

6-30-2016

# Relationship between Teacher Characteristics and Accuracy in Identifying Middle School Students with Symptoms of Anxiety and Depression

Elizabeth Storey

*University of South Florida*, estorey@mail.usf.edu

Follow this and additional works at: <http://scholarcommons.usf.edu/etd>



Part of the [Education Commons](#), and the [Psychiatric and Mental Health Commons](#)

## Scholar Commons Citation

Storey, Elizabeth, "Relationship between Teacher Characteristics and Accuracy in Identifying Middle School Students with Symptoms of Anxiety and Depression" (2016). *Graduate Theses and Dissertations*.  
<http://scholarcommons.usf.edu/etd/6404>

This Thesis is brought to you for free and open access by the Graduate School at Scholar Commons. It has been accepted for inclusion in Graduate Theses and Dissertations by an authorized administrator of Scholar Commons. For more information, please contact [scholarcommons@usf.edu](mailto:scholarcommons@usf.edu).

Relationship between Teacher Characteristics and Accuracy in  
Identifying Middle School Students with Symptoms of Anxiety and Depression

by

Elizabeth D. Storey

A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Education Specialist  
Department of Educational and Psychological Studies  
College of Education  
University of South Florida

Major Professor: Shannon Suldo, Ph.D.  
Natalie Romer, Ph.D.  
John Ferron, Ph.D.

Date of Approval:  
June 16, 2016

Keywords: school-based mental health, anxiety, depression, teacher nomination, universal screening

Copyright © 2016, Elizabeth D. Storey

## **ACKNOWLEDGMENTS**

There are many individuals without whom the completion of my thesis would not have been possible. First, I would like to thank my major professor Dr. Shannon Suldo for her support, feedback, and guidance every step of the way. From helping me conceptualize the basis of my study to finalizing the document you are reading today, her infectious passion for students' mental health continuously inspires me both as a future researcher and practitioner, and I am forever grateful for her mentorship. Next, I would like to thank my committee members Dr. John Ferron and Dr. Natalie Romer for their contributions and feedback throughout my thesis. I also would like to thank my colleagues in the USF School Psychology Program, especially my cohort and roommate Courtney Lynn, for their advice, friendship, and encouragement. Finally, I would like to thank my family for their continuous love and encouragement in every facet of my life.

## TABLE OF CONTENTS

List of Tables .....	v
List of Figures .....	vi
Abstract.....	vii
Chapter One: Introduction .....	1
Statement of the Problem.....	1
Purpose of the Study .....	4
Definition of Key Terms.....	5
Mental Health Disorder.....	5
Externalizing Symptoms.....	5
Internalizing Symptoms.....	5
Anxiety.....	6
Depression.....	6
Self-Efficacy Beliefs.....	6
Acceptance of Identification Method.....	7
Accuracy .....	7
Sensitivity .....	7
Positive Predictive Value.....	8
Specificity .....	8
Negative Predictive Value .....	8
Miss Rate .....	9
Misidentified Rate.....	9
Research Questions.....	9
Contributions to the Literature.....	11
Chapter Two: Review of the Literature .....	13
Prevalence Rates of Students with Mental Health Concerns.....	13
Universal Screenings .....	15
Evaluating a Universal Screening Method's Effectiveness .....	16
Universal Rating Scales .....	18
Review of School Records.....	23
Parent and Student Referral .....	25
Teacher Referral.....	27
School-Based Mental Health Professional Nomination .....	28
Teacher Nomination.....	30
Multiple-Gating Screening Procedures.....	35

Factors Affecting Accuracy of Teacher Nominations .....	37
Teacher Training in Mental Health Issues .....	37
Self-Efficacy Beliefs.....	41
Teachers' Acceptance of Identification Method.....	44
Professional Experience (Years Teaching).....	45
Gender.....	47
Subject Taught .....	48
Conclusions.....	50
 Chapter Three: Methods .....	52
Research Design.....	52
Participants.....	53
Participation Rates .....	56
Measures .....	57
Demographic Information Form .....	57
Self-Efficacy Beliefs.....	57
Acceptance of Teachers as Identification Method.....	58
Multidimensional Anxiety Scale for Children 2 <sup>nd</sup> Edition .....	58
Children's Depression Inventory 2 <sup>nd</sup> Edition.....	61
Recruitment Procedures .....	62
School .....	62
Teacher.....	63
Student Participants .....	63
Data Collection .....	64
Teacher Data Collection .....	64
Student Data Collection .....	65
Data Analyses .....	66
Descriptive Statistics.....	66
Teacher Accuracy Identifying Students with Symptoms of Anxiety or Depression .....	67
Research Question One.....	70
Research Question Two .....	71
Research Question Three .....	72
 Chapter Four: Results .....	74
Data Screening.....	75
Missing Data .....	75
Accuracy of Data Entry .....	76
Cronbach's Alpha Statistics.....	76
Descriptive Statistics.....	77
Bivariate Analyses .....	81
Correlations.....	81
Subject Area Differences .....	82
Sensitivity .....	82
Specificity .....	82
Positive Predictive Value.....	82

Negative Predictive Value .....	83
Gender Differences .....	83
Sensitivity .....	84
Specificity .....	84
Positive Predictive Value.....	84
Negative Predictive Value .....	85
Multiple Linear Regression Analyses.....	85
Analysis of Assumptions .....	85
Research Question One.....	86
Equation 1a .....	87
Equation 1b .....	87
Equation 1c .....	87
Equation 1d .....	87
Research Question Two .....	88
Equation 2a .....	89
Equation 2b .....	89
Equation 2c .....	90
Equation 2d .....	90
Research Question Three .....	91
Equation 3a .....	92
Equation 3b .....	92
Equation 3c .....	93
Equation 3d .....	93
 Chapter Five: Discussion .....	96
Validity in the Accuracy of Middle School Teachers in Identifying Distressed Students .....	96
Predictors of Sensitivity in Identifying Students with Anxiety or Depression Symptoms .....	99
Predictors of Specificity in Identifying Students with Anxiety or Depression Symptoms .....	103
Predictors of Positive Predictive Value in Identifying Students with Anxiety or Depression Symptoms .....	108
Predictors of Negative Predictive Value in Identifying Students with Anxiety or Depression Symptoms .....	110
Implications for School Psychologists.....	111
Contributions to the Literature.....	117
Limitations and Delimitations.....	119
Directions for Future Research .....	120
Summary .....	123
 References .....	125
Appendices .....	141
Appendix A: Teacher Demographic Form .....	141
Appendix B: Student Demographic Form .....	142

Appendix C: School Handout .....	143
Appendix D: Teacher Consent Form .....	146
Appendix E: Parent Consent Form .....	148
Appendix F: Teacher Nomination Form .....	150
Appendix G: Student Assent Form .....	151
Appendix H: Current Approval to Conduct Additional Analyses of the Approved study.....	152
Appendix I: Initial IRB Approval .....	154

## **LIST OF TABLES**

Table 1:	Demographic Characteristics of Student Participants.....	54
Table 2:	Demographic Characteristics of Educator Participants .....	55
Table 3:	Correct and Incorrect Classifications for Accuracy Variable .....	69
Table 4:	Decision Categories into Conditional Probability Indices.....	70
Table 5:	Correlations Between Items on Teacher Self-Efficacy Scale .....	77
Table 6:	Descriptive Statistics for Teacher Continuous Variables .....	78
Table 7:	Teacher Frequencies and Accuracy Variables.....	80
Table 8:	Correlations Between Predictor and Outcome Variables .....	81
Table 9:	Comparison of Teacher Subject Taught and Teacher Accuracy .....	83
Table 10:	Results of t-test and Descriptive Statistics for Outcome Variables by Teacher Gender.....	84
Table 11:	Research Question 1: Predictive Models of Teacher Beliefs and Teacher Accuracy Identifying Students with Anxiety and Depression .....	88
Table 12:	Research Question 2: Predictive Models of Teacher Demographic Variables and Teacher Accuracy Identifying Students with Anxiety and Depression .....	91
Table 13:	Research Question 3: Predictive Models of Teacher Factors and Teacher Accuracy Identifying Students with Anxiety and Depression .....	95

## **LIST OF FIGURES**

Figure 1: Matrix of Important Terms Used to Describe a Universal Screening Method's Accuracy .....	7
--	---

## **ABSTRACT**

As a universal screening method, teacher nominations have been found to both miss and misidentify a substantial proportion of students with internalizing disorders such as anxiety and depression (Cunningham & Suldo, 2014; Golley, 2014; Moor et al., 2007). Although some research has explored the accuracy of teacher nominations when used to identify students with anxiety and depression, no research examined the teacher characteristics that are potentially related to accuracy. The current study conducted a secondary analysis of an archival dataset (Golley, 2014) to determine which characteristics of teachers ( $N= 19$ ) are more closely related to accuracy in identifying middle school students ( $N = 233$ ) with elevated levels of anxiety or depression. Teacher characteristics examined include: teacher self-efficacy beliefs in identifying students with anxiety and depression, teacher acceptance of the general method of asking teachers as a whole to identify students with anxiety and depression, teacher gender, years teaching, and subject taught. Multiple regression analyses were used to examine the relationships between the aforementioned teacher characteristics and teacher accuracy, defined by the conditional probability indices sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV). The combined predictors explained 38 to 69% of the variance in those indicators of accuracy. Results indicated that in predicting sensitivity, being a language arts or math teacher (as compared to being a social studies teacher), having fewer years of professional experience, and reporting greater acceptance of method may predict higher sensitivity rates. In regards to specificity, higher teacher self-efficacy, being a social studies

teacher, being male, and having fewer years of professional experience predicted higher specificity rates. In terms of PPV, having higher acceptance of method and more self-efficacy may explain higher PPV rates. Finally, in terms of NPV, having fewer years of professional experience may explain higher NPV rates. Results from this study may be used to guide collaboration and consultation with teachers in universal screenings, and may inform teacher training programs aimed to increase teacher knowledge and confidence identifying students experiencing emotional distress at school.

## **CHAPTER ONE:**

### **INTRODUCTION**

#### **Statement of the Problem**

Many Americans experience mental health difficulties before they can vote or even drive.

Large studies of American adolescents have found about one in five youth experience mental disorders (Merikangas et al., 2010; Perou et al., 2013). Specifically, 32% of these youth experienced anxiety, 19% met criteria for a behavior disorder, and 14% experienced a mood disorder, such as depression (Merikangas et al., 2010).

Although large numbers of students suffer from mental health disorders, many of these students do not receive any treatment for their disorder. In the National Comorbidity Survey for Adolescents, only 45% of youth surveyed had received treatment in the past twelve months (Costello, He, Sampson, Kessler, & Merikangas, 2014). For youth with behavior disorders, 45-60% of these youth received some form of mental health treatment (Merikangas et al., 2011). Adolescents with anxiety and mood disorders are less likely to receive treatment. Specifically, only 18% of youth with an anxiety disorder and 38% of youth with any mood disorder received some form of mental health treatment (Merikangas et al., 2011).

The consequences of untreated mental health disorders are serious. Both externalizing and internalizing mental health disorders in adolescence have been associated with a variety of negative outcomes across social, psychological, behavior, and academic domains. Students or youth with mental health difficulties are more likely to experience lower academic achievement,

less school engagement and participation, poorer family and peer relationships, and are more likely to drop out of school (Esch et al., 2014; Glover & Albers, 2007; Meldrum, Venn, & Kutcher, 2009). Youth mental illness has been found to predict drop out at four key places in a youth's education: elementary graduation (Duchesne, Vitaro, Larose, & Tremblay, 2008), high school graduation, college entry, and college graduation (Breslau, Lane, Sampson, & Kessler, 2008). The effects of mental health disorders are not limited to school outcomes. Mental health problems in childhood and adolescence also predict criminal convictions in early adulthood (Aebi, Giger, Plattner, Metzke, & Steinhausen, 2014).

School systems currently serve as the primary mental health provider for many students to receive needed treatment and interventions. The National Comorbidity Survey found 23.6% of adolescents who experienced any mental health disorder received services in a school setting (Costello, He, Sampson, Kessler, & Merikangas, 2014). Only one out of four students with a diagnosable psychiatric disorder was found to receive services outside of school (Merikangas et al., 2011). Some estimates are even higher, with findings that students were 21 times more likely to visit school-based mental health settings compared to community based settings (Juszczak, Melinkovich, & Kaplan, 2003). Schools are in a unique position by nature of having wide access to students on a daily basis, and can deliver early intervention and prevention to students at risk for later mental health disorders (Doll, Cummings, & Capla, 2014). Although schools are a major mental health service provider, the discrepancy between treatment rates for students with externalizing versus students with internalizing disorders is large, with research reporting students with internalizing disorders are underrepresented in school mental health services (Merikangas et al., 2011).

In attempts to proactively identify students with both internalizing and externalizing disorders in schools and connect students in need to appropriate services, different methods of universal screenings have been developed. Universal screening methods include universal rating scales for completion by students and teachers; review of data in school records; compilation of referrals by concerned parents, students, and/or teachers; and identification (nomination) of students with specified symptoms by school based mental health professionals or teachers. In particular, teacher nomination methods are easily implemented and least time-intensive (Dowdy, Doane, Eklund, & Dever, 2011; Ollendick, Oswald, & Francis, 1989). Additionally, research has found teacher nomination screenings have promise as an accurate screening tool to identify students with externalizing disorders (Dwyer, Nicholson, & Battistutta, 2006; Mollins & Clopton, 2002). Findings from research are less promising with respect to teacher nominations being used as a screening tool to identify students with *internalizing* disorders, finding teachers had a low rate of identifying students who are actually experiencing internalizing symptoms (called sensitivity) and an imperfect rate of correctly not nominating students who are actually not experiencing internalizing symptoms (called specificity) (Auger, 2004; Cunningham & Suldo, 2014; Dadds, Spence, Holland, Barret, & Laurens, 1997; Gelley, 2014; Layne, Bernstein, & March, 2006; Moor et al., 2007; Ollendick, Oswald, & Francis, 1989).

The aforementioned studies support that teacher nomination methods tend to both miss and misidentify students with symptoms of anxiety and depression in school. But, little research has explored potential relationships between different teacher characteristics and subsequent teacher accuracy. One teacher characteristic that has been partially examined in the literature is whether teachers feel confident identifying students. Moor and colleagues (2007) conducted teacher psychoeducational training (i.e., information about common signs and symptoms of

students with depression) and found teachers who underwent training reported increased confidence in their abilities to identify students with depression in school. But, teachers who underwent trainings were actually less accurate identifying students with depression after training, *suggesting* that beliefs do not always correspond to skills. However, Moor et al. (2007) did not report findings from analyses to examine the direct relationship between confidence and teacher accuracy (skill) in identifying students with depression at one time point. Moor and colleagues (2007) also did not examine the potential role of other teacher characteristics such as gender, professional experience, subject taught, and attitudes towards the ability of other teachers as a whole to identify students with symptoms of anxiety and depression in school.

### **Purpose of the Study**

The purpose of this study was to explore the relationship between different teacher characteristics and teachers' accuracy in identifying middle school students with elevated symptom levels of anxiety and depression. This study attempted to add to the knowledge base about universal screenings, particularly teacher nomination methods. Knowing the relationship between different teacher characteristics may inform future teacher training practices that attempt to increase teacher accuracy and knowledge identifying students with mental health concerns. Furthermore, knowing specific teacher characteristics such as years teaching, subject taught, and gender can inform future effective universal screening procedures, in terms of suggesting which types of teachers may be particularly likely to be accurate informants, and which types of teachers may be best to not include in a universal screening procedure such as teacher nomination. As students with internalizing disorders are underrepresented in school mental health treatment (Merikangas et al., 2011), and are often underrepresented in teacher nomination screenings (Lane & Menzies, 2005; Richardson, Caldarella, Young, Young, &

Young, 2009; Soles, Bloom, Heath, & Karagiannakis, 2008), it is pertinent to know what teacher variables are related to accuracy in identifying this underserved population in schools.

Characteristics of middle school teachers examined in the present study included teacher self-efficacy beliefs around identifying students with symptoms of anxiety or depression, teacher acceptability towards other teachers in identifying students with symptoms of anxiety or depression, subject taught, gender, and professional experience.

### **Definition of Key Terms**

**Mental health disorder.** The *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* by the American Psychiatric Association define mental health disorders as “a syndrome characterized by clinically significant disturbance in an individual’s cognition, emotion regulation, or behavior that reflects a dysfunction in the psychological, biological, or developmental processes underlying mental functioning” (American Psychiatric Association, 2013). Key symptoms of many mental health disorders or syndromes can often be classified in one of two categories: “externalizing” or “internalizing” (Achenbach, 1978).

**Externalizing symptoms.** Externalizing symptoms are a class of behaviors that can sometimes indicate a mental health disorder, or its symptoms, that is generally disruptive to others. Externalizing symptoms are behaviors visible to others that are detrimental to the person’s outside environment (Achenbach, 1978). Common externalizing symptoms are oppositional or disruptive behaviors, hyperactivity, and aggression (Hinshaw, 1987).

**Internalizing symptoms.** Internalizing symptoms are a different class of behaviors that can also be a sign of a larger mental health disorder, or symptoms of a disorder, that reflects problems turned inward. Internalizing symptoms are behaviors that affect more of a person’s internal state (Achenbach, 1978). Common internalizing symptoms are being withdrawn,

anxious, and depressed (Achenbach, 1978). Anxiety disorders and symptoms fall under the larger umbrella of internalizing disorders and symptoms.

**Anxiety.** Anxiety encompasses several discrete disorders, all of which are characterized by anxiety and fear symptoms that cause significant impairment on a person's daily life and functioning (American Psychiatric Association, 2013). Common anxiety disorders include Specific Fears, Social Anxiety Disorder and Separation Anxiety Disorder (American Psychiatric Association, 2013). Symptoms of anxiety in youth include persistent worries, fears, feeling on edge, and somatic symptoms such as stomachaches.

**Depression.** Depression is a form of mood disorders. Depression is characterized by a sad, irritable mood and a loss of pleasure in activities once enjoyed (American Psychiatric Association, 2013). Depression disorders and symptoms also can be classified as internalizing symptoms and disorders. Examples of specific depression disorders include Major depressive disorder, persistent depressive disorder (dysthymia), and more (American Psychiatric Association, 2013). Symptoms of depression include sad or irritable mood, hopelessness, less interest in previously enjoyed activities, and somatic symptoms such as headaches or stomachaches.

**Self-efficacy beliefs.** Self-efficacy beliefs are domain specific, and reflect one's confidence in his or her ability to competently perform tasks in a specific area such as social relationships, academic performance, emotional control, etc. (Bandura, 1997). In the present study, self-efficacy beliefs with regard to one's role in youth mental health identification refers to an individual teacher's confidence about his or her knowledge of anxiety and depressive disorders, and confidence in recognizing a student with symptoms of depression and anxiety.

**Acceptance of identification method.** In the present study, acceptance of method refers to an individual teacher's attitudes towards whether teachers as a whole are qualified to recognize students with depressive and anxious symptoms.

**Accuracy.** A universal screening tool or another assessment is evaluated according to its sensitivity, specificity, miss rate, and misidentified rate (Albers & Kettler, 2014). Other common definitions of the accuracy of a universal screener are positive predictive value and negative predictive value (Albers & Kettler, 2014).

	Student self-reported symptoms in the elevated range	Student did not self-report symptoms in the elevated range
Student Nominated by Teacher	True Positive	False Negative
Student Not Nominated by Teacher	False Positive	True Negative

*Figure 1.* Matrix of key terms used to describe a universal screening method's accuracy (adapted from Green & Zar, 1989)

**Sensitivity.** Sensitivity refers to “the proportion of examinees who need help who are accurately identified” (Albers & Kettler, 2014, p. 123). Sensitivity is calculated by taking the true positives and dividing that value by the sum of true positives and false negatives (miss rate; Albers & Kettler, 2014). High accuracy may be the most important goal of a screening method, given the intended desire to “catch” nearly all individuals who are in need of assistance, in order to direct them to the appropriate intervention service. The equation to calculate sensitivity is as follows, as reported by Albers and Kettler (2014),

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

**Positive predictive value.** Positive predictive value refers to “the proportion of examinees who are identified who actually need help” (Albers & Kettler, 2014, p. 123). Positive predictive value is calculated by taking the true positives (sensitivity) and dividing that value by the sum of true positives (sensitivity) and false positives (misidentified rate; Albers & Kettler, 2014). The specific equation to calculate positive predictive value is as follows,

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

**Specificity.** Specificity refers to “the proportion of examinees who do not need help who are accurately not identified” (Albers & Kettler, 2014, p. 123). Specificity is calculated by taking the true negatives and dividing that value by the sum of true negatives and false positives (misidentified rate; Albers & Kettler, 2014). High specificity helps to reduce waste of clinical attention towards individuals who are not in need of assistance, as well as prevents unnecessary concern and time on the part of students who do not have elevated problems and are appropriately left alone. The equation to calculate specificity is as follows,

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

**Negative predictive value.** Negative predictive value refers to “the proportion of examinees who are not identified who actually do not need help” (Albers & Kettler, 2014, p. 123). Negative predictive value is calculated by taking the true negatives (specificity) and

dividing them by the sum of true negatives and false negatives (miss rate; Albers & Kettler, 2014). The equation to calculate negative predictive value is as follows,

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

**Miss rate.** Miss rate, or false negative, refers to “not identified by the screening system but needing help in reality” (Albers & Kettler, 2014, p. 123). Miss rate is calculated by taking the false negatives and dividing that value by the sum of false negatives and true positives (sensitivity; Albers & Kettler, 2014). In a screening procedure, a high value here is very problematic, given that students who are missed at the first pass are omitted for consideration at subsequent assessment gates.

**Misidentified rate.** Miss rate, or false positive, refers to “identified by the screening system but not needing help in reality” (Albers & Kettler, 2014, p. 123). Misidentified rate is calculated by taking the false positives and dividing that value by the sum of false positives and true negatives (specificity; Albers & Kettler, 2014). In a screening procedure, a high value here is not viewed as overly problematic, given additional assessment gates can screen out students who were misidentified during the initial pass.

## Research Questions

The current study attempted to answer the following questions:

1. To what extent, if any, is there a relationship between a teacher’s *accuracy* in recognizing students with symptoms of anxiety and depression and a teacher’s *beliefs* regarding (a) self-efficacy regarding personal ability to identify students with anxiety and depressive symptoms and (b) acceptance of method of teacher nomination? Accuracy was defined in terms of:

- a. Sensitivity
- b. Specificity
- c. Positive predictive value
- d. Negative predictive value

2. To what extent, if any, is there a relationship between a teacher's *accuracy* in recognizing students with symptoms of anxiety and depression and a *teacher's demographic characteristics*, specifically: professional experience (i.e., years teaching), gender, and subject taught (Language Arts, Math, and Social Studies)? Accuracy was defined in terms of:

- a. Sensitivity
- b. Specificity
- c. Positive predictive value
- d. Negative predictive value

3. When considered simultaneously, which *teacher factors* (beliefs specific to identification self-efficacy and acceptance of method; demographic factors including professional experience, gender, and subject taught) are most important in predicting *accuracy* rates? Accuracy was defined in terms of:

- a. Sensitivity
- b. Specificity
- c. Positive predictive value
- d. Negative predictive value

## **Contributions to the Literature**

There were several gaps in the literature on teacher nominations the present study intended to address. First, no current research was found that studied the relationship between teacher characteristics and accuracy in identifying secondary students with symptoms of anxiety or depression. Specifically, there were gaps in the literature concerning the relationship between teacher self-efficacy beliefs specific to identifying students' anxiety and depression (internalizing) symptoms and teacher accuracy in identifying middle school students with elevated internalizing symptom levels. Also, no research was found studying the relationship between a teacher's acceptance of the method of teacher nomination to identify middle school students with elevated levels of anxiety and depression and the individual teacher's ability to accurately identify middle school students with elevated symptoms of anxiety or depression. Furthermore, another current gap in the literature was whether the combined variables of teacher self-efficacy beliefs, teacher acceptance of identification method, gender, years teaching, and subject predict teacher accuracy identifying students with elevated levels of anxiety and depression (internalizing) symptoms.

In regards to defining the outcome of accuracy itself, most studies report sensitivity (where a student is identified as having elevated symptoms and the student reports elevated symptom levels) and specificity (where a student is not identified as having elevated symptoms and the student does not report elevated symptoms levels) when judging a universal screening methods' effectiveness (Albers & Kettler, 2014). Fewer studies used positive predictive value (the proportion of students who are identified as having elevated symptoms and the student reported the same) and negative predictive value (the proportion of students who are not identified as having elevated symptoms and the student reported the same). Using these

additional indices provides more insights about the potential relationship between different teacher characteristics and teacher accuracy. Specifically, Johnson et al., (2016) stated that while a high positive predictive value and negative predictive value indicates the “efficiency” of a screener, a lower positive predictive value and higher sensitivity shows the utility of a screener that will be used in multiple-gating procedures (p. 15). In a multiple-gating procedure, under identifying or ‘missing’ a student would be more of a concern, because the student would be ‘missed’ in later gates (Johnson et al., 2016). While teacher nomination methods are commonly used as a first gate in a multiple-gating procedure such as the Systematic Screening of Behavior Disorders (SSBD; Walker, Severson, & Feil, 2014), understanding the teacher characteristics associated with accuracy using indices such as positive predictive value and negative predictive value will better extend the current study’s results within the context of a teacher nomination first gate in a multiple-gating procedure. The current study thus analyzed the relationship between different teacher variables and sensitivity, specificity, but also positive predictive value and negative predictive value.

## **CHAPTER TWO:**

### **REVIEW OF THE LITERATURE**

This chapter provides a review of relevant literature to establish the current study's importance. The review begins with information about adolescent mental health prevalence rates, and why school-based mental health services are best suited to serve students with mental health needs. Next, the literature review emphasizes the importance of universal screening methods' within a prevention and early identification framework in school-based mental health programs. The literature review then delineates different universal screening methods, including each method's advantages and disadvantages. Throughout, the effectiveness of different universal screening methods' accurately identifying students with internalizing disorders in particular is also discussed. The literature review next focuses specifically at one method, teacher nomination, and reviews different factors that may affect a teacher's accuracy in nominations. Lastly, the literature review identifies a current gap in the literature, specifically which teacher factors are related to accuracy identifying students with elevated symptoms of anxiety or depression.

#### **Prevalence Rates of Students with Mental Health Concerns**

Current studies of American adolescents found about 20% of youth suffer severe impairment from a mental disorder (Merikangas et al., 2010; Perou et al., 2013). Of these adolescents, anxiety disorders were the most common, with behavior disorders next, and mood disorders following. Further, 40% of students with severe impairment from a mental health

disorder met criteria for more than one disorder (Merikangas et al., 2010). Students with mental health difficulties are more likely to experience lower academic achievement, less school engagement and participation, poorer family and peer relationships, are more likely to drop out of school, and have future employment challenges (Copeland, Miller-Johnson, Keeler, Angold, & Costello, 2007; Glover & Albers, 2007; Masten et al., 2005; Meldrum, Venn, & Kutcher, 2009). Although large portions of adolescents suffer from mental disorders, the National Comorbidity Survey found only half received treatment for their disorder (Merikangas et al., 2011). A twelve month follow up survey of adolescents in the National Comorbidity Survey (Merikangas et al., 2011) found 45% of adolescents with psychiatric disorders received services in the past 12 months (Costello, He, Sampson, Kessler, & Merikangas, 2014). Adolescents with Attention-Deficit/Hyperactivity Disorder most commonly received treatment (59.8% of adolescents reported treatment), with behavior disorders coming in second (45.4% of adolescents reported treatment). Of adolescents with mood disorders, 37.7% received any form of treatment. Treatment rates fell sharply when looking at adolescents with anxiety, eating, or substance use disorders, as less than one in five of these youth reported receiving treatment for their disorder (Merikangas et al., 2011). Of all students receiving treatment, most of these students received services in school-based settings. The National Comorbidity Survey found 23.6% of adolescents surveyed received services in a school setting (Costello, et al., 2014). Earlier research found that only one out of four youth with a diagnosable psychiatric disorder received services outside of school (Merikangas et al., 2011).

Schools are an important mental health service provider (Burns et al., 1995; Center for Mental Health in Schools at UCLA, 2005). School systems are in a unique position to provide mental health interventions and prevention services of all intensities and forms, in part due to

how much time youth spend in school (Doll, Cummings, & Capla, 2014), and can reduce costs tied to providing students services in community settings (Center for Mental Health in Schools, 2005). Additionally, schools should take a vested interest in supporting the mental health of students as mental health promotion has been linked to academic success. A review of 23 studies of school mental health interventions that focused on mental health and academics found 91% produced significant gains in academic outcomes (Vidair et al., 2014). Although mental health treatment is important for schools, schools also should participate in prevention and early intervention within a Multi-Tiered System of Supports (MTSS) service delivery system. Mental health intervention and assessment within an MTSS delivery system includes prevention at a Tier 1 (universal) level, specific and intensive interventions fit to students' needs, progress monitoring, and screening (Kilgus, Reinke, & Jimerson, 2015). Universal screenings for symptoms of mental health problems are an important source to identify students at-risk or already meeting criteria for mental health illnesses. Such screenings are essential ways to identify which students are offered potential Tier 2 and 3 level supports.

### **Universal Screenings**

Universal screenings are systematic examinations of all students that determine which individual students need additional supports (Albers & Kettler, 2014). Universal screenings can inform prevention services for students at risk for having elevated symptomology, and/or identify students already experiencing impairments (Albers, Glover, & Kratochwill, 2007; Albers & Kettler, 2014; Levitt, Saka, Romanelli, & Hoagwood, 2007). Movements such as the President's New Freedom Commission on Mental Health (2003) advocated for early identification of youth with mental health difficulties as an important component of quality and comprehensive mental health services. Early intervention can prevent later difficulties in life, and

prevention services can also counteract concerns before they arise. The combination of early identification and intervention for students at risk for mental illness can decrease symptoms and prevent more negative outcomes (Lane & Menzies, 2003; Walker & Shinn, 2002). Screenings can come in many forms, and can survey students' academic, behavioral, and psychological well-being (Albers & Kettler, 2014). The current study focused on universal screenings for students' mental health and emotional difficulties, and particularly on teacher nomination as a method to identify symptomatic youth.

Common universal screening methods include universal rating scales; reviewing and analyzing school records; referrals made by concerned parents, students, or teachers; and systematic nominations made by school-based mental health professionals and teachers. While screening methods come in different forms, they all can be evaluated using conditional property indices (details provided in the next section) to capture each method's strengths and weaknesses in different domains.

**Evaluating a universal screening method's effectiveness.** Several indicators called conditional property indices are used to evaluate the level of effectiveness of a universal screening method's effectiveness (Albers & Kettler, 2014). Conditional property indices calculate values to evaluate two important properties of a screener: that students who need intervention are identified and students who do not need an intervention are not identified (Albers & Kettler, 2014). The two most commonly reported conditional property indices are sensitivity and specificity (Albers & Kettler, 2014). Sensitivity, also referred to as 'True Positives' occurs when a student meets criteria for a diagnosis or elevated symptoms and is correctly identified as such. Sensitivity is calculated by dividing the number of 'true positives' (students who were identified by the screener as needing help, and who do need help in reality,

as determined by a gold standard such as clinical interviews) into the sum of true positives and false negatives (students who were not identified by the screener, but who need help in reality; Green & Zar, 1989). Specificity, also referred to as ‘true negatives,’ is defined as when a student does not meet criteria for a diagnosis or elevated symptoms and is correctly identified as not having a diagnosis or elevated symptoms. Specificity is calculated by dividing the number of ‘true negatives’ (students who were not identified by the screener as needing help, and do not need help in reality) into the sum of true negatives and false positives (students who were identified by the screener as needing help, but do not need help in reality; Green & Zar, 1989).

Two terms, false positives and false negatives, refer to two errors a universal screening can make. False positive is defined as a student who is identified by a screener as needing further services or meeting diagnostic criteria, but the student does not need help. False negative is defined as a student who is not identified by a screener as at risk or meeting diagnostic criteria, but the student does actually need services or meets diagnostic criteria.

Two additional proportions also used to examine a universal screener’s effectiveness are positive predictive value and negative predictive value. Positive predictive value refers to the proportion of students who are identified as meeting diagnostic criteria that truly do need services, while considering the students who did not need help but were still identified by the screener. Positive predictive value is calculated by dividing the number of ‘true positives’ (students who were identified by the screener as needing help, and who need help in reality) into the sum of true positives and false positives (students who were identified by the screener as needing help, but do not need help in reality). Negative predictive value is the proportion of students who are not identified by the universal screener as meeting diagnostic or service criteria who do not need services or interventions. This value also considers the amount of students who

do need services but were not identified by the screener as needing services. Negative predictive value is calculated by dividing the number of ‘true negatives’ (students who were not identified by the screener as needing help, and who do not need help in reality) into the sum of true negatives and false negatives (students who were not identified by the screener, but who need help in reality). The current study used the values of sensitivity, specificity, positive predictive value, and negative predictive value to examine the relationship between different teacher self-efficacy beliefs and teacher acceptance of method identifying students with symptoms of anxiety or depression in a middle school sample.

**Universal rating scales.** One universal screening method is universal rating scales filled out by students and/or teachers (Flaherty, Weist, & Warner, 1996; Garber & McCauley, 2002; Horowitz & Garber, 2006). Universal rating scales are the most common mental health screening method (Weist et al., 2007). For students, universal rating scales ask every participating student to fill out a measure to assess current levels of psychopathology. Student universal rating scales gather information directly from the student regarding his or her symptom levels. Garber and McCauley (2002) and Horowitz and Garber (2006) found student self-report of depressive symptoms was more accurate compared to other sources such as parent or teacher report about students. For teachers, a universal rating scale is filled out for every student the teacher has in his or her class.

Systematically administering universal rating scales to students have been found to detect more students with mental health difficulties. Husky et al. (2011) conducted a study comparing the detection rates of two different universal screening methods: (1) universal rating scales with follow-up diagnostic interviews, and (2) standard school professional referral teams. The referral team, called a Student Assistance Program, consisted of a team of the school principal, a mental

health professional, guidance counselor, teacher, nurse, and school based probation officer. Students in the screening group all individually completed the Columbia Health Screener (CHS). Students identified by the CHS as having a risk for mental health issues were followed up with Post Screening Structured Interview (PSSI) with a school counselor. Students in the referral group were left to be identified using standard referral protocol, where concerned professionals identified students they were concerned about to the team to discuss. Husky and colleagues (2011) found the combination screener of the universal rating scale and interview referred more students with mental health difficulties to be connected with both school- and community based-services.

For teachers, universal rating scales have been found to identify more students potentially at risk for developing mental health problems compared to another universal screening method, teacher nomination (Dowdy, Doane, Eklund, & Dever, 2011; Eklund & Dowdy, 2014). Dowdy and colleagues (2011) compared teacher nomination and universal rating scales to identify behavioral and emotional risk in a sample of 849 elementary and middle school students. Teachers were assigned to two conditions. One group filled out the Behavior Assessment for Children–Second Edition (BASC-2) Behavioral and Emotional Screening System (BESS; Kamphaus & Reynolds, 2007) teacher screening form for each student. Another group filled out a teacher nomination form asking teachers to list students who he or she believed “are at risk behaviorally or emotionally” (p. 130) and to circle the students in this list who she or he believed was at high risk behaviorally or emotionally. Teachers were allowed to make unlimited nominations for students at either risk or high risk. Dowdy and colleagues (2011) found the teachers filling out the BESS detected a larger number of students as having elevated risk for mental health problems, as compared to the pure nomination method. Comparison of the students

yielded from these two methods indicated that the students who were identified through the BESS who had lower reading grades; the groups of students identified from different methods did not differ in terms of office disciplinary referrals, cooperation levels, and study habits. Reading scores, office disciplinary referrals, cooperation levels, and study habits have all been tied to being at risk for mental health concerns. The researchers concluded there was a slight advantage towards using teacher universal rating scales over teacher nomination. But, it is important to note this study did not incorporate student self-report scales when evaluating each method's efficacy. The researchers also did not differentiate whether students were nominated for externalizing or internalizing concerns (Dowdy et al., 2011).

Eklund and Dowdy (2014) conducted a similar study comparing BESS teacher nomination forms and traditional school referral methods, such as whether the student had been referred to a child study team by teacher, parent, or student, or was already receiving special education or other intervention services. Comparing students who had already been identified through traditional forms and students found to be at risk from the BESS, traditional school referral methods missed 13 of 24 students (54%) who were found to be in the elevated range by teachers on the BESS. After looking at student characteristics of students who were missed by traditional school referral mechanisms, students who were missed in traditional methods had better grades. Eklund and Dowdy (2014) concluded universal rating scales for teachers may be more effective to identify all students needing supports, as traditional school referral methods may have biases against students with at least satisfactory school achievement.

Although universal rating scales allow students to self-report symptoms, and systematically allow teachers to rate and consider each student individually, there are several drawbacks that make schools hesitant to use them. One reason is the high cost and time

commitment when using universal rating scales. Kuo, Vander Stope, Kernic, and McCauley (2009) estimated a universal screening for depression may cost almost \$7 per student for rating scales, staff trainings, data analysis, and the increased services for students identified by the screener as needing supports. Additionally, many times universal rating scales require parental consent for student participation. If parent consent is required for a student's participation, student self-report is not 'universal' in the sense it may 'miss' students whose parents did not consent to the screener (Kuo et al., 2013).

Another drawback to the method of universal rating scales is the accuracy of informants. Merrell and Whitcomb (2013) summarized many current trends in the research regarding accuracy in informants: generally child and parent agreement is low, correlations in accuracy is lower when detecting symptoms of anxiety or depression compared to externalizing, but gender of the student or rater does not seem to affect accuracy correlations. When regarding the accuracy of different informants for universal screenings, Dowdy and Kim (2012) recommended that during attempts to detect students with externalizing concerns, practitioners should use a multiple-gating screening procedure. In such an approach, teachers might fill out rating scales at the first gate, and parents provide additional rating scale data at the second gate (but only parents of students who emerged as symptomatic in the first gate). Dowdy and Kim (2012) discuss that when attempting to detect students with internalizing concerns, different types of informants (such as youth self-report) may be needed for effective identification.

Most studies examining informant agreement are conducted in clinical settings, but Miller, Martinez, Shumka, and Baker (2014) examined multiple informant agreement between child (self), parent, and teacher ratings of child anxiety across three time points in a community sample of public school students. Students varied from 3<sup>rd</sup> to 7<sup>th</sup> grade, and 49.28% of the sample

of 1,039 students were male. The measures used for agreement for parents and teachers were the Behavior Assessment for Children–Second Edition (BASC-2; Kamphaus & Reynolds, 2007) and Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) in the three time points, which were three prevention studies for anxiety. Child participants in the anxiety prevention studies completed the Multidimensional Anxiety Scale for Children (MASC; March, 1997). Researchers reported remarkably high correlations between parents and teachers' ratings on the same measures (SDQ or BASC-2) at each time point, including correlations between parent and teacher reports as high as  $r = .96$  at a given wave of data collection (i.e., time 1). However, the correlations between child and adult raters were not as strong as parent and teacher reports of children's anxiety across all three time points, perhaps in part due to method differences (for example, child report on the MASC was correlated with parent ratings on the BASC or SDQ). At different waves of data collection, the correlations between child MASC and teacher BASC or SDQ ratings were significant ( $p < 0.001$ ) but small in magnitude, ranging from  $r = .21$  (time 1) to  $r = .26$  (time 3). Correlations between child and parent ratings were also significant ( $p < 0.001$ ) but similarly low ( $r = .14$  at time 1 to  $r = .28$  at time 3).

Although when comparing parent and teacher ratings of a child's anxiety, correlations remained strong across all three time points, agreement between child and parent ratings, and agreement between child and teacher ratings, remained low across all three time points. Miller, Martinez, Shumka, and Baker (2014) noted measurement error may be present in their results, as the SDQ and BASC-2 are similar, but do not measure the same exact behaviors. Overall, the researchers concluded there was low agreement between parent, child, and teacher ratings for anxiety in the community sample.

One study by Berg-Nielsen, Solheim, Belsky, and Wichstrom (2012) explored how different parent and teacher characteristics affected parent-child disagreement on preschoolers' psychosocial problems. The sample consisted of 732 four year olds in a Norwegian community sample. Parents filled out the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) Teachers filled out the Student-Teacher Relationship Scale (STRS; Pianta, 2001) and the Teacher Rating Form (TRF) of the ASEBA (TRF; Achenbach & Rescorla, 2000). Parents also brought their child to a clinic with completed measures for extensive interviews and observation measures of each child. After analyzing parent-teacher disagreements on child ratings, the researchers found there was more disagreement for internalizing problems compared to externalizing. Additionally, there was more parent-teacher disagreement for girls' externalizing problems in contrast to boys' externalizing problems, where there was more agreement between raters. Researchers found conflict between teacher and child predicted 26.4% of the variance in parent-teacher disagreement on ratings. The researchers concluded parent and teacher characteristics can play a role in parent-teacher disagreement, and child characteristics like gender may also explain differences. However, the study was only conducted with preschool students with no self-report ratings (Berg-Nielsen, Solheim, Belsky, & Wichstrom, 2012).

**Review of school records.** Another universal screening method for mental health difficulties is obtaining school records and using retrospective student data to identify which students may be at risk for having mental health difficulties. Kuo, Stoep, Hertig, Grupp, and McCauley (2013) created a formula using student grades, attendance, suspensions, and basic demographic information to explore whether the formula's results could predict students' self report scores on a screening measure of psychopathology, specifically the Moods and Feelings Questionnaire (MFQ; Angold & Costello, 1987). A logistic regression analysis found a positive

predictive value of 71%, and a regression tree analysis found a positive predictive value of 65.4%. Although the population of students needing services that were identified was high, the false positive rate was 20%. Combining the regression tree and logistic regression analyses, the school record algorithm also missed 50-75% of students with elevated levels of depression. Due to the high false positive and low sensitivity levels, Kuo and colleagues (2013) concluded school records were not a suitable alternative for identifying individual students who did or did not meet criteria for depression symptoms. The researchers advised school record review could be used to create low, medium, and high risk subgroups to guide further screenings and assessments, but not to identify individual students at risk for depression (Kuo et al., 2013).

Using student records as a screener or as a tool to guide future screeners may be a cost-effective strategy to identify students at risk or currently experiencing mental health concerns. Kuo et al. (2013) estimated the cost of reviewing student records is \$0.25 per student, considerably less than a cost of almost \$7 per student for universal rating scales (Kuo et al., 2009). Spending less money on a universal screener may free up more time and monetary resources to provide the students identified as at-risk for mental illness better services. Although, student record review alone is not a powerful universal screening option in terms of sensitivity and specificity.

A specific component of school records used to screen students with mental health concerns is using office disciplinary referrals (ODRs). Office disciplinary referrals are given to students who violate school rules, such as by acting out or skipping classes (Miller et al., 2015). Of all potential data sources available, ODRs are data most often used by schools to identify students for mental health risk (McIntosh, Campbell, Carter, & Zumbo, 2009). Predy, McIntosh, Frank, and Flitchcock (2014) found ODRs early in the year were significant predictors of ODRs

later in the year in middle school students, signifying for ODRs being a viable tool to identify students in need of interventions for disruptive behavior (Predy, et al., 2014). Pas, Bradshaw, and Mitchell (2011) similarly found using ODRs are a valid and reliable predictor of later disruptive behavior in students. A downside to using ODRs as a screening tool is that this method is not recommended to screen for students with internalizing concerns, as it will tend to ‘miss’ these students (Severson et al., 2007).

**Parent and student referral.** Another identification method relies on parent referral of students, or student self-referral. Although waiting for referrals by concerned parents can be less time-intensive than a universal screening method such as universal rating scales, parents have been found to not be as accurate as adolescent self-report, and are also less accurate identifying children with internalizing concerns (Edelbrock, Costello, Dulcan, Conover & Kala, 1986; Logan & King, 2001). Edelbrock and colleagues (1986) conducted structural interviews with both children and parents in a large psychiatric clinic setting and compared parent with child reporting. Parents and children had low to moderate agreement on children’s psychiatric disorders. When looking at individual disorders, parents and children had more agreement on behavior and conduct problems and less agreement on anxiety, fears, obsession-compulsions, and other internalizing disorders (Edelbrock et al., 1986). Parents may not only have difficulties accurately detecting whether their children are experiencing mental health difficulties, but also face barriers when referring children for services. Logan and King (2001) conducted a literature review on adolescent mental health service utilization and found variables such as family stress and low parent-student communication could prevent parents from proactively and accurately nominating his or her child as needing mental health services.

Another barrier to using parent referral as a school-based screener is that parents may not also think of schools treating their child's mental illness, making them less likely to refer their child to school based mental health services. Shanley, Reid, and Evans (2008) found of all parents who had children with mental health problems, only 22% first contacted school based mental health services. A larger percentage, 40%, initially contacted physicians instead of school professionals. Parents were also more likely to refer their children who were having externalizing problems, as opposed to internalizing. The researchers found 75% of parents reported their child with aggression or defiance, 40% for overall family functioning, and only 22% reported their child with anxiety or depression to outside services (Shanley, Reid, & Evans, 2008). Although some research has been conducted on parent nomination accuracy and barriers referring for service use, not much research has been conducted on parent referral within a school-based mental health context.

Student referral puts identification into the students' hands, allowing students to either self refer or refer peers who they believe may be experiencing symptoms of a mental illness. Often students in a referral method will refer peers or themselves to teachers, counselors, or psychologists. Although student referral may be easily implemented and cheap as well, this method also has negative implications making it not a feasible method for screening purposes (Dubow, Lovko & Kausch, 1990; Raviv, Raviv, Vago-Gefen, & Fink, 2009). Research points towards students not feeling comfortable or willing to refer to these professionals (Dubow et al., 1990; Raviv et al., 2009). Raviv and colleagues (2009) surveyed 662 high schoolers' willingness to refer themselves and fellow peers to either friends or psychologists within the school context. Students reported that they preferred to refer students to peers, and that they had referred students to peers more often than they had referred to psychologists (Raviv et al., 2009). If

students are less likely to refer fellow students to appropriate professionals, this method will not function as a universal screener. Dubow and colleagues (1990) found similar results further showing student referral may not be a viable screening option for early identification and intervention, as many barriers deter students from referring themselves or peers. The researchers found youth may believe they can solve mental health problems without a therapists' help, and feel worried referrals or therapy may not stay confidential. Students also cited the stigma surrounding mental illness preventing them or others from referring peers or themselves (Dubow et al., 1990).

**Teacher referral.** Teacher referral gives an opportunity to refer students they believe are having difficulties, as they see fit. Using teacher referral to identify students with mental health concerns is easily implemented, and not time-intensive. Students spend most of the school day being observed by teachers, so teachers may be able to identify students having mental health difficulties. Not much current or previous research has evaluated whether reactive forms of teacher referral could be a viable universal screening option. The scant literature found does point towards teacher referral not being an efficacious method to identify students with mental health concerns. First, for a student to be referred he or she must exhibit significant distress that the teacher notices as sufficiently atypical to seek out a school mental health professional. Requiring a student to already experience distress from a mental illness removes the opportunity for early prevention and intervention of students at-risk or with elevated symptoms (Eklund & Dowdy, 2014). Additionally, teachers would refer at varying rates because each teacher's ability to work with students with different needs depends on the individual teacher (Severson et al., 2007). Teachers are also less likely to be sensitive to referring students with mental health

concerns and are more likely to identify students with academic concerns (Walker, Nishioka, Zeller, Severson, & Eeil, 2000).

**School-based mental health professional nomination.** Another nomination tactic that can be used as a universal screening method relies on school-based mental health professionals to nominate. School-based mental health professionals such as school psychologists, social workers, school counselors, and nurses usually have the most training on mental health issues in the school building. But, these professionals may only spend a few days a week at each school and have several schools on their caseload (Gelley, 2014). For school psychologists, the 2010 National Association of School Psychologists (NASP) member survey found the average school psychologist-to-student ratio is 1:1,383 (Castillo, Curtis, & Gelley, 2012), suggesting a typical school psychologist would likely serve, for instance, two elementary schools. School-based mental health professionals also usually spend time with students who are already identified as at risk or are designated in exceptional student education, and not time with students who are not known to be experiencing difficulties. A review of the literature only found two dissertation studies that evaluated the effectiveness of school based mental health professional nomination.

A dissertation by Cunningham (2011) was the first study found to evaluate school based mental health professional student nomination accuracy identifying fourth and fifth graders who self-reported experiencing anxiety and depression symptoms. The fourth and fifth graders reported their anxiety and depression symptoms twice. The schools' mental health teams were asked to separately list all students they knew to exhibit elevated levels of anxiety and depression. Cunningham compared school-based mental health professional nomination accuracy when the team's nominations were combined, and when the professionals nominated individually. The team combined accurately identified about 67% of fourth- and fifth-graders

experiencing elevated anxiety symptoms and 45% of fourth- and fifth-graders experiencing elevated depression symptoms. Misidentification rates were high, with the team misidentifying 35% of the students as experiencing anxiety and 31% of the students as experiencing depression. However, it is important to note the team did not include school nurses, who may have insight into students experiencing the somatic side effects of internalizing disorders.

Gellee (2014) conducted a similar study comparing nomination accuracy between teachers and school based mental health professionals for middle school students experiencing elevated symptom levels of anxiety and depression. Middle school students self-reported anxiety and depression symptoms twice. The school-based mental health professional team consisted of the school psychologist, school social worker, and three school counselors, a team that usually worked together to nominate and refer students who needed services or supports. The school nurse nominated students separately to mimic how nomination screenings would be conducted in the actual school setting. The team's accuracy identifying students with anxiety (sensitivity) was 12.50%, and the team's ability to not identify students not experiencing anxiety (specificity) was 89.69%. The team only misidentified 10% of students not experiencing elevated levels of anxiety. The nurse's accuracy in specificity, sensitivity, and misidentification rate for students with anxiety were similar to the school-based mental health team.

The school-based mental health team's accuracy to identify students experiencing elevated depression levels was 26.32%. The team's specificity to not nominate students without depression was 74.51%. Again, the school nurse's accuracy rates were similar to the team's. The school based mental health professional team missed a vast majority of students experiencing elevated levels of depression and anxiety. When comparing results to Cunningham's dissertation (2011), Gellee (2014) commented school-based mental health professionals may spend even less

time with students in middle schools, leading to the decreased accuracy in nominations compared to Cunningham's findings (2011). Golley (2014) concluded it may be best for these professionals to support others to nominate and identify students in need, instead of nominating students themselves. Overall, school-based mental health professionals do not seem to be a viable universal screening option, especially for secondary schools.

**Teacher nomination.** Teacher nominations in universal screening methods ask teachers to nominate any (or sometimes a specific number is prescribed) students he or she believes would benefit from receiving mental health services, or is exhibiting certain behaviors and symptoms in the classroom. Teachers can be seen as an important link between students and school-based mental health services, therefore teacher nomination can be seen as a natural way to link students in need to correct services (Eklund et al., 2009). Teachers are also usually the adult students spend the most time with in a school day, leading them to observe many instances of a student's behavior. Although few teachers have training in mental health disorders and services, teachers may be better equipped to recognize students with mental health concerns compared to school-based mental health professionals due to the length and nature of time they spend with students. Williams and colleagues (2007) found teachers were also often see events that may lead to future mental health difficulties, such as bullying, violence, or sexual harassment.

There are several advantages to a teacher nomination screening. First, when teachers nominate students, they are hypothetically considering all of their students, making it a quick and efficient universal screener (Cunningham & Suldo, 2014). Next, teacher nominations are easy to implement as a screener, as it is not time intensive and is not costly (Dowdy, Doane, Eklund, & Dever, 2011; Ollendick, Oswald, & Francis, 1989). Research has also confirmed teacher

nominations may be an effective tool to screen for students with externalizing concerns (Dwyer, Nicholson, & Battistutta, 2006; Mollins & Clopton, 2002; Pearcy, Clopton, & Pope, 1993).

Although teachers have been able to identify students with externalizing concerns through a nomination process, there is less support towards teachers accurately identifying students with internalizing disorders and symptoms (Dwyer, Nicholson, & Battistutta, 2006). When comparing nomination rates of students with internalizing and externalizing symptoms, teachers have been found to identify more students with externalizing disorders (Lane & Menzies, 2005; Richardson et al., 2009; Soles, Bloom, Heath, & Karagiannakis, 2008). Soles and colleagues (2008) found teachers were five times more likely to nominate students with externalizing behaviors compared to students with internalizing behaviors. This may be because teachers have reported being more concerned with behavioral disorders compared to emotional disorders (Loades & Mastroyannopoulou, 2010).

One reason why teachers may be differentially accurate when nominating students with externalizing symptoms is teachers have reported more comfort identifying externalizing mental health problems (Williams et al., 2007). In contrast, teachers reported less confidence identifying students with depression and anxiety (Walter, Gouse, & Lim, 2006). Teacher's low confidence identifying students with internalizing disorders may explain why teacher accuracy rates identifying students with internalizing disorders are lower. As detailed next, initial research by Roeser and Midgley (1997) showed teachers may be able to accurately identify students with internalizing symptoms. Other research found teachers tend to have both low to moderate sensitivity and specificity to identify students with symptoms and diagnoses of anxiety and depression in the schools (Auger, 2004; Cunningham & Suldo, 2014; Dadds, et al., 1997; Gelley,

2014; Layne, Bernstein, & March, 2006; Moor, et al., 2007; Ollendick, Oswald, & Francis, 1989).

Early research by Roeser and Midgley (1997) showed promising results that teachers were good informants about their students' mental health needs, particularly in identifying students with anxiety. Roeser and Midgley asked 200 elementary school teachers to nominate students they thought would benefit from seeing a psychologist. The students who were nominated by their teachers nominated reported significantly more anxiety symptoms using the Multidimensional Anxiety Scale for Children (MASC; March, 1997) than the students who were not nominated, showing teachers had good sensitivity to individual student mental health needs (Roeser & Midgley, 1997).

Other research points towards teacher nomination not being a viable option to identify students with anxiety. Dadds et al. (1997) conducted a research study as part of the Queensland Early Intervention and Prevention of Anxiety Project, looking specifically at the screening procedure used to identify students for a subsequent anxiety intervention. A sample of 1,786 children from Australia, who ranged in from 3<sup>th</sup> to 7<sup>th</sup> grade, filled out the Revised Children's Manifest Anxiety Scale for Children (RCMAS; Reynolds & Richmond, 1979). Teachers were asked to nominate the top three children from each class who exhibited anxiety symptoms, and the top three children from each class who exhibited disruptive behavior. The researchers also conducted interviews of parents who had nominated children with elevated scores on the RCMAS and met other criteria. Teachers only correctly identified 19.3% of students who self-reported elevated anxiety symptoms, and missed 80.7% of student exhibiting symptoms. The false positive rate was also high, as 9% of students teachers nominated did not have clinically significant anxiety symptoms. As noted by Gelle (2014), the researchers only had students

report anxiety symptoms once, potentially measuring more temporary anxiety symptoms instead of long-term symptoms. The researchers also used the same cut score (20) on the RCMAS to designate students with clinical levels of anxiety symptoms, not taking into account individual student age or gender (Gelley, 2014).

Other research does not support teacher nomination being an accurate tool to identify students with depression symptoms in schools. Moor and colleagues (2007) conducted a study to examine teacher nomination accuracy for identifying high school students with depression. The researchers found teachers correctly recognized only 41-52% of students who were diagnosed with depression. With only elevated and not clinical levels of depression, teachers only had a 4.5% sensitivity (meaning a teacher correctly identified a student who also reported elevated depression symptoms). Auger (2004) conducted a similar study and found teachers missed 73% of students who were clinically depressed. Although teacher sensitivity was low, teacher specificity was high, as 91% of students without symptoms were correctly not nominated by teachers having depressive symptoms.

Research by Cunningham and Suldo (2014) conducted a teacher nomination screener for elementary school teachers to evaluate whether teachers could accurately identify elementary school students with elevated levels of anxiety or depression. Elementary school students were given the Children's Depression Inventory (CDI; Kovacs, 2003) and the Multidimensional Anxiety Scale for Children (MASC; March, 1997) twice. Only students who twice reported elevated levels were deemed symptomatic. Teachers were given a nomination form allowing them to nominate up to three students they perceived to experience anxiety and or depression symptoms. The researchers found within elementary school teachers, teachers had a sensitivity of 50% (meaning they correctly identified half of the students who exhibited depression

symptoms). Teachers also correctly did not identify 83.80% of students that did not exhibit depression symptoms (i.e., specificity). In regards to anxiety, teacher sensitivity was similar, at 40.74%. Teachers correctly did not identify 82.46% of students with no anxiety symptoms. Cunningham and Suldo (2014) concluded there was moderate support for elementary school teachers nominating students with internalizing issues within their classes.

A dissertation by Gellee (2014), the source of data analyzed in the current study, also examined the effectiveness of teacher nominations for students with elevated anxiety or depression symptoms, but at the middle school level. Gellee (2014) gave 233 middle school students the Children's Depression Inventory 2<sup>nd</sup> Edition (CDI 2; Kovacs, 2011) and the Multidimensional Anxiety Scale for Children 2<sup>nd</sup> Edition (MASC 2; March, 2013). Students with elevated scores on the CDI 2 or the MASC 2 re-completed the measure(s) one week later. The purpose of the second administration was to rule out students who only had transient symptom elevations. Teachers were asked to nominate as many students as they thought were experiencing anxiety and/or depression. Teachers had 58% sensitivity of detecting students experiencing elevated levels of anxiety and 37% sensitivity to students with elevated levels of depression, meaning they missed 42% and 63% of students with repeatedly elevated levels of anxiety and depression, respectively. Teachers' specificity to elevated anxiety levels was 66%, and 77% specificity for depression. Teachers mistakenly identified students without anxiety at a 35% rate, and a rate of 23% for depression. Gellee (2014) concluded teachers were moderately accurate identifying middle school students with elevated anxiety, and less accurate in identifying students with elevated depression. Gellee (2014) did not report positive predictive value and negative predictive value when evaluating teacher nomination accuracy, and did not formally evaluate factors that may differentiate teachers who were more or less accurate.

**Multiple-gating screening procedures.** Multiple-gating universal screening procedures include several screening methods in a systematic ‘gating’ system. A gating system uses “a combination of assessments to select a small pool of individuals from a larger one (e.g., a classroom of students)” (Walker, Severson, & Feil, 2014, p. 7). One popular multiple-gating screening procedure is the Systematic Screening for Behavior Disorders (SSBD), first developed by Walker and Severson in 1990. The first edition of the SSBD, designed for use with first through sixth grade students, has been designated as the “gold standard of systematic screening” (Kauffman, 2001). Two reasons why the SSBD was regarded as a “gold standard” multiple gating procedure included how the SSBD gathers input from teachers and how professionals regarded it as an effective tool to identify students suffering from symptoms of anxiety and depression (Morris, Shah, & Morris, 2002). The second edition of the SSBD, published in 2014, includes two separate, but similar procedures for identification and referral of PreK and kindergarten students, and one for first through ninth grade students (Walker, Severson, & Feil, 2014). For the purposes of the current study, only the first through ninth grade procedure is detailed below.

The SSBD for elementary and middle school students involves both teacher nomination and teacher rating scale screening methods. In Stage 1 of the SSBD, teachers nominate five students who he or she believes fits separate dimensions of externalizing and internalizing symptom profiles. The teachers then rank order the five nominated students for which students ‘best fit’ the given internalizing and externalizing symptom profiles. Because of the reliance on teacher nominations in Stage 1 in order to be more fully considered in subsequent stages, the SSBD is particularly relevant to the current study which is focused on accuracy of this method (teacher nomination). In Stage 2, teachers are asked to more thoroughly screen or complete

rating scales for the top three students that Stage 1 identified as highest risk for internalizing disorders and the top three students that Stage 1 identified as highest risk for externalizing disorders. For Stage 2, normative data and cutoff points can further guide assessment or intervention planning. In total, Walker, Severson, and Feil estimated that Stage 1 and 2 should take 45 minutes per classroom teacher (2014). The SSBD also includes an optional Stage 3, which can include School Archival Records search or systematic Behavior Codes (Walker, Severson, & Feil, 2014).

There are several benefits to multiple-gating screening procedures, including decreased false positives, or a lower misidentified rate (Kilgus, Chafouleas, Riley-Tillman, & Welsh, 2012). Kilgus and colleagues (2012) conducted a study to evaluate the diagnostic accuracy and concurrent validity of Direct Behavior Rating Scale Single Item Scales (DBR-SIS), but also to evaluate using DBR-SIS in a multiple-gating procedure. Twelve second grade teachers each rated ten randomly selected student in their classroom for a total sample of 118 students using the Behavioral and Emotional Screening System (BESS; Kamphaus, & Reynolds, 2007) and the Social Skills Improvement System (SSIS; Elliott & Gresham, 2007). Teachers also observed students using DBR-SIS across 30 time points completing three different behaviors of interest: academic engagement, disruptive behavior, and compliance. The researchers found DBR-SIS ratings alone at one time point had a high misidentified rate, but when DBR-SIS and other scales were used in a multiple-gating procedure the misidentified rate decreased. Therefore, multiple-gating procedures effectively decreased false positive compared to a one-time use of DBR-SIS (Kilgus, Chafouleas, Riley-Tillman, & Welsh, 2012).

Kilgus, Riley-Tillman, Chafouleas, Christ, and Welsh (2014) conducted a similar study to further investigate the effectiveness of using Direct Behavior Rating Single Item Scale (DBR-

SIS) as a universal screener in schools. Thirty-one first grade, 25 fourth grade, and 23 seventh grade teachers rated about 15 randomly selected students in their class, for a total sample of 1108 students. Teachers rated students on three measures: the BESS, the Student Risk Screening Scale (SSRS; Drummond, 1994), and the Direct Behavior Rating Single Item Scale (DBR-SIS). Kilgus and colleagues (2014) found that using DBR-SIS and other rating scales in a multiple-gating procedure produced higher accuracy in first and seventh grade participants, by way of limiting the number of false positives. The researchers also recommended that multiple gating procedures were a good fit for sites where there is an emphasis on an efficient use of resources for mental health service delivery (Kilgus, Riley-Tillman, Chafouleas, Christ, & Welsh, 2014)

Although multiple-gating screening procedures combine and utilize several different data sources and screening methods, these screening procedures require substantially more organization, training, data collection, and analysis compared to using a single-occasion screening method. Additionally, Walker, Severson, and Feil (2014) indicate that while accuracy of multiple-gating can be high, costs to schools can be medium compared to solely teacher referral or intervention-based identification, and there can be difficulties obtaining effective school-based and/or community-based services and supports for students identified.

### **Factors Affecting Accuracy of Teacher Nominations**

**Teacher training in mental health issues.** A teacher's initial or post-graduate training may prepare him or her to be better able to identify students experiencing mental health concerns. Professional education about students' mental health issues have been shown to increase teacher knowledge and self-efficacy for how they interpret student behavior, interact with students, approach parents, and collaborate with students and parents (Aspell-Williams & Murray-Harvey, 2013; Jorm, et al., 2010; Moor, et al., 2007). Teacher trainings can come in the

form of professional development, pre-service training, or different educator knowledge programs such as Mental Health First Aid (Mental Health First Aid, 2013), Typical or Troubled? (Typical or Troubled?® School Mental Health Education Program, 2014), and Question, Persuade, and Refer (QPR) Gatekeeper Training (QPR Institute for Suicide Prevention, 2014). Although there are studies showing teacher training and education produces positive effects on knowledge, self-efficacy, and mental health stigma (Jorm et al., 2010; Reis & Cornell, 2008), there is less support that teacher trainings causes meaningful effects on accuracy in identifying students with mental health concerns (Moor et al., 2007).

Most studies evaluating the effectiveness of educator knowledge programs focus on changes in knowledge and attitudes as outcomes, not accuracy in identifying students with mental health concerns. Jorm and colleagues (2010) conducted a cluster randomized study to evaluate the effectiveness of one educator knowledge course, Youth Mental Health First Aid. Youth Mental Health First Aid is an eight-hour long training (in one day or two half-days) that provides participants knowledge about different mental health concerns, how to assess and evaluate risk in a student experiencing mental health distress, and how to encourage help seeking (Mental Health First Aid, 2013). In Jorm and colleague's (2010) study, a modified version of Youth Mental Health First Aid was presented over the course of two training days, each day consisting of seven hours. The modified version of the training also included departmental policy on mental health issues. Jorm and colleagues (2010) found the 327 South Australian high school teachers who completed Youth Mental Health First Aid Training had increased knowledge and confidence in providing help to students, in addition to reduced stigma surrounding mental health issues (Jorm, et al., 2010).

Studies that evaluated another similar training program, Question Persuade, Refer (QPR) studied similar outcomes. In a single training session of variable duration (1 to 3 hours), QPR training aims to teach educators and other professionals how to identify and monitor students they believe are at risk for suicide, how to approach students at-risk for suicide, and how to help students find appropriate services (QPR Institute for Suicide Prevention, 2014). Reis and Cornell (2008) conducted a follow up study of 403 elementary, middle, and high school teachers and counselors who completed the QPR Gatekeeper Training program about five months after training, comparing knowledge to 172 controls. The researchers found both teachers and counselors who had completed QPR training had significantly more knowledge of suicide risk factors and completed more ‘no-harm contracts’ with students who were at risk for committing suicide (Reis & Cornell, 2008).

Although educator knowledge programs have been found to increase knowledge and decrease stigma surrounding mental health issues (Deacon, 2015; Jorm et al., 2010; Reis & Cornell, 2008), two studies that attempted to ‘teach’ teachers how to better recognize students facing mental health concerns were not found to be effective in regards to increasing nomination sensitivity (Deacon, 2015; Moor et al., 2007). Moor and colleagues (2007) evaluated whether ‘teaching’ teachers would produce meaningful changes in teacher accuracy identifying students with depression. Moor and colleagues’ participants (2007) included 151 teachers from eight high schools in Scotland. Sixty-nine of these teachers were “guidance teachers,” whose job was to have “special responsibility for pupil pastoral care” (Moor et al., 2007, p. 83). The remaining 82 were “class registration” teachers, specialized subject teachers, or learning support teachers. First, all teacher participants nominated students they thought had clinical levels of depression. Teachers were also given an Attitudes Questionnaire to measure their confidence in themselves

and in teachers as a whole to identify students with depression. The Attitudes Questionnaire consisted of ten questions created by the research team asking teachers about their individual attitudes towards depression in adolescence, a teacher's confidence in his/her self recognizing students with depression, and attitudes towards school-based identification of adolescents with depression. For participating students, all 2,262 filled out the Moods and Feelings Questionnaire (MFQ; Angold & Costello, 1987). Students who reported elevated depression symptoms on the MFQ took part in a Schedule for Affective Disorders and Schizophrenia for school aged children- present and lifetime version (K-SADS-PL; Kaufman et al., 1997) semi-structured clinical interview to detect whether he or she had a clinical diagnosis of depression (Kaufman et al., 1997). Participating teachers were either randomly assigned to an experimental condition where they received a two hour school-based psychoeducational intervention intended to recognize students experiencing depression symptoms. The psychoeducational intervention contained information on the symptoms and signs of adolescent depression, case vignettes of students with depression, and discussion of the importance of early identification of students experiencing depression (Moor et al., 2000). Teachers who were not assigned to the intervention were in a control condition where teachers received a generic filler task including no training components. Teachers who received the mental health education intervention subsequently decreased their nominations of students with depression. At the second nomination round, teachers receiving the intervention reported 49% less students as depressed, and decreased in accuracy of correctly nominating students with depression. Moor and colleagues (2007) suggested the intervention may have made teachers reconsider students who they previously nominated at Time 1, and teachers decided many of those students were not experiencing depression. The teachers who received the intervention decreased from 52% sensitivity at Time 1

to 45% sensitivity at Time 2. Although the intervention unintentionally decreased teacher accuracy in identifying students with depression symptoms, it did affect some teachers' attitudes. After receiving the intervention, teachers felt more confident in their ability to identify students with depression, and felt more confident in teachers as whole to identify students with depression. Unfortunately, the increased teacher confidence in his or her personal ability to identify students with depression and increased confidence in teachers as a whole to identify student did not affect accuracy of teacher nomination (Moor et al., 2007).

Deacon (2015) evaluated the efficacy of a teacher training program, *Training Teachers to Identify Children with Anxiety Problems* (T-TICAP; Feeney-Kettler, Auster, & Kratochwill, 2005). T-TICAP is a teacher training program aimed to increase teacher knowledge and accuracy of identifying elementary school students with anxiety. Of the ten fourth through sixth grade teachers participating in the study, five teachers were randomly selected to receive the 50-minute T-TICAP training, and five were randomly selected for a control condition. The T-TICAP training consisted of risk factors for anxiety, anxiety symptoms, and what roles teachers can play in identifying students with anxiety in the classroom. After training or a non-training session, all teachers completed out an Anxiety Nomination Rubric provided by the T-TICAP program, and all students completed the MASC-2. Deacon (2015) did not find a statistically significant difference in teacher accuracy in identifying students with elevated MASC-2 scores between training and non-training groups. Although the program was not associated with improving teacher accuracy in identifying students with anxiety, the T-TICAP program significantly increased teacher knowledge of anxiety symptoms between pre and post-training.

**Self-efficacy beliefs.** Teachers' beliefs regarding their ability to identify students with mental health problems may have a relationship with their accuracy nominating students.

Although teachers are in a convenient location to support and identify students facing mental health concerns (Johnson, Eva, Johnson, & Walker, 2011), teachers have been found to not feel confident in their personal ability to identify students with mental health concerns (Papandrea & Winefield, 2011; Rothi, Leavey, & Best, 2007; Walter, Gouze, & Lim, 2006). But the research is slightly conflicting in this area, with one qualitative study suggesting teachers did report feeling comfortable recognizing mental health difficulties in students (Williams et al., 2007). When looking at teacher confidence in supporting students with mental health concerns in the classroom, teachers have also reported not feeling prepared to manage students who need mental health supports in the classroom (Kidger et al., 2010; Mazzer & Rickwood, 2013; Rothi, Leavey, & Best, 2007; Walter, Gouze, & Lim, 2006).

To investigate urban elementary school teachers' thoughts and experiences with mental health service delivery, Williams and colleagues (2007) conducted two focus groups from two schools, with 19 teachers total. Teachers reported feeling generally comfortable recognizing mental health problems in students. When discussing common mental health issues in students, teachers primarily focused on externalizing behaviors. Similarly, teachers reported personal strengths in identifying externalizing behaviors. This may be related to the teachers' perceptions that students with externalizing behaviors caused the biggest issues in the classroom. After further questioning by researchers, teachers expressed they felt they would be able to identify internalizing symptoms in students. Overall, teachers reported a barrier to identifying mental health disorders in students was that they were "too busy managing behavior" to identify and refer students they had concerns about in school (Williams et al., 2007). Teachers did feel confident to act as a gateway to mental health service referrals, but felt more comfortable referring students with externalizing symptoms over students with internalizing symptoms.

Another qualitative study of teachers investigated teachers' thoughts concerning their training and skills to identify students with mental health issues (Rothi, Leavey, & Best, 2008). Semi-structured interviews of 30 English primary, secondary, and specialized school teachers revealed they did not feel qualified to identify students with mental health issues without additional training. Teachers reported one barrier to better serving students' mental health needs was knowing the difference between each mental health diagnosis. Teachers also reported not feeling competent to identify mental health issues in their students. Rothi, Leavey, and Best (2008) noted overall throughout interviews teachers paid attention to and identified more students with externalizing, as opposed to internalizing, symptoms. Some teachers admitted to recognizing internalizing symptoms in students after being asked follow-up questions by the interviewers.

A needs assessment survey with teachers from six inner-city elementary schools similarly suggested that teachers do not feel confident to identify and address student mental health needs in the classroom (Walter, Gouze, & Lim, 2006). Of the 119 teachers surveyed, 50% of the teachers chose disruptive behavior as the biggest mental health problem in their students. When surveyed about mental health issues, teachers did not have a depth of knowledge about different mental health disorders (Walter, Gouze, & Lim, 2006). Teachers tied their lack of information and training about mental health issues to why they reported a low level of confidence to identify and assist students with mental health issues in the classroom (Walter, Gouze, & Lim, 2006). Teachers overall did not report high self-efficacy in identifying students with mental health issues in the classroom. Particular to internalizing disorders, teachers reported less confidence in identifying students with depression and anxiety compared to teachers' self-reported confidence

in adapting a curriculum for a student with ADHD or implementing a behavior plan for a student with a disruptive behavior disorder (Walter, Gouze, & Lim, 2006).

Although research has explored different aspects of teacher confidence with identifying and supporting students with mental health issues in the classroom, only one study was found that explored the relationship between teacher confidence in identifying students with depression and teacher accuracy in identifying students with depression (Moor et al., 2007). Moor and colleagues' (2007) study primarily focused on whether teacher training increased teacher accuracy identifying students with depression in several high schools in Scotland. But, the researchers did look at trends over time in the teachers' self-report of confidence levels identifying students with depression. For the group of teachers receiving the teacher psychoeducational program, teachers' confidence levels identifying students with depression increased after the psychoeducational program. But, as mentioned previously, the teachers in the training program group decreased in nomination accuracy (sensitivity, specifically) after receiving training. Although Moor et al.'s (2007) research measured confidence and accuracy changes over time after a psychoeducational program, they did not conduct separate analyses looking at the direct relationship between teacher confidence and accuracy in identifying students with depression or another internalizing disorder such as anxiety. Additionally, Moor et al.'s study (2007) did not measure teacher accuracy in identifying students with anxiety.

**Teachers' acceptance of identification method.** When conceptualizing their own role as teachers, research yields mixed findings whether or not teachers see supporting student mental health as part of their larger role as a teacher. Some research has found teachers do not see students' mental health concerns as their responsibility (Roeser & Midgely, 1997; Severson et al., 2007). Some teachers may not see identifying and supporting students with mental health

concerns as part of a teacher's role, because supporting students' mental health is not tied directly to student academic achievement and is a relatively new teacher responsibility (Mazzer & Rickwood, 2005). Teachers have reported feeling reluctant to include supporting student mental health as within their role as teachers (Daniszewski, 2013). However, other studies have found teachers do perceive supporting student mental health is part of a teacher's role (Andrews, McCabe, & Wideman-Johnston, 2014; Graham et al., 2011; Reinke, Stormont, Herman, Puri, & Goel, 2011; Rothi, Leavey, & Best, 2008).

Although some research has found teachers generally perceive identifying and supporting student mental health as part of their role, not much research was found that looked at teachers' attitudes towards being qualified to identify students with mental health concerns. As part of Moor et al.'s (2007) larger study on whether teacher psychoeducational training can improve teacher accuracy in identifying students with depression, the researchers asked teachers whether they thought teachers were "unqualified to recognize pupils with depressive symptoms" (Moor et al., 2007, p. 91). For teachers in the psychoeducational training group, significantly fewer teachers thought teachers were unqualified to identify students with depression after the training. However, as previously mentioned, after teachers completed the psychoeducational training session they were less accurate in correctly nominating students who also self-reported depression symptoms (Moor et al., 2007). Again, Moor and colleagues' (2007) did not analyze changes in teacher confidence in others and the individual's teacher's accuracy identifying students with depression symptoms in the same analyses, or include teacher nominations with identifying students with anxiety symptoms.

**Professional experience level (years teaching).** Professional experience, defined by years teaching may have a relationship with teacher accuracy in identifying students with

symptoms of anxiety or depression. One qualitative study by Koller, Osterlind, Paris, and Weston (2012) found differences in teacher's reports of preparedness to support students with mental health needs in the classroom across teacher years of experience. Koller and colleagues (2012) interviewed novice and expert teachers to see how prepared teachers felt with their training to assist students in the classroom with mental health needs. The study found novice teachers felt significantly more prepared with undergraduate training to support students with mental health needs. The researchers concluded this may be explained by shifts in teacher preparation programs' content over time. Alternatively, newer teachers may not have enough experiences with students who have diverse needs to feel that teacher preparation programs did not adequately prepare them to feel confident facing student health needs in their classroom (Koller et al., 2012). In regards to whether teacher experience is related to supporting students with mental health concerns in the classroom, research has found teachers with more years of experience reported to taking more steps to support student mental health in their classrooms (Daniszewski, 2013). Although this difference was found to be statistically significant, Daniszewski (2013) concluded it was not clinically significant.

In Berg-Nielsen and colleagues' study of teacher and parent characteristics as predictors of parent-teacher disagreement of problem behavior in preschoolers, one teacher characteristic measured and included in analyses was years teaching, or experience with children. The researchers found experience with children did not explain parent-teacher disagreement. Although Berg-Nielsen (2012) and colleagues did not find a relationship between teacher experience and differences in parent-teacher ratings, the research was only completed with preschool students, and therefore did not include self-report ratings of externalizing or internalizing concerns.

**Gender.** A teacher's gender may affect the ability to accurately nominate students with elevated levels of anxiety and depression in class. No research was found on the teacher's gender affecting nomination accuracy for students with mental health concerns. In her dissertation, Golley (2014) proposed demographic variables such as gender, ethnicity, and professional experience may affect teacher nomination accuracy; however, she did not analyze those variables in her study. The effect of a teacher's gender has been studied in reference to help-seeking behavior in students. Le Mare and Sohbat (2002) conducted semi-structured interviews and questionnaires with 115 students who varied in age from second to seventh grade, and asked students what affected their willingness to ask teachers for help. Responses varied from teacher characteristics such as willingness, global personality, reactions to help seeking, relationships, and more. The least occurring response Le Mare and Sohbat (2002) found was students reporting a teacher's gender affected their likelihood to seeking help from a teacher. When mentioned, a few students reported they felt more comfortable asking female rather than male teachers for help. It is important to note help seeking in Le Mare and Sohbat's study (2002) was defined as any time students asked for help and not pinpointed as asking for help with emotional or behavioral problems. The study was also conducted with primary and secondary school students. Secondary school students spend less time with each teacher, potentially affecting the student-teacher relationship and consequently their willingness to ask for help. Le Mare and Sohbat's (2002) findings suggest students feel more comfortable asking female teachers for assistance, meaning female teachers may have more knowledge of students' problems to more accurately nominate students.

Berg-Nielsen, Solhein, Belsky, and Wichstrom's study (2012) analyzed the relationship between different teacher and parent characteristics and disagreement in teacher-parent ratings of

externalizing and internalizing behaviors in preschool students. The researchers found that *student* gender seemed to have an impact on parent-teacher disagreement, as there was more parent-teacher disagreement for girls' externalizing problems in contrast to boys' externalizing problems, where there was more agreement. One potential explanation the researchers proposed in explaining this disagreement was that there may be a same-gender bias in female teachers. Teachers in general rated girls' externalizing behavior lower than boys.<sup>3</sup> As 86.2% of the teacher sample was female, female teachers may perceive female students' externalizing behaviors as less abnormal compared to boys' externalizing behaviors. Although Berg-Nielsen and colleagues proposed this same-gender bias, teacher and parent gender was not included in analyses. Furthermore, the same pattern of disagreement was not found for preschoolers' internalizing parent-teacher ratings.

**Subject taught.** Teachers who teach certain subjects may be more or less accurate in identifying students with elevated symptoms of anxiety or depression. The only research found on the accuracy of teachers from certain subjects over others was Golley's (2014) dissertation research. Golley suggested English language arts and math teachers had similar levels of sensitivity and specificity. English language arts ( $n = 6$ ) and math teachers ( $n = 6$ ) had about a 17% sensitivity rate in accurately nominating students with elevated levels of depression. For anxiety, language arts teachers had 41% sensitivity and math teachers had 31% sensitivity. Social studies teachers ( $n = 6$ ) had a sensitivity of 4% for detecting elevated levels of depression and 6% for detecting elevated levels of anxiety. Social studies teachers nominated fewer students in general, contributing to a high specificity: 96% for students without elevated levels of depression and 97% for students without elevated levels of anxiety. Language arts teachers and math teachers similarly did not nominate about 89% of students without elevated depression

levels and about 82% of students without elevated anxiety levels. To explain trends in differences, Golley (2014) proposed because of high-stakes testing in language arts and math classes, these teachers may have more opportunities to see students having difficulties compared to social studies teachers. Overall, Golley (2014) suggested if teacher nominations should be used as a screening tool, it may be best to ask core subject teachers such as English language arts and math teachers as opposed to social studies teachers.

Although Golley's (2014) research was the only study that explored the potential relationship between teachers of certain subjects and accuracy in identifying students with elevated levels of anxiety and depression symptoms, research has found personality differences between secondary teachers of single subjects. For a dissertation, Kelsey (2002) surveyed 80 secondary teachers with the Meyer's Briggs Type Indicator to examine differences in teacher team type in personality (MBTI; Myers, McCaulley, Quenk, & Hammer, 1998). English teachers' overall team type was ENFP (or Extraversion, Intuitive, Feeling, Perceiving). Kelsey concluded English teachers may be more likely to be open to change and try new things, and were more intuitive as a whole. Math teachers' overall team type was ESTJ (or Extraversion, Sensing, Thinking, Judging). Kelsey explained math teachers may be more resistant to change, and are more logical in decision making. Social studies and science teachers' overall team type was ISTJ (or Introversion, Sensing, Thinking, Judging). Kelsey discussed social studies and science teachers liked to gather all different types of past and present information before making decisions (Kelsey, 2002). Overall, this suggests secondary teachers with certain characteristics and personality types choose certain subjects to teach, and this may have implications on their perceptions of youth mental health, thereby their accuracy in identifying students with symptoms of anxiety or depression.

## Conclusions

There are many students in schools who need early intervention or treatment for mental illness. Although universal screeners can be used to identify these youth, there are pros and cons for each universal screening method, including issues of accuracy, timeliness, training, and cost.

One commonly used method, teacher nomination, is relatively easy to implement and is cost-effective. Research on the accuracy of teacher nomination has found this method can be used to identify students with externalizing symptoms (Dwyer, Nicholson, & Battistutta, 2006; Mollins & Clopton, 2002; Pearcy, Clopton, & Pope, 1993), but tends to miss and misidentify many students with symptoms of anxiety or depression (Auger, 2004; Cunningham & Suldo, 2014; Dadds et al., 1997; Golley, 2014; Layne, Bernstein, & March, 2006; Moor et al., 2007; Ollendick, Oswald, & Francis, 1989). Although the research is clear that teacher nominations are a less accurate tool to identify students with internalizing disorders (as compared to externalizing disorders), it is unclear why this occurs. Different teacher characteristics, such as self-efficacy beliefs to identify students, acceptance of method of relying on other teachers to identify students, years teaching, gender, and subject taught may be differentially related to one teacher's accuracy identifying middle school students with elevated symptoms of anxiety or depression in schools. The current study explored this relationship, analyzing the simultaneous relationship between those teacher characteristics and teacher accuracy in identifying middle school students with elevated symptoms of anxiety and depression. This study also analyzed the relationships between teacher beliefs (*self-efficacy beliefs* in the domain of identifying students with symptoms of anxiety or depression and *acceptance of method* in teachers as a whole to identify students with anxiety or depressive symptoms and accuracy identifying students with elevated symptoms of anxiety or depression) and the relationship between teacher demographic

characteristics (*number of years teaching, gender, and subject taught*) and teacher accuracy in identifying middle school students with elevated symptoms of anxiety and depression.

## **CHAPTER THREE:**

### **METHODS**

The aim of this study was to examine the relationship between certain teacher characteristics, such as teacher self-efficacy beliefs to identify students with internalizing disorders, acceptance of method towards teachers as a whole to identify students with internalizing disorders, gender, professional experience and subject taught, and a teacher's level of accuracy in identifying middle school students with elevated levels of internalizing (anxiety and depression) problems. This chapter describes the study's research design, participants, procedures, and outcome measures. The chapter also explains the data analysis plan for each research question.

#### **Research Design**

The present study was a secondary analysis of Golley's (2014) original study that analyzed the accuracy of teacher nominations in identifying middle school students who reported elevated symptom levels of anxiety and/or depression. A non-experimental, descriptive research design was used to determine the relationship between teacher nomination accuracy (sensitivity, specificity) and student self-report of anxiety and depression symptoms. The current study also employed a non-experimental, descriptive research design in order to explore the relationships between certain teacher characteristics and subsequent teacher accuracy.

## **Participants**

The data pertinent to the research questions in the present study included data gathered from teachers and students in one middle school from a large, urban school district in the Southeastern United States. The single middle school was chosen because the principal was interested in increasing the school-based mental health services at the middle school. After the study's identification process was over, interventions and services were provided to students experiencing elevated symptoms of anxiety or depression. Both school-based mental health professionals at the middle school and the researcher's colleagues in the USF School Psychology Program provided the services to identified students.

The school selected for study participation had Title 1 distinction. Therefore, the school received extra federal funding because many of the enrolled students were from low-income households. The school was located in a suburban area of the city, and received a "D" school grade for the year (2012-2013) and year before the study was conducted (2011-2012). The components that create a school grade include student performance and learning trends over time on statewide assessments and end-of-course (EOC) assessments. EOC assessments are typically conducted for high school students, but middle school students can obtain extra points towards school grade by taking EOC assessments. The middle school that participated had 957 students enrolled in 2012-2013 when the study took place. During data collection, the middle school enrolled 6<sup>th</sup> grade students ( $n = 332$ ), 7<sup>th</sup> grade students ( $n = 292$ ), and 8<sup>th</sup> grade students ( $n = 333$ ). Table 1 contains the demographic information for the year the study was conducted. The teachers and students' demographics are shown in both Tables 1 and 2.

Table 1

*Demographic Characteristics of Student Participants*

Variable	Student Sample (n=233)		Total School (N=957)	
	n	%	N	%
<b>Grade</b>				
6	--	--	332	34.70
7	102	43.78	292	30.50
8	131	56.22	333	34.80
<b>Gender</b>				
Male	111	47.64	511	53.40
Female	122	52.36	446	46.60
<b>Ethnicity</b>				
Hispanic or Latino	63	27.04	--	--
Not Hispanic or Latino	170	72.96	--	--
<b>Race</b>				
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
<b>Lunch Status</b>				
Free or Reduced-Price School Lunch	198	84.98	832	87.00
Not Free or Reduced-Price School Lunch	35	15.02	125	13.00

Teacher participants ( $n = 19$ ) had a mean age of 39.3 years old ( $SD = 11.3$ ; range: 23 to 57). The average professional experience (years teaching) was 9.42 years ( $SD = 10.16$ ; range: 1 to 36).

Table 2

*Demographic Characteristics of Educator Participants*

Variable	Teachers ( $n=19$ )	
	<i>n</i>	%
Grades Taught		
7 <sup>th</sup>	6	31.58
8 <sup>th</sup>	7	36.84
Both	6	31.58
Gender		
Male	9	47.37
Female	10	52.63
Subject Taught		
Math	6	31.58
Language Arts	6	31.58
Social Studies	6	31.58
Exceptional Student Education	1	5.20
Ethnicity		
Hispanic or Latino	0	0
Not Hispanic or Latino	19	100.00
Race		
Asian, Native Hawaiian, Pacific Islander	1	5.26
Black or African American	8	42.11
White, Non-Hispanic	10	52.63
Highest Education Level		
Bachelors/College Degree	11	57.89
Master's Degree	5	26.32
M.A. + 30 (or equivalent)	3	15.79
Professional Development in Mental Health		
Yes	1	5.26
No	18	94.74

## **Participation Rates**

All students in grades 7 and 8 ( $N = 657$ ) were recruited for the larger study (Gelley, 2014). Students in self-contained classrooms for Intellectual Disabilities were excluded from participation because of potential challenges understanding the study's written materials and rating scales. Of all students in grades seven and eight, 284 students returned signed parent consent forms, yielding a 43% response rate. Of the students with signed parental consent forms, 243 parent consent forms contained positive parental consent. Therefore, the positive consent rate of all students was 37%. Students with and without parent positive consent still qualified for recruitment incentives, as they had obtained parent or guardian signature and returned it to school. Of the 243 students who received consent for the study, four students were dropped. Three students were dropped because they were often absent. One student was dropped because of the student's limited English proficiency, which may have prevented the student from accurately filling out the rating scales. A total of 239 students were given rating scales. Of these 239, three students' data were not used in analyses. For two of these students, an anxiety and depression  $T$ -score could not be calculated due to missing data. For another student, teachers did not feel comfortable nominating the student due to schedule changes. At Time 2, three students who had been identified as symptomatic at Time 1 were unable to complete anxiety and/or depression measures, excluding these three students from the final sample. In all, data from 233 students were used in analyses, which reflects 35% of the original population.

All 19 teachers who were recruited for the study consented to give nominations and fill out short rating forms asking about teacher confidence in self and attitudes towards other teachers identifying students with symptoms of anxiety or depression in school, resulting in a

100% participation rate. In the current study, analyses were conducted using a dataset that consists of ratings from 233 students and 19 teachers.

## Measures

**Demographic information form.** All teachers and students filled out a demographic rating form used in similar prior research (Cunningham & Suldo, 2014). The demographic rating form asked participants about age, gender, ethnicity, socioeconomic status (SES), and grade level enrolled in or taught. Each version of the demographic rating form is attached in Appendices A and B.

**Self-efficacy beliefs.** In addition to the demographic information form, all teachers filled out two short scales (one with four items, and one with two items) to examine their self-efficacy beliefs and acceptance of method towards other teachers as a whole being able to identify students with anxiety and depression. The first four-item scale measured the teachers' self-efficacy in the domain of their personal knowledge of anxiety and depression, and his or her perceptions of teachers' ability to identify symptoms on anxiety and depression in students. The four-item scale was taken from previous literature measuring teachers' mental health self-efficacy and teacher attitudes surrounding students with mental health problems in schools (Moor, et al., 2007; Walter, Gouze, & Lim, 2006). The teachers' responses on the scale were measured on a five-point Likert scale (1= *Strongly disagree*, 2= *Disagree*, 3= *Neither agree nor disagree*, 4= *Agree*, and 5= *Strongly agree*). A teacher's individual score for self-efficacy (confidence in personal ability to identify students with anxiety and depression) was the mean of the four items (items 1-4 at the bottom of Appendix A). The internal consistency for these four items is good ( $\alpha = .88$ ).

**Acceptance of teachers as identification method.** The second two-item scale measured the teachers' attitudes towards teachers as a whole to accurately identify symptoms of anxiety and depression in students. These two items were adapted from Moor and colleagues' study (2007), which measured teacher attitudes and confidence to identify students with depression in school. The teachers' responses on the scale were measured with the same Likert scale as described above, ranging from (1) *Strongly disagree* to (5) *Strongly agree*. A teacher's individual score for attitudes towards teachers was the two items' mean (items 5 and 6 at the bottom of Appendix A). The internal consistency for these two items is excellent ( $\alpha = .96$ ). Prior to conducting any data analyses, these items were reverse scored such that higher scores meant that teachers had *higher* levels of acceptance of teachers as an identification method, akin to the interpretation of higher levels of teacher self-efficacy.

**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 that can be used with children and adolescents ranging in age from 8 to 19. The MASC 2 consists of 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). The MASC 2 also creates three composite scores, Total Anxiety, Anxiety Probability, and Inconsistency Index. Total Anxiety is calculated by taking the sum of all subscales except the GAD Index. Anxiety Probability is calculated by taking the total of the number of elevated *T*-scores on three subscales- Social Anxiety, Separation Anxiety/Phobias, and GAD Index. The Inconsistency Index consists of eight pairs of items, where lower scores signify accurate responding. MASC 2 responses 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*. Excluding the Inconsistency Index, higher scores on each subscale and composite are related to higher risk for anxiety symptoms.

For the final data set, the Inconsistency Index mean score 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. Both averages are under the raw score designation of eight points. The MASC 2 manual suggests scores larger than eight on the Inconsistency Index may be indicative of inconsistencies and interpreted with some caution. At both Time 1 and Time 2, one student generated an Inconsistency Index score above eight. During Time 1, 33 students generated an Inconsistency Index score above eight. Of these 33, 12 students generated a *T*-score above 60. During Time 2, seven students generated an Inconsistency Index score above eight. These participants were retained in the dataset.

The normative sample used to develop the MASC-2 contained 1,800 North American children and adolescents, ranging in age from 8 to 19. The sample was matched to North American Census data to make sure the normative sample represented the population in gender, race, age/ethnicity, parental educational level, and geographic region. The demographics of the normative sample are as follows, 3.9% Asian, 14.2% Black, 21.5% Hispanic/Latino, 55.9% White, and 4.5% Other. It is important to note the sample's student participants are more diverse than the MASC 2 normative sample, with 52% of the student sample being Black. MASC 2 *T*-scores were generated using the student's gender and age, as the MASC 2 does not give separate *T*-scores for race/ethnicity.

The MASC 2 provides interpretation labels based off of *T*-score levels. *T*-scores are calculated from raw scores that are translated into standard scores, and take into account the subject's age and gender. Any *T*-score below 60 is treated as average. A score within the 55 to 59 range is designated as High Average (marginal symptom levels of concern), a score within the 40

to 54 range is designated as Average (average symptoms levels), and a score below 40 is designated as Low (lower symptoms levels compared to average). Any *T*-score at or above 60 represents symptom levels higher than average. *T*-scores in the 60 to 64 range are designated as Slightly Elevated (slightly higher symptom levels above average), scores in the 65 to 69 range are designated as Elevated (higher symptom levels above average), and scores in the 70 and above range are designated as Very Elevated (many more symptoms levels above average).

Information from the MASC 2 manual shows the average internal consistency for the Total Anxiety scale is acceptable to excellent ( $\alpha = .92$ ). Internal consistency is similar for the individual subscales as well (Physical Symptoms  $\alpha = .88$ ; Harm Avoidance  $\alpha = .75$ ; Social Anxiety  $\alpha = .85$ ; Separation Anxiety/Phobias  $\alpha = .77$ ; GAD Index  $\alpha = .72$ ; Obsessions & Compulsions;  $\alpha = .86$ ). Strong one- to four-week test-rest reliabilities were reported ( $r = .80$  to  $r = .94$ ). The final MASC 2 data for the current study shows an excellent internal consistency for all MASC 2 items ( $\alpha = .91$ ).

In regards to convergent validity, the MASC 2 Total Anxiety scores establish moderate convergent validity with the Beck Youth Inventory- Anxiety Total Score (Beck, Beck, & Jolly, 2001;  $r = .73$ ). The MASC 2 also had moderate to strong discriminant validity. Between the target and comparison population group, effect size comparisons varied from  $d = .34$  to  $d = .94$  for the Total Anxiety score and every other subscale but Harm Avoidance. Between each target group and non-anxious clinical groups, MASC 2 developers found small to large differences, ranging from  $d = .25$  to  $d = .81$ . Small to large differences were also found for each target group and the other MASC 2 anxiety subscales, ranging from  $d = .31$  to  $d = .70$ . Due to copyright designations, the MASC 2 cannot be included as an appendix.

**Children's Depression Inventory 2<sup>nd</sup> Edition (CDI-2; Kovacs, 2011).** The CDI 2 is a 28-item measure of depressive symptoms that can be used with children and adolescents ranging in age from 7 to 17. The CDI 2 contains two scales, Emotional Problems (15 items) and Functional Problems (13 items). In the Emotional Problems scale, there are two subscales- Negative Mood/Physical Symptoms (9 items) and Negative Self-Esteem (6 items). In the Functional Problems scale, there are two subscales- Interpersonal Problems (5 items) and Ineffectiveness (8 items). A Total Score is calculated from all 28 items, or the two scales and/or four subscales scores. Each item on the CDI 2 has a three-point Likert scale: (0) *absence of symptoms*, (1) *mild or probable symptom*, (2) *definite symptom*. The higher the CDI 2 Total score, the more likely the participant shows higher risk for depressive symptoms.

The normative sample used to develop the CDI 2 contained 1,100 U.S. children and adolescents, ranging in age from 7 to 17, from 28 different states. Developers employed a stratified sampling method using U.S. Census data to certify the normative sample was representative in race/ethnicity and geographic region. The normative sample's race composition was as follows- 3.3% Asian, 16.1% Black, 14.5% Hispanic, 62% White, and 4.1% Multiracial/Other. Similar to the MASC 2, the current study's student participant sample was more diverse, with 52% of the student sample being Black. *T*-scores were created using the student's gender and age, as the CDI 2 does not designate separate norms for race/ethnicity.

The CDI 2 also provides interpretation labels for *T*-scores in certain ranges. *T*-scores in the 40 to 59 range are designated as Average (average depressive symptom levels). *T*-scores below 40 are designated as Low (less depressive symptom levels compared to average). CDI 2 *T*-scores 60 and above are above average. Specifically, *T*-scores in the 60-64 range are designated as High Average (slightly higher symptom levels compared to average), scores in the 65 to 69

range are designated as Elevated (higher symptom levels compared to average), and scores 70 and above are designated as Very Elevated (much higher depressive symptom levels compared to average).

In regards to reliability and validity of the CDI 2, the CDI 2 manual reports acceptable to excellent internal consistency ( $\alpha = .73$  to  $\alpha = .91$ ). Moderate to strong two- to four-week test-retest reliability was also found ( $r = .76$  to  $r = .92$ ). In the dataset to be analyzed in the proposed study, internal validity for all CDI 2 items is strong ( $\alpha = .82$ ). The CDI 2's convergent validity with related scales on the Beck Depression Inventory- Youth Version (Beck, Beck, Beck, Jolly, & Steer, 2001) showed large associations. The CDI 2 is fairly accurate in identifying children and adolescents who are and are not depressed, yielding a high sensitivity (83%) and specificity (73%). Due to copyright designations, the CDI 2 cannot be included as an appendix.

### **Recruitment Procedures**

**School.** In the school where the original study took place, Golley (2014) first designed a handout (Appendix C) that provided important research about anxiety and depression prevalence rates and outcomes of internalizing disorders to distribute to key school personnel (i.e., administrators, school-based mental health professionals). The handout also summarized the study and provided support for using teacher nominations to identify students with mental health needs. The handout's purpose was to raise awareness of the study and gain cooperation with important school personnel. In turn, the handout's distribution opened a line of communication between school personnel and the researcher to ensure the study's design fit the school's needs. One pertinent issue that affected study design was that a community-based mental health program was already being used for sixth-grade students. Therefore, teacher nominations were not conducted for sixth-grade students and teachers at the participating middle school. All school

personnel agreed to participate and subsequently support school based mental health professionals to provide group-based mental health interventions for students identified as needing services throughout the study.

**Teacher.** Three inclusion criteria were used to identify relevant teachers to recruit for data collection. The first was the teacher had to have taught a core academic subject area (Math, Language Arts, Science, or Social Studies). The second criterion was that the teacher had to teach seventh and or eighth grade students. Finally, the teacher had to have at least five hours of face-to-face weekly contact with students. This translated to the teacher had to see seventh and eighth grade students for about one class period each school day, every week. Teachers who met criteria were given a consent form (Appendix D). Participating teachers were also entered into a drawing for one of several \$25 gift cards to local stores. During various department meetings at the end of the fall semester, teachers were recruited to participate in the study. When teachers were recruited, Gellee provided a summary of the study. The summary included the study's purpose and rationale, prevalence rates of depression and anxiety, and how students that are nominated could benefit from subsequent school-based mental health interventions.

**Student participants.** Four criteria were used to identify students in grades seven and eight to participate in the original study. The first was the student had to be in at least one class where a teacher had consented to participate. Second, the student had to be proficient in English. Students without English proficiency were not asked to participate because of potential challenges reading and accurately filling out rating scales. The next criterion was the student was asked to participate by his or her participating teacher, or in a standardized approach. Last, the student had to not be enrolled in a self-contained classroom for students with Intellectual

Disabilities. Students in these self-contained classrooms were not invited to participate because of potential barriers understanding and answering rating scales.

To raise the number of consent forms returned, a full-size candy bar was given to students who returned any signed consent form, regardless of if consent was positive or negative. An interdependency group contingency was also implemented in the five classrooms for each participating teacher (for example, each of the math teacher's classes). The class that had the highest consent form return rate (regardless of positive or negative response) could earn a reward, such as a donut party. Throughout the recruitment process, positive and negative consent forms were tracked to calculate the students' response rate.

### **Data Collection**

Data were obtained in the third nine-week grading period of the 2012-2013 school year, in February. In the third grading period, teachers had several months experience with students and were acquainted enough with students to provide informed nominations. After the teacher consented to the study, consent letters were sent home to parents of students (Appendix E) in all of the teacher's classrooms that met study criteria. The consent letter framed the study as a universal screening for social-emotional wellness, summarized the study, and allowed parents to consent for their child's participation.

**Teacher data collection.** Teachers were first given a roster of students within their classes who had parent permission for study participation. With the rosters, teachers also received a handout with behavioral descriptions of symptoms of childhood anxiety and depression (Appendix F). Teachers in the study were then asked to nominate as many students as they desired who demonstrated these symptoms of anxiety and/or depression. Prior research on teacher nominations for secondary students allowed teachers to nominate as many students as

they liked (see Auger, 2004 or Moor et al., 2007). Teachers nominated about 5% of their eligible high school students (Moor et al., 2007) and about 13% of fifth-graders (Roeser & Midgley, 1997) when not given nomination limits. Therefore, research found teachers tend to not nominate large numbers of students even when given unlimited nomination possibilities. When determining whether a student was nominated, only one positive nomination by a teacher was needed to designate a student as nominated, which is consistent with how teacher nominations have been used previously in applied school settings.

**Student data collection.** Throughout the same week data were obtained by school personnel, students with positive parent consent were collected in small groups in a private area of the school. Golley (2014) described the study's purpose to the students, and read aloud the student assent form (Appendix G). Students who then assented to the study filled out the student demographic form, MASC 2, and CDI 2. Golley, faculty, and the graduate student colleagues who assisted with data collection were all members of the University of South Florida's School-Based Mental Health Research Group and were approved members on the Institutional Review Board (IRB) protocol for the original study. The researchers organized the students' seating to make sure no other students could see others' responses and the students' privacy was maintained. If any student had difficulties reading, understanding, or concentrating, several research team members were present to provide standardized responses or and/or assist students. Research team members also observed students for any signs of distress and any student who wished to withdraw from the study. Immediately following each survey's completion, researchers checked items relevant to suicidality to ensure the student immediately received assistance from a school-based mental health professional to assess the student's risk.

After student data were initially collected at Time 1, raw responses were added together on the CDI 2 and MASC 2. MASC 2 scores were transformed to matching *T*-scores for the participant's age and gender. Students who received scores at or above the Slightly Elevated cutoff range ( $T \geq 60$ ) were gathered together one week later in small groups to fill out rating scales again. The Time 2 data collection for students with elevated symptomatology was to ensure a student was not having only temporary symptom levels or was a false positive. CDI 2 scores were also transformed to matching *T*-scores according to the participant's age and gender. Similarly, students who received scores at or above Slightly Elevated cutoff range ( $T \geq 60$ ) on the CDI 2 were also asked to gather together one week later in small groups to fill out scales for a second time. Specific cut off levels were chosen for each group because these students reported at risk symptomology. For both anxiety and depression symptoms, at-risk was operationally defined as more than one standard deviation higher than the norm group mean on MASC 2 and CDI 2. Students who self-reported high symptom levels of anxiety or depression at Time 2 were sent home a letter for their parents, to communicate that these students would be offered school-based group counseling serviced delivered by school-based mental health professionals. The letter also listed community mental health agencies parents could contact for further assessments and services, if they desired. School-based mental health professionals organized and implemented school based mental health interventions for students recognized in the study in the spring of the 2012-2013 school year. School based mental health interventions were only delivered to those students who obtained parent consent for services.

## **Data Analyses**

**Descriptive statistics.** Descriptive statistics were conducted for to provide an overview of the sample's demographic features, including students' and teachers' responses on the

demographic rating form. Additionally, correlations between all non-dichotomous predictors and outcome variables (e.g., accuracy variables) were calculated. For the teacher self-efficacy and acceptance of method scales, descriptive statistics were also conducted, including means, standard deviations, skewness, kurtosis, and ranges. After conducting initial descriptive statistics, one teacher, referred to in Golley's (2014) study as Teacher 1004, was found to have no students who self-report anxiety or depression. As Teacher 1004 had no possibility of accurately nominating a student who self-report elevated symptoms of anxiety and depression, Teacher 1004 was not included in analyses predicting the outcome variables of sensitivity or positive predictive value, but was included in analyses predicting the outcome variables of specificity and negative predictive value.

#### **Teacher accuracy identifying students with symptoms of anxiety or depression.**

Golley (2014) focused on identifying the correspondence between teacher nominations and student self-reported anxiety or depression, to determine how accurately a group of teachers could identify the students with consistently high levels of each *type* of internalizing disorder. Since the current study was more concerned with understanding variables that may relate to teachers' accuracy with regard to students with internalizing symptoms of mental health problems (rather than anxiety or depression specifically), a combined accuracy variable permitted analyses of predictors of accuracy of identifying students with either type of internalizing disorder (anxiety and/or depression) rather than having to duplicate analyses by type of internalizing symptom. This reduction in the number of tests by half (i.e., 1 vs. 2 outcome to examine) was driven by a desire to limit the chance for Type I errors. An accuracy variable was calculated by classifying different nomination decisions as 'Correct' or 'Incorrect.' For the purposes of the current study, and as teacher nominations are commonly used as a first gate in a

multiple-gating procedure, a teacher's nomination decision was classified as 'correct' if the teacher decided to refer a student on either anxiety or depression (or both) and the student self-reported anxiety or depression (or both). Another example of a 'correct' decision was if the student did not self-report elevated anxiety and depression symptoms and the teacher correctly did not nominate the student for either symptom type. If a student self-reported elevated anxiety symptoms, but not elevated depression symptoms, and the teacher nominated the student for depression and not anxiety, this was still considered as 'correct' for the current study, as in a multiple-gating procedure the student would proceed to the next gating procedure for further analyses of social-emotional concerns. In a multiple-gating procedure it is more preferable to misidentify than miss at each gate, because if a student is misidentified, the student is hopefully correctly taken out of intervention consideration in the next assessment gate. However, if a student is missed, this is more detrimental because the student will not be included in subsequent assessment gates. A list of 'correct' and 'incorrect' decisions for the current study is in Table 3.

After classifying teacher nomination decisions into 'correct' and 'incorrect' and classified as a true positive, false positive, false negative, and true negative, the conditional probability indices of interest (specificity, sensitivity, positive predictive value, negative predictive value) were calculated. A table of the decision number categories into the categories of true positive, false negative, false positive, and true negative, is below in Table 4. For example, decision number 12 (where students self-reported neither anxiety nor depression, and the teacher correctly did not nominate them as having anxiety or depression symptoms) would be classified as demonstrating a true negative, as the teacher correctly did not nominate a student who did not self-report anxiety or depression symptoms. Decision number 1, where a student self-reported both elevated symptom levels of anxiety and depression and the teacher correctly nominated the

student for both anxiety and depression, was classified as true positive, as the teacher correctly did nominate the student as having anxiety and/or depression symptoms and the student also self-reported either depression and/or anxiety symptoms.

Table 3

*Correct and Incorrect Classification for Accuracy Variable*

Decision Number	Student self-report elevated anxiety	Student self-report elevated depression	Teacher nominates student for anxiety?	Teacher nominates student for depression?	Correct or Incorrect	Conditional Probability Indices
1	Elevated	Elevated	Yes	Yes	Correct	True Positive
2	Elevated	Not elevated	Yes	Yes	Correct	True Positive
3	Not elevated	Elevated	Yes	Yes	Correct	True Positive
4	Not elevated	Not elevated	Yes	Yes	Incorrect	False Positive
5	Elevated	Elevated	Yes	No	Correct	True Positive
6	Elevated	Not elevated	Yes	No	Correct	True Positive
7	Not elevated	Elevated	Yes	No	Correct	True Positive
8	Not elevated	Not elevated	Yes	No	Incorrect	False Positive
9	Elevated	Elevated	No	Yes	Correct	True Positive
10	Elevated	Not elevated	No	Yes	Correct	True Positive
11	Not elevated	Elevated	No	Yes	Correct	True Positive
12	Not elevated	Not elevated	No	No	Correct	True Negative
13	Elevated	Elevated	No	No	Incorrect	False Negative
14	Elevated	Not elevated	No	No	Incorrect	False Negative
15	Not elevated	Elevated	No	No	Incorrect	False Negative
16	Not elevated	Not elevated	No	Yes	Incorrect	False Positive

Table 4

<i>Decision Categories into Conditional Probability Indices</i>		
	Student does not report elevated symptoms of anxiety or depression	Student does report elevated symptoms of anxiety or depression
Teacher does not nominate student	<b>True Positives</b> Decision Number: 12	<b>False Negatives</b> Decision Numbers: 13,14, 15
Teacher nominates student	<b>False Positives</b> Decision Numbers: 4, 8, 16	<b>True Negatives</b> Decision Numbers: 1, 2, 3, 5, 6, 7, 9, 10, 11

### Research Question One

To what extent, if any, is there a relationship between a teacher's *accuracy* in recognizing students with symptoms of anxiety and depression and a teacher's *beliefs* regarding (a) self-efficacy regarding personal ability to identify students with anxiety and depressive symptoms and (b) acceptance of method of teacher nomination? Accuracy was defined in terms of:

- a. Sensitivity
- b. Specificity
- c. Positive predictive value
- d. Negative predictive value

Although there are several options to answer this research question, including multilevel analyses, to best answer the research question within the sample size's capabilities, four multiple regression equations were run in order to predict the relationship between different teacher beliefs and indices of accuracy. The first equation had teacher sensitivity as the outcome

variable, the next equation teacher specificity as the outcome variable, next equation had positive predictive value as the outcome, and the last equation had negative predictive value as the outcome. For positive predictive value and negative predictive value, no prior research was found that offered guidance on ‘acceptable’ values, and so for this and the proceeding research questions, simply the higher the value (for positive predictive value and negative predictive value), the stronger the support for accuracy for a given teacher. The predictor variables in these multiple regression equations were teachers’ self-efficacy in his or her personal ability to identify students with symptoms of anxiety or depression and teachers’ acceptance of teachers in general as an identification method. For each regression analysis, the following assumptions were checked: linear relationship, normality, no or little multicollinearity, and homoscedasticity. A residual analysis was also run while checking assumptions.

## **Research Question Two**

To what extent, if any, is there a relationship between a teacher’s *accuracy* in recognizing students with symptoms of anxiety and depression and a *teacher’s demographic characteristics*, specifically: professional experience (i.e., years teaching), gender, and subject taught (Language Arts, Math, and Social Studies)? Accuracy was defined in terms of:

- a. Sensitivity
- b. Specificity
- c. Positive predictive value
- d. Negative predictive value

To answer research question two, four multiple regression equations were also run. The first equation had teacher sensitivity as the outcome variable, the next equation teacher specificity as the outcome variable, and furthermore. The predictor variables in these multiple

regression equations were professional experience (defined by number of years teaching), gender, and subject taught (language arts, math, and social studies). Subject taught was dummy coded in analyses, and had three levels: English, Math, and Social Studies. For each regression analysis, the following assumptions were checked: linear relationship, normality, no or little multicollinearity, and homoscedasticity. A residual analysis was also run while checking assumptions.

### **Research Question Three**

When considered simultaneously, which *teacher factors* (beliefs specific to identification self-efficacy and acceptance of method; demographic factors including professional experience, gender, and subject taught) are most important in predicting *accuracy* rates? Accuracy was defined in terms of:

- a. Sensitivity
- b. Specificity
- c. Positive predictive value
- d. Negative predictive value

To answer the final research question, four multiple regression equations were run. The first equation had teacher sensitivity as the outcome variable, the next equation teacher specificity as the outcome variable, and furthermore. The predictor variables in these multiple regression equations were teacher's self-efficacy beliefs regarding his or her personal ability to identify students with symptoms of anxiety or depression, teacher's acceptance of identification method towards teachers in general to recognize symptoms of anxiety and depression, professional experience (number of years teaching), gender, and subject taught. Subject taught was dummy coded in analyses, and had three levels: English, Math, and Social Studies. For each

multiple regression equation, the following assumptions were checked: linear relationship, normality, no or little multicollinearity, and homoscedasticity. A residual analysis was also run while checking assumptions.

## **CHAPTER FOUR:**

### **RESULTS**

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

1. To what extent, if any, is there a relationship between a teacher's *accuracy* in recognizing students with symptoms of anxiety and depression and a teacher's *beliefs* regarding (a) self-efficacy regarding personal ability to identify students with anxiety and depressive symptoms and (b) acceptance of method of teacher nomination? Accuracy was defined in terms of:
  - a. Sensitivity
  - b. Specificity
  - c. Positive predictive value
  - d. Negative predictive value
2. To what extent, if any, is there a relationship between a teacher's *accuracy* in recognizing students with symptoms of anxiety and depression and a *teacher's demographic characteristics*, specifically: professional experience (i.e., years teaching), gender, and subject taught (Language Arts, Math, and Social Studies)? Accuracy was defined in terms of:
  - a. Sensitivity
  - b. Specificity
  - c. Positive predictive value
  - d. Negative predictive value

3. When considered simultaneously, which *teacher factors* (beliefs specific to identification self-efficacy and acceptance of method; demographic factors including professional experience, gender, and subject taught) are most important in predicting *accuracy* rates? Accuracy was defined in terms of:

- a. Sensitivity
- b. Specificity
- c. Positive predictive value
- d. Negative predictive value

The chapter begins by presenting preliminary analyses to check assumptions and confirm the dataset's trustworthiness. Next, the multiple regression equations conducted to answer the three research questions are presented.

## Data Screening

**Missing data.** Missing data in the study were reviewed before proceeding with analyses. As described in Chapter 3, three students' were removed from analyses due to a significant number of missing items that did not allow their self-report measures to be accurately scored. One teacher participant, Teacher 1004 had no students with either elevated anxiety and/or depression at both time points. Therefore, Teacher 1004's sensitivity, positive predictive values, and negative predictive values were missing from analyses, as Teacher 1004 had no students meeting elevated internalizing symptom criteria. For the self-efficacy variable, one teacher participant's self-efficacy score was calculated as an average of three items (instead of four), as one of the four items on the self-efficacy measure was missing for the particular teacher. Similarly for the acceptance of method variable, one item on one teacher participant's acceptance

of method values was not answered, and the participant's answer to the other item on the scale was used as the value for the teacher's acceptance of method score.

**Accuracy of data entry.** Golley (2014) examined original data entry for accuracy.

Minimum and maximum values were all found to be in the expected ranges. A representative sample, or 10%, of student surveys and 100% of educator nominations had been checked by hand. Any errors were immediately changed to the accurate value in the database. If any errors occurred, the surveys entered both before and after the survey containing the error were also checked for accuracy. Golley (2014) reported the data entry error rate for student self-report data was 0.01%, meaning there was an accuracy rate of 99.99% for student self-report data. The data entry error rate for educator nominations was 0.01%, meaning there was an accuracy rate of 99.99% for educator nomination data entry. This researcher verified the accuracy of all educator survey and demographic data analyzed in this study.

**Cronbach's alpha statistics.** Cronbach's alphas for teacher self-efficacy and teacher acceptance of method were calculated to determine the internal reliability of each predictor variable. For teacher self-efficacy, a high Cronbach's alpha ( $> .80$ ) was found for the scale (.88). The Pearson Correlation Coefficients between all of the items on the teacher self-efficacy scale can be found in Table 5.

Table 5

*Correlations Between Items on Teacher Self-Efficacy Scale*

Item	Item 1	Item 2	Item 3	Item 4
Item 1	—	.62**	.81**	.49*
Item 2		—	.53*	.81**
Item 3			—	.57**
Item 4				—

\*Correlations significant at the  $p < .05$  level, \*\*Correlations significant at the  $p < .01$  level  
Cronbach's alpha for the teacher acceptance of method scale was calculated to determine the internal reliability of the scale. For teacher acceptance of method, the Cronbach's alpha value = .96. The Pearson Correlation Coefficients between the two items in the scale is .94.

**Descriptive statistics.** Descriptive analyses were conducted for continuous and relevant teacher characteristics and outcome variables to examine, skewness, kurtosis, and outliers; findings are summarized in Table 6. In regards to the sample's professional experience (defined as number of years teaching), there was much variability within the sample, as years teaching ranged from 1 to 36 years, with a mean of 9.42 years spent teaching. Likewise, as reported in Table 2, there was substantial variation in the gender (47% of participants were male) and subject taught (6 per subject level) by the 19 participants. For teacher self-efficacy, teachers ranged from 1.00 to 5.00, with a mean of 3.37. After visually inspecting the data for outliers, Teacher 1004's low self-efficacy score was deemed to be an outlier, therefore sensitivity analyses were conducted with and without Teacher 1004's self-efficacy score. Because conclusions about relationships did not change with exclusion or inclusion of Teacher 1004's self-efficacy score, the participant's data was retained in analyses. For teacher acceptance of method, teachers ranged from 2.00 to 5.00 with a mean of 3.63. The number of student

participants a given teacher had in the sample ranged from 8 to 74, with a mean of 39.11 student participants to consider during the rating process. Teachers nominated 2% to 56% of these students as anxious or depressed, with a mean of 24%.

Table 6

*Descriptive Statistics for Teacher Continuous Variables*

Variables	Mean	SD	Range	Min	Max	Skewness	Kurtosis
Years Teaching (Professional Experience)	9.42	10.16	35	1.00	36.00	1.50	1.72
Teacher Age	39.26	11.25	34	23	57	0.10	-1.15
Number of Student Participants	39.11	23.36	66	8	74	-0.28	-1.66
Teacher Self-Efficacy	3.37	0.86	4	1.00	4.50	-1.03	1.80
Teacher Acceptance of Method	3.63	0.88	3	2.00	5.00	-0.45	-0.43
Number of Student Participants in Study	39.11	23.26	66	8	74	-0.28	-1.66
Percentage of Students Nominated	0.24	0.19	0.55	0.02	0.56	0.50	-1.29
Sensitivity	0.25	0.22	0.64	0	0.63	0.41	-1.24
Specificity	0.76	0.22	0.70	0.30	1.00	-0.89	-0.52
PPV	0.32	0.26	1.00	0	1.00	0.93	1.51
NPV	0.75	0.11	0.39	0.50	0.89	-1.25	1.26

Accuracy statistics and mean levels of each variable were calculated for each teacher participants, and presented in Table 7. As shown in the table, the sensitivity rates ranged from 0 to 0.63, with a mean of 0.25. Thus, the *most accurate* teacher in fact correctly identified as emotionally distressed 63% of students who reported elevated levels of either anxiety or depression; but the *average* teacher in this sample correctly identified as emotionally distressed only 25% of students who reported elevated levels of either anxiety or depression, and therefore missed 75% of students who reported elevated symptoms. For specificity, rates ranged from 0.30

to 1.00, with a mean of 0.76. Therefore, the *most accurate* teacher correctly did not identify 100% of students who did not self-report elevated levels of either anxiety or depression; but, the *average* teacher correctly did not identify only 76% of non-symptomatic students, and therefore misidentified as symptomatic 24% of students who did not self-report anxiety and/or depression symptoms. Regarding PPV, rates ranged from 0 to 1.00, with a mean of .32. Thus, the *most accurate* teacher correctly identified as emotionally distressed 100% of students who they felt displayed elevated levels of either anxiety or depression. But, the *average* teacher in this sample correctly identified as emotionally distressed only 32% of the students who they nominated as displaying elevated levels of either anxiety or depression. Finally, in regards to NPV, rates ranged from 0.50 to 0.89, with a mean of 0.75. Therefore, the *most accurate* teacher in regards to NPV correctly did not identify 89% of their students who did not self-report elevated levels of either anxiety or depression. But, the *average teacher* correctly did not identify only 75% of students who did not self-report elevated levels of either anxiety or depression.

Table 7

*Teacher Frequencies and Accuracy Variables*

Teacher	Gender	Subject Taught	Years Teaching	Self-Efficacy	Acceptance of Method	# of Student Part.	% of Students Nominated	Sensitivity	Specificity	PPV	NPV
1000	Male	SS	3	3.00	2.00	62	2%	0%	98%	0%	80%
1001	Male	SS	10	3.00	5.00	54	4%	7%	97%	50%	73%
1002	Male	SS	7	3.00	3.00	17	6%	0%	92%	0%	75%
1003	Male	SS	2	4.00	3.00	55	7%	20%	96%	50%	84%
1004	Female	SS	18	1.00	4.50	9	56%	*	44%	*	*
1005	Male	SS	2	3.00	5.00	55	11%	22%	91%	33%	86%
1006	Male	M	30	4.00	3.00	55	26%	18%	73%	14%	78%
1007	Female	M	2	2.00	4.00	48	56%	56%	44%	19%	81%
1008	Male	M	1	4.00	4.00	43	30%	50%	74%	31%	87%
1009	Female	M	13	3.00	4.00	38	21%	27%	83%	50%	63%
1010	Female	M	1	5.00	3.00	74	8%	12%	93%	33%	78%
1011	Male	M	10	4.00	4.00	9	11%	33%	100%	100%	75%
1012	Female	+	36	4.00	4.00	11	9%	0%	88%	0%	70%
1013	Female	LA	2	5.00	4.00	10	30%	50%	83%	67%	71%
1014	Female	LA	11	3.00	2.00	8	50%	33%	40%	25%	50%
1015	Male	LA	1	3.00	2.50	57	5%	8%	95%	33%	78%
1016	Female	LA	7	3.00	4.00	62	39%	64%	65%	28%	89%
1017	Female	LA	20	4.00	4.00	13	54%	0%	30%	0%	50%
1018	Female	LA	3	4.00	4.00	63	40%	0%	30%	0%	50%
Mean	--	--	9.42	3.37	3.63	39.11	24%	25%	76%	32%	75%

Notes. \*= Teacher 1004 had no students who self-reported anxiety or depression, was not included in sensitivity/specificity/NPV analyses, += Teacher 1012 was an ESE teacher, was not included in analyses in which subject taught was a predictor variable. Part = Participant in this study. SS= Social Studies teacher, LA= Language Arts teacher, M= Math teacher, PPV= positive predictive value, NPV= negative predictive value.

## Bivariate Analyses

**Correlations.** Correlations between continuous predictors variables such as acceptance of method, self-efficacy, and professional experience (years teaching) and outcome variables such as sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) were calculated to analyze the relationship between variables included in proceeding analyses. A significant positive correlation was found between specificity and NPV ( $r = .48, p = .04$ ), meaning as specificity increased, NPV tended to increase as well. A negative correlation trending towards significance was found between professional experience and NPV ( $r = -.43, p = .07$ ), meaning that as professional experienced increased, NPV tended to decrease. A positive correlation trending towards significance ( $r = .41, p = .08$ ) was found between specificity and self-efficacy, meaning as self-efficacy increased, specificity tended to increase as well. The Pearson correlations between all continuous variables are presented in Table 8.

Table 8

	<i>Correlations Between Predictor and Outcome Variables</i>					
	Acceptance of Method	Self-Efficacy	Sensitivity	Specificity	PPV	NPV
Professional Experience	.11	-.01	-.38	-.24	-.33	-.43 <sup>t</sup>
Acceptance of Method	—	-.10	.28	-.08	.32	.17
Self-Efficacy		—	.01	.41 <sup>t</sup>	.34	.02
Sensitivity			—	-.36	.39	.33
Specificity				—	.42	.48*
PPV					—	.12
NPV						—

\* $p < .05$ , <sup>t</sup>  $p < .10$

Note. \*Correlations significant at the  $p < .05$  level.

<sup>t</sup> = Correlations trending towards significance at the  $p < .10$  level

**Subject area differences.** Four one-way analyses of variance tests (ANOVA) were calculated to examine the differences in teacher sensitivity, specificity, positive predictive value, and negative predictive value between Math, Social Studies, and Language Arts teachers. Teacher 1012, an ESE teacher, was not included in the ANOVAs. The results of the four one-way ANOVAs are presented in Table 9.

**Sensitivity.** An ANOVA was conducted to examine the differences between teachers of different subject areas and sensitivity. The result of the ANOVA was not significant,  $F(2, 14) = 2.66, p = .10$ . The group means were examined since a trend was suggested by the .10 p-value. The sensitivity of the Social Studies teachers ( $M = 0.10, SD = 0.11$ ) tended to be lower than the levels of the Math ( $M = 0.33, SD = 0.17$ ) and Language Arts teachers ( $M = 0.35, SD = 0.26$ ). An Eta squared calculation yielded a value of .28, an effect size small in magnitude (Ellis, 2010).

**Specificity.** An ANOVA was conducted to examine the differences between teachers of different subject areas and specificity. The result of the ANOVA was not significant,  $F(2, 15) = 1.72, p = .21$ . There were no significant differences between Social Studies ( $M = 0.87, SD = 0.21$ ), Math ( $M = 0.78, SD = 0.20$ ), and Language Arts teachers ( $M = 0.63, SD = 0.25$ ) on specificity. An Eta squared calculation yielded a value of .19, an effect size small in magnitude (Ellis, 2010).

**Positive Predictive Value.** An ANOVA was conducted to examine the differences between teachers of different subject areas and positive predictive value. The result of the ANOVA was not significant,  $F(2, 14) = 0.43, p = .66$ . There were no significant differences between Social Studies ( $M = 0.27, SD = 0.25$ ) Math ( $M = 0.41, SD = 0.31$ ), and Language Arts teachers ( $M = 0.32, SD = 0.21$ ) on positive predictive value. An Eta squared calculation yielded a value of .07, an effect size small in magnitude (Ellis, 2010).

**Negative Predictive Value.** An ANOVA was conducted to examine the differences between teachers of different subject areas and negative predictive value. The result of the ANOVA was not significant,  $F(2, 14) = 1.10, p = .36$ . There were no significant differences between Social Studies ( $M = 0.80, SD = 0.06$ ), Math ( $M = 0.77, SD = 0.08$ ), and Language Arts teachers ( $M = 0.70, SD = 0.17$ ) on negative predictive value. An Eta squared calculation yielded a value of .14, an effect size small in magnitude (Ellis, 2010).

Table 9

*Comparison of Teacher Subject Taught and Teacher Accuracy*

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	$\eta^2$
Sensitivity						
Social Studies	5	0.10	0.11			
Math	6	0.33	0.17			
Language Arts	6	0.35	0.26	2.66	.10	.28
Specificity						
Social Studies	6	0.87	0.21			
Math	6	0.78	0.20			
Language Arts	6	0.63	0.25	1.72	.21	.19
Positive Predictive Value						
Social Studies	5	0.27	0.25			
Math	6	0.41	0.31			
Language Arts	6	0.32	0.21	0.43	.66	.07
Negative Predictive Value						
Social Studies	5	0.80	0.06			
Math	6	0.77	0.08			
Language Arts	6	0.70	0.17	1.10	.36	.14

**Gender differences.** Four t-tests were conducted to examine the differences in teacher sensitivity, specificity, positive predictive value, and negative predictive value between male and female teachers. The results of the t-tests are presented in Table 10.

Table 10

*Results of t-test and Descriptive Statistics for Outcome Variables by Teacher Gender*

	Male			Female			df	t	d
	M	SD	n	M	SD	n			
Sensitivity	0.18	0.16	9	0.33	0.25	9	17	-1.56	0.71
Specificity	0.91	0.10	9	0.64	0.22	10	12.74	3.43*	1.58
PPV	0.35	0.31	9	0.29	0.22	9	17	0.48	0.22
NPV	0.80	0.05	9	0.70	0.14	9	10.06	1.85	0.86

Notes. d= Cohen's d, \* $p < .05$

**Sensitivity.** A t-test was conducted to examine the differences between male and female teachers on sensitivity. The result of the t-test was not significant,  $t(17) = -1.56, p = .14$ . There were no significant differences between male teachers ( $M = 0.18, SD = 0.16$ ) and female teachers ( $M = 0.33, SD = 0.25$ ) in terms of sensitivity rates. However, a Cohen's d effect size calculation indicated the size of this effect was 0.71, corresponding to a medium to almost large sized effect (Ellis, 2010).

**Specificity.** A t-test was conducted to examine the differences between male and female teachers on sensitivity. As analyses indicated the equality of variances assumption of t-tests was not met, the Satterthwaite unequal t-test estimation was used. The result of the t-test was significant,  $t(12.74) = 3.43, p = .005$ . There were significant differences between male teachers ( $M = 0.91, SD = 0.10$ ) and female teachers ( $M = 0.64, SD = 0.22$ ) in terms of specificity rates, with male teachers having significantly higher specificity rates. A Cohen's d effect size calculation indicated the size of this effect was 1.58, a large effect (Ellis, 2010).

**Positive Predictive Value.** A t-test was conducted to examine the differences between male and female teachers on positive predictive values. The result of the t-test was not significant,  $t(17) = 0.48, p = .64$ . There were no significant differences between male teachers ( $M = 0.35, SD = 0.31$ ) and female teachers ( $M = 0.29, SD = 0.22$ ) in terms of positive predictive

values. A Cohen's d effect size calculation indicated the size of this effect was 0.22, which is small in magnitude (Ellis, 2010).

**Negative Predictive Value.** A t-test was conducted to examine the differences between male and female teachers on negative predictive values. As analyses indicated the equality of variances assumption of t-tests was not met, the Satterthwaite unequal t-test estimation was used. The result of the t-test was not statistically significant but trended such,  $t(10.06) = 1.85, p = .09$ . There were no significant differences between male teachers ( $M = 0.80, SD = 0.05$ ) and female teachers ( $M = 0.70, SD = 0.14$ ) in terms of negative predictive values. A Cohen's d effect size calculation indicated the size of this effect was 0.86, which is large in magnitude (Ellis, 2010).

### Multiple Linear Regression Analyses

**Analysis of assumptions.** For research questions one, two, and three, several multiple linear regression equations were created. As part of the multiple regression analyses, residual analyses were conducted to examine linear relationship, normality, and homoscedasticity. The first residual analysis conducted was to confirm linear relationships between each predictor and outcome variable. For all twelve multiple linear regression equations, linear relationships were detected, based on visual analysis of scatterplots. Therefore, it is unlikely this assumption was violated.

The next residual analysis was normality of residuals. A visual analysis of scatterplots from all twelve multiple linear regression equations indicated in some instances there were tendencies towards a negative skew in residuals, but the degree of non-normality was not substantial enough to jeopardize the following results.

The next data screen checked was homoscedasticity. In each multiple linear regression equation, homoscedasticity means residuals were randomly distributed, as indicated by visually

examining plots of the residuals as a function of the predicted values. No violations of the assumptions were noted.

The next data screen checked for each multiple linear regression was multicollinearity; high levels would indicate that the predictor variables were highly correlated. During analyses, tolerance statistics were examined to determine that all tolerance values were greater than .2. Tolerance values for all linear multiple regression equations in research question one, two, and three varied from .56-.99, indicating multicollinearity assumptions were met.

After assumptions were checked, the predictors were simultaneously entered into multiple linear regressions to explore the relationships between different teacher characteristics and subsequent teacher accuracy in identifying students with symptoms of anxiety and depression. For sensitivity and positive predictive value equations, Teacher 1004 was not included in analyses as that teacher participant had no students who self-reported anxiety or depression symptoms. For all analysis interpretations of the multiple regression equations, this research considered indicators of clinical significance (effect size), including the  $R^2$  values (how much the equation explains the variability in outcome variables) and Beta statistics (a standardized unit that estimate a variable's importance), in addition to traditional indicators of statistical significance, namely the  $p$  values. Statistical significance for all equations was set at  $p \leq .05$ , but  $p$  values that trended towards significance ( $p < .10$ ) were considered as such during analysis interpretation.

**Research question one.** Four multiple regression equations were conducted to examine the relationship between teacher belief variables and four different conditional probability indices of accuracy. Statistical significance for all four equations was set at  $p \leq .05$ . The results of the predictive models for research question one are in Table 11.

**Equation 1a.** The  $R^2$  for the first equation, which analyzed the relationship between teacher sensitivity and teacher beliefs, did not reach statistical significance ( $p = .55$ ) and accounted for 8% of the variability for the level at which teacher self-efficacy and teacher acceptance of method can predict teacher sensitivity of students with elevated anxiety or depression symptoms. No predictors were significant in this model.

**Equation 1b.** The  $R^2$  for the second equation, which analyzed the relationship between teacher specificity and teacher beliefs, did not reach statistical significance ( $p = .22$ ) and accounted for 17% of the variability for the level at which teacher self-efficacy and teacher acceptance of method can predict teacher specificity of students with elevated anxiety or depression symptoms. No predictors were significant in this model. The self-efficacy predictor trended towards significance ( $p = .09$ ) and had a beta weight of .41, meaning that with one standard deviation unit increase of self-efficacy, specificity increased .41 in standard deviation units, while holding all other independent variables constant.

**Equation 1c.** The  $R^2$  for the third equation, which analyzed the relationship between teacher positive predictive value and teacher beliefs, did not reach statistical significance ( $p = .20$ ) and accounted for 20% of the variability for the level at which teacher self-efficacy and teacher acceptance of method can predict teacher positive predictive value of students with elevated anxiety or depression symptoms. No predictors were significant in this model.

**Equation 1d.** The  $R^2$  for the fourth equation, which analyzed the relationship between teacher negative predictive value and teacher beliefs, did not reach statistical significance ( $p = .80$ ) and accounted for 3% of the variability for the level at which teacher self-efficacy and teacher acceptance of method can predict teacher negative predictive value of students with elevated anxiety or depression symptoms. No predictors were significant in this model.

Table 11

*Research Question 1: Predictive Models of Teacher Beliefs and Teacher Accuracy Identifying Students with Anxiety and Depression*

<i>Outcome Variable</i>	<i>Predictor Variable</i>	$\beta$	<i>beta</i>	<i>SE</i>	<i>p</i>	$R^2$
Sensitivity (n=18)	Self-efficacy	-0.003	-0.01	0.08	.97	.08
	Acceptance of Method	0.07	0.28	0.06	.28	
Specificity (n=19)	Self-efficacy	0.10	0.41 <sup>t</sup>	0.06	.09	.17
	Acceptance of Method	-0.01	-0.04	0.06	.87	
Positive Predictive Value (n=18)	Self-efficacy	0.12	0.31	0.09	.20	.20
	Acceptance of Method	0.09	0.29	0.07	.23	
Negative Predictive Value (n=18)	Self-efficacy	-0.0003	-0.0002	0.04	.99	.03
	Acceptance of Method	0.02	0.17	0.03	.51	

<sup>t</sup> $p < .10.$

**Research question two.** Four multiple regression equations were conducted to examine the relationship between teacher demographic variables and four different conditional probability indices of accuracy. Statistical significance for all four equations was set at  $p \leq .05$ . The teacher subject taught variable was dummy coded, with social studies teachers serving as the reference variable for all equations. Teacher gender was also dummy coded, with male teachers serving as the reference variable for all equations. For subject taught variable, the Exceptional Student Education (ESE) Teacher (Teacher 1012) was not included, as there was only one ESE Teacher in the data set. For sensitivity and positive predictive value equations, Teacher 1004 was not included in analyses as the teacher participant had no students who self-reported anxiety or

depression symptoms. The results of the predictive models for research question two are in Table 12.

**Equation 2a.** The  $R^2$  for the first equation, which analyzed the relationship between teacher sensitivity and teacher demographics, did not reach statistical significance but evidenced a trend ( $p = .06$ ) and accounted for 43% of the variability for the level at which teacher subject taught, gender, and professional experience can predict teacher sensitivity of students with elevated anxiety or depression symptoms. No predictors were significant in this model, but the Math Teacher variable trended towards significance ( $p = .10$ ) with a beta weight of .54, meaning that with being a Math teacher, sensitivity increased .54 in standard deviation units, while holding all other independent variables constant. Math teachers predicted higher sensitivity rates compared to Social Studies teachers.

**Equation 2b.** The  $R^2$  for the second equation, which analyzed the relationship between teacher specificity and teacher demographics, reached statistical significance ( $p = .01$ ) and accounted for 60% of the variability for the level at which teacher subject taught, gender, and professional experience can predict teacher specificity of students with elevated anxiety or depression symptoms. Two predictors were significant in this model: professional experience and gender. For professional experience, higher professional experience (defined by number of years teaching) predicted *lower* specificity rates. The beta weight for professional experience was -0.38, meaning that with one standard deviation unit increase of professional experience, specificity decreased .38 in standard deviation units, while holding all other independent variables constant. For gender, being a male teacher predicted *higher* specificity rates compared to female teachers. The beta weight for gender was -0.59, meaning that with being a female

teacher, specificity decreased .59 in standard deviation units, while holding all other independent variables constant.

**Equation 2c.** The  $R^2$  for the third equation, which analyzed the relationship between teacher positive predictive value and teacher demographics, did not reach statistical significance ( $p = .70$ ) and accounted for 15% of the variability for the level at which teacher subject taught, gender, and professional experience can predict teacher positive predictive value of students with elevated anxiety or depression symptoms. No predictors were significant in this model.

**Equation 2d.** The  $R^2$  for the fourth equation, which analyzed the relationship between teacher negative predictive value and teacher demographics, did not reach statistical significance, but trended towards significance ( $p = .10$ ) and accounted for 45% of the variability for the level at which teacher subject taught, gender, and professional experience can predict teacher negative predictive value of students with elevated anxiety or depression symptoms. One predictor was significant in this model: professional experience. Higher professional experience (defined by number of years teaching) predicted *lower* negative predictive values. The beta weight for professional experience was -0.53, meaning that with one standard deviation unit increase of professional experience, specificity decreased .53 in standard deviation units, while holding all other independent variables constant. For gender, the predictor of being a male teacher trended towards significance, ( $p = .18$ ), meaning that being a male teacher may predict *higher* negative predictive values compared to female teachers. No other predictors were significant.

Table 12

*Research Question 2: Predictive Models of Teacher Demographic Variables and Teacher Accuracy Identifying Students with Anxiety and Depression*

Outcome Variable	Predictor Variable	$\beta$	beta	SE	p	$R^2$
Sensitivity (n=18)	Professional Experience	-0.01	-0.37	0.01	.13	.43
	Gender	0.07	0.18	0.12	.56	
	Math Teacher	0.24	0.54 <sup>t</sup>	0.13	.10	
	Language Arts Teacher	0.22	0.49	0.16	.19	
Specificity (n=19)	Professional Experience	-0.02	-0.38*	0.01	.05	.60
	Gender	-0.26	-0.59*	0.09	.01	
	Math Teacher	0.03	-0.06	0.10	.80	
	Language Arts Teacher	-0.05	-0.12	0.11	.64	
Positive Predictive Value (n=18)	Professional Experience	-0.01	-0.28	0.01	.33	.15
	Gender	-0.12	-0.25	0.18	.50	
	Math Teacher	0.25	0.48	0.19	.22	
	Language Arts Teacher	0.17	0.34	0.22	.45	
Negative Predictive Value (n=18)	Professional Experience	-0.008	-0.53	0.003	.03*	.45
	Gender	-0.09	-0.41	0.06	.18	
	Math Teacher	-0.05	-0.23	0.07	.45	
	Language Arts Teacher	-0.002	-0.001	0.08	.98	

*Note.* Social studies teacher and male teachers were set as the reference categories for all multiple linear regressions.

\* $p < .05$ , <sup>t</sup>  $p < .10$ .

**Research question three.** Four multiple regression equations were conducted to examine the relationship between teacher characteristics and four different conditional probability indices of accuracy. Statistical significance for all four equations was set at  $p \leq .05$ . The teacher subject taught variable was dummy coded, with social studies teachers serving as the reference variable for all equations. Teacher gender was also dummy coded, with male teachers serving as the reference variable for all equations. For subject taught variable, the Exceptional Student Education (ESE) Teacher (Teacher 1012) was not included, as there was only one ESE Teacher in the data set. For sensitivity and positive predictive value equations, Teacher 1004 was not

included in analyses as the teacher participant had no students who self-reported anxiety or depression symptoms. The results of the predictive models for research question three are in Table 13.

**Equation 3a.** The  $R^2$  for the first equation, which analyzed the relationship between teacher sensitivity and teacher characteristics, did not reach statistical significance ( $p = .15$ ) but accounted for 55% of the variability for the level at which teacher subject taught, gender, professional experience, self-efficacy, and teacher acceptance of method can predict teacher sensitivity of students with elevated anxiety or depression symptoms. No predictors were significant in this model. The math teacher variable did trend towards significance ( $p = .08$ ), with being a math teacher predicted higher sensitivity rates compared to social studies teachers. The beta weight for math teachers was .63, meaning that with being a math teacher, sensitivity increased .63 in standard deviation units, while holding all other independent variables constant. Being a language arts teacher also trended towards significance ( $p = .11$ ), with being a language arts teacher associated with higher sensitivity rates compared to social studies teachers. The beta weight for language arts teachers was .65, meaning that being a language teacher, sensitivity increased .65 in standard deviation units, while holding all other independent variables constant.

**Equation 3b.** The  $R^2$  for the second equation, which analyzed the relationship between teacher specificity and teacher characteristics, reached statistical significance ( $p = .02$ ) and accounted for 69% of the variability for the level at which teacher subject taught, gender, professional experience, self-efficacy, and teacher acceptance of method can predict teacher specificity of students with elevated anxiety or depression symptoms. No predictors were significant in this model. The self-efficacy variable did trend towards significance ( $p = .10$ ), with higher levels of self-efficacy predicting higher specificity rates. The self-efficacy predictor had a

beta weight of .39, meaning that with one standard deviation unit increase of self-efficacy, specificity increased .39 in standard deviation units, while holding all other independent variables constant. Gender also trended towards significance ( $p = .11$ ); being a male teacher predicted *higher* specificity rates compared to female teachers. The beta weight for gender was -0.41, meaning that with being a female teacher, specificity decreased .41 in standard deviation units, while holding all other independent variables constant.

**Equation 3c.** The  $R^2$  for the third equation, which analyzed the relationship between teacher positive predictive value and teacher characteristics, did not reach statistical significance ( $p = .40$ ) but accounted for 41% of the variability for the level at which teacher subject taught, gender, professional experience, self-efficacy, and acceptance of method can predict teacher positive predictive value of students with elevated anxiety or depression symptoms. No predictors were significant in this model. The largest beta weights were associated with teacher self-efficacy ( $\beta = .35, p = .22$ ) and acceptance of method ( $\beta = .37, p = .17$ ), with the trends in the data suggesting that higher levels of each variable associated with a greater positive predictive value.

**Equation 3d.** The  $R^2$  for the fourth equation, which analyzed the relationship between teacher negative predictive value and teacher characteristics, did not reach statistical significance ( $p = .25$ ) and accounted for 49% of the variability for the level at which teacher subject taught, gender, professional experience, self-efficacy, and acceptance of method can predict teacher negative predictive value of students with elevated anxiety or depression symptoms. Professional experience was a significant predictor, with less professional experience associated with higher negative predictive values ( $\beta = -.53, p = .05$ ). Although not significant, gender trended towards

significance, suggesting that male teachers may have had higher levels of negative predictive value than female teachers ( $\beta = -.47$ ,  $p = .18$ ). No other predictors were significant.

Table 13

*Research Question 3: Predictive Models of Teacher Factors and Teacher Accuracy Identifying Students with Anxiety and Depression*

<i>Outcome Variable</i>	<i>Predictor Variables</i>	$\beta$	<i>beta</i>	<i>SE</i>	<i>p</i>	<i>R</i> <sup>2</sup>
Sensitivity ( <i>n</i> =18)	Professional Experience	-0.01	-0.38	0.01	.12	.55
	Gender	0.03	0.07	0.13	.82	
	Math Teacher	0.28	0.63 <sup>t</sup>	0.14	.08	
	Language Arts Teacher	0.28	0.65	0.16	.11	
	Self-efficacy	-0.04	-0.11	0.08	.64	
	Acceptance of Method	0.08	0.34	0.05	.15	
Specificity ( <i>n</i> =19)	Professional Experience	-0.01	-0.28	0.01	.14	.69
	Gender	-0.18	-0.40	0.10	.11	
	Math Teacher	-0.10	-0.21	0.12	.42	
	Language Arts Teacher	-0.19	-0.40	0.13	.19	
	Self-efficacy	0.10	0.39 <sup>t</sup>	0.06	.10	
	Acceptance of Method	-0.01	-0.03	0.04	.89	
Positive Predictive Value ( <i>n</i> =18)	Professional Experience	-0.01	-0.23	0.01	.39	.40
	Gender	-0.12	-0.24	0.17	.51	
	Math Teacher	0.16	0.31	0.19	.43	
	Language Arts Teacher	0.14	0.26	0.22	.55	
	Self-efficacy	0.14	0.35	0.10	.22	
	Acceptance of Method	0.10	0.37	0.07	.17	
Negative Predictive Value ( <i>n</i> =18)	Professional Experience	-0.53	-0.35	0.003	.05*	.49
	Gender	-0.47	-0.07	0.07	.18	
	Math Teacher	0.27	0.08	0.08	.46	
	Language Arts Teacher	0.07	-0.09	0.09	.87	
	Self-efficacy	-0.04	-0.01	0.04	.89	
	Acceptance of Method	0.20	0.02	0.03	.42	

Note. Social studies teacher and male teachers were set as the reference categories for all multiple linear regressions.

<sup>t</sup>*p* < .10, \**p* = .05

## **CHAPTER FIVE:**

### **DISCUSSION**

The purpose of this study was to explore the relationship between different teacher characteristics (belief and demographic variables) and teacher accuracy in identifying students who self-reported elevated levels of anxiety or depression. This chapter recaps the current study's findings and places findings in the context of extant literature. Then, the limitations of the present study limitations are discussed. Finally, implications for school psychologists and potential future research directions are presented.

#### **Variability in the Accuracy of Middle School Teachers in Identifying Distressed Students**

In the present study, accuracy was examined through four different calculations: sensitivity, specificity, positive predictive value, and negative predictive value. Sensitivity indicates the proportion of students who twice self-reported anxiety or depression were correctly nominated as either having anxiety or depression symptoms (Albers & Kettler, 2014). Sensitivity is a critical accuracy variable in screening procedures, as the goal is to identify virtually all the students who may be experiencing emotional distress, in order to connect them to needed services. Similarly, positive predictive value (PPV) in the present study indicates the proportion of students who are nominated by teachers as having anxiety or depression symptoms and who also twice self-reported elevated levels of either anxiety or depression. The difference between sensitivity and positive predictive values comes in their calculations: sensitivity takes into

account the students who were missed in the screening process, and is calculated by taking the true positives and dividing that value by the sum of true positives (students who both self-reported elevated anxiety or depression symptoms) and *false negatives* (students who self-reported elevated anxiety or depression symptoms, but were incorrectly not nominated by teacher; Albers & Kettler, 2014), positive predictive value is calculated by taking the true positives and dividing that value by the sum of the true positives and *false positives* (students who did not self-report elevated anxiety or depression symptoms, but were incorrectly nominated by teacher; Albers & Kettler, 2014). In essence, PPV reflects the proportion of students a teacher correctly identified as distressed from the pool of students they nominate at all (vs. in relation to the pool of distressed students); how accurate is a teacher's assertion that a student he or she identified is actually symptomatic? In terms of interpretation of results, sensitivity is the accuracy index prioritized over others, as it reflects the main goal of universal screenings in practice: to connect students with symptoms of psychopathology to needed services.

Specificity indicates the proportion of students who did not twice self-report elevated anxiety or depression symptoms and were accurately not nominated as having depression or anxiety symptoms (Albers & Kettler, 2014). Specificity is valuable in that it prevents unnecessary time and resources from being devoted to students who truly do not need mental health services or interventions. In a related vein, negative predictive value (NPV) indicates the proportion of students who were not nominated by their teacher as having anxiety or depression and also did not twice self-report elevated anxiety or depression symptoms (Albers & Kettler, 2014). The difference between specificity and negative predictive values also comes in their calculations: while specificity is calculated by taking the true negatives (student did not report elevated levels of anxiety or depression symptoms, and teacher did not nominate student as

having anxiety or depression) and dividing that value by the sum of true negatives and *false positives* (students who did not self-report elevated anxiety or depression symptoms, but were incorrectly nominated by teacher; Albers & Kettler, 2014), negative predictive value is calculated by taking the true negatives and dividing them by the sum of true negatives and *false negatives* (students who self-reported elevated anxiety or depression symptoms, but were incorrectly not nominated by teacher; Albers & Kettler, 2014). Thus, NPV considers the miss rate and is more likely (than specificity) to be adversely affected by some teachers' tendencies to simply nominate fewer students, as teachers who identify less in general are more likely to miss symptomatic students than teachers perhaps taking a more comprehensive approach to recommending many potential students for subsequent consideration.

In regards to the degree of accuracy evidenced by teachers in the present study, there was great range in sensitivity, specificity, positive predictive value, and negative predictive value for the 19 teacher participants. In regards to sensitivity, teachers' varied from 0% to 63%, with an average sensitivity rate of 25%. The average sensitivity rate indicates that the average teacher 'missed' 75% of students who twice self-reported elevated levels of anxiety or depression. In regards to specificity, teachers varied from 30% to 100%, with an average specificity rate of 76%. The average specificity rate indicates that the average teacher misidentified 24% of students as having anxiety or depression and the students in reality did not self-report having elevated levels of anxiety or depression. In regards to positive predictive values, teachers' values varied from 0% to 100%, with an average positive predictive value of 32%. In regards to negative predictive values, teachers' values ranged from 50% to 87%, with an average negative predictive value of 75%. To shed light on what may account for the vast variability in teacher accuracy rates, the next sections synthesize primary findings of analyses conducted to answer all

research questions, findings which are reported in greater detail in a question-by-question fashion in Chapter 4.

### **Predictors of Sensitivity in Identifying Students with Anxiety or Depression Symptoms**

The first accuracy indicator examined in this study in relation to teacher characteristics was sensitivity, or the proportion of students who twice self-reported anxiety or depression were correctly nominated as either having anxiety or depression symptoms (Albers & Kettler, 2014). Overall, all teacher characteristics explained 55% of the variance in teacher sensitivity. Although this is a large amount of variance, it was not statistically significant using traditional levels of statistical significance ( $p > .05$ ). The teacher characteristic associated with the largest effect size on sensitivity was teachers' subject taught. In bivariate and multivariate calculations, language arts and math teachers was associated with higher sensitivity compared to social studies teachers. For the multiple regression equation examining the relationship between all teacher factors and sensitivity, a review of the beta weights indicated that being a math teacher or a language arts teacher predicted higher sensitivity rates compared to social studies teachers, effects that were large even when other potential predictors were considered simultaneously. This predictive analysis extends the descriptive analyses from the same dataset as reported by Golley (2014). Golley (2014) noted that language arts and math teachers had similar accuracy rate in identifying students who self-report elevated levels of anxiety, or students who self-reported elevated levels of depression. Golley (2014) examined accuracy of identifying anxiety and depression separately (not together, as "distressed" or "internalizing" students as in the present study). To explain these differences, Golley proposed that because there are high-stakes testing in language arts and math classes, these teachers may be more likely to see students exhibiting signs of mental health problems, compared to social studies teachers. Besides Golley's interpretation of the data, there

is not any other current literature to explain these differences between language arts, math, and social studies middle school teachers and sensitivity levels. There is research suggesting there are personality differences between teachers who teach each subject. Kelsey's (2002) dissertation explored differences in teachers from different subjects and personality using the Meyer's Briggs Type Indicator. Kelsey (2002) suggested English teachers may be more open to change and were more intuitive, math teachers may be more resistant to change and more logical while making decisions, and social studies and science teachers were more likely to gather multiple sources of information before making a decision. Kelsey's research suggests teachers with certain personality types may be drawn to certain subjects to teach over others. Differences in teacher personality by subject area may explain why sensitivity rates may be different across subjects, as people with certain personality types may be more or less likely to have certain perceptions of students with anxiety or depression and this may impact sensitivity rates. Considering that the effects of being a math teacher or language arts teacher did not exceed the traditional level of statistical significance of .05 (instead,  $p = .08$  and  $p = .11$ , respectively), the aforementioned differences may have been found due to chance. However, each predictor's beta weights was strong and positive, supporting the strength of each of these predictors in explaining variability in sensitivity.

The next teacher characteristics that evidenced a moderate effect on explaining variance in sensitivity rates was level of professional experience (defined by years teaching) and teacher acceptance of method. For professional experience, a moderate bivariate correlation was seen in number of years teaching, with teachers with less professional experience having larger sensitivity rates. Within the final multiple regression equation, which examined all teachers' characteristics simultaneously when predicting sensitivity, another moderate beta weight was

found with teachers with less professional experience having larger sensitivity rates. No previous research was found to suggest that the number of years a teacher has taught may affect accuracy in identifying students with anxiety and depression. But, research has indicated that as the content and focus of teacher preparation programs change, newer teachers in the field may feel more prepared to support students with mental health needs (Koller et al., 2012). Koller and colleagues found that novice teachers felt more prepared to support students with mental health needs in the classroom due to their teacher training. Of note, the correlational analyses reported in chapter 4 (see Table 8) did not indicate a strong relationship between years of experience and beliefs related to teachers as identifiers of youth mental health problems ( $r = -.01$  with self-efficacy beliefs, and  $r = .11$  with acceptance of teachers as method of identifying internalizing students). Such changes in training may lead to younger teachers being more likely to accurately identify students who are not displaying symptoms of anxiety or depression, even if they don't necessarily perceive themselves as particularly accurate in relation to more experienced teachers. Less experienced teachers may also be less removed from their training, as opposed to 'older' teachers who may have forgotten aspects of preservice training, or their training did not include youth mental health issues. Next, teacher acceptance of method, or belief that teachers in general are able to accurately identify students with anxiety or depression, also had a moderate relationship with explaining sensitivity, with teachers who had more positive attitudes in teachers' in generals' abilities tending to have higher sensitivity rates, as indicated by the predictor's moderate-sized beta weight yielded in the multivariate analyses. Overall, although the effect sizes associated with these variables was half as large as for subject taught, teachers who were less experienced and had more positive attitudes towards teachers' ability to recognize

anxiety and depression tended to have higher sensitivity rates in detecting emotionally distressed students.

Although in the final analysis teacher gender did not seem to explain much unique variance in teacher sensitivity, further examination of the data reveals that subject taught and gender are interlinked within the study's sample. The effect teacher's gender may be having in explaining the variance in sensitivity may not be apparent when more female teachers teach the subjects that had higher sensitivity. For example, 67% of language arts teachers were female, 16% of social studies teachers were female, and 50% of math teachers were female. As more language arts teachers were female, this may explain why teacher gender as a predictor did not explain much of the variance in sensitivity when considered alongside other potential predictors. Indeed, although the current study was underpowered to detect a significant effect, the overall sensitivity rates of female teachers in the current study were somewhat higher than the average sensitivity rate of male teachers; specifically, the average female teacher correctly identified as distressed 33% of students who reported elevated levels of anxiety or depression, whereas the average male teacher correctly identified as distressed only 18% of students who reported elevated symptom levels.

In terms of the possibility that teacher self-efficacy may predict actual accuracy, no findings from bivariate or multivariate calculations in the current study provided support for the notion that a teachers' personal self-efficacy beliefs predict significant variance in sensitivity. The only prior study found that looked at a relationship between teacher self-efficacy and teacher acceptance of method was Moor et al.'s (2007) study on evaluating whether a teacher psychoeducational training could improve teacher accuracy in identifying high school students with depression. For the teacher group who received the psychoeducational training, teacher

accuracy *decreased* after the intervention. But, between pre- and post-training for the training group, teacher self-efficacy and teacher acceptance of method increased (significantly fewer teachers thought teachers were unqualified to identify students with depression after the training). However, Moor et al. (2007) did not report results of analyses specifically looking at the direct relationship between teacher confidence and accuracy in identifying students with depression. However, since beliefs increased at the same time accuracy decreased, it is unlikely that analyses of that dataset would find support for the notion that more positive beliefs about teacher accuracy co-occur with actual accuracy. Similarly, the current study did not find any statistically significant relationships between teacher self-efficacy and sensitivity at bivariate and multivariate levels. Simply feeling confident in one's ability to identify distressed students (found to be significantly impacted by the training teachers went through in Moor et al., 2007) may not correlate with actual teacher accuracy rates in identifying students who report elevated symptoms of depression.

### **Predictors of Specificity in Identifying Students with Anxiety or Depression Symptoms**

The next teacher accuracy variable examined in the study was specificity, or the proportion of students who did not twice self-report elevated anxiety or depression symptoms and were accurately not nominated as having depression or anxiety symptoms (Albers & Kettler, 2014). Overall, all teacher characteristics examined in this study explained 69% of the variance in teacher specificity, and the multiple regression equation that explored the relationship between all teacher characteristics and specificity reached statistical significance ( $p = .02$ ). Of note, specificity rates are highly affected by a general tendency to nominate individuals as at-risk, such that simply nominating fewer students could contribute to a high specificity rate since fewer students would have an opportunity to be misidentified. Arguably, higher sensitivity is preferable

to higher specificity, as in a multiple-gate procedure a misidentified student could be ruled out in a later stage of data collection, whereas missed students are removed from further consideration entirely and thus unlikely to be offered services.

The largest contributor to explaining variance in teacher specificity was self-efficacy, which had a moderate to large correlation, both in bivariate and multivariate analyses. Higher levels of teacher self-efficacy were associated with more specificity. As shown in the correlation matrix in Chapter 4, self-efficacy had a moderate correlation with specificity. Additionally, when examined in the context of the relationship between teacher beliefs and specificity, self-efficacy again was a moderate and significant predictor with specificity. Finally, when examined with all other teacher characteristics considered simultaneously, self-efficacy was a moderate predictor in explaining variance in specificity, an effect that trended towards significance ( $p < .10$ ).

As mentioned above, the only prior research known to examine teacher self-efficacy and was Moor et al.'s study (2007) who explored teacher self-efficacy and acceptance of method before and after a teacher psychoeducational training to increase accuracy identifying students with depression. After teachers had been through Moor et al.'s (2007) psychoeducational training to increase accuracy in identifying youth with depression, they decreased the number of nominations and subsequently decreased in accuracy, but also increased in teacher self-efficacy. Moor et al. (2007) only defined accuracy in terms of sensitivity, meaning that specificity may have increased after the teacher psychoeducational training because of the decreased percentage of students nominated. Increased teacher self-efficacy may be associated with higher specificity, but not sensitivity. The present study similarly did not find a relationship between teacher self-efficacy and sensitivity, but did indicate a relationship between self-efficacy and specificity.

The next predictor in terms of explaining variance in specificity was teacher subject taught, where social studies teachers tended to have higher specificity level compared to language arts teachers. Within bivariate analyses, this association was small, but for multivariate analyses, the beta weights indicated the association was moderate. This finding should be considered within the context of how specificity is calculated, which depends upon the number of students each teacher nominates. If a teacher tends to not nominate many students, it again may be easier to more accurately not nominate students who do not have anxiety or depression symptoms. Further examinations revealed visual differences in the mean and median number of social studies, language arts, and math teachers' percentage of students nominated, an important factor when looking at specificity. For social studies teachers, the average percentage of student participants nominated was 14.33% (median = 6.5%), and five of the six social studies teachers nominated fewer than 12% of student participants. For language arts teachers, the average percentage of student participants nominated was 36.33% (median = 39.5%). For math teachers, the average percentage of student participants nominated was 26.83% (median = 16%). As language arts teachers tended to nominate more students compared to social studies teachers, this may explain part of the reason why being a social studies teacher explained a moderate amount of the variance in specificity.

Gender was the next strongest predictor in explaining specificity, with male teachers having higher specificity than female teachers. When t-tests were conducted to examine differences between genders in terms of accuracy, male teachers were similarly seen as having significantly higher levels of specificity than female teachers. In the multiple regression equation examining the simultaneous effect of all predictors on explaining variance in specificity, gender was a moderate predictor and trended towards statistical significance ( $p = .11$ ). Although, these

differences may be partly explained by the differences in percentage of students nominated by male and female teachers. Male teachers on average nominated 11.33% of student participants (median = 7%). Female teachers on average nominated 36.30% of student participants (median = 39.50%). Therefore, male teachers' higher specificity rates may be due to the lower percentages of students nominated compared to female teachers.

In reference to whether a teacher's gender may affect specificity in identifying students with anxiety or depression, no previous research was found examining the relationship between teacher gender and accuracy, but previous research has found differences between male and female teachers when looking at who are students more likely to ask for help. Le Mare and Sohbat (2002) examined which teacher characteristics affected students' (who ranged in age from second to seventh grade) willingness to ask for help. Although teacher gender was the least occurring response, a small proportion of students self-reported they felt more comfortable asking female rather than male teachers for help (Le Mare & Sohbat, 2002). The current study found that male teachers had higher specificity rates, or the proportion of students who did not twice self-report elevated anxiety or depression symptoms and were accurately not nominated as having depression or anxiety symptoms. If students may feel more comfortable seeking help from female teachers more than male and be more likely to ask female teachers for help, female teachers may have a different perspective on which students are experiencing anxiety and depression compared to male teachers. Indeed, although the current study was underpowered to detect a significant effect, the sensitivity rates of female teachers in the current study were somewhat higher than the average sensitivity rate of male teachers; specifically, the average female teacher correctly identified as distressed 33% of students who reported elevated levels of anxiety or depression, while the average male teacher correctly identified as distressed only 18%

of students who reported elevated symptom levels. Students' possible tendency to be less likely to seek support from male teachers may have contributed to the lower nomination rate seen among males in the current study, which may have driven their relatively high specificity level.

Additionally, Berg-Nielsen, Solheim, Belsky, and Wichstrom (2012) examined the relationship between different teacher and parent characteristics and subsequent disagreement in teacher-parent ratings of both externalizing and internalizing behaviors in preschool students. Berg-Nielsen and colleagues suggested that there may be a same-gender bias in preschool female teachers, as teachers rated boys' externalizing behaviors higher than girls. Although Berg-Nielsen and colleagues (2012) did not find similar differences in rating preschool students' internalizing behaviors, their research suggests teacher gender may affect how teachers perceive students' behaviors based on a student's gender.

In terms of specificity, teacher professional experience (years teaching) was the next strongest predictor in explain variance in specificity, with a medium effect on specificity. Similar to sensitivity, the fewer years of teaching experience a teacher had, the higher specificity the teacher tended to have. At the bivariate level, professional experience had a similar, but small correlation with specificity rates. As stated previously, no previous research indicated 'younger' teachers may be more accurate in specificity rates, but recent changes in teacher training programs may explain differences between teachers with more or less years of professional experience (Koller et al., 2012). But, teachers with less experience may again be less removed from their training, as opposed to 'older' teachers who may have forgotten aspects of preservice training, or their training did not include youth mental health issues.

Teacher beliefs pertinent to acceptance of teachers as an identification method did not explain variance in specificity rates in any of the data analytic strategies used to investigate any

research question. Teacher acceptance of method may better predict other forms of teacher accuracy, given the aforementioned finding that teacher acceptance of method was a moderate predictor of sensitivity rates, but was not a strong predictor of specificity rates.

### **Predictors of Positive Predictive Value in Identifying Students with Anxiety or Depression**

#### **Symptoms**

In addition to the accuracy variables of sensitivity and specificity, the present study also examined the relationship with teacher accuracy variables positive predictive value. Positive predictive value (PPV), or the proportion of students who are nominated by teachers as having anxiety or depression symptoms and who also twice self-reported elevated levels of either anxiety or depression (Albers & Kettler, 2014). PPV indicates the proportion of students a teacher correctly nominated as having anxiety or depression from the limited group of students a teacher nominated (instead of the pool of all student participants with anxiety and depression). Essentially, PPV examines the accuracy of a teacher's idea that a student he or she nominated actually has anxiety or depression symptoms. Overall, all teacher characteristics explained 40% of the variance in teacher PPV, and the multiple regression equation that explored the relationship between all teacher characteristics and PPV did not reach statistical significance ( $p = .40$ ). Nevertheless, as the  $R^2$  value for positive predictive value was 40%, this indicates the combined effect of all of the teacher factors explained a considerable amount of the variability in positive predictive values, but the model was not a statistically significant fit to the data. Positive predictive value and negative predictive value are more recently conceptualized conditional probability indices used in current research. Johnson and colleagues (2016) reported these indices may be more indicative of the "efficiency" (p. 15) of a screener in a multiple-gating

procedure, as ‘missing’ a student is more concerning than ‘over-identifying’ a student, as missing a student would not be included in subsequent gates.

Although the overall equations were not statistically significant, a review of the beta weights in the multiple regression equation examining the relationship between all teacher characteristics and PPV indicated teacher acceptance of method and self-efficacy were both moderate predictors of explaining the variance in PPV. Both higher levels of self-efficacy and acceptance of method were associated with higher PPV. Not only were these associations seen in multivariate equations, but self-efficacy and acceptance of method also both had moderate bivariate correlations with PPV.

In terms of the relationship with acceptance of method and PPV, as PPV is loosely related to sensitivity, the similar relationship found between acceptance of method and sensitivity is commensurate with how both are calculated. Sensitivity incorporates the students who were missed in the teacher nomination procedure. The equation for sensitivity is calculated by taking the true positives and dividing that by the sum of true positives and false negatives (students who self-reported elevated anxiety or depression symptoms, but were incorrectly not nominated by teacher; Albers & Kettler, 2014). PPV is also calculated by taking the true positives, but divides true positives by the sum of true positives and false positives (students who did not self-report elevated anxiety or depression symptoms, but were incorrectly nominated by teacher; Albers & Kettler, 2014). Because PPV is more indicative of how a screening tool works in a multiple-gated screening procedure, teachers’ beliefs towards other teachers’ ability to accurately nominate students may be moderately predictive of PPV rates, but also teachers’ beliefs in their own ability (self-efficacy) to accurately nominate students may be related to PPV compared to being related to sensitivity. Although teacher beliefs were a moderate predictor in

explaining variance in PPV, this association is not statistically significant in consideration of traditionally acceptable probability levels, and may be due to chance.

No teacher demographic variables helped contribute greatly to the prediction of PPV (a screener's utility within a multiple-gating screening procedure). No previous research that loosely examined different teacher variables examined the effect of teacher variables within a multiple-gating screening procedure (Berg-Nielsen et al., 2012; Koller et al., 2012; Le Mare & Sohbat, 2002; Moor et al., 2007). Findings from the current study suggest that teacher attitudes are more influential than demographic variables in accounting for variability in PPV.

### **Predictors of Negative Predictive Value in Identifying Students with Anxiety or Depression Symptoms**

The last accuracy variable examined in relation to teacher characteristics was negative predictive value (NPV), which indicates the proportion of students who were not nominated by their teacher as having anxiety or depression and additionally did not self-report elevated anxiety or depression symptoms (Albers & Kettler, 2014). Although NPV is related to specificity in how each is calculated, NPV considers the miss rate, and is therefore more likely to be negatively affected by teachers' who may nominate a low percentage of students. Conversely, high specificity rates may be more closely to teachers who simply nominate fewer percent of students. Overall, all teacher characteristics explained 49% of the variance in teacher NPV, and the multiple regression equation that explored the relationship between all teacher characteristics and NPV did not reach statistical significance ( $p = .25$ ). Although, after visually examining the beta weights of predictors, professional experience had a moderate, inverse associations with NPV. Teachers with less professional experience tended to have higher NPV rates. Additionally,

teacher gender trended towards significance, suggesting that male teachers may have higher NPV compared to female teachers ( $p = .18$ ).

In terms of professional experience explaining variance in NPV, both multivariate and bivariate analyses showed a small relationship with less professional experience co-occurring with higher NPV rates. In correlation analyses, years of experience had a moderate negative correlation with NPV ( $r = -.43$ ). NPV is loosely related to specificity, and professional experience was also a moderate predictor of variance in specificity; teachers who are ‘newer’ in the field seem to be more accurate in terms of not identifying students who did not self-report emotional distress.

Additionally, both bivariate and multivariate analyses suggest that teacher gender may be related to NPV, suggesting that male teachers having higher NPV values compared to female teachers. Again, NPV is loosely related to specificity, and male teachers tended to have higher specificity. Analyses similarly suggested male teachers may have higher NPV. In terms of bivariate analyses of gender and NPV, a  $t$ -test was not statistically significant, but there was a large effect, with male teachers having higher NPV compared to female teachers. Although, this trend was not statistically significant and could have been found due to chance.

No support was provided for associations between other teacher demographic characteristics such as subject taught, or any teacher belief variables such as acceptance of method and self-efficacy.

### **Implications for School Psychologists**

Recent research has found that about 20% of American youth experience mental disorders (Merikangas et al., 2010; Perou et al., 2013). Not only do large numbers of American youth experience difficulties from mental disorders, but many of these youth do not receive any

treatment. The National Comorbidity Survey for Adolescents found less than half of youth surveyed received treatment in the past year for their mental disorder (Costello, He, Sampson, Kessler, & Merikangas, 2014). For students experiencing internalizing disorders such as anxiety and depression, these estimates are even lower. Research has found for youth with behavior disorders, 45-60% of these youth received treatment, but only 18% of youth with an anxiety disorder and 38% of youth with any mood disorder received any form of mental health treatment (Merikangas et al., 2011).

Youth with mental health disorders are more likely to experience worse academic achievement, less school engagement and participation, poorer family and peer relationships, are more likely to drop out of school, and be more likely to have criminal convictions in early adulthood (Aebi et al., 2014; Esch, et al., 2014; Glover & Albers, 2007; Meldrum, Venn, & Kutcher, 2009). Mental health services provided in the schools serve as a primary support for many youth. Large national research studies have found that only one out of four students with a diagnosable psychiatric disorder received services outside of school (Merikangas et al., 2011). Although school-based mental health services provide different forms of support to many students, students with internalizing disorders remain underrepresented and students with externalizing disorders are overrepresented in these services (Merikangas et al., 2011).

Clearly, schools need efficient and accurate methods to identify students with both externalizing and internalizing needs in schools, to enable schools to proactively match student need to service intensity. Such methods include universal screenings in which data is reviewed that comes from rating scales, review of school data, referrals by parents, students, and/or teachers, teacher nominations, and multiple-gating procedures. Teacher nomination methods in particular have multiple benefits for school use, as they are easily implemented and not time-

intensive (Dowdy, Doane, Eklund, & Dever, 2011; Ollendick, Oswald, & Francis, 1989). Teacher nomination methods have also been found to be an accurate way to identify students with externalizing disorders (Dwyer, Nicholson, & Battistutta, 2006; Mollins & Clopton, 2002). In terms of identifying students with internalizing disorders such as anxiety and depression, teacher nomination methods have less support for accuracy. In particular, teacher nomination methods used to identify students with internalizing concerns have yielded a low sensitivity rate and an imperfect specificity rate (Auger, 2004; Cunningham & Suldo, 2014; Dadds, Spence, Holland, Barret, & Laurens, 1997; Golley, 2014; Layne, Bernstein, & March, 2006; Moor et al., 2007; Ollendick, Oswald, & Francis, 1989). In the current study, there were similar results found, with an average teacher only having a sensitivity rate of 25% and a specificity rate of 75%. Therefore, the study compounds previous research findings that teacher nomination procedures to identify students with elevated levels of anxiety and depression are not highly accurate in terms of low sensitivity and imperfect specificity. Teacher nomination procedures are not an ideal practice to identify high proportions of students with internalizing symptoms to link them with needed services. When school-based mental health professionals plan universal screening procedures, the limitations of teacher nominations should be noted, and if nominations procedures are used, practitioners should advocate for a teacher nomination procedure to be combined with other gates in a multiple-gating procedure, including student-self report measures or diagnostic interviews with students.

Although previous research has explored teacher nomination accuracy rates in identifying students with elevated levels of anxiety and depression in school, little is known about the relationship between different teacher characteristics such as teacher self-efficacy, a teacher's attitudes towards the ability of other teachers to identify students with symptoms of anxiety and

depression, professional experience (i.e., years teaching), teacher gender, and subject taught and subsequent teacher accuracy in identifying middle school students who self-reported elevated levels of anxiety and depression. The current study provided support for some teacher characteristics that explain variability in difference indices of teacher accuracy in identifying students with anxiety and depression.

In regards to sensitivity rates (the ability of teachers to accurately identify students who are experiencing either elevated levels of anxiety or depression), teacher subject taught, professional experience, and acceptance of method all contributed to explaining sensitivity rates. Out of all the accuracy variables used in the current study, sensitivity represents the primary goal of universal screening procedures: to identify virtually all students with distress so they can be connected to needed services. Therefore, teacher characteristics that are associated with sensitivity are prioritized over other accuracy indices in the following implications for practice. In terms of teacher characteristics that are most associated with sensitivity identifying students with anxiety and depression, math and language arts teachers were more likely to have higher sensitivity compared to social studies teachers. Next, the less professional experience a teacher had was related to higher sensitivity. Lastly, greater confidence in teachers as a wholes' ability to accurately nominate students (acceptance of method) was related to higher sensitivity rates. Although gender was not found to be a unique predictor, in the current sample gender and subject taught were interlinked, therefore there may be some element of teacher gender in predicting sensitivity as suggested in bivariate analyses that detected a trend for female teachers to have higher sensitivity compared to male teachers. Teacher's personal self-efficacy beliefs did not predict sensitivity.

For specificity rates (the ability of teachers to accurately not identify students who are not experiencing either elevated levels of anxiety or depression), teacher self-efficacy, teacher subject taught, gender, and professional experience all predicted variance in specificity. The more self-efficacy teachers had, there was a trend to have higher specificity rates. Next, males and social studies teachers had higher specificity levels compared to females and language arts teachers, respectively, although this difference may be a byproduct of the low percentages of students nominated by male and social studies teachers. Additionally, the more professional experience a teacher had, the more likely a teacher was to have lower specificity rates. Although the current study found some teacher characteristics were associated with specificity rates, as the goal of teacher nomination procedures is to maximize sensitivity, these characteristics (higher teacher self-efficacy, being a language arts teacher and being a male teacher) have less implications for practice.

Although this study's conclusions regarding factors that influence sensitivity and specificity are tentative based on several predictors only trending towards statistical significance, taken together, when organizing, designing, and analyzing data from universal screening procedures in secondary schools, school psychologists might consider the effect of teacher subject taught, professional experience (i.e., years teaching), and beliefs regarding acceptance of method on teachers' likely accuracy in identifying students with anxiety or depression symptoms.

Especially in secondary settings where multiple teachers interact with each student, teacher characteristics may be a salient consideration when planning which teachers should be included in a teacher nomination screening. In terms of implications for the effect of teacher demographic variables on universal screening practices, the current study suggests language arts

and math teachers have higher sensitivity rates compared to social studies teachers, therefore language arts and math teachers may be more imperative teacher groups to include in nomination procedures, and social studies teachers could be left out for the highest sensitivity rates. Additionally, less years of professional experience was found to be associated with higher sensitivity, specificity, and NPV. Teachers who are “newer” in the field and have less professional experience are an important group to include and prioritize for organizing teacher nomination procedures compared to teachers with more years of professional experience.

In terms of the implication of teacher beliefs of teacher nomination procedures, when collecting teachers’ nominations, school psychologists or school-based mental health professional could simultaneously gather data on teachers’ acceptance of method. When analyzing nomination data, the current study suggests teachers with higher acceptance of method beliefs may have higher sensitivity; therefore their nominations could be prioritized over others in terms of referring nominated students for further screening and/or services.

To increase sensitivity, the primary accuracy variable of importance in screenings, school psychologists possibly could conduct teacher psychoeducational trainings (such as the one in Moor et al.’s (2007) study) to increase teacher beliefs such as acceptance of method. Although Moor et al., (2007) found after training although teachers increased in self-efficacy and acceptance of method but decreased in sensitivity, the current study suggests that more acceptance of method was related to higher sensitivity, and more self-efficacy was related to higher specificity. If school psychologists design their own teacher trainings, a teacher’s belief that other teachers can accurately identify students with anxiety and depression (acceptance of method) would be the best belief to target for intervention, as more acceptance of method beliefs

were associated with higher sensitivity. Sensitivity is the most prioritized accuracy outcome in a screening procedure, as it accurately identifies students who truly need services.

The current study also has implications for school psychologists using teacher nomination methods in a multiple-gating screening procedure. Specifically, a “gold standard of systematic screening” (Kauffman, 2001), the Systematic Screening for Behavior Disorders (SSBD), uses teacher nomination as the first gate in the multiple-gating procedure. When using multiple-gating procedures such as the SSBD, teacher nominations are crucial for further consideration of a student, thus sensitivity is key whereas low specificity is not problematic. In such a system, school psychologists could consider teacher characteristics such as subject taught (language arts and math teachers should be prioritized over social studies teachers), professional experience (less years of experience was associated with higher sensitivity), and acceptance of method (higher acceptance of method beliefs were more associated with higher sensitivity). Conversely, social studies teachers, teachers with more professional experience, and lower acceptance of method may be more likely to miss students, and have low sensitivity could be less prioritized or perhaps exempted from a multiple-gating screening procedure.

### **Contributions to the Literature**

The current study provides the first focused glimpse at potential teacher characteristics that are related to teacher accuracy in identifying students with elevated levels of anxiety and depression. Several studies have indicated teacher nomination procedures have low sensitivity and imperfect specificity in identifying students with anxiety and depression (Auger, 2004; Cunningham & Suldo, 2014; Dadds, Spence, Holland, Barret, & Laurens, 1997; Gelley, 2014; Layne, Bernstein, & March, 2006; Moor et al., 2007; Ollendick, Oswald, & Francis, 1989) but no previous research until the current study was found that explored if there is a relationship

between different teachers characteristic and teacher accuracy rates in identifying students with anxiety and depression. Findings indicated that teacher characteristics such as subject taught, professional experience, and acceptance of method may explain teacher sensitivity, teacher self-efficacy, subject taught, gender, and professional experience can explain teacher specificity, professional experience and self-efficacy may explain PPV, and professional experience may explain NPV.

In terms of teacher demographic variables, in particular, male teachers had higher *specificity* rates, whereas female teachers tended towards having higher *sensitivity* rates compared to male teachers. Math and language arts teachers tended to have higher *sensitivity* rates compared to social studies teachers, whereas social studies teachers tended to have higher *specificity* compared to language arts teachers. Finally, less professional experience was related to higher levels of both specificity, sensitivity, and NPV.

In terms of teacher belief variables, teachers with more self-efficacy related to their ability to identify youth with anxiety and depression tended to have higher specificity. Teachers who believe other teachers can accurately identify students with anxiety and depression have higher sensitivity, and also may be related to more PPV.

Another contribution of the current study was the exploration of different teacher characteristics and subsequent teacher accuracy in the conditional probability indices of positive predictive value and negative predictive value. Positive predictive value (the proportion of students who are identified as having elevated symptoms and the student reported the same) and negative predictive value (the proportion of students who are not identified as having elevated symptoms and the student reported the same) are conditional probability indices that fewer studies have used to examine accuracy of a given universal screener. The current study's use of

these indices gave further insight in the relationships between teacher characteristics and teacher accuracy in identifying students with anxiety or depression. Although, Johnson and colleagues (2016) indicate that a lower positive predictive value and higher sensitivity may be acceptable to indicate a screener's ability to be employed in a multiple-gating procedure if under-identification "is associated with significant consequences," (p. 8) or if later gates will improve overall screening accuracy. Although the current study did not find a strong association between teacher characteristics and both PPV and NPV, findings suggest higher self-efficacy and higher acceptance of method may predict higher PPV rates, and less years of professional experience may predict higher NPV rates.

### **Limitations and Delimitations**

The present study has several delimitations and limitations that may threaten its results and generalizability. Delimitations include the study taking place in a single middle school and data being restricted to only 7<sup>th</sup> and 8<sup>th</sup> grade students and teachers, with no 6<sup>th</sup> grade students and teachers participating (Gelley, 2014).

A limitation of the current study is the teacher sample size of 19 (and for some variables only 17 teachers were used) although all teachers who were recruited positively consented to participate in the study. Another limitation of the accuracy measure may be that student symptom levels are only measured using rating scales. Rating scales and a structured clinical interview may be a more accurate determination of a student's anxiety and depression symptom severity. Additionally, the study design did not mimic a true universal screening process, as dataset was only relevant to the subset of youth with parent consent to participate. Results may yield different conclusions if all students within the school building were screened and parent consent was not required. Furthermore, the Teacher Self-Efficacy Beliefs and Acceptance of

Method questionnaires and teacher attitudes have not been used extensively in prior research.

Finally, another limitation of the study is that the design is non-experimental, and only correlational findings can be concluded.

### **Directions for Future Research**

The current study both explored a new area of research, specifically potential relationships between features of teachers that may influence their accuracy in identifying students with elevated levels of anxiety and depression. Findings from the current study suggest that the greatest variability across teacher accuracy indices (sensitivity, specificity, PPV, NPV) was explained by the combination of both teacher beliefs (such as self-efficacy and acceptance of method) and demographic characteristics (such as professional experience, gender, and subject taught). Therefore, future studies of contributors to teacher accuracy may be wise to explore both beliefs (e.g., subject taught, or outside influences such as teacher trainings and professional development) as well as the teacher demographic characteristics that are unlikely to be modifiable.

As the current study was the first known study to examine different teacher characteristics and their relationship with teacher accuracy, future research is essential in order to replicate or extend the findings of this study. Teacher nomination methods alone or used in the greater context of a multiple-gating screening procedure have the benefits of being not costly or time-intensive. But, little is known about what explains the considerable variability in accuracy of these methods. Much of the current study's results were not statistically significant, but many of the teacher characteristics explained a substantial amount of teacher accuracy. Therefore, future research with larger samples sizes (and thus greater statistical power) should further explore these or other teacher characteristics (described next paragraph) and the relationship with

teacher accuracy. Additionally, in the current study's sample teacher gender and subject taught was interlinked. When gender and accuracy was examined in bivariate tests, being a female teacher trended towards higher sensitivity and being a male teacher was significantly related to higher specificity. Future research should be conducted to piece apart the possible separate effects of teacher subject taught and gender on accuracy identifying students with emotional distress.

Future research should also explore factors that may explain variance in percentage of students nominated by teachers. In the current study, the percentage of students nominated varied greatly; with some teachers only nominating 2% of his or her students, and other teachers nominating up to 56% of his or her students. Teachers may vary in the number of students nominated based on his or her knowledge of the base rates of mental health disorders. Future research should explore whether a brief training in such topics by school-based mental health professionals may affect either the sheer number of students nominated or accuracy identifying students with symptoms of psychopathology. Additionally, future research could explore whether the appearance of the form itself teachers use to nominate students may affect the number of students nominated. For instance, having teachers circle or highlight students from a roster, having teachers write students' names on a certain number of lines may affect the number of students nominated, or prescribing a limit to the number of students nominated may affect the percentage of students nominated by teachers.

Future research should also explore the relationship between other teacher characteristics and subsequent teacher accuracy in identifying students with anxiety and depression. One teacher characteristic that may play a role is a teacher's previous experience with internalizing disorders. Previous experience may come from a personal experience with anxiety or depression,

or knowing someone close to them who has experienced anxiety or depression. A teacher's personal experience may also come in the form of prior coursework or professional development on mental health, such as prior participation in mental health awareness programs such as Youth Mental Health First Aide. Only one teacher in the current study reported receiving preservice training in mental health, which did not permit analyses whether the preservice training may have a relationship with teacher accuracy identifying students with anxiety or depression.

Another teacher characteristic that may have a relationship with teacher accuracy is a teacher's conceptualization of his or her role in the classroom with students. For example, a teacher who conceptualizes one of their job roles as supporting student mental health may be more attuned to students who demonstrate symptoms of anxiety or depression. If a teacher emphasizes teacher-student relationships as part of their job role, he or she may have closer relationships and may even be better able to detect when a student is showing symptoms of anxiety or depression. A teacher's conceptualization of their role may also come from administrators and district policies. For example, if part of a district's mission statement is to support early identification and intervention of students with mental health difficulties, teachers may be more likely to notice and accurately interpret students who show signs of anxiety or depression. If a district's mission statement emphasizes high-stakes testing and accountability pressures, teachers may conceptualize their role as to solely identify students who need additional academic supports instead of students who need additional mental health supports.

Future research may also explore a relationship between teacher-student match in regards to different demographic variables, such as cultural, racial, economic, and linguistic, and teacher accuracy in identifying students with elevated levels of anxiety or depression. Teachers may be more or less accurate depending on cultural or ethnic similarities between teachers and students.

Both samples of teachers and students in the current study included considerable ethnic diversity. Finally, future research should explore using multilevel analyses to further explore which teacher characteristics are more associated with accuracy identifying students with emotional distress, while accounting for the nested nature of teachers' classes who have different students. By nature of students being enrolled within different classrooms within each teacher, multilevel analyses may yield different implications for practice.

## **Summary**

The current study both adds to the current literature about teacher nomination screening methods, specifically which features of teachers may affect their ability to accurately identify students with elevated levels of anxiety and depression. This thesis found support for the notion that several teacher characteristics are related to accuracy in identifying students with symptoms of anxiety or depression. Specifically, higher teacher self-efficacy, being a male teacher, teaching social studies, and having less professional experience predicted higher specificity rates.

Acceptance of method was not related to specificity rates. In regards to sensitivity, teacher demographic variables such as subject taught, professional experience, and acceptance of method towards other teachers accurately identifying students with elevated levels of anxiety or depression emerged as probably predictors. Being a math or language arts teacher predicted higher sensitivity rates compared to social studies teacher, and having fewer years of professional experience and more acceptance of method was also related to higher sensitivity. Teacher self-efficacy did not explain variance in sensitivity.

When looking at the relationship between teacher characteristics and PPV and NPV, there was less strength in the relationship between teacher characteristics and these indices as compared to the traditional indicators of sensitivity and specificity. For PPV, teachers' beliefs-

specifically higher confidence in the ability of other teachers to identify students with anxiety and depression and higher self-efficacy- may predict higher rates of PPV. For NPV, less professional experience may predict higher rates of NPV. But, these results in regards to PPV and NPV were neither significant or trending towards significance and although do explain some of the variability in indicators, the relationships may have been due to chance. Additional research with larger samples and more variables examined is warranted to confirm and extend the trends identified in this study.

## REFERENCES

- Achenbach, T. M. (1978). The child behavior profile: I. Boys aged 6–11. *Journal of Consulting and Clinical Psychology*, 46, 478–488.
- Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA Preschool Forms and Profiles: An Integrated System of Multi-Informant Assessment*. University of Vermont Department of Psychiatry, Burlington.
- Aebi, M., Giger, J., Plattner, B., Metzke, C. W., & Steinhagen, H. (2014). Problem coping skills, psychosocial adversities and mental health problems in children and adolescents as predictors of criminal outcomes in young adulthood. *European Child & Adolescent Psychiatry*, (5), 283-293.
- Albers, C. A., & Kettler, R. J. (2014). Best practices in universal screening. In P. L. Harrison & A. Thomas (Eds.), *Best practices in school psychology: Data-based and collaborative decision making* (121-131). Bethesda, MD: NASP Publications.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Andrews, A., McCabe, M., & Wideman-Johnston, T. (2014). Mental health issues in the schools: Are educators prepared? *The Journal of Mental Health Training, Education and Practice*, 9(4), 261-272.
- Angold, A., & Costello, E. J. (1987). *Mood and Feelings Questionnaire (MFQ)*. Durham, NC: Developmental Epidemiology Program, Duke University.

- Askell-Williams, H., & Murray-Harvey, R. (2013). Did that professional education about mental health promotion make any difference? Early childhood educators' reflections upon changes in their knowledge and practices. *Australian Journal of Guidance and Counselling*, 23(02), 201-221.
- Auger, R. W. (2004). The accuracy of teacher reports in the identification of middle school students with depressive symptomatology. *Psychology in the Schools*, 41(3), 379-389.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: W. H. Freeman and Company.
- Burns, B. J., Costello, E. J., Angold, A., Tweed, D., Stangl, D., Farmer, E. M., & Erkanli, A. (1995). Children's mental health service use across service sectors. *Health Affairs (Project Hope)*, 14(3), 147-159.
- Beck, J. S., Beck, A. T., Jolly, J. B., & Steer, R. (2001). *Beck Youth Inventories for Children and Adolescents*. San Antonio, TX: Pearson.
- Berg-Nielsen, T. S., Solheim, E., Belsky, J., & Wichstrom, L. (2012). Preschoolers' psychosocial problems: In the eyes of the beholder? Adding teacher characteristics as determinants of discrepant parent-teacher reports. *Child Psychiatry & Human Development*, 43, 393-413.
- Breslau, J., Lane, M., Sampson, N., & Kessler, R. C. (2008). Mental disorders and subsequent educational attainment in a US national sample. *Journal Of Psychiatric Research*, 42(9): 708-716. doi:10.1016/j.jpsychires.2008.01.016
- Center for Mental Health in Schools. (2005). Screening mental health problems in schools. University of California, Los Angeles: Author. Retrieved October 25, 2015 from <http://smhp.psych.ucla.edu/pdfdocs/policyissues/mhscreeningissues.pdf>.

- Center for Mental Health in Schools at UCLA. (2005). *Youngsters' mental health and psychosocial problems: What are the data?* Los Angeles: Author.
- Conners, C.K. (2008). *Conners Comprehensive Behavior Rating Scales*. North Tonawanda, NY: Multi-Health Systems, Inc.
- Copeland, W. E., Miller-Johnson, S., Keeler, G., Angold, A., Psych, M., & Costello, E. J. (2007). Childhood psychiatric disorders and young adult crime: A prospective, population-based study. *The American Journal of Psychiatry, 164*(11), 1668-1675.
- Castillo, J. M., Curtis, M. J., & Gelley, C. (2012). School psychologists' professional practices and implications for the field. *Communique, 40*(8), 4-8. Retrieved November 9, 2015, from <http://www.nasponline.org/publications/periodicals/communique/issues/volume-40-issue-8>
- Costello, E. J., He, J., Sampson, N. A., Kessler, R. C., & Merikangas, K. R. (2014). Services for adolescents with psychiatric disorders: 12-month data from the national comorbidity Survey—Adolescent. *Psychiatric Services, 65*(3), 359-366.
- Cunningham, J. (2011). *Accuracy of educator nominations in identifying students with elevated levels of anxiety and depression*. (Unpublished doctoral dissertation). Retrieved from ProQuest.
- Cunningham, J. M., & Suldo, S. M. (2014). Accuracy of teachers in identifying elementary school students who report at-risk levels of anxiety and depression. *School Mental Health, 6*(4), 237-250.
- Dadds, M. R., Spence, S. H., Holland, D. E., Barrett, P. M., & Laurens, K. R. (1997). Prevention and early intervention for anxiety disorders: A controlled trial. *Journal of Consulting and Clinical Psychology, 65*(4), 627.

Deacon, S. K. (2015). *Evaluation of a training on teachers' identification of anxiety in students* (Unpublished thesis). Retrieved from ProQuest.

Daniszewski, Tamara D., "Teachers' Mental Health Literacy and Capacity towards Student Mental Health" (2013). University of Western Ontario - Electronic Thesis and Dissertation Repository. Paper 1165.

Doll, B., Cummings, J. A., & Chapla, B. A. (2014). Best practices in population-based school mental health services. In P. L. Harrison & A. Thomas (Eds.), *Best Practices in School Psychology: Systems Level Services* (149-163). Bethesda, MD: NASP Publications.

Dowdy, E., & Kim, E. (2012). Choosing informants when conducting a universal screening for behavioral and emotional risk. *School Psychology Forum: Research in Practice*, 6(4), 1-10.

Dowdy, E., Doane, K., Eklund, K., & Dever, B. V. (2011). A comparison of teacher nomination and screening to identify behavioral and emotional risk within a sample of underrepresented students. *Journal of Emotional and Behavioral Disorders*.

Drummond, T. (1994). *The student risk screening scale (SRSS)*. Grants Pass, OR: Josephine County Mental Health Program.

Dubow, E. F., Lovko Jr, K. R., & Kausch, D. F. (1990). Demographic differences in adolescents' health concerns and perceptions of helping agents. *Journal of Clinical Child Psychology*, 19(1), 44-54.

Duchesne, S., Vitaro, F. L., Larose, S., & Tremblay, R. E. (2008). Trajectories of anxiety during elementary-school years and the prediction of high school noncompletion. *Journal of Youth and Adolescence*, 37, 1134–1146. doi:10.1007/s10964-007-9224-0.

- Dwyer, S. B., Nicholson, J. M., & Battistutta, D. (2006). Parent and teacher identification of children at risk of developing internalizing or externalizing mental health problems: A comparison of screening methods. *Prevention Science*, 7(4), 343-357.
- Edelbrock, C., Costello, A. J., Dulcan, M. K., Conover, N. C., & Kala, R. (1986). Parent-child agreement on child psychiatric symptoms assessed via structured interview *Journal of Child Psychology and Psychiatry*, 27(2), 181-190.
- Eklund, K., & Dowdy, E. (2014). Screening for behavioral and emotional risk versus traditional school identification methods. *School Mental Health*, 6(1), 40-49.
- Eklund, K., Renshaw, T. L., Dowdy, E., Jimerson, S. R., Hart, S. R., Jones, C. N., & Earhart, J. (2009). Early identification of behavioral and emotional problems in youth: Universal screening versus teacher-referral identification. *California School Psychologist*, 14, 89-95.
- Elliott, S. N., & Greshman, F. M. (2007). *SSiS: Social Skills Improvement System*. Minneapolis, MN: Pearson.
- Ellis, P. D. (2010). *The essential guide to effect sizes: Statistical power, meta-analysis, and the interpretation of research results*. Cambridge University Press.
- Esch, P., Bocquet, V., Pull, C., Couffignal, S., Lehnert, T., Graas, M., & ... Ansseau, M. (2014). The downward spiral of mental disorders and educational attainment: a systematic review on early school leaving. *BMC Psychiatry*, 14(1), 136-161. doi:10.1186/s12888-014-0237-4
- Feeney-Kettler, K.A., Auster, E.R., & Kratochwill, T.R. (2005). *Teacher training to identify children with anxiety problems (T-TICAP)*. Unpublished manuscript, University of Wisconsin-Madison.

- Fergusson, D. M., & Woodward, L. J. (2002). Mental health, educational, and social role outcomes of adolescents with depression. *Archives of General Psychiatry*, 59, 225–231. doi:10.1001/archpsyc.59.3.225.
- Flaherty, L. T., Weist, M. D., & Warner, B. S. (1996). School-based mental health services in the united states: History, current models and needs. *Community Mental Health Journal*, 32(4), 341-352.
- Garber, J., & McCauley, E. (2002). Prevention of depression and suicide in children and adolescents. In M. Lewis (Ed.), *Child and Adolescent Psychiatry* (3rd ed., pp. 805–821). Philadelphia: Lippincott Williams and Wilkins.
- Gelley, C. (2014). *Accuracy of educators in identifying middle school students with elevated levels of anxiety or depression* (Unpublished doctoral dissertation). Retrieved from ProQuest.
- Glover, T. A., & Albers, C. A. (2007). Considerations for evaluating universal screening assessments. *Journal Of School Psychology*, 45(2), 117-135, doi:10.1016/j.jsp.2006.05.005
- Goodman, R. (1997). The Strength and Difficulties Questionnaire: A research note. *Journal of Child Psychology and Psychiatry*, 38, 581-685.
- Graham, A., Phelps, R., Maddison, C., & Fitzgerald, R. (2011). Supporting children's mental health in schools: Teacher views. *Teachers and Teaching*, 17(4), 479-496.
- Green, H.G. & Zar, J. H. (1989). A basic program to compute the sensitivity, specificity, and predictive values of screening tests. *Educational and Psychological Measurement*, 49, 147-150. doi:10.1177/0013164489491015

Horowitz, J. L., & Garber, J. (2006). The prevention of depressive symptoms in children and adolescents: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 74(3), 401-415.

Husky, M. M., Kaplan, A., McGuire, L., Flynn, L., Chrostowski, C., & Olfson, M. (2011). Identifying adolescents at risk through voluntary school-based mental health screening. *Journal of Adolescence*, 34(3), 505-511.

Johnson, C., Eva, A. L., Johnson, L., & Walker, B. (2011). Don't turn away: Empowering teachers to support students' mental health. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 84(1), 9-14.

Johnson, A. H., Miller, F. G., Chafouleas, S. M., Welsh, M. E., Riley-Tillman, C. T., & Fabiano, G. A. (2016). Evaluating the technical adequacy of DBR-SIS in tri-annual behavior screening: A multisite investigation. *Journal of School Psychology*, 54, 39-57.  
doi:10.1016/j.jsp.2015.10.001

Jorm, A. F., Kitchener, B. A., Sawyer, M. G., Scales, H., & Cvetkovski, S. (2010). Mental health first aid training for high school teachers: A cluster randomized trial. *BMC Psychiatry*, 10, 51-62. doi:10.1186/1471-244X-10-51

Juszczak L., Melinkovich P., & Kaplan, D. (2003). Use of health and mental health services by adolescents across multiple delivery sites. *Journal of Adolescent Health*, 32(6 Suppl.), 108–118. doi:10.1016/S1054- 139X(03)00073-9

Kamphaus, R. W., & Reynolds, C. R. (2007). *Behavior Assessment System for Children-Second Edition (BASC-2): Behavioral and Emotional Screening System (BESS)*. Bloomington, MN: Pearson.

Kauffman, J. M. (2001). *Characteristics of emotional and behavioral disorders of children and youth* (7<sup>th</sup> ed.). Columbus, OH: Merrill.

Kaufman, J., Birmaher, B., Brent, D., Rao, U., Flynn, C., Moreci, P., et al. (1997).

Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): Initial reliability and validity data.

Kelsey, C. L. (2002). *Relationships among personality types of secondary teachers when analyzed according to their subject matter teaching majors* (Doctoral dissertation).

Retrieved from ProQuest.

Kidger, J., Gunnell, D., Biddle, L., Campbell, R., & Donovan, J. (2010). Part and parcel of teaching? Secondary school staff's views on supporting student emotional health and well-being. *British Educational Research Journal*, 36(6), 919-935.

doi:10.1080/01411920903249308

Kilgus, S. P., Chafouleas, S., Riley-Tillman, T., & Welsh, (2012). Direct behavior rating scales as screeners: A preliminary investigation of diagnostic accuracy in elementary school. *School Psychology Quarterly*, 27, 41-50.

Kilgus, S. P., Reinke, W. M., & Jimerson, S. R. (2015). Understanding mental health intervention and assessment within a multi-tiered framework: Contemporary science, practice, and policy. *School Psychology Quarterly*, 30(2), 159-165.

doi:10.1037/spq0000118

Kilgus, S. P., Riley-Tillman, T. C., Chafouleas, S. M., Christ, T. J., Welsh, M. E. (2014). Direct behavior rating as a school-based behavior universal screener: Replication across sites. *Journal of School Psychology*, 52, 63-82.

- Kovacs, M. (2003). *Children's Depression Inventory Manual*. North Tonawanda, NY: Multi-Health Systems, Inc.
- Kovacs, M. (2011). *Children's Depression Inventory 2<sup>nd</sup> Edition (CDI 2) Manual*. North Tonawanda, NY: Multi-Health Systems, Inc.
- Koller, J. R., Osterlind, S. J., Paris, K., & Weston, K. J. (2004). Differences between novice and expert teachers' undergraduate preparation and ratings of importance in the area of children's mental health. *International Journal of Mental Health Promotion*, 6(2), 40-45.
- Kuo, E. S., Vander Stoep, A., Herting, J. R., Grupp, K., & McCauley, E. (2013). How to identify students for School-Based depression intervention: Can school record review be substituted for universal depression screening? *Journal of Child and Adolescent Psychiatric Nursing*, 26(1), 42-52.
- Kuo, E., Vander Stoep, A., McCauley, E., & Kernic, M. A. (2009). Cost-effectiveness of a school-based emotional health screening program. *Journal of School Health*, 79(6), 277-285. doi:10.1111/j.1746-1561.2009.00410.x
- Lane, K. L., & Menzies, H. M. (2003). A school-wide intervention with primary and secondary levels of support for elementary students: Outcomes and considerations. *Education and Treatment of Children*, 26(4) 431-451.
- Layne, A. E., Bernstein, G. A., & March, J. S. (2006). Teacher awareness of anxiety symptoms in children. *Child Psychiatry and Human Development*, 36(4), 383-392.
- Le Mare, L., & Sohbat, E. (2002). Canadian Students' Perceptions of Teacher Characteristics That Support or Inhibit Help Seeking. *The Elementary School Journal*, 102(3). 239.

- Levitt, J. M., Saka, N., Romanelli, L. H., & Hoagwood, K. (2007). Early identification of mental health problems in schools: The status of instrumentation. *Journal of School Psychology*, 45(2), 163-191.
- Loades, M. E., & Mastroyannopoulou, K. (2010). Teachers' recognition of children's mental health problems. *Child and Adolescent Mental Health*, 15(3), 150-156.
- Logan, D. E., & King, C. A. (2001). Parental facilitation of adolescent mental health service utilization: A conceptual and empirical review. *Clinical Psychology: Science and Practice*, 8(3), 319-333.
- March J. (1997). *Multidimensional anxiety scale for children*. MultiHealth Systems Inc., North Tonawanda, NY.
- March, J. (2013). *Multidimensional anxiety scale for children 2<sup>nd</sup> edition*. MultiHealth Systems Inc., North Tonawanda, NY.
- Masten, A. S., Roisman, G. I., Long, J. D., Burt, K. B., Obradović, J., Riley, J. R., . . . Tellegen, A. (2005). Developmental cascades: Linking academic achievement and externalizing and internalizing symptoms over 20 years. *Developmental Psychology*, 41(5), 733.
- Mazzer, K. R., & Rickwood, D. J. (2013). Community-based roles promoting youth mental health: Comparing the roles of teachers and coaches in promotion, prevention and early intervention. *International Journal of Mental Health Promotion*, 15(1), 29-42.
- McIntosh, K., Campbell, A. L., Carter, D. R., & Zumbo, B. D. (2009). Concurrent validity of office discipline referrals and cut points used in schoolwide positive behavior support. *Behavioral Disorders*, 34(2) 100-113.
- Meldrum, L., Venn, D., & Kutcher, S. (2009). Mental health in schools: How teachers have the power to make a difference. *Health & Learning Magazine*, 8, 3-5.



Mental Health First Aid. (2013). Mental Health First Aid. Retrieved June 10, 2015, from

<http://www.mentalhealthfirstaid.org/cs/>

Merikangas, K. R., He, J., Burstein, M., Swendsen, J., Avenevoli, S., Case, B., . . . Olfson, M.

(2011). Service utilization for lifetime mental disorders in US adolescents: Results of the national comorbidity Survey–Adolescent supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*, 50(1), 32-45.

Merikangas, K.R., Jian-ping H., Burstein, M., Swanson, S. A., Avenevoli, S., Lihong C., Benjet, C., Georgiades, K., & Swendsen, J. (2010). New research: Lifetime prevalence of mental disorders in U.S. adolescents: Results from the national comorbidity survey replication- Adolescent supplement (NCS-A). *Journal of the American Academy of Child & Adolescent Psychiatry*, 49(10), 980-989. doi:10.1016/j.jaac.2010.05.017

Merrell, K. W. & Whitcomb, S. A. (2013). *Behavioral, social, and emotional assessment of children and adolescents 4<sup>th</sup> edition*. New York, NY: Routledge.

Miller, F. G., Cohen, D., Chafouleas, S. M., Riley-Tillman, T., Welsh, M. E., & Fabiano, G. A. (2015). A comparison of measures to screen for social, emotional, and behavioral risk. *School Psychology Quarterly*, 30(2), 184-196. doi:10.1037/spq0000085

Miller, L. D., Martinez, Y. J., Shumka, E., Baker, H. (2014). Multiple informant agreement of child, parent, and teacher ratings of child anxiety within community samples. *Canadian Journal of Psychiatry*, 59(1), 34-39.

Mollins, N. C., & Clopton, J. R. (2002). Teachers' reports of the problem behavior of children in their classrooms. *Psychological Reports*, 90(1), 157-164.

- Moor, S., Sharrock, G., Scorr, J., McQueen, H., Wrate, R., Cowan, J., & Blair, C. (2000). Evaluation of a teaching package designed to improve teachers' recognition of depressed pupils - a pilot study. *Journal of Adolescence*, 23(3), 331-342.
- Moor, S., Maguire, A., McQueen, H., Wells, E. J., Elton, R., Wrate, R., & Blair, C. (2007). Improving the recognition of depression in adolescence: Can we teach the teachers? *Journal of Adolescence*, 30, 81-95. doi:10.1016/j.adolescence.2005.12.001
- Morris, R. J., Shah, K., & Morris, Y. P. (2002). Internalizing behavior disorders. In K.L. Lane, F. M. Gresham, & T. E. O'Shaughnessy (Eds.), *Interventions for children with or at risk for emotional and behavioral disorders* (pp. 223-241). Boston: Allyn & Bacon.
- Myers, I., McCaulley, M., Quenk, N., & Hammer, A. (1998). *MBTI manual: A guide to the development and use of the Myers-Briggs Type Indicator (3<sup>rd</sup> ed.)*. Palo Alto, CA: Consulting Psychologists Press.
- Ollendick, T. H., Oswald, D. P., & Francis, G. (1989). Validity of teacher nomination in identifying aggressive, withdrawn, and popular children. *Journal of Clinical Child Psychology*, 18(3), 221-229.
- Papandrea, K., & Winefield, H. (2011). It's not just the squeaky wheels that need the oil: Examining teachers' views on the disparity between referral rates for students with internalizing versus externalizing problems. *School Mental Health*, 3(4), 222-235.
- Pas, E. T., Bradshaw, C. P., & Mitchell, M. M. (2011). Examining the validity of office discipline referrals as an indicator of student behavior problems. *Psychology in the Schools*, 48(6), 541-555.

- Pearcy, M. T., Clopton, J. R., & Pope, A. W. (1993). Influences on teacher referral of children to mental health services gender, severity, and internalizing versus externalizing problems. *Journal of Emotional and Behavioral Disorders*, 1(3), 165-169.
- Perou, R., Bitsko, R. H., Blumberg, S. J., Pastor, P., Ghandour, R. M., Gfroerer, J. C., . . . Schieve, L. A. (2013). Mental health surveillance among children—United States, 2005–2011. *Morbidity and Mortality Weekly Report*, 62(2), 1-35.
- Pianta, R. C. (2001). *STRS Student-Teacher Relationships Scale*. Professional Assessment Resources, Inc.
- Preddy, L., McIntosh, K., Frank, J. L., & Flitchcock, J. (2014). Utility of number and type of office discipline referrals in predicting chronic problem behavior in middle schools. *School Psychology Review*, 43(4), 472-489.
- President's New Freedom Commission on Mental Health. (2003). The President's New Freedom Commission on Mental Health. Retrieved from <http://govinfo.library.unt.edu/mentalhealthcommission/reports/FinalReport/downloads/FinalReport.pdf>
- QPR Institute for Suicide Prevention. (2014). What is QPR?. Retrieved June 11, 2015, from <https://www.qprinstitute.com/about-qpr>
- Raviv, A., Raviv, A., Vago-Gefen, I., & Fink, A. S. (2009). The personal service gap: Factors affecting adolescents' willingness to seek help. *Journal of Adolescence*, 32, 483-499. doi:10.1016/j.adolescence.2008.07.004
- Reinke, W. M., Stormont, M., Herman, K. C., Puri, R., & Goel, N. (2011). Supporting children's mental health in schools: Teacher perceptions of needs, roles, and barriers. *School Psychology Quarterly*, 26(1), 1.

- Reis, C., & Cornell, D. (2008). An evaluation of suicide gatekeeper training for school counselors and teachers. *Professional School Counseling*, 11(6), 386-394.
- Reynolds, W.M. (1987). *Reynolds Adolescent Depression Scale: Professional Manual*. Odessa, FL: Psychological Assessment Resources.
- Richardson, M. J., Caldarella, P., Young, B. J., Young, E. L., & Young, K. R. (2009). Further validation of the systematic screening for behavior disorders in middle and junior high school. *Psychology in the Schools*, 46(7), 605-615.
- Roeser, R. W., & Midgley, C. (1997). Teachers' views of issues involving students' mental health. *The Elementary School Journal*, 2, 115-133.
- Rothì, D. M., Leavey, G., & Best, R. (2008). On the front-line: Teachers as active observers of pupils' mental health. *Teaching and Teacher Education*, 24(5), 1217-1231.
- Severson, H. H., Walker, H. M., Hope-Doolittle, J., Kratochwill, T. R., & Gresham, F. M. (2007). Proactive, early screening to detect behaviorally at-risk students: Issues, approaches, emerging innovations, and professional practices. *Journal of School Psychology*, 45(2), 193-223.
- Shanley, D. C., Reid, G. J., & Evans, B. (2008). How parents seek help for children with mental health problems. *Administration and Policy in Mental Health and Mental Health Services Research*, 35, 135-146.
- Soles, T., Bloom, E. L., Heath, N. L., & Karagiannakis, A. (2008). An exploration of teachers' current perceptions of children with emotional and behavioural difficulties. *Emotional and Behavioural Difficulties*, 13(4), 275-290.

The Depressed Child. (2013, July). Retrieved October 2, 2015, from

[http://www.aacap.org/AACAP/Families\\_and\\_Youth/Facts\\_for\\_Families/FFF-Guide/The-Depressed-Child-004.aspx](http://www.aacap.org/AACAP/Families_and_Youth/Facts_for_Families/FFF-Guide/The-Depressed-Child-004.aspx)

Typical or Troubled?® School Mental Health Education Program. (2014). *Typical or Troubled? School Mental Health Education Program*. Retrieved June 11, 2015, from

<http://www.americanpsychiatricfoundation.org/what-we-do/public-education/typical-or-troubled>

Vidair, H., Sauro, D., Blocher, J., Scudellari, L., & Hoagwood, K. (2014). Empirically supported school-based mental health programs targeting academic and mental health functioning.

*Handbook of Evidence-Based Practices for Emotional and Behavioral Disorders: Applications in Schools*, 15-53.

Walker, H. M., Nishioka, V. M., Zeller, R., Severson, H. H., & Feil, E. G. (2000). Causal factors and potential solutions for the persistent underidentification of students having emotional or behavioral disorders in the context of schooling. *Assessment for Effective Intervention*, 26(1), 29-39.

Walker, H. M., Severson, H., & Feil, E. G. (2014). *Systematic screening for behavior disorders* (2<sup>nd</sup> ed.). Eugene, OR: Pacific Northwest Publishing.

Walker, H. M., Severson, H. (1990). *Systematic screening for behavior disorders: A multiple gating approach*. Longmont, CO: Sopris West.

Walker, H. M., & Shinn, M. R. (2002). Structuring school-based interventions to achieve integrated primary, secondary, and tertiary prevention goals for safe and effective schools. *Interventions for Academic and Behavior Problems II: Preventive and Remedial Approaches*, 1-25.

- Walter, H. J., Gouze, K., & Lim, K. G. (2006). Teachers' beliefs about mental health needs in inner city elementary schools. *Journal of the American Academy of Child & Adolescent Psychiatry*, 45(1), 61-68.
- Weist, M. D., Rubin, M., Moore, E., Adelsheim, S., & Wrobel, G. (2007). Mental health screening in schools. *Journal of School Health*, 77(2), 53-58.
- Williams, J. H., Horvath, V. E., Hsi-sheng, W., Van Dorn, R. A., & Jonson-Reid, M. (2007). Teachers' perspectives of children's mental health service needs in urban elementary schools. *Children & Schools*, 29(2), 95.
- Your Adolescent - Anxiety and Avoidant Disorders. (2015). Anxiety Disorder Resource Center. Retrieved October 2, 2015, from  
[http://www.aacap.org/AACAP/Families\\_and\\_Youth/Resource\\_Centers/Anxiety\\_Disorder\\_Resource\\_Center/Your\\_Adolescent\\_Anxiety\\_and\\_Avoidant\\_Disorders.aspx](http://www.aacap.org/AACAP/Families_and_Youth/Resource_Centers/Anxiety_Disorder_Resource_Center/Your_Adolescent_Anxiety_and_Avoidant_Disorders.aspx)

## APPENDICES

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

5. My highest education level is:  
a. Bachelors/college degree d. Ed.S/Specialist level degree  
b. Master's degree e. Ph.D. or Psy.D.  
c. M.A. + 30 (or equivalent) 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 student 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: Student Demographic 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 school lunch for a free or reduced-price?                    Yes                    No

4. My ethnicity is:

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

5. 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): \_\_\_\_\_

6. My parents are:

- a. Married
- b. Divorced
- c. Separated

- d. Never married
- e. Never married but living together
- f. Widowed

7. Which adult(s) do you live with most of the time?

- a. Mother and Father
- b. Mother only
- c. Father only
- d. Mother and Step-father (or mom's partner)

- e. Father and Step-mother (or dad's partner)
- f. Grandparent(s)
- g. Other relative (please specify): \_\_\_\_\_
- h. Other (please specify): \_\_\_\_\_

*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.*

I read books all the time.

I read books once in a while.

I never read books.

*Please circle the number that describes **how often the sentence is true about you**.*

1. I'm scared of dogs

	Never	Rarely	Sometimes	Often
1. I'm scared of dogs	0	1	2	3

## Appendix C: 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 Golley (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 D: Teacher Consent Form

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.

DEPARTMENT OF PSYCHOLOGICAL AND SOCIAL FOUNDATIONS • COLLEGE OF EDUCATION  
University of South Florida • 4202 East Fowler Avenue – EDU 105 • Tampa, FL 33620-5650  
(813) 974-3246 • FAX (813) 974-5814

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

Version 1-November 13, 2012

## Appendix E: 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 Golley, 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 the 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.

DEPARTMENT OF PSYCHOLOGICAL AND SOCIAL FOUNDATIONS • COLLEGE OF EDUCATION  
University of South Florida • 4202 East Fowler Avenue – EDU 105 • Tampa, FL 33620-5650  
(813) 974-3246 • FAX (813) 974-5814

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. Golley 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 Golley, 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 F: Teacher Nomination Form

### 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, identify 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 circling the names of the students from the attached lists that demonstrate the behaviors below.

Thank you!

Anxiety	Depression
Appears nervous	Cries often
Acts in a fearful manner	Looks sad
Cries, tantrums, freezes in social situations	Excessively shy
Reluctant or afraid to attend school	Avoids or withdraws from social situations
Acts jittery or fidgety	Lack of, or diminished, interest in peers or activities
Worries often	Prefers to spend time alone
Is timid or unassertive	Has a lack of energy/appears tired
Has trouble separating from caregiver	Might act irritable or agitated
Worry about harm befalling caregiver	Changes in appetite—increased or decreased
Physical complaints (headache, stomachache)	Difficulty concentrating
Fear of being humiliated or embarrassed	

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 G: 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 H: Current Approval to Conduct Additional Analyses of Approved Study



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) 974-7091

11/25/2015

Cheryl Gelley, M.A.  
USF Department of Educational and Psychological Studies  
4202 East Fowler Avenue EDU 105  
Tampa, FL 33620

RE: **Expedited Approval for Continuing Review**  
IRB#: CR3\_Pro00010545  
Title: Wellness of Middle School Children

**Study Approval Period: 12/14/2015 to 12/14/2016**

Dear Ms. Gelley:

On 11/25/2015, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within including those outlined below.

**Approved Item(s):**

**Protocol Document(s):**

Dissertation Document

This study involving child participants falls under the minimal risk category 45 CFR 46.404: Research not involving greater than minimal risk.

The IRB determined that your study qualified for expedited review based on federal expedited category number(s):

(9) Continuing review of research, not conducted under an investigational new drug application or investigational device exemption where categories two (2) through eight (8) do not apply but the IRB has determined and documented at a convened meeting that the research involves no greater than minimal risk and no additional risks have been identified.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with USF HRPP policies and procedures and as approved by the USF IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within

five (5) calendar days.

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,

A handwritten signature in black ink, appearing to read "John Schinka, Ph.D."

John Schinka, Ph.D., Chairperson  
USF Institutional Review Board

## Appendix I: Initial IRB Approval



### DIVISION OF RESEARCH INTEGRITY AND COMPLIANCE

Institutional Review Boards, FWA No. 00001669  
12901 Bruce B. Downs Blvd. MDC095 • Tampa, FL 33612-4799  
(813) 974-5636 • FAX (813) 974-5615

December 21, 2012

Cheryl Gelley  
Psychological and Social Foundations  
15426 Plantation Oaks Drive Apt. 1  
Tampa, FL 33647

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/Accent Document(s)  
[Parent Consent Letter.pdf](#)  
[Parent Self-Consent Letter.ndf](#)  
[SBMH Professional Consent Letter.ndf](#)  
[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