were drawn from a single middle school in a Southeastern state. Although the obtained sample was fairly large, some of the findings may reflect characteristics that are unique to the students and teachers at this particular school. Also, data were only collected from seventh and eighth graders due to an existing mental health initiative for sixth-

graders at the participating middle school. Because the students identified as a result of the current study were invited to participate in mental health interventions after the identification process, the current study did not want to conflict with the mental health interventions in place for to sixth grade students. Finally, the team of SBMH professionals was not provided with a standardized process for making their nominations, as their process was not an aim of this study and the researchers wanted the team to meet and collaborate in an authentic manner. Thus, information on the process they used to make their nominations cannot be generalized to future studies.

### **Limitations**

Limitations describe elements of the study that could not be controlled for and may threaten the internal validity of the study. A limitation of the present study is the low return rate of consent forms (43%), despite using several different methods to elicit consent, including small individual incentives, interdependency group contingency reward, and drawings for larger individual incentives. The return rate in the current study is lower than rates found in prior studies (56% to 61%; Cunningham & Suldo, 2014; Layne et al., 2006). Further, the actual participation rate was even lower, with only 37% of seventh- and eighth-grade students at this particular school actually participating in the study (41 students' parents indicated on a returned consent form that they did *not* want their child to take part in the study). It is likely that other students at that participating school also experienced elevated anxiety and/or depression, but were not eligible for teacher nomination due to lack of parent consent.

Another limitation is the low numbers of participants from ethnic minority groups beyond African American. Although the participating school was diverse in terms of race/ethnicity, in analyses several groups had to be combined into a single "other ethnic minority" category due to

low sample sizes for comparison analyses. Had the participation rate from this diverse school been higher, the analyses examining differences by race/ethnicity could likely have investigated more than the three categories with sufficiently large numbers—White, Black, other ethnic minority.

A third limitation in this study pertains to the large number of students who were unknown to the team of SBMH professionals (48% of sample) and the school nurse (36% of sample). The mental health staff's lack of familiarity with students was surprising and suggests that, at the middle school level, the mental health staff is more likely to have intense contact with a small number of students than relatively equal interaction frequency with all students. In addition, despite the literature describing school nurses as major providers of psychosocial services in schools, the school nurse in the present study reported on the demographic information form that she had not received any graduate training or professional development, related to mental health. Thus, including the school nurse as a member of the school-based mental health professional team at this particular school may have been uncalled for in the present study.

Last, the use of student self-report for determining elevated levels of anxiety and depression (instead of a clinical interview with a trained interviewer) is also a limitation of the present study, in part because it is unknown how much students' reports would have aligned with those from another informant, such as a parent. However, it was much more feasible to assess a large number of students' anxiety and depression via rating scales, as the current study did not have the resources to conduct individual clinical interviews with each student or collect data from each family. To mitigate the possible error inherent to self-report data, student participants

were considered to be at-risk only if they reported twice that they experienced elevated symptomatology.

### **Implications for School Psychologists**

The findings from the current study have several implications for school psychologists. One implication is the continued need for mental health services for youth. In the current study, approximately 16% of middle school students repeatedly reported elevated levels of anxiety and 12% reported elevated levels of depression. As early adolescence is a particularly vulnerable developmental period, it is imperative that these children's mental health needs are addressed due to the psychosocial and academic outcomes associated with elevated levels of internalizing psychopathology. School psychologists are in an ideal position to work closely with other school personnel to support students' social-emotional needs on a systemic level.

The findings on teacher accuracy suggest that teacher nominations are a viable method of identifying the majority of students with elevated anxiety, and a small number of students with elevated depressive symptoms. Given the cost-effectiveness of this method of identification, these results are promising, particularly for anxiety. For example, instead of having a teacher complete a rating scale for every child (which can easily take 10-15 minutes for each child, not including time for scoring by a mental health provider), teachers can provide nominations via circling students on their class roster who meet criteria for certain internalizing disorders (which takes 10-15 minutes total). School psychologists' review of the list of students who were nominated can be completed more quickly than scoring each rating scale. Thus, a list of students potentially in need of services can be generated more quickly using teacher nomination procedures. School psychologists would likely be able to rely on teacher nominations to identify a large number of students in need of mental health services. Given the similarities in accuracy

when asking all teachers vs. teachers from three different subject areas, school psychologists may want to consider limiting the number of teachers that are included in the nomination process (for the sake of efficiency). It is likely that school psychologists do not need to ask *every* teacher for nominations for anxiety and depression. The findings in the current study suggest that combining the nominations from teachers of two core subject areas—Language Arts and Math—is superior to relying on the ratings from only one of those teachers, when identifying anxiety. For depression, Language Arts and Math teachers’ ratings considered in isolation were similarly not as accurate as the identification rates yielded when combining nominations from multiple teachers. Also notable, relying on nominations from teachers of a particular subject area (Social Studies) is not recommended. In sum, to maximize the accuracy of teacher nominations, a school psychologist would likely want to elicit nominations from multiple subject area teachers, particularly Language Arts and Math teachers. That said, the significantly higher misidentification rate that follows nominations yielded from combined teacher groups underscores the need to conduct follow-up assessment with all students nominated by at least one teacher, in order to rule out students who deny elevated symptoms (e.g., on the CDI 2 or MASC 2) when given an opportunity.

Another implication relates to the use of nominations from school-based mental health professionals. In the present study, SBMH professionals correctly nominated only about 13% to 15% of students for anxiety and 14% to 26% of students for depression. Although less promising than prior findings in elementary schools, SBMH professionals’ unique roles in secondary settings may prohibit sufficient direct contact with students. Thus, rather than relying on themselves and their mental health colleagues to have a pulse on which students in the school have mental health needs, school psychologists may be better off focusing their efforts on

supporting school-wide efforts for promoting students' wellness and further assessing students who are referred to them through teacher nomination.

There are many factors to consider when deciding how to identify students in need of mental health services in schools. There are advantages and disadvantages associated with each method and the decision should be driven by the purpose of identification. Schools that wish to identify all students who need mental health services would ideally want to use a universal screening method, as teachers in the present study still missed about 42% of students with anxiety and over two-thirds of students with depression. However, the extensive time and resources needed to implement a universal screener, as well as the ethical concerns associated with being able to serve all the students who are identified, may outweigh the benefits of using this method. Further research is needed to evaluate the extent to which teachers' nominations are a valid method of identification in the middle school setting.

A final implication of the present study relates to reducing the stigma associated with mental health. In the present study, the principal at the participating middle school was extremely motivated to improve the mental health of students and expressed extensive support to this researcher's efforts to identify and serve these children. Under this principal's leadership, the teachers and school-based mental health professionals at this particular school were similarly supportive. However, not all school administrators, instructional personnel, and/or staff share these same viewpoints. Thus, school psychologists may have to consult extensively with these individuals to change their perceptions of mental health and support efforts to promote students' mental health. School psychologists may also have to similarly consult with parents. In the present study, approximately 63% of parents did not provide consent for their child to participate in this study (either by returning the consent form and indicating negative consent or not



returning the consent form at all). It is possible that these parents did not provide consent because of the stigma associated with mental health services. School psychologists may need to provide psychoeducation to parents in order to dispel myths regarding mental health. In addition to working proactively to establish enduring and trusting relationships with families, school psychologists should emphasize the links between mental health and academic outcomes and impress upon school personnel and parents alike the importance of identifying these issues early on in order to prevent detrimental psychosocial and academic outcomes. Given that teachers in the present study were not that accurate in identifying students with anxiety or depression, as well as the less than desirable return rate of consent forms, the findings also underscore the need for school-wide social-emotional services (i.e., tier 1 in a multi-tiered system of supports). These universal practices would promote students' wellness and serve as more of a preventative method of meeting youth's psychosocial needs. Additionally, as parental consent is not required for services provided to all students, the stigma related to mental health would no longer serve as a potential barrier to improving these students' mental health.

### **Future Directions**

The current study is one of the few investigations of the accuracy of educator nominations in identifying youth with elevated levels of anxiety or depression. Further, this study serves as a preliminary investigation in the identification of *middle school* students in particular. The scarcity of research in this area warrants additional studies, especially in secondary settings, in order to draw definitive conclusions that were suggested by findings in the present study. Specifically, future studies should investigate the accuracy of teachers from other subject areas (e.g., science, electives), in addition to the ones investigated in the current study, in order to determine the number (and type) of teacher nominations needed to optimize sensitivity

rates. Also, future research should examine differences in teacher characteristics (e.g., gender, race/ethnicity, years of experience, confidence in identifying anxiety and/or depression) and whether or not those features contribute to variability between teachers in terms of their accuracy rates. Although the current study found that students misidentified for depression did experience more symptoms of depression (albeit still in the normal range relative to other adolescents in the norm sample) and were less satisfied with their lives, additional research is needed to see if these findings hold true and to explore other explanations for why students are missed or misidentified. For instance, perhaps high-achieving students are missed by teachers because their positive academic adjustment suggests across-the-board adequate adjustment to teachers. A similar form of halo bias may be apparent in misidentified students, such that students who misbehave in the classroom are more likely to be viewed as anxious or depressed by teachers, despite the separability of internalizing and externalizing forms of psychopathology. Future research may also want to investigate the appropriateness of including the school nurse as a member of the SBMH professional team. In addition to the school nurse reporting that she had limited training related to mental health, the other SBMH professionals at this particular school also reported that they typically nominate students separately from the school nurse. Thus, although school nurses may be a major provider of mental health services in schools, they may not be integrated as members of SBMH professional teams. Finally, future research is needed to evaluate the accuracy of nominations from SBMH professionals using different procedures (i.e., team vs. independent nomination). Although not an aim of this study, the process that the team of SBMH professional used may have had an adverse impact on their accuracy rates. SBMH providers may have been more accurate if they had completed the nomination forms independently (as done by the nurse) as opposed to operating as a team.

## Conclusions

In conclusion, the findings from the present study suggest that teacher nominations in the middle school setting may be a more viable method for identifying anxiety than depression. In the present study, 16% of middle school students reported elevated levels of anxiety and 12% reported elevated levels of depression. Teachers at this middle school correctly identified around 58% of these anxious youth, but only 32% of these depressed youth. Thus, schools may want to consider using a different method for initially identifying depression in a secondary setting. Additionally, nominations can be elicited from a few core subject area teachers without a cost to accuracy. However, overall, SBMH professionals were not sufficiently accurate in identifying anxiety or depression among middle school students (accurately identified 13% to 26% of anxious or depressed youth). Further investigation into the characteristics of missed and misidentified students will shed light on which students may be more or less likely to be accurately identified by educators. This information can then be utilized to inform practices concerning mental health assessment in schools. In sum, the current study provides limited support for the use of teacher nominations as a promising method of identifying youth in need of mental health services, particularly in the case of early adolescents who experience elevated depressive symptoms. Findings also underscore the need for more preventative efforts to promote students' wellness (e.g., provision of school-wide social-emotional supports).

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## Appendix A: Teacher Demographic Information Form

### Teacher Demographic Information Form

ID # \_\_\_\_\_

PLEASE READ EACH QUESTION AND CIRCLE **ONE** ANSWER PER QUESTION (*except items 6 and 7*):

1. I teach grade:                    7                    8
2. My gender is:                    Male                    Female
3. My ethnicity is:
  - a. Hispanic or Latino
  - b. Not Hispanic or Latino
4. My race is:
  - a. American Indian or Alaska Native
  - b. Asian
  - c. Black or African American
  - d. Native Hawaiian or Other Pacific Islander
  - e. White
  - f. Multi-racial (please specify): \_\_\_\_\_
  - g. Other (please specify): \_\_\_\_\_
5. My highest education level is:
  - a. Bachelors/college degree
  - b. Master's degree
  - c. M.A. + 30 (or equivalent)
  - d. Ed.S/Specialist level degree
  - e. Ph.D. or Psy.D.
  - f. Other (please specify): \_\_\_\_\_
6. Number of years teaching: \_\_\_\_\_
7. Age: \_\_\_\_\_ years old
8. Have you received professional development related to student mental health issues?
 

Yes                    No

If YES, please list professional development sessions you have attended related to students' mental health issues:

\_\_\_\_\_

\_\_\_\_\_

PLEASE CIRCLE HOW MUCH YOU AGREE OR DISAGREE WITH EACH STATEMENT BELOW:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. I feel confident about my knowledge of depressive symptoms.	1	2	3	4	5
2. I feel confident about my knowledge of anxiety symptoms.	1	2	3	4	5
3. I feel confident about recognizing a student with depression	1	2	3	4	5
4. I feel confident about recognizing a student with anxiety	1	2	3	4	5
5. I feel teachers are unqualified to recognize students with depressive symptoms.	1	2	3	4	5
6. I feel teachers are unqualified to recognize students with anxious symptoms.	1	2	3	4	5



## Appendix B: School-Based Mental Health Professional Demographic Information Form

### School-Based Mental Health Professional Demographic Information Form

ID # \_\_\_\_\_

PLEASE READ EACH QUESTION AND CIRCLE **ONE** ANSWER PER QUESTION:

1. I am a:

- a) School psychologist
- b) Guidance counselor
- c) School social worker
- d) School nurse

2. My gender is:                      Male                      Female

3. My ethnicity is:

- a) Hispanic or Latino
- b) Not Hispanic or Latino

4. My race is:

- a) American Indian or Alaska Native
- b) Asian
- c) Black or African American
- d) Native Hawaiian or Other Pacific Islander
- e. White
- f. Multi-racial (please specify): \_\_\_\_\_
- g. Other (please specify): \_\_\_\_\_

5. My highest education level is:

- a) Bachelors/college degree
- b) Master's degree
- c) M.A. + 30 (or equivalent)
- d) Ed.S./Specialist level degree
- e) Ph.D. or Psy.D.
- f) Other (please specify): \_\_\_\_\_

6. Number of years working as a school mental health professional: \_\_\_\_\_

7. Age: \_\_\_\_\_ years old

8. Have you received graduate training specific to student mental health issues?

Yes                      No

If YES, please list the courses you have completed:

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9. Have you received professional development specific to student mental health issues?  
Yes                      No

If YES, please list professional development sessions you have attended related to mental health issues:

---

---

---

**Please respond to the following questions based upon the time you spend at this school:**

10. Number of days (based upon an 8 hour school day) per week spent at this school:

---

11. Please estimate the number of hours per week you spend consulting with teachers at this school: \_\_\_\_\_

12. Please estimate the number of hours per week you spend in classrooms engaged in programming (e.g., classroom guidance) at this school:

---

13. Please estimate the number of hours per week you spend providing individual or small group counseling at this school: \_\_\_\_\_

14. How do you become informed of individual students at this school who might be in need of mental services?

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---

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## Appendix C: Student Demographic Information Form

ID # \_\_\_\_\_

Version \_\_\_\_\_

Birthdate: \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_  
(month) (day) (year)

PLEASE READ EACH QUESTION AND CIRCLE **ONE** ANSWER PER QUESTION:

1. I am in grade:                      7                      8
2. My gender is:                      Male                      Female
3. Do you receive free or reduced-price school lunch?      Yes                      No
4. My ethnicity is:
  - a) Hispanic or Latino
  - b) Not Hispanic or Latino
5. My race is:
 

<ol style="list-style-type: none"> <li>a. American Indian or Alaska Native</li> <li>b. Asian</li> <li>c. Black or African American</li> <li>d. Native Hawaiian or Other Pacific Islander</li> </ol>	<ol style="list-style-type: none"> <li>e. White</li> <li>f. Multi-racial (please specify): _____</li> <li>g. Other (please specify): _____</li> </ol>
---	---
6. My parents are:
 

<ol style="list-style-type: none"> <li>a. Married</li> <li>b. Divorced</li> <li>c. Separated</li> </ol>	<ol style="list-style-type: none"> <li>d. Never married</li> <li>e. Never married but living together</li> <li>f. Widowed</li> </ol>
---	--
7. Which adult(s) do you live with most of the time?
 

<ol style="list-style-type: none"> <li>a. Mother and Father</li> <li>b. Mother only</li> <li>c. Father only</li> <li>d. Mother and Step-father (or mom's partner)</li> </ol>	<ol style="list-style-type: none"> <li>e. Father and Step-mother (or dad's partner)</li> <li>f. Grandparent(s)</li> <li>g. Other relative (please specify): _____</li> <li>h. Other (please specify): _____</li> </ol>
--	--

*Sample Questions:*

*From the group of three sentences, pick **one** sentence that describes you best for the **past two weeks**. Put a mark next to the sentence that describes you best.*

- |   |
|---|
| <input type="radio"/> I read books all the time.    |
| <input type="radio"/> I read books once in a while. |
| <input type="radio"/> I never read books.           |

*Please circle the number that describes **how often the sentence is true about you**.*

	Never	Rarely	Some-times	Often
1. I'm scared of dogs.	0	1	2	3

## Appendix D: Students' Life Satisfaction Scale (SLSS; Huebner, 1991) and Children's Social Desirability Questionnaire (CSDQ SF-A; Carifio, 1994)

### SLSS

We would like to know what thoughts about life you've had during the past several weeks. Think about how you spend each day and night and then think about how your life has been during most of this time. Here are some questions that ask you to indicate your satisfaction with life. In answering each statement, circle a number from (1) to (6) where (1) indicates you **strongly disagree** with the statement and (6) indicates you **strongly agree** with the statement.

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
1. My life is going well	1	2	3	4	5	6
2. My life is just right	1	2	3	4	5	6
3. I would like to change many things in my life	1	2	3	4	5	6
4. I wish I had a different kind of life	1	2	3	4	5	6
5. I have a good life	1	2	3	4	5	6
6. I have what I want in life	1	2	3	4	5	6
7. My life is better than most kids'	1	2	3	4	5	6

### CSDQ SF-A

This questionnaire lists a number of experiences that most children have at one time or another. Read each of these carefully. After you have read one, decide whether it does or does not fit you. If it does, circle **True**; if it doesn't, circle **False**.

1. I am always respectful of older people.	True	False
2. Sometimes I do not feel like doing what my teachers want me to do.	True	False
3. Sometimes I have felt like throwing things or breaking them.	True	False
4. I never "mouth off" or "talk back" to my parents.	True	False
5. When I make a mistake, I always admit that I am wrong.	True	False
6. I sometimes feel like making fun of other people.	True	False
7. I always wash my hands before every meal.	True	False
8. Sometimes I wish I could just "goof off" instead of having to go to school.	True	False
9. I have never been tempted to break a rule or a law.	True	False
10. Sometimes I dislike helping my parents even though I know they need my help around the house.	True	False
11. Sometimes I say things just to impress my friends.	True	False
12. I never shout when I feel angry.	True	False

## Appendix E: School Handout

### Wellness of Middle School Children: School-Wide Screening and Follow-Up Interventions for Students with Anxiety and Depression

Shannon Suldo, Ph.D. and Cheryl Gelley (doctoral candidate)  
University of South Florida, School Psychology Program

#### ***Why Focus on Students with Internalizing Problems?***

- About 1 in 5 students demonstrate behaviors and symptoms consistent with a diagnosable DSM-IV disorder, but only a small percentage of these students (approximately one-third) receive services to address their mental health needs.
  - National studies suggest that 2.5% of children and 8% of adolescents in the U.S. suffer from clinical depression. Even more students (8 – 20%) have anxiety disorders; anxiety is the most common form of psychological distress in childhood and youth.
  - Depression and anxiety often co-occur in young people, as well as predict other problems including disruptive behavior and substance abuse.
- Schools are often charged with ensuring the social-emotional health of students, often by monitoring students' wellness and providing mental health services when they are indicated.
- School-based mental health providers such as school psychologists, guidance counselors, social workers, and school nurses strive to meet this goal by identifying youth with emotional concerns (often by conducting formal assessments) and providing time-limited group counseling services.
  - However, such services are most often only provided to students in severe need (i.e., students who come to the attention of the study support team because they fail to meet social, behavioral, and/or academic benchmarks).
  - It is imperative to identify the full range of students with symptoms of internalizing distress (i.e., anxiety and depression), so that these students can be offered services before their problems become very severe.

#### ***A Cost-Effective Screening Option: Asking Teachers to Identify Students in their Class who Display Symptoms of Anxiety and Depression (Students who may need Counseling Services)***

- Research shows teachers can accurately identify which students in their class have externalizing problems such as ADHD and noncompliance.
- Our recent research with two Hillsborough elementary schools found that teachers correctly identified as anxious and depressed 40 – 50% of students who reported clinical levels of these problems. It is unknown if middle school teachers can also accurately identify students with concerns of anxiety and depression.
- Traditional methods for identification of students at-risk for anxiety and depression requires student self-report of these symptoms, which can be time intensive and intrusive.
- If teachers can be shown to accurately identify the same students who self-report high levels of symptoms of internalizing distress, then school mental health staff would have a data-based rationale for asking teachers to nominate students who demonstrate internalizing distress, rather than conduct school-wide screenings.

### ***Purpose of Proposed Research Project***

- This study aims to determine the extent to which teachers can accurately identify the students in their class that experience internalizing distress.
  - Does accuracy increase if multiple teachers provide nominations?
  - How long must a teacher have a student in class in order to feel comfortable rating his or her behavior?
  - In the case of students whose teachers disagree with the students' self-report of anxiety and depression, do parents generally see the same behaviors as teachers or their children?
- Additionally, this study aims to provide the Greco mental health staff with a list of students who would benefit from group counseling targeting symptoms of anxiety and depression (specifically, students who self-reported high levels of these symptoms during the screening process) to assist the school mental health staff provide services to the most appropriate groups of youth.
  - The USF team is happy to co-lead the school-based counseling groups for students in need, who have parent permission to participate

### ***Proposed Method***

- A professor and graduate students in the USF College of Education (School Psychology Program) will conduct the research project. All costs associated with the collection, entry, and analysis of assessment/identification data will be incurred by the USF team.
- Participation will be sought from students in grades 7 – 8 at Greco middle school.
  - How would you recommend increasing students likelihood of returning a parent permission form to take part in the screening?
- During the 2<sup>nd</sup> nine-week grading period, multiple teachers in each grade level will be asked to identify/nominate those students in each of their classes that demonstrate symptoms of anxiety and depression. School mental health staff will also be asked to identify/nominate those students in grades 7 and 8 that demonstrate symptoms of anxiety and depression.
- That same week, students with parent permission to participate will complete paper-and-pencil measures of anxiety and depression.
  - Students who self-report elevated levels of depression or anxiety will be re-administered the same measures the following week, to ensure their problems were not temporary
- Parents will also be asked to complete paper-and-pencil measures of anxiety and depression in reference to their children.
  - How and when would you recommend getting this data from parent?
- For students who self-report high levels of symptoms during the screening process, their parents will immediately receive letters that contain contact information for community mental health agencies, so that concerned parents can seek services immediately rather than wait to receive services from the school mental health staff.
- Shortly after Christmas break, the Greco mental health staff will receive a list of students appropriate for inclusion in school-based group counseling due to the students' responses on the screening measures and teachers perceptions of these students' functioning (via the nomination procedure).

- During the spring semester, the USF research team will analyze the data received from teachers to determine the accuracy of teacher nominations (i.e., (a) the proportion of students who self-reported high levels of internalizing distress and were identified as demonstrating these symptoms by the teacher, and (b) the number of “false positives”, specifically the proportion of students who denied feelings of anxiety and depression but were nominated by their teachers)

### ***Benefits of Participation***

- The screening process would give the Greco mental health staff the knowledge of which kids to target for participation in evidence-based group counseling interventions for anxiety and depression, namely Coping Cat and Taking ACTION.
- If more students emerge as in need of services than the school mental health staff can accommodate through small group counseling, the USF School Psychology Program would be happy to assist in leading and co-leading additional groups using the aforementioned intervention programs.
- Greco will learn the results of the study with regard to the accuracy of their teachers’ and school mental health staff’s abilities to identify students with internalizing forms of emotional distress.
- This study will answer a question of great importance to the larger community of school mental health providers who aim to provide services to students with internalizing problems, and desire to know if teacher nominations are an effective way to identify students in need.

### ***Parent Permission Letter***

- Only students with parent permission to complete the screening measures of anxiety and depression will be permitted to participate in the study.
- The letter includes details such as:
  - You are being asked to permit your child to participate in a free assessment of his/her emotional wellness. The assessment will involve asking you and your child to complete brief surveys of your child’s symptoms of common mental health concerns in youth, namely anxiety and depression. Teachers and school mental health professionals will also be asked to nominate students who have demonstrated these same symptoms at school.
  - All data from parents, students, and teachers will remain confidential; only the university research team assisting with this project will have access to your child’s specific responses.
  - This assessment process is part of your school’s commitment to improve the emotional well-being of students who may have symptoms of distress, such as anxiety and depression. This commitment to promoting comprehensive health in students is in line with research that shows that students’ academic success is tied to their emotional health. Therefore, later in the school year, your school mental health team intends to offer free group counseling services to students deemed most appropriate for the school-based group counseling.

- The surveys you and your child will be asked to complete will help the school determine which students would be most appropriate for these interventions. In the event that your child indicates elevated levels of anxiety and/or depression on the surveys, you will be notified in writing regarding your child's level of emotional distress. This written communication would include referrals for community agencies that provide psychological care. Later in the year, your school mental health team will send separate information/permission forms to parents of youth who were deemed most appropriate for the school-based group counseling interventions. At that time, parents will have the option of providing permission for their children to receive the free interventions at school, or to decline the offer for services for reasons such as the child is already receiving psychological care in the community, or the child is not interested in participating. This permission form only requests permission for your child to take part in the screening process, and does not obligate your child to take part in follow-up counseling services.

**Contact for Additional Information**

- Dr. Shannon Suldo, Associate Professor of School Psychology: 813-974-2223 or Suldo@usf.edu



## Appendix F: Teacher Consent Letter

Study ID:Pro00010545 Date Approved: 12/14/2012 Expiration Date: 12/14/2013

Dear Teacher:

This letter provides information about a research study that will be conducted in your middle school by researchers from the University of South Florida. Research shows that students with common mental health problems like anxiety and depression often underperform in school due to challenges focusing and participating in class. Only about one-third of students with mental health problems receive the psychological assistance that they need. In order for schools to offer services to the students most in need, we need accurate and efficient methods to identify students with symptoms of anxiety and depression. This letter provides information about a study that will be conducted to determine how accurately educational professionals (e.g., teachers, guidance counselors) can identify students with diminished wellness.

- ✓ **Who We Are:** The research team is led by Cheryl Gelley, M.A., a doctoral candidate in the School Psychology Program at the University of South Florida (USF), and Shannon Suldo, Ph.D., a professor in the School Psychology Program at USF. We are planning the study in cooperation with the administration of your middle school to make sure that the study provides information that will be useful to the school.
- ✓ **Why We are Requesting Your Participation:** This study is being conducted as part of a project entitled, "Wellness of Middle School Children." You are being asked to participate in this project because you are a classroom teacher at a middle school that has agreed to take part in the research project. A primary aim of the study is to examine the appropriateness of using teacher nominations to identify students with "at-risk" levels of anxiety and/or depression, as compared to students' self-report of their own symptoms.
- ✓ **Why You Should Participate:** Because we need to know more about how to accurately identify students in need of mental health services! Specifically, students with elevated levels of anxiety or depression tend to "fly under the radar," and therefore often fail to be identified as in need of mental health services. Therefore, it is crucial that we know more about potential methods of identification aimed specifically at this sub-group of students. In this study, information that you provide will be combined with information from all other participating teachers and students. The group-level results of the study will be shared with the teachers, school mental health providers, and administrators at your middle school in order to increase their knowledge of accurate methods of identifying students with elevated levels of anxiety or depression. In sum, this information will allow us to evaluate effective mechanisms for identifying students that are often overlooked, and ensure they receive the mental health services to make them successful. Each teacher who agrees to participate will be entered into a drawing for one of six \$25 giftcards to a local store, which will be distributed after completion of the student nomination process. Please note, students will only be able to participate in the free mental health screening if at least one of their classroom teachers agrees to participate.
- ✓ **What Participation Requires:** Teachers who agree to participate will be provided with a list of students in their classes for whom written parent permission for participation has been obtained. Teachers will then be asked to identify which of these students in their classes show elevated symptoms of anxiety and/or depression, who they feel meet the behavioral criteria provided. This nomination process is expected to take between 5-10 minutes. Teachers will also be asked to fill out a brief (less than 5 minute) one-page survey about their demographic background and attitudes towards identifying students with anxiety and depression. Because of the sensitive nature of this topic, it is imperative that you do not discuss your nominations with anyone else in order to protect the confidentiality of students who are taking part in this study. There are no guaranteed direct benefits associated with your participation in this study.
- ✓ **Please Note:** Your decision to participate in this research study must be completely voluntary. You are free to participate in this research study or to withdraw from participation at any time. If you choose not to participate, or if you withdraw at any point during the study, this will in no way affect your relationship with your middle school, USF, or any other party.

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Version 1-November 13, 2012



- ✓ **Confidentiality of Your Responses:** There is minimal risk for participating in this research. Your privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project, but your individual responses will not be shared with school system personnel or anyone other than the USF research team. Your completed nomination form will be assigned a code number to protect the confidentiality of your responses. Only the USF research team will have access to the locked file cabinet stored at USF that will contain all records linking code numbers to participants' names.
- ✓ **What We'll Do With Your Responses:** We plan to use the information from this study to determine the appropriateness of using teacher nominations to identify students with elevated levels of anxiety or depression. It is anticipated that these results can inform future practices within schools. The results of this study may be published. However, the data obtained from you will be combined with data from other people in the publication. The published results will not include your name or any other information that would in any way personally identify you.
- ✓ **Questions?** If you have any questions about this research study, please contact me (Ms. Gelley) at [cherylduong@mail.usf.edu](mailto:cherylduong@mail.usf.edu) or (813) 421-9871. If you have questions about your rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the USF at (813) 974-5638 (please refer to eIRB # 00010545).
- ✓ **Want to Participate?** To participate in this study, please sign the attached consent form.

Sincerely,

Cheryl Gelley, M.A.  
School Psychology Doctoral Candidate  
University of South Florida

Shannon Suldo, Ph.D.  
Associate Professor of School Psychology  
Department of Psychological and Social Foundations

---

**Consent to Take Part in this Research Study**

I freely give my permission to take part in this study. I understand that this is research. I have received a copy of this letter and consent form for my records.

\_\_\_\_\_  
Signature of teacher

\_\_\_\_\_  
Printed name of teacher

\_\_\_\_\_  
Date

**Statement of Person Obtaining Informed Consent**

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

\_\_\_\_\_  
Signature of person  
obtaining consent

\_\_\_\_\_  
Printed name of person  
obtaining consent

\_\_\_\_\_  
Date

## Appendix G: School-Based Mental Health Professional Consent Letter

Study ID:Pro00010545 Date Approved: 12/14/2012 Expiration Date: 12/14/2013

Dear School-Based Mental Health Professional:

This letter provides information about a research study that will be conducted in your middle school by investigators from the University of South Florida. Research shows that students with common mental health problems like anxiety and depression often underperform in school due to challenges focusing and participating in class. Only about one-third of students with mental health problems receive the psychological assistance that they need. In order for schools to offer services to the students most in need, it is important to develop accurate and efficient methods to identify students with elevated levels of anxiety and depression. This letter provides information about a study that will be conducted to determine how accurately educational professionals (e.g., teachers, guidance counselors) can identify students with diminished wellness.

- ✓ **Who We Are:** The research team is led by Cheryl Gelley, M.A., a doctoral candidate in the School Psychology Program at the University of South Florida (USF), and Shannon Suldo, Ph.D., a professor in the School Psychology Program at USF. We are planning the study in cooperation with the administration of your middle school to make sure that the study provides information that will be useful to the school.
- ✓ **Why We are Requesting Your Participation:** This study is being conducted as part of a project entitled, “Wellness of Middle School Children.” You are being asked to participate in this project because you are a school-based mental health professional at a middle school that has agreed to take part in the research project. A primary aim of the study is to examine the appropriateness of using nominations by school-based mental health professionals to identify students with “at-risk” levels of anxiety and/or depression, as compared to students’ self-report of their own symptoms.
- ✓ **Why You Should Participate:** Because we need to know more about how to accurately identify students in need of mental health services! Specifically, students with elevated levels of anxiety or depression tend to “fly under the radar,” and therefore often fail to be identified as in need of mental health services. Therefore, it is crucial that we know more about potential methods of identification aimed specifically at this sub-group of students. In this study, information that you provide will be combined with information from all other participating school-based mental health professionals and students. These group-level results of the study will be shared with the teachers, school mental health providers, and administrators at your elementary school in order to increase their knowledge of accurate methods of identifying students with elevated levels of anxiety or depression. In sum, this information will allow us to evaluate effective mechanisms for identifying students that are often overlooked, and ensure they receive the mental health services to make them successful. Each mental health professional who participates will be entered into a drawing for one \$25 giftcard to a local store, which will be distributed after completion of the student nomination process.
- ✓ **What Participation Requires:** School-based mental health professionals who agree to participate will be provided with a list of students by grade level for whom parent permission for participation has been obtained. School-based mental health professionals will then be asked to identify which students on the list(s) show elevated symptoms of anxiety and/or depression, to the extent that intervention might be beneficial. This nomination process is expected to take between 5-10 minutes. School-based mental health professionals will also be asked to fill out a brief (less than 5 minute) demographic questionnaire. There are no guaranteed direct benefits for your participation in this study.

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- ✓ **Please Note:** Your decision to participate in this research study must be completely voluntary. You are free to participate in this research study or to withdraw from participation at any time. If you choose not to participate, or if you withdraw at any point during the study, this will in no way affect your relationship with your middle school, USF, or any other party.
- ✓ **Confidentiality of Your Responses:** There is minimal risk for participating in this research. Your privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project, but your individual responses will not be shared with school system personnel or anyone other than the USF research team. Your completed nomination form will be assigned a code number to protect the confidentiality of your responses. Only the USF research team will have access to the locked file cabinet stored at USF that will contain all records linking code numbers to participants' names.
- ✓ **What We'll Do With Your Responses:** We plan to use the information from this study to determine the appropriateness of using educator nominations to identify students with elevated levels of anxiety or depression. It is anticipated that these results can inform future practices within schools. The results of this study may be published. However, the data obtained from you will be combined with data from other people in the publication. The published results will not include your name or any other information that would in any way personally identify you.
- ✓ **Questions?** If you have any questions about this research study, please contact me (Ms. Gelley) at [cherylduong@mail.usf.edu](mailto:cherylduong@mail.usf.edu) or (813) 421-9871. If you have questions about your rights as a person who is taking part in a research study, you may contact a member of the Division of Research Compliance of the USF at (813) 974-5638 (please refer to eIRB # 00010545).
- ✓ **Want to Participate?** To participate in this study, please sign the attached consent form.

Sincerely,

Cheryl Gelley, M.A.  
School Psychology Doctoral Candidate  
University of South Florida

Shannon Suldo, Ph.D.  
Associate Professor of School Psychology  
Department of Psychological and Social Foundations

-----  
**Consent to Take Part in this Research Study**

I freely give my permission to take part in this study. I understand that this is research. I have received a copy of this letter and consent form for my records.

\_\_\_\_\_  
Signature of educator

\_\_\_\_\_  
Printed name of educator

\_\_\_\_\_  
Date

**Statement of Person Obtaining Informed Consent**

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

\_\_\_\_\_  
Signature of person  
obtaining consent

\_\_\_\_\_  
Printed name of person  
obtaining consent

\_\_\_\_\_  
Date

## Appendix H: Parent Consent Letter

Study ID:Pro00010545 Date Approved: 12/14/2012 Expiration Date: 12/14/2013

Dear Parent or Caregiver:

Research shows that students with low emotional wellness often underperform in school due to challenges focusing and participating in class. Only about one-third of these students receive the assistance that they need. In order for schools to offer services to the students most in need, we need accurate and efficient methods to identify students with emotional concerns. This letter provides information about a study that will be conducted to determine how accurately educational providers (i.e., teachers, guidance counselors) can identify students with diminished wellness.

- ✓ **Who We Are:** The research team is led by Cheryl Gelley, M.A., a doctoral candidate in the School Psychology Program at the University of South Florida (USF), and Shannon Suldo, Ph.D., a professor in the School Psychology Program at USF. We are planning the study in cooperation with the administration of your middle school to make sure that the study provides information that will be useful to the school.
- ✓ **Why We are Requesting Your Child's Participation:** This study is being conducted as part of a project entitled, "Wellness of Middle School Children." Your child is being asked to participate in this project because the middle school that he or she attends has agreed to take part in the research project. We are seeking participation from all students in 7<sup>th</sup> and 8<sup>th</sup> grade levels at the school.
- ✓ **Why Your Child Should Participate:** Because we need to know more about how to accurately identify students who may benefit from school counseling services. In this study, information about your child will be combined with information about all other participating students. These group-level results of the study will be shared with the teachers, school mental health providers, and administrators at your middle school in order to increase their knowledge of accurate methods of identifying students with factors that impede their success. You may also want to allow your child to participate due to the opportunity to receive important information about your child's current level of emotional wellness. Specifically, participating students will take part in a free screening of their wellness. In the event a student indicates symptoms of emotional problems, parents will be notified via a written letter. This letter will also direct you how to seek appropriate counseling services in the community. In sum, this information will give your family current knowledge about your child's wellness, as well as appropriate referral resources. Please note neither you nor your child will be paid for your child's participation in this study. However, small rewards will be provided to classes in which a high proportion of students return this parent permission form.
- ✓ **What Participation Requires:** Children with written permission to participate in the study will fill out a set of paper-and-pencil surveys that contain questions about your child's thoughts, feelings, and behaviors over the past few weeks. These surveys will take approximately 30 minutes to complete. Members of the USF research team will administer the surveys at your child's middle school, during school hours, to large groups of students. Children whose initial scores on the surveys of emotional wellness indicate above-average levels of problems will be asked to complete the same survey(s) a second time approximately one week later, which will take 5 to 15 minutes to complete. In total, participation will take between 30 and 45 minutes of your child's time. The parents of students who reliably report diminished wellness (specifically, above-average levels of anxiety and/or depression) will receive a letter notifying them of such. This letter will also include contact information for available community counseling services. Another part of participation involves allowing your child's teachers to consider him or her when the teacher is asked to identify students in his or her classroom who show symptoms of diminished wellness. Similarly, school student support personnel (e.g., guidance counselors, social workers) will also be asked to review a list of students who have parent permission to participate in the study, and then asked to identify which of these students show symptoms of anxiety and depression. Early in the spring semester, your school psychologist will receive a list of participating students who twice reported diminished wellness, as well as a list of students who were identified by teachers or other educators as exhibiting symptoms of diminished wellness at school. Your school's psychologist will consider these lists when deciding which students to invite for participation in group counseling interventions to be provided at school (at no cost to you). Parents of those students will then be contacted by the school to see if you would like for your child to take part in the appropriate intervention. Agreeing to take part in the screening does not obligate you to take part in later group counseling interventions. A final part of participation involves a review of your child's school records. Under the supervision of school administrators, we will retrieve the following information about your child during the 2012 – 2013 school year: grades earned, attendance, discipline referrals, and eligibility for free or reduced-price lunch.

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Version 1-November 13, 2012



- ✓ **Please Note:** Your decision to allow your child to participate in this research study must be completely voluntary. You are free to allow your child to participate in this research study or to withdraw him or her at any time. Your decision to participate, not to participate, or to withdraw participation at any point during the study will in no way affect your child's student status, his or her grades, or your relationship with your middle school, USF, or any other party.
- ✓ **Confidentiality of Your Child's Responses:** There is minimal risk to your child for participating in this research. Your child's privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project, but we will not share your child's individual responses to the surveys with school system personnel or anyone other than us and our research assistants. Your child's completed surveys will be assigned a code number to protect the confidentiality of his or her responses. Only we will have access to the locked file cabinet stored at USF that will contain: (1) all records linking code numbers to participants' names, and (2) all information provided by all participants (teachers, school mental health providers, students, and school records). All records from the study (completed surveys, information from teachers) will be destroyed in five years. *Please note that although your child's specific responses will not be shared with school staff, if your child indicates that he or she intends to harm him or herself or someone else, we will immediately contact your school psychologist to ensure your child's safety as well as the safety of others. Also, after the study concludes, school mental health providers will receive a list of the names of all students whose responses on the surveys twice indicate that they are potentially in need of assistance due to experiencing above-average symptoms of anxiety or depression.*
- ✓ **What We'll Do With Your Child's Responses:** We plan to use the information from this study to determine the appropriateness of using educators to identify students with diminished wellness. It is anticipated that these results can inform future practices within schools. Results of this study may be published. However, the data obtained from your child will be combined with data from other students in the publication. The published results will not include your child's name or any other information that would in any way personally identify your child.
- ✓ **Questions?** If you have any questions about this research study, please contact Ms. Gelley at [cherylduong@mail.usf.edu](mailto:cherylduong@mail.usf.edu) or (813) 421-9871. If you have questions about your rights as a person who is taking part in a research study, please contact a member of the Division of Research Compliance of the USF at (813) 974-5638 (refer to eIRB # 00010545).
- ✓ **Want Your Child to Participate?** To permit your child to participate in the study, please complete the attached consent form (below) and have your child turn it in to his or her classroom teacher.

Sincerely,

Cheryl Gelley, M.A.  
School Psychology Doctoral Candidate  
University of South Florida

Shannon Suldo, Ph.D.  
Associate Professor of School Psychology  
Department of Psychological and Social Foundations

---

**Consent for Child to Take Part in this Research Study**

I freely give my permission to let my child take part in this study. I understand that this is research. I have received a copy of this letter and consent form for my records.

\_\_\_\_\_  
Printed name of child

\_\_\_\_\_  
Grade level of child

\_\_\_\_\_  
Child's teacher

\_\_\_\_\_  
Signature of parent of child  
taking part in the study

\_\_\_\_\_  
Printed name of parent

\_\_\_\_\_  
Date

**Statement of Person Obtaining Informed Consent**

I certify that participants have been provided with an informed consent form that has been approved by the University of South Florida's Institutional Review Board and that explains the nature, demands, risks, and benefits involved in participating in this study. I further certify that a phone number has been provided in the event of additional questions.

\_\_\_\_\_  
Signature of person obtaining consent

\_\_\_\_\_  
Printed name of person obtaining consent

\_\_\_\_\_  
Date

Version 1-November 13, 2012



## Appendix I: Teacher Nomination Form

ID #: \_\_\_\_\_

Thank you for agreeing to participate in a research study about different ways to identify students in need of mental health services.

**Directions:** Please review the attached roster list of students who have parent permission to participate in this study. Then, nominate the participating students that, based on your knowledge of this student and his/her typical behavior, demonstrate symptoms of anxiety and/or depression (these conditions are defined below for your convenience). You may circle as few or as many students as you feel fit the criteria below for elevated anxiety, for elevated depression, or for both conditions.

Please do not discuss your nominations with any colleagues; please complete this form independently by writing down the names of the students from the attached lists that demonstrate the behaviors below.

Thank you!

---

### Anxiety

Appears nervous  
Acts in a fearful manner  
Cries, tantrums, freezes in social situations  
Reluctant or afraid to attend school  
Acts jittery or fidgety  
Worries often  
Is timid or unassertive  
Has trouble separating from caregiver  
Worry about harm befalling caregiver  
Physical complaints (headache, stomachache)  
Fear of being humiliated or embarrassed

### Depression

Cries often  
Looks sad  
Excessively shy  
Avoids or withdraws from social situations  
Lack of, or diminished, interest in peers or activities  
Prefers to spend time alone  
Has a lack of energy/appears tired  
Might act irritable or agitated  
Changes in appetite—increased or decreased  
Difficulty concentrating

Behavioral descriptors adapted from the Systematic Screening for Behavior Disorders (Walker & Severson, 1992), Multidimensional Anxiety Scale for Children (March, 1997), & the Children's Depression Inventory 2 (Kovacs, 2011), Phobic and Anxiety Disorders in Children and Adolescence (Ollendick & March, 2004)

## Appendix J: School-Based Mental Health Professional Team Nomination Form

ID #: \_\_\_\_\_

Thank you for agreeing to participate in a research study about different ways to identify students in need of mental health services.

**Directions:** Please review the attached grade level rosters of students who have parent permission to participate in the study. Then, working together as a team, please circle as few or as many students from each grade who, based on your knowledge of the student and his/her typical behavior, demonstrate symptoms of anxiety and/or depression. You may nominate a student for anxiety, for depression, or for both conditions. If no one on the team is familiar with a student (i.e., no one recognizes this student by name), please check the “We do not know this student” column next to that student’s name.

Thank you!

*To assist you in determining students that may be demonstrating symptoms of anxiety and/or depression, we have provided behavioral descriptors of how these symptoms might look in children. Please note, the examples listed below are not exhaustive; they are provided to provide a basis for nomination.*

### Anxiety

Appears nervous  
Acts in a fearful manner  
Cries, tantrums, freezes in social situations  
Reluctant or afraid to attend school  
Acts jittery or fidgety  
Worries often  
Is timid or unassertive  
Has trouble separating from caregiver  
Worry about harm befalling caregiver  
Physical complaints (headache, stomachache)  
Fear of being humiliated or embarrassed

### Depression

Cries often  
Looks sad  
Excessively shy  
Avoids or withdraws from social situations  
Lack of, or diminished, interest in peers or activities  
Prefers to spend time alone  
Has a lack of energy/appears tired  
Might act irritable or agitated  
Changes in appetite—increased or decreased  
Difficulty concentrating

Behavioral descriptors adapted from the Systematic Screening for Behavior Disorders (Walker & Severson, 1992), Multidimensional Anxiety Scale for Children (March, 1997), & the Children’s Depression Inventory 2 (Kovacs, 2011), Phobic and Anxiety Disorders in Children and Adolescence (Ollendick & March, 2004)



## Appendix K: School Nurse Nomination Form

### School-Based Mental Health Professional Nomination Form

ID #: \_\_\_\_\_

Thank you for agreeing to participate in a research study about different ways to identify students in need of mental health services.

**Directions:** Please review the attached grade level rosters of students who have parent permission to participate in the study. Then, working independently, please circle as few or as many students from each grade who, based on your knowledge of the student and his/her typical behavior, demonstrate symptoms of anxiety and/or depression. You may identify a student for anxiety, for depression, or for both conditions. If you are not familiar with a student (i.e., you don't recognize this student by name), please check the "I do not know this student" column next to that student's name.

Thank you!

*To assist you in determining students that may be demonstrating symptoms of anxiety and/or depression, we have provided behavioral descriptors of how these symptoms might look in children. Please note, the examples listed below are not exhaustive; they are provided to provide a basis for nomination.*

#### Anxiety

Appears nervous  
Acts in a fearful manner  
Cries, tantrums, freezes in social situations  
Reluctant or afraid to attend school  
Acts jittery or fidgety  
Worries often  
Is timid or unassertive  
Has trouble separating from caregiver  
Worry about harm befalling caregiver  
Physical complaints (headache, stomachache)  
Fear of being humiliated or embarrassed

#### Depression

Cries often  
Looks sad  
Excessively shy  
Avoids or withdraws from social situations  
Lack of, or diminished, interest in peers or activities  
Prefers to spend time alone  
Has a lack of energy/appears tired  
Might act irritable or agitated  
Changes in appetite—increased or decreased  
Difficulty concentrating

Behavioral descriptors adapted from the Systematic Screening for Behavior Disorders (Walker & Severson, 1992), Multidimensional Anxiety Scale for Children (March, 1997), & the Children's Depression Inventory 2 (Kovacs, 2011), Phobic and Anxiety Disorders in Children and Adolescence (Ollendick & March, 2004)

## Appendix L: Student Assent Form

Study ID:Pro00010545 Date Approved: 12/14/2012 Expiration Date: 12/14/2013

Dear Student:

You are being asked to take part in a research study about how you think, feel, and act. The title of the study is "Wellness of Middle School Children." The goal of the study is to learn more about how to identify students with low levels of wellness. This is important because such students may benefit from working with counselors to improve their thoughts and feelings, and in general feel better. You are being asked to take part in this study because you are a student at the school. Your parent/guardian has already said its okay for you to take part in this study.

To take part in this study, you will be asked to fill-out several brief surveys now and maybe one or two of them again one week from now. These surveys will ask you questions about your thoughts, feelings, and things you have done recently. Your answers will stay private unless you are in danger, then we will have to get help to make sure you stay safe. If you decide to take part in the study you still have the right to change your mind later. No one will think badly of you if you decide to stop.

---

### Assent to Participate

I understand what the person running this study is asking me to do. I have thought about this and agree to take part in this study.

\_\_\_\_\_  
Name of person agreeing to take part in the study

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of person agreeing to take part in the study

\_\_\_\_\_  
Name of person providing information to child

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature of person providing information to child

Version 1-November 13, 2012



## Appendix M: IRB Approval Letter



DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE  
Institutional Review Boards, FWA No. 00001669  
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799  
(813) 974-5638 • FAX (813) 974-5618

December 21, 2012

Cheryl Gelley  
Psychological and Social Foundations



RE: **Full Board Approval** for Initial Application  
IRB#: Pro00010545  
Title: Wellness of Middle School Children  
Study Approval Period: 12/14/2012 to 12/14/2013

Dear Ms. Gelley,

On 12/14/2012 the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents outlined below. Please note that your approval for this study will expire on 12/14/2013.

Approved Items:

Protocol Document(s):

[Dissertation Document](#)

Consent/Assent Document(s)

[Parent Consent Letter.pdf](#)

[Parent Self-Consent Letter.pdf](#)

[SBMH Professional Consent Letter.pdf](#)

[Student Assent Letter.pdf](#)

[Teacher Consent Letter.pdf](#)

This study involves children and as such was approved under 45CFR46.404: Research not involving greater than minimal risk.

Please note, if applicable, the **informed consent/assent documents are valid during the period indicated by the official, IRB-Approval stamp located on the form.** You are to use only the watermarked/stamped consent forms found under the "Attachment Tab" in the recruitment of participants. Make copies from the original.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,



John Schinka, PhD, Chairperson  
USF Institutional Review Board

**Appendix N: Participation Rates and Elevated Anxiety and Depression Rates by Teacher**

Teacher	Grade Level(s) Taught	Subject(s) Taught	# of Students Taught	# of Student Participants	Student Study Participation Rate	# of Students with MASC 2 T-Score $\geq$ 60 at Time 1	# of Students with MASC 2 T-Score $\geq$ 60 at Time 2	% of Student Participants with Elevated MASC 2 T-Scores at Time 2	# of Students with CDI $\geq$ 2 T-Score at Time 1	# of Students with CDI $\geq$ 2 T-Score at Time 2	% of Student Participants with Elevated CDI 2 T-Scores at Time 2
1	7	SS	154	62	40.26%	16	9	14.50	11	8	12.90
2	8	SS	151	54	35.76%	12	9	16.67	12	8	14.81
3	7 & 8	SS	127	17	13.39%	3	3	17.65	3	3	17.65
4	8	SS	136	55	40.44%	12	8	14.55	12	6	10.91
5	7	SS	162	9	5.56%	0	0	0.00	1	0	0.00
6	7 & 8	SS	202	55	27.23%	12	7	12.73	6	3	5.45
7	7	Math	151	55	36.42%	14	8	14.55	7	6	10.91
8	8	Math	170	48	28.24%	11	7	14.58	10	3	6.25
9	7	Math	177	43	24.29%	8	5	11.63	11	6	13.95
10	7 & 8	Math	153	38	24.84%	13	11	28.95	12	9	23.68

Teacher	Grade Level(s) Taught	Subject(s) Taught	# of Students Taught	# of Student Participants	Student Study Participation Rate	# of Students with MASC 2 T-Score ≥ 60 at Time 1	# of Students with MASC 2 T-Score ≥ 60 at Time 2	% of Student Participants with Elevated MASC 2 T-Scores at Time 2	# of Students with CDI T-Score ≥ 60 at Time 1	# of Students with CDI T-Score ≥ 60 at Time 2	% of Student Participants with Elevated CDI 2 T-Scores at Time 2
11	8	Math	137	74	54.01%	15	12	16.22	12	8	10.81
12	8	Math	125	9	7.20%	2	2	22.22	2	2	22.22
13	7 & 8	--	53	11	20.75%	3	3	27.27	2	1	9.09
14	7 & 8	LA	91	10	10.99%	3	3	30.00	3	3	30.00
15	8	LA	126	8	6.35%	2	2	25.00	2	2	25.00
16	7	LA	147	57	38.78%	14	10	17.54	11	8	14.04
17	7 & 8	LA	147	62	42.18%	12	8	12.90	12	6	9.68
18	7	LA & Math	101	13	12.87%	3	3	23.08	2	1	7.69
19	8	LA	142	63	44.37%	17	12	19.05	12	7	11.11

Note. SS=Social Studies; LA=Language Arts. Teacher 13 was the ESE Specialist at the participating school; Teacher 18 taught mostly LA classes and 1 Math class. MASC 2=Multidimensional Anxiety Scale for Children, Second Edition; CDI 2=Children's Depression Inventory, Second Edition.

## Appendix O: Comparison of Student and Teacher Report of Elevated Anxiety Symptoms by Teacher

Teacher	Student Participants	# of Students with MASC 2 T-Score $\geq$ 60 at Time 2	# of Participants Teachers Nominated for Anxiety	# of True Positives (Sensitivity)	# of False Negatives (Missed)	# of True Negatives (Specificity)	# of False Positives (Misidentified)
1	62	9	1	0 (0%)	9 (100%)	52 (98.11%)	1 (1.89%)
2	54	9	0	0 (0%)	9 (100%)	45 (100%)	0 (0%)
3	17	3	1	0 (0%)	3 (100%)	13 (92.86%)	1 (7.14%)
4	55	8	3	2 (25%)	6 (75%)	46 (97.87%)	1 (2.13%)
5	9	0	3	--	--	6 (66.67%)	3 (33.33%)
6	55	7	5	1 (14.29%)	6 (85.71%)	44 (91.67%)	4 (8.33%)
7	55	8	12	2 (25%)	6 (75%)	37 (78.72%)	10 (21.28%)
8	48	7	18	4 (57.14%)	3 (42.86%)	27 (65.85%)	14 (34.15%)
9	43	5	8	3 (60%)	2 (40%)	33 (86.84%)	5 (13.16%)
10	38	11	5	2 (18.18%)	9 (81.82%)	24 (88.89%)	3 (11.11%)
11	74	12	3	0 (0%)	12 (100%)	59 (95.16%)	3 (4.84%)
12	9	2	1	1 (50%)	1 (50%)	7 (100%)	0 (0%)
13	11	3	1	0 (0%)	3 (100%)	7 (87.5%)	1 (12.5%)
14	10	3	2	1 (33.33%)	2 (66.67%)	6 (85.71%)	1 (14.29%)
15	8	2	4	1 (50%)	1 (50%)	3 (50%)	3 (50%)
16	57	10	1	1 (10%)	9 (90%)	47 (100%)	0 (0%)
17	62	8	20	4 (50%)	4 (50%)	38 (70.37%)	16 (29.63%)
18	13	3	7	0 (0%)	3 (100%)	3 (30%)	7 (70%)
19	63	12	18	7 (58.33%)	5 (41.67%)	40 (78.43%)	11 (21.57%)
Average	39.11	6.42	5.95	1.61 (25.07%)	5.17 (74.93%)	28.26 (82.35%)	4.42 (17.65%)
Overall	233	36	89	21 (58.33%)	15 (41.67%)	129 (65.48%)	68 (34.52%)

Note. MASC 2= Multidimensional Anxiety Scale for Children, Second Edition.

**Appendix P: Comparison of Student and Teacher Report of Elevated Depression Symptoms by Teacher**

Teacher	Student Participants	# Students with CDI 2 T-Score ≥ 60 at Time 2	# Students Teachers Nominated for Depression	# True Positives (Sensitivity)	# False Negatives (Missed)	# True Negatives (Specificity)	# False Positives (Misidentified)
1	62	8	1	0 (0%)	8 (100%)	53 (98.15%)	1 (1.85%)
2	54	8	2	1 (12.5%)	7 (87.5%)	45 (97.83%)	1 (2.17%)
3	17	3	0	0 (0%)	3 (100%)	14 (100%)	0 (0%)
4	55	6	1	0 (0%)	6 (100%)	48 (97.96%)	1 (2.04%)
5	9	0	4	--	--	5 (55.56%)	4 (44.44%)
6	55	3	1	0 (0%)	3 (100%)	51 (98.08%)	1 (1.92%)
7	55	6	7	0 (0%)	6 (100%)	42 (85.71%)	7 (14.29%)
8	48	3	9	0 (0%)	3 (100%)	36 (80.00%)	9 (20.00%)
9	43	6	7	0 (0%)	6 (100%)	30 (81.08%)	7 (18.92%)
10	38	9	7	3 (33.33%)	6 (66.67%)	25 (86.21%)	4 (13.79%)
11	74	8	3	2 (25%)	6 (75%)	65 (98.48%)	1 (1.52%)
12	9	2	0	0 (0%)	2 (100%)	7 (100%)	0 (0%)
13	11	1	1	0 (0%)	1 (100%)	9 (90%)	1 (10%)
14	10	3	1	1 (33.33%)	2 (66.67%)	7 (100%)	0 (0%)
15	8	2	0	0 (0%)	2 (100%)	6 (100%)	0 (0%)
16	57	8	2	0 (0%)	8 (100%)	47 (95.92%)	2 (4.08%)
17	62	6	13	2 (33.33%)	4 (66.67%)	45 (80.36%)	11 (19.64%)
18	13	1	5	0 (0%)	1 (100%)	7 (58.33%)	5 (41.67%)
19	63	7	7	2 (28.57%)	5 (71.43%)	51 (91.07%)	5 (8.93%)
Average	39.11	4.74	3.74	0.61 (9.23%)	4.39 (90.77%)	31.21 (89.20%)	3.16 (10.80%)
Overall	233	28	57	9 (32.14%)	19 (67.86%)	157 (76.59%)	48 (23.41%)

Note: CDI 2=Children's Depression Inventory, Second Edition.