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Exploring Complete Mental Health Screening Using Adolescent Self-Reports

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EXPLORING COMPLETE MENTAL HEALTH SCREENING USING ADOLESCENT SELF-REPORTS

by

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ABSTRACT

Exploring Complete Mental Health Screening Using Adolescent Self-Reports

by

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This multiple-paper dissertation explores the technical adequacy of a complete mental health screening protocol that provides information regarding social, emotional, and behavioral problems as well as wellbeing indicators of adolescent student populations. Complete mental health screenings are a promising alternative to tradition identification models to identify students at risk for a variety of behavioral. Emotional, academic, and social problems. Additionally, the inclusion of wellbeing indicators, or strengths, provides a more comprehensive snapshot of student functioning to better inform interventions. In paper 1, the study explores the differences in technical adequacy for a combination of independent screeners versus using these same screeners in an integrated, combined assessment battery. Paper 1 consisted of both exploratory and confirmatory factor analysis of a complete mental health screening protocol comprised of the Student Subjective Wellbeing Questionnaire (SSWQ; Renshaw et al., 2015), the Youth Internalizing Problems Scale (YIPS; Renshaw & Cook, 2018b), the Youth Externalizing Problems Scale (YEPS; Renshaw & Cook, 2019), and Subjective Academic Problems Scale (SAPS; Renshaw, 2018a) measures. Results from exploratory

factor analysis in paper 1 yielded a 16-item integrated measure with strong global model fit indices and psychometric properties. This resulting measure was named the Total Wellbeing School Screening Tool (TWSST). Paper 2 expanded on the first study by testing the resulting complete mental health screening protocol from paper 1 in relation to commonly used clinical measures of anxiety and depression. Further validation analyses support the potential use of the TWSST as a strong school-based screening measure. Additionally, the TWSST yielded moderate to strong discrimination ability for anxiety and depression risk. When taken together, paper 1 and paper 2 support the use of the TWSST as a promising complete mental health universal screening tool within a multi-tiered system of supports.

(127 pages)

PUBLIC ABSTRACT

Exploring Complete Mental Health Screening Using Adolescent Self-Reports

Stephanie Vinal

This study comprises two separate papers that ultimately aim to create and support the use of a new school screening tool to identify student risk for a variety of school-based problems as well as identify their individual strengths. Complete mental health screening refers to a process by which the entire student body of a school is administered a screening tool in order to cast a wide net and increase the likelihood of identifying any student at risk for behavioral, social, emotional, or academic difficulties. By identifying student strengths as well as their risk for problems, schools are better aimed at leveraging the students' skills and informing their interventions in a way that can lead to better outcomes. Using a collection of pre-existing measures, a new measure was created and tested using a series of statistical analyses. The result of these analyses produced a 16-item complete mental health screening measure named the Total Wellbeing School Screening Tool (TWSST). Further study was conducted to support the use of this measure in a new sample with promising results. The TWSST is a promising research tool to explore further validation studies, and a useful option for schools to use as a school screening tool.

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Stephanie Vinal

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Chapter I Introduction

Background, Rationale, and Project Outline

According to survey reports, 46% of adolescents between the ages of 14-18 experience symptoms of a mental illness (Merikangas et al., 2010). Two of the most commonly diagnosed mental health disorders in youth populations ages 3-17 are anxiety (4.1 million) and depression (1.9 million), with prevalence rates only expected to rise (Bitsko et al., 2022). Untreated childhood anxiety or depression is related to chronic anxiety, depression, substance abuse, panic attacks, oppositional defiant disorder (ODD), attention deficit/hyperactivity disorder (ADHD), poor social interactions, decreased academic performance, and proportionately higher rates of early marriage and child-bearing (e.g., Beesdo et. al., 2007; Duchesne et. al., 2008; Kendall & Kessler, 2002; Kessler et. al., 1995; Kessler et al., 1997; Woodward & Fergusson, 2001). Additionally, youth mental health problems have been correlated with various dimensions of distress such as decreased motivation, emotional or behavioral problems, academic failure, and peer problems, (Catalano et al., 2004).

Unfortunately, approximately only half of adolescents diagnosed with a psychiatric disorder receive treatment (Costello et al., 2014). This presents an issue in current mental health services wherein many youth who need services are not likely to receive them. Given the global impact of untreated mental health problems on academic, social, and emotional functioning, identifying and treating these youth mental health problems should be a high priority of school systems. Not only does mental health impact overall educational functioning, but schools are often the primary setting for behavioral and emotional interventions for students (Hoagwood et al., 2005). An interdisciplinary

and interprofessional field of research and practice known as *school-based mental health* has been developing and growing over the last couple decades to help meet this need (Weist et al., 2013; Michael & Jameson, 2017).

School-Based Mental Health Services

Research shows that schools are one of the highest utilized service setting for students to receive mental health services (Hoagwood et al., 2005). Survey estimates of service utilization are often more localized to a geographic area or in service of another research question. It is likely that additional factors such as access to outpatient providers, geographically contextual factors, and availability of school-based services influence the utilization rates. According to a survey of adolescents ages 12-17 regarding any services they received over the past 12 months, 16% (3.9 million) indicated they received services in a private mental health facility, 14.2% (3.4 million) in an educational setting, and 3.1% in a general medical setting (Substance Abuse and Mental Health Services, 2018). Other studies estimate around 23.6% of adolescents received services in school settings, whereas 22.8% received services within an outpatient mental health setting (Costello et al., 2014). Additional research suggests that the most vulnerable populations, including racially or sexually minoritized and low-income individuals, are less likely to have access to mental health services in specialty settings outside of schools (Edelbrock et al., 1986). Since schools are often one of the primary service delivery settings for many adolescents receiving mental health treatment, schools need effective tools to support identification of students placed at risk for mental health concerns (Lipari et al., 2016).

Traditionally, student identification models in schools begin with a referral from a teacher or parent based on an observed problem or issue (Strein et al., 2003). A study conducted by Short et al. (1996) found that 79% of referrals were completed by general education teachers, usually for disruptive behaviors or other behavioral problems. Since these referrals are predominantly focused on behavior as opposed to internalizing problems (e.g., anxiety, depression, trauma-related concerns), other referral pathways may be better at identifying students at-risk for a wider variety of mental health problems (Tilly, 2008). This pattern in referrals may be due to the lack of specific training teachers receive in identifying students experiencing mental health challenges. Notably, teacher-based referrals yield disproportionately high rates of African American or Black males as being placed at risk for emotional and behavioral problems in schools (Ahram et al., 2011; Hosp & Reschly 2003; Jasper & Bouck 2013). The overidentification of certain populations of students for mental health services also leads to the under identification of other groups, including females (Wehmeyer & Schwartz, 2001). To address these concerns, researchers have been investigating more systematic and equitable approaches to identifying youth with mental health concerns by conducing school-based screening for emotional and behavioral problems.

Mental Health Screening in Schools

A key area of current research is focused on the utility of mental health screeners in school settings to aid in systematic and equitable identification of students with mental health challenges. Universal screening refers to the process of systematically assessing an entire population (i.e., a grade level or school) using standardized measurement tools (Glovers & Albers, 2007). Previous use of academic screening using curriculum-based

measures have yielded less disproportional referrals of students of color for special education services when compare to traditional teacher-referral protocols (VanDerHeyden et al., 2003). The same logic applies to school-based mental health screening (Cook et al., 2015). Not only are universal screenings evidenced to reduce bias in referrals and improve service delivery, but the use of universal screenings also supports destigmatization of mental health services and promotes utilization of interventions (Pinfold et al., 2005). Universal screening provide crucial individual student-level data as well as schoolwide or group-level data around student mental health functioning (Humphrey & Wigelsworth, 2016). This big picture data provides schools with an opportunity to evaluate their systems and support service delivery for a larger group of students.

The process of employing universal screening to evaluate every student for risk related to academic, social, emotional, and behavioral problems can be a daunting task. Although the prevalence of universal screening is high with regard to academics, only 2–15% of schools utilize universal screenings for behavioral and mental health concerns (Bruhn et al. 2014; Evans et al., 2005; Romer & McIntosh, 2005). Relying on teachers or other school staff as the sole referral source not only increases the burden on individuals, but also increases the likelihood that some students, especially those experiencing less observable internalizing problems, will not be identified or provided resources (Eklund et al. 2009; Walker et al., 1988). Researchers have theorized the low rates of universal mental health screenings conducted in schools may be attributed to limited resources to purchase the necessary measurement tools, lack of training or support in administration and analysis of resulting data, and ambiguity with regard to best practice guidance around

developing appropriate, feasible, and sustainable screening protocols (Glover & Albers, 2007; Splett et al., 2013). Schools require access to high-quality assessment tools and alternative referral models in order to conduct effective universal mental health screening, and more guidance is emerging on this topic over time.

Complete Mental Health Screening

One emerging area for improving the acceptability and effectiveness of school-based mental health screening focuses around expanding the definition of mental health to include wellbeing indicators. While research indicates that measures of behavior or emotional problems have potential to predict academic problems, solely problem-focused screenings do not provide meaningful information regarding the student strengths that are valued by educators and caregivers. By incorporating problems and strengths-based evaluations of student functioning, practitioners can create more acceptable, targeted, and informative treatment plans. The inclusion of well-being indicators, or strengths, is referred to as *complete mental health screening* (Moore et al., 2015). This model reflects a duality perspective as illustrated by the "dual-factor" (Suldo & Shaffer, 2008) or "two-continua" (Keyes, 2005) models that present mental health and mental illness not as two mutually exclusive concepts or polarized poles, but rather as related constructs.

Within the complete mental health screening model, one construct is the symptomology related to psychological distress or behavior problems, and the second construct is subjective well-being or social-emotional strengths. Research indicates that the complete mental health screening approach is related to higher student engagement (Antaramian et al., 2010), social functioning and academic attainment (Suldo & Shaffer 2008), and physical health (Renshaw & Cohen, 2014). Screening for problems and well-

being indicators provides a more holistic understanding of students and supports the identification of students at-risk for problems before they become more severe (Furlong et al., 2014). Research shows there is a strong relationship between social, behavioral, emotional, and academic problems on overall student functioning (Kamphaus et al., 2010). Therefore, conducting universal screening for only mental health problems fails to capture the bi-directional relationship between these domains of wellbeing.

When applying the complete mental health screening model with an adolescent population, self-reports are the preferred assessment method given it provides information regarding the individual's internal experiences and their perception of their own subjective wellbeing free from third-party interpretation (Smith et al., 2007). When combined within a prevention framework, universal complete mental health screening has the potential to support the overall wellbeing of not only students placed at-risk, but the mental health of all students in the school population. There is therefore increasing research focused around developing relevant and high-quality screening protocols that address students' complete mental health (e.g., Dowdy et al., 2018; Moore et al., 2015; Furlong et al., 2014; Kamphaus & Reynolds, 2007).

Relevant and High-Quality Screening Protocols

The selection of relevant and high-quality assessment instruments is a key consideration in a complete mental health screening model. Glover and Albers (2007) outlined three considerations to evaluate the quality of a universal screening tool: (a) *appropriateness for the intended use* (e.g., Does this measure evaluate the relevant constructs?), (b) *technical adequacy* (e.g., Does this measure produce valid and reliable scores?), and (c) *usability* (e.g., How reasonable is this measure to use in a practical

setting?). Additionally, Lane et al. (2010) expand on implementation and feasibility considerations for emotional and behavioral screeners specifically, such as the cost and the length of the measure. In order to better facilitate the implementation of universal complete mental health screening tools in schools, research is needed to ensure these measures are affordable, empirically valid, relevant, and easy to administer and use resulting data.

Although the appropriateness, technical adequacy, and usability of mental health problem screeners is well documented (e.g., Stifler & Dever, 2015; von der Embse et al., 2022), models of complete mental health screening are relatively new and requires additional exploration (Moore et al., 2015; Kim et al., 2014). Specifically, additional research is needed to explore the practical utility and predictive ability of complete mental health screening protocols (cf. Albers et al., 2007; Nickerson & Fishman 2013). This form of screening is relatively new and therefore there are limited implementation suggestions for schools with regard to selecting appropriate measures to conduct complete mental health screenings. In order to further support the implementation of these screenings in schools, additional research is needed to generate evidence that can be used to establish best-practice suggestions for the selection of measures and procedures.

Purpose of the Present Dissertation

This multiple-paper dissertation aims to explore the technical adequacy of a complete mental health screening protocol that provides information regarding social, emotional, and behavioral problems as well as wellbeing indicators of adolescent student populations. The first paper of this multiple-paper dissertation aims to explore the differences in technical adequacy for a combination of independent screeners versus

using these same screeners in an integrated, combined assessment battery. The second paper of this study will build off the first study by testing the predictive validity of this same complete mental health screening protocol in relation to traditional clinical measures of anxiety and depression.

Paper 1: *Comparison of Independent Measures Versus an Integrated Measurement Model for Screening Student Wellbeing and Problems*

Paper 1 will consist of a series of factor analyses (both exploratory and confirmatory factor analysis) of a complete mental health screening protocol comprised of the Student Subjective Wellbeing Questionnaire (SSWQ; Renshaw et al., 2015), the Youth Internalizing Problems Scale (YIPS; Renshaw & Cook, 2018b), the Youth Externalizing Problems Scale (YEPS; Renshaw & Cook, 2019), and Subjective Academic Problems Scale (SAPS; Renshaw, 2018a) measures. Using two pre-existing data sets (one from 2019 and one from 2021), this study will evaluate the technical adequacy of these screeners as individual measures versus an integrated, combined set. The overarching aim of this study is test if, considering theoretical research and factor loadings, the integrated screening battery can be simplified and reduced to yield an equally strong measurement tool compared with the individual screeners. The research questions are as follows:

1. Does confirmatory factor analyses of the SSWQ (student wellbeing), YIPS (internalizing problems), YEPS (externalizing), and the SAPS (academic problems) yield adequate structural properties as independent measures for use as school-based screeners?

2. Do scores from the SSWQ, YIPS, YEPS, and the SAPS demonstrate theory consistent relationships (convergent and divergent validity) with each other?
3. Does exploratory factor analyses of the combined, integrated protocol consisting of the SSWQ, YIPS, YEPS, and SAPS yield a latent structure that aligns with the four domains of the independent measures (student wellbeing, internalizing problems, externalizing problems, academic problems)?
4. Based on theoretical considerations and factor loadings resulting from the exploratory factor analysis of the combined screening protocol, can the measurement model be reduced to a more simple structure that adequately represents the identified latent variables?

The data analyses for Paper 1, using preexisting datasets, was completed at the time of this study. This paper was coauthored with the dissertation Chair, Dr. Tyler Renshaw.

Paper 2: Predictive Validity of Independent Screeners Versus an Integrated Screening Model on Clinical Measures of Anxiety and Depression

Paper 2 will further evaluate the technical adequacy of the combined, integrated complete mental health screening protocol tested in Paper 1. Whereas the previous study used a preexisting dataset, this study will collect new data using online survey panels. This study will expand on the previous study by exploring the predictive validity of the screening tools, both as individual measures and as an integrated assessment battery, in relation to traditional clinical measures of anxiety and depression. By doing so, this study aims to further establish the construct convergence/ divergence of the school screening tools to predict clinical levels of anxiety and depression problems. If predictive validity

can be established, this study may further inform the use of completing mental health universal screening within a multi-tiered system of supports. The research questions are as follows:

1. Does confirmatory factor analyses of the SSWQ (student wellbeing), YIPS (internalizing problems), YEPS (externalizing), and the SAPS (academic problems) yield adequate structural properties as independent measures for use as school-based screeners?
2. Does confirmatory factor analyses of the abbreviated complete mental health screening model (yielded from EFA in Paper 1) yield adequate structural properties as an integrated school-based screener?
3. Do theory consistent relationships exist between commonly used clinical measures of adolescent anxiety and depression and the domains assessed by the independent screeners and the integrated, abbreviated screening battery?
4. Do the abbreviated and integrated complete mental health screening protocol (yielded from EFA in Paper 1) have differential predictive validity related to clinical levels of anxiety and depression when compared to the individual screening measures?

Chapter II Paper 1

Background, rationale, and paper outline

Addressing adolescent mental health needs in school systems is a pivotal area of continued research, practice, and policy. Given current estimates indicate 46% of adolescents ages 14-18 experience symptoms related to mental illness, emphasis on proper identification and treatment is crucial. The most common adolescent behavioral and mental health problems are commonly referred to in two subgroups: internalizing (e.g., anxiety, depression) and externalizing (e.g., oppositional defiant disorder, attention deficit hyperactivity disorder) (Hoagwood et al., 2012). Although a significant amount of research supports the increasing prevalence of youth and adolescent mental health problems (Merikangas et al., 2010), research also shows that most adolescents with such problems do not receive treatment (Radez et al., 2021). Untreated mental illness is correlated with decreased academic performance, school enrollment, cognitive capabilities, homework and class assignment completion, and higher rates of absenteeism (Joe et al., 2009). With regards to academic functioning, without mental health services students are at a higher risk for lower reading and math scores as well as lower GPA and high school noncompletion (Bussing et al., 2012; Cunningham et al., 2013; DeSocio & Hootman, 2004; Bailey et al., 2012). In addition to academic challenges, youth and adolescents with mental health problems are more likely to engage in risk-taking behaviors (e.g., substance abuse, unplanned pregnancy; Joe et al., 2009), which may have long-term consequences on their health and wellbeing.

Mental Health Services and Screening in Schools

Given the high rates of untreated mental health problems in youth and adolescent populations, an emphasis on developing systems and tools to support school-based interventions is a growing need. Research indicates that schools are often the primary or only service setting for students with emotional and behavioral problems (Burns et al., 1995), especially for those exposed to social risk factors (e.g., financial barriers, cultural or systemic oppression) (Radez et al., 2021). The first step in providing services to struggling students is to have a way to identify them. School-wide or universal mental health screenings are gaining support in research and practice as a way to identify students experiencing mental health problems and, following, to connect them with services (Dowdy et al., 2015; Costello, 1996). This systematic and early identification screening model is an alternative to a referral-based system, where struggling students are referred by a teacher or concerned parent based on an observed concern (Strein et al., 2003).

In practice, universal screening in accomplished using a measure or combination of measures administered to the entire student body of a school. Based on the results of the screening, individual students are identified, categorized, and then may receive follow-up services based on their specific problems. Additionally, schools can use the aggregate student data in order to improve systems of identification and service delivery (Dowdy et al., 2010). Universal screenings as a model of student identification and risk assessment increases the likelihood of accurately identifying overlooked students—such as those from under or over-identified groups, sub-clinical risk populations, or those with internalizing problems—and providing these students needed services (Dowdy et al.

2010; Eklund et al. 2009). Schools have long used methods of curriculum-based and standardized academic screening as a component of schoolwide prevention programming (Ikeda et al., 2008; Lane et al., 2010). However, using the same approach to systematically assess for mental or behavioral problems is relatively new. Initial research has indicated some potential benefits for universal mental health screenings; however, additional research is needed to evaluate the efficacy, utility, and predictive validity of these screenings (Epstein & Sharma 1998; Furlong et al., 2014). Specifically, the inclusion of protective factors and social-emotional skills related to academic, emotional, social, and behavioral wellbeing is a key area of future research for screening studies.

Complete Mental Health Screening

The inclusion of strengths as well as problems produces a more complete and meaningful assessment of overall student functioning. This model of screening student strengths and deficits is referred to as *complete mental health screening* (Moore et al., 2015). A study conducted by Kim et al. (2014) found that strengths-based measures explained 32% of student overall wellbeing while deficits-based measures explained 8% of the variance. Based on previous research (Furlong et al., 2014; Suldo & Shaffer, 2008), complete mental health models have been comprised of various psychological distress and social-emotional strengths measures (Keyes, 2005; Suldo & Shaffer, 2008). Instead of presenting mental health as solely the absence of problems, this alternative model of mental health considers the balance between problems and wellbeing.

Importantly, the complete mental health screening model is relevant to all students within a school population. Although not all students will be identified for risk, all students have varying skills and strengths. This approach to screening helps schools to

see not only the problems their students are experiencing, but also the assets and strengths that they can bolster to improve overall student functioning (Epstein, 1999). Recent research suggests that this form of screening is linked to higher levels of student engagement (Antaramian et al., 2010), social functioning and academic attainment (Suldo & Shaffer 2008), and physical health (Renshaw & Cohen, 2014). Complete mental health screening protocols are more likely to accurately identify students at-risk when compared to traditional referral models. Additionally, complete mental health screenings provide a more robust picture of student functioning that emphasizes the desirable indicators that educators and caregivers value.

Commonly Used Screening Tools

Currently, complete mental health screening protocols use individual or sets of broadband screening tools to assess various domains of student functioning. In contrast to disorder specific measurements, broadband screeners assess a variety of symptoms (Whitcomb, 2013). Additionally, broadband screeners streamline the screening process by limiting the use of independent measures and increase the likelihood of identifying a wide range of mental health disorders, especially co-occurring disorders that have high prevalence rates in youth and adolescent populations (Rutter & Sroufe, 2000). The goal of screening is not to evaluate the intensity or frequency of specific problems, but to identify students placed at-risk for a variety of problems, and who could benefit from additional services or interventions (Feil et al., 2002). Given the few emotional and behavioral broadband screeners currently available are lengthy or disorder specific (Stiffler & Dever, 2015), schools are often forced to combine independent measures in order to assess for their domains of interest. This can negatively impact the

administration and the data analysis of the aggregated results. Not only does the inclusion of multiple measures increase the burden on the respondents, but the presentation of multiple measures (e.g., which order they are presented in) can impact responses (Moore et al., 2015).

Although there are a variety of emotional and behavioral broadband screening tools with strong psychometric properties, few assess for academic domains of functioning as well. Stiffler and Dever (2015) provide a comprehensive review of available screening tools that assess varying components of academic, behavioral, and emotional functioning (referred to as "psychosocial risk"). According to the authors, these tools include the Social, Academic, and Emotional Behavioral Risk Screener (SAEBRS; Kilgus et al., 2013), the Behavioral and Emotional Screening System (BASC-2 BESS; Dowdy et al., 2011), and the Pediatric Symptom Checklist (PSC; Jellinek et al., 1986). Another widely used broadband screener that could be added to this list is the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). Although each of these broadband screeners provide useful information regarding the presence of problems, they do not meet criteria alone as a screening protocol of complete mental health.

The PSC is a widely-used screening tool to assess emotional and behavioral problems available in a variety of informant report formats. The PSC contains three subscales: the Attention Subscale, the Anxiety/Depression (Internalizing) Subscale, and the Conduct (Externalizing) Subscale. Although the PSC is evidenced to predict academic problems (Shell et al., 1989), it does not directly address academic skills or deficits. Additionally, the PSC does not provide information regarding student strengths across any of the targeted domains. The BESS (Kamphaus & Reynolds, 2007) was

developed within the theoretical constructs of the disorder-specific BASC-2 measure to identify students at-risk for developing a disorder. Further factor analysis research suggested the BESS assesses domains of internalizing, externalizing, school problems, inattention, and adaptive skills (see Dowdy et al. 2011; Dever et al. 2012). According to Dowdy et al. (2011), the adaptive skills domain included items that assessed aspects of functional communication, adaptability, attention, social skills, leadership, and daily living. Upon further analysis of the items within the adaptive skills domain, some of the items are negatively-worded. For example, the item "I feel out of place around people" logically represents the absence of a skill rather than the presence of a strength or wellbeing.

The SDQ (Goodman, 1997) is a broad screening tool used to identify students at-risk for conduct problems, inattention-hyperactivity, emotional symptoms, peer problems, and prosocial behaviors. Additionally, the SDQ provides an overall difficulties score and an impact severity score. The SDQ is available in parent, teacher, and self-report informant formats, with all formats indicating adequate psychometric properties (Goodman and Scott 1999; Mellor 2004; Goodman et al. 2003). The main concern with using the SDQ as a screening tool is that is has shown to have a low false positive and higher false negative rates—meaning many students may go unidentified using this tool (White et al., 2013; Lane et al, 2010). The final measure identified by Stiffler and Dever (2015), the SAEBRS (Kilgus et al. 2013), most closely aligns with the assessment targets of a complete mental health screening approach. The SAEBRS is a 14-item teacher-informant measure that yields three domain scale scores; social behavior, academic behavior, and emotional behavior. The measure is short and takes only 3 minutes per

rating. The SAEBRS is limited, however, as it reverses scores risk or problem items to give a positive total score, which does not allow for separating out an assessment of student strength from student problems. Ultimately, all of the screening tools previously discussed are reliable and useful for supporting mental health services in schools. However, for the purpose of complete mental health screening of emotional, behavioral, and academic problems and strengths, these measures would not be sufficient tools, as they are primarily problem oriented.

To aid in the selection of screening tools, Glover and Albers (2007) provided a guideline of three key considerations. The first consideration is how *appropriate* the measure is for its intended use (e.g., Does this measure the concepts we want to measure?). The second consideration is if the measure have acceptable *technical adequacy* (e.g., Does it reliably produce expected results?). Finally, the third consideration is how *usable* the measure is (e.g., How easily can this measure be used in the relevant setting?). In addition to these considerations, Lane et al. (2010) recommends considering the cost of the measure and the feasibility of implementation (e.g., is it easy to administer, not too long to be laborious). These guidelines provide a helpful structure to evaluate the selection and use of screening measures. Given there is not a gold-standard broadband screening tool that meets these selection considerations to assess students' complete mental health, more research is needed to validate potential complete mental health screening protocols for use in schools.

Purpose of the Current Study

The purpose of the current study is to utilize best-practice considerations for the selection and use of behavioral mental health measures in order to establish a complete

mental health screening protocol. The goal of this screening is to provide useful information regarding student problems as well as strengths, which will be referred to as *wellbeing indicators* (positive or desirable skills or traits; Roberson & Renshaw, 2019). Given the population of interest for this study is adolescent students, a self-report measure is the preferred from of reporting (Whitcomb, 2018). Keeping the Glover and Albers (2007) guidelines in mind, the measures selected for this study are the Student Subjective Wellbeing Questionnaire (SSWQ; Renshaw, 2015; Renshaw et al., 2014), the Youth Internalizing Problems Scale (YIPS; Renshaw & Cook, 2016), the Youth Externalizing Problems Scale (YEPS; Renshaw & Cook, 2018), and the Subjective Academic Problems Scale (SAPS; Renshaw, 2017). These measures were selected as they are available for free, have adequate psychometric properties, were developed specifically for use in school settings within a prevention oriented model, and, when combined, they provide a picture of complete mental health (Kim et al., 2021).

Although various brief mental health screeners have been developed and validated for use in school settings, there is a lack of empirical support for a comprehensive measurement tool that provides information regarding common behavior problems (e.g., anger, difficulty concentrating, oppositional behaviors), internalizing problems (e.g., anxiety, low self-confidence, depression), and academic problems (e.g., low grades, lack of motivation) in combination with positive wellbeing indicators (e.g., feeling connected to school, meaningful friendships, engagement in learning). The combination of the SSWQ/YIPS/YEPS/SAPS measures yields a relatively comprehensive battery for screening broad student functioning. While research supports their use as independent measures, exploring the structure of these measures as a combined battery will support its

use as a complete mental health screening protocol. By evaluating the technical adequacy of both the independent measures as well as the combined or integrated battery, this study will provide evidence-based guidelines as to how to best use these measures for complete mental health screening. Additionally, it is possible that there is overlap between some of the constructs assessed by these four measures. In order to support feasibility of use, this study will also explore the possibility of simplifying or streamlining the combined battery into a more fundamental set of items that accounts for students' complete mental health functioning.

This study was conducted using two similar samples of adolescents from naturalistic school-based screening occasions that occurred two years apart. The research questions guiding this study are as follows:

1. In both samples, do confirmatory factor analyses (CFA) of the SSWQ (student wellbeing), YIPS (internalizing problems), YEPS (externalizing), and the SAPS (academic problems) yield adequate structural properties as independent measures for use as school-based screeners?
2. In both samples, do scores from the SSWQ, YIPS, YEPS, and the SAPS demonstrate theory consistent relationships (convergent and divergent validity) with each other?
3. In the first sample, do exploratory factor analyses (EFA) of the combined, integrated protocol consisting of the SSWQ, YIPS, YEPS, and SAPS yield a latent structure that aligns with the four domains of the independent measures (student wellbeing, internalizing problems, externalizing problems, academic problems)?

4. In the first sample, can the EFA measurement model be reduced to a simpler structure that adequately represents the identified latent variables?
5. In the second sample, do CFA on the measurement model resulting from the EFA (conducted with the first sample) yield adequate structural properties to support a multidimensional integrated screener?

Methods

Participants and Data Collection

The preexisting data set used in this study consists of practice-based self-report screening data obtained from secondary students as part of a data-sharing agreement between a local school district and the university. Two screening administrations comprise the dataset: one from May 2019 (N = 1,881) and the other from February 2021 (N = 1,642). Participants included students from grades 6–12, ages 11–19 years, who were majority White-identifying. All available participant demographics are presented in Table 1. The data was securely stored in a FERPA compliant platform and all information was de-identified.

Measures

Student Subjective Wellbeing Questionnaire (SSWQ)

The SSWQ (Renshaw et al., 2015) is a 16-item self-report measure that evaluates four domains of school-specific student wellbeing: academic efficiency, school connectedness, joy of learning, and educational purpose. The four domains comprised

together also yield an overall student subjective wellbeing total score. According to the measure developers, the SSWQ takes 3 minutes to complete, has a 3rd-4th grade readability, and is suggested for use with students ages 11-18. The measure is free to use and can be downloaded in an electronic version on the Open Science Framework. The SSWQ items are positively worded to reflect student perceptions of their functioning (e.g., "I feel like I belong at my school" and "I feel it is important to do well in my classes"). Responses are presented in a relative frequency of experience format ranging from 1-4 (1 = Almost Never, 4 = Almost Always). Score interpretations are provided for each of the subscales mirroring the response format, representing lower or higher relative frequencies of wellbeing. Although these scores are not true cut off scores to determine level of risk or specific problem, higher scores indicate more positive wellbeing while lower scores indicate lower wellbeing. Previous research shows the SSWQ has adequate factor structure, internal consistency reliability, and convergent/ discriminant validity to support its use as a school-based screening tool (Renshaw et al., 2015; Zadworna et al., 2022).

Youth Internalizing Problems Screener (YIPS)

The YIPS (Renshaw & Cook, 2018b) is a 10-item, self-report measure of the presence of internalizing problems presented in relative frequency of experience format ranging from 1-4 (same as the SSWQ). The items reflect a variety of internalizing problems associated with domains of anxiety (e.g. "I feel nervous or afraid") and depression (e.g., "I feel worthless or lonely when I'm around other people"). The measure yields a total score that can be used to assess the respondents' level of risk associated for internalizing mental health problems. Preliminary research suggests that a

cut-off score of 21 represents a higher or lower risk for internalizing problems. The YIPS measure developers suggest using local norming protocols as no nationally representative normative-level data currently exists. Previous research shows the YIPS has adequate factor structure, internal consistency reliability, and convergent/ discriminant validity to support its use as a school-based screening tool (Renshaw & Cook, 2018b; Arslan & Renshaw, 2019).

Youth Externalizing Problems Scale (YEPS)

The YEPS (Renshaw & Cook, 2019) is a 10-item self-report measure of student externalizing problems, intended for use a screening and research tool in school settings. The measure contains items that assess a variety of behavioral problem domains such as aggression (e.g., "I fight and argue with other people"), inattention (e.g., "I get distracted by the little things happening around me"), and impulsivity (e.g., "I talk a lot and interrupt others when they are talking"). Responses are presented in relative frequency of experience format ranging from 1-4 (1 = Almost Never, 4 = Almost Always). Similar to the YIPS, currently there is no normative data is available for the YEPS to inform cutoff scores. Therefore, the developers suggest using local norming approaches to assess relative risk specific to context of the administration. Generally, the higher the overall score suggests the greater level of student's presence of externalizing problems. Previous research shows the YEPS has adequate factor structure, internal consistency reliability, and convergent/ discriminant validity to support its use as a school-based screening tool (Renshaw & Cook, 2019).

Subjective Academic Problems Scale (SAPS)

The SAPS (Renshaw, 2018a) is a 7-item, self-report measure developed as a research and screening tool to assess student perceptions of their academic functioning. The items are negatively worded, meaning they reflect academic-related problems that a student may be experiencing (e.g., “I have a hard time doing my homework” and “I am not a very good student”). SAPS items are arranged along the same response scale as the SSWQ, YIPS, and YEPS. While no national or regional data currently exists to inform cutoff scores or classifications, higher SAPS ratings indicate higher levels of academic problems. Overall scores can be utilized to assess the overall levels of student problems at an aggregate (e.g., school or grade level) or individual student level. Previous research shows the SAPS has adequate factor structure, internal consistency reliability, and convergent/ discriminant validity to support its use as a school-based screening tool (Renshaw, 2018a).

Data Analyses

Preliminary Analyses

Preliminary analysis of the datasets were performed to clean the data using visual analysis to remove any mis-labeled or inaccurately identified responses. Before visual and statistical analysis, variables of the data set were re-coded in a more user-friendly manner (e.g., calculating values for subscales and total scores). Data set one (2019) included 1880 data points, with seven entries missing the “age” response. No other data points were missing for “grade”, “gender”, or “race/ethnicity”. Data set two (2021) comprised 1641 data points, with two missing data points for “grade”, one for “age”, two for “race/ethnicity”, and 667 for “gender”. The high number of missing gender data can

be attributed to many of the respondents choosing not to provide any answer, or the answers were not codable. No multivariate outliers were detected for either data set. Descriptive statistics were run on both samples to assess the distributions, and internal consistency reliabilities. Additionally, correlations were run to examine the relationships between each of the total measures. Expected convergent and divergent relationships were observed via the correlation matrix. All relations among the scales and subscales were theoretically consistent with the expected strength and directionality. Participant demographics for each sample can be found in Table 1 and Table 2.

Table 1. Participant Demographics for Sample 1

Demographic	Frequency	Percent
Race/Ethnicity		
Asian	73	3.88
Black or African American	46	2.44
Latino/a or Hispanic	463	24.63
Multiple or mixed	143	7.61
Native American / Native Alaskan	27	1.44
Native Hawaiian or Pacific Islander	32	1.70
White	1096	58.30
Gender		
Male	912	48.51
Female	940	50.00
Other	28	1.49
Grade		
12	127	6.76
11	156	8.30
10	210	11.17
9	249	13.25
8	337	17.93
7	402	21.38
6	399	21.22

Table 2. Participant Demographics for Sample 2

Demographic	Frequency	Percent
Race/Ethnicity		
Asian or Asian American	58	3.53
Black or African American	50	3.05
Latinx or Hispanic	421	25.66
Multiple or mixed	97	5.91
Native American / Native Alaskan	20	1.22
Native Hawaiian or Pacific Islander	43	2.62
White	844	51.43
I prefer not to answer	93	5.67
Other	13	0.79
Gender		
Male	463	28.22
Female	477	29.07
Non-Binary	6	0.37
Transgender	6	0.37
Other	22	1.34
Missing	667	40.65
Grade		
12	197	14.56
11	246	15.00
10	239	14.58
9	292	17.81
8	230	14.02
7	209	12.75
6	226	13.79

Primary Analyses

Primary analyses were conducted in two phases using the two datasets described above. In the first phase, independent CFA for each measure and bivariate correlations were performed on the dataset from May 2019 (Sample 1). Using this same dataset, EFA was conducted to explore the covariance and reduce ambiguity and redundancy of the

latent constructs represented in the SSWQ, YIPS, YEPS, and the SAPS (Kahn, 2006; Costello & Osborne, 2005; Kootstra, 2004). The goal of the EFA was to identify a more simplified factor structure than the pre-existing factor structure of the independent measures. In order to guide the model refinement process, certain consideration rules were developed. First, a parallel analysis and scree test to evaluate the eigenvalues will indicate which factor structures to retain (Costello & Osborne, 2005). Additionally, an oblique rotation was used to observe the correlations between the factors (Kahn, 2006). To retain the strongest model representation, any items or factors with variable coefficients lower than .30 were removed (Field, 2013). Assuming redundancy of the items, items with the strongest variable coefficients balanced with theoretical value will be retained across each of the factors.

In the second phase, independent and integrated CFA (resulting from EFA with Sample 1) as well as bivariate correlations were conducted with the February 2021 dataset (Sample 2). Further details about primary analyses for Sample 1 and Sample 2 are included in the Results section, below.

Results

Sample 1 Results

CFA for Independent Measurement Models

A CFA was conducted using an ordinal estimator on each of the independent measures to explore their structural properties as school-based screeners. Results from the CFA of the SSWQ, suggest a strong global model fit: $c^2 = 346.928$, $df = 98$, $p = <.001$;

CFI = .993; RMSEA (90% CI: 0.0033, 0.041) = 0.037 and SRMR = 0.040. Standard estimates of the SSWQ factor loadings were strong (0.550–0.797). Strong global model fit was also found for the YIPS: c^2 = 69.534, *df* = 35, *p* = <.001; CFI = .997; RMSEA (90% CI: 0.033-0.041) = 0.037 and SRMR = 0.040. Standard estimates of the YIPS factor loadings were strong (0.550–0.797). The CFA of the YEPS again yielded a strong global model fit: c^2 = 69.534, *df* = 35, *p* = <.001; CFI = .997; RMSEA (90% CI: 0.015-0.031) = 0.023 and SRMR = 0.032. Standard estimates of the YEPS factor loadings were strong (0.5430–0.687). Finally, the CFA of the SAPS again yielded adequate but weaker global model fit indices: c^2 = 251.342, *df* = 35, *p* = <.001; CFI = .952; RMSEA (90% CI: 0.051, 0.064) = 0.057 and SRMR = 0.087. Standard estimates of the SAPS factor loadings were weak to strong (0.196–0.556). The weakest loading item for the SAPS was 0.420 and the highest was 0.634.

Correlations

Table 3 presents the correlations among the original versions of the SSWQ, YIPS, YEPS, and SAPS scores. Strong to moderate positive correlations were found between the SSWQ subscales, which suggests that markers of student wellbeing are interconnected. Specifically, there were strong correlations found between the SSWQ Total Wellbeing subscale and the Joy of Learning, School Connectedness, Educational Purpose, and Academic Efficacy subscales of the measure. Additionally, there was a strong correlation between the SSWQ Educational Purpose and Joy of Learning subscales.

Small to moderate positive correlations were found among the rest of the SSWQ subscales. Specifically, moderate positive correlations were found between the SSWQ

Joy of Learning subscale with the School Connectedness and Academic Efficacy subscales. There were also moderate positive relationships found between the SSWQ School Connectedness subscale with the Educational Purpose and the Academic Efficacy subscales. Finally, there were moderate positive correlations between the SSWQ Educational Purpose subscale and the Academic Efficacy subscale (see Table 3).

Expected negative relationships were found between the YIPS, YEPS, and SAPS, which were problems-focused measures, and the SSWQ wellbeing subscales. Specifically, there were strong negative correlations found between the SAPS and the SSWQ Total Wellbeing and the Academic Efficacy subscales.

Moderate negative relationships were also found between the YIPS and the SSWQ Total Wellbeing and School Connectedness scales. Similarly, moderate negative relationships were found between the YEPS and the SSWQ Total Wellbeing, Educational Purpose, Academic Efficacy scales. The SAPS was moderately negatively correlated with the SSWQ Joy of Learning and the Educational Purpose subscales. Small negative correlations were found between the YIPS total and the SSWQ Academic Efficacy subscale, the YEPS total and the SSWQ School Connectedness and Joy of Learning subscales, and the SAPS total and the SSWQ School Connectedness subscale (see Table 3).

Table 3. Bivariate Correlations (r) Between Independent Screening Measures with Sample 1

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. SW	—							

2. JL	.836	—						
3. SC	.758	.518	—					
4. EP	.838	.669	.482	—				
5. AE	.762	.495	.395	.543	—			
6. YIPS	-.498	-.391	-.576	-.336	-.277	—		
7. YEPS	-.503	-.395	-.382	-.422	-.406	.569	—	
8. SAPS	-.609	-.46	-.369	-.431	-.684	.496	.581	—

Note. All correlations were significant at the $p < .001$ level. SW = Student Wellbeing total scale of the SSWQ; JOL = Joy of Learning subscales of the SSWQ; SC = School Connectedness subscales of SSWQ; EP = Educational Purpose subscales of SSWQ; AE = Academic Efficacy subscales of SSWQ; YIPS = Youth Internalizing Problems Screener; YEPS = Youth Externalizing Problems Screener; SAPS = Subjective Academic Problems Scale.

EFA of Integrated Screener Model

Unconstrained EFA Model Evaluation. Results of the unconstrained EFA yielded strong Kaiser-Meyer-Olkin (KMO) sampling adequacy (0.96) and consisted of five factors with weak to strong factor correlations. Factor 1 was strongly positively correlated with Factor 2 (0.522) and Factor 4 (0.562), and a strong negative correlation was found between Factor 1 and Factor 3 (-0.508). No correlation was found between Factor 1 and Factor 5 (0.002). A strong positive correlation was found between Factor 2 and Factor 4 (0.588), a strong negative correlation as found between Factor 2 and Factor 3 (-0.676), and a near-zero negative correlation was found between Factor 2 and Factor 5

(-0.054). Factor 3 was strongly negatively correlated with Factor 4 (-0.545) and there was a small positive correlation between Factor 3 and Factor 5 (0.271).

Factor 1 contained 18 items from the SSWQ, YIPS, and YEPS measures. More specifically, this factor was comprised of items from the SSWQ Joy of Learning subscale and one from the School Connectedness subscale, all of the YIPS items, and three of the YEPS items. Conceptually, these items are broadly connected to the problems and positive aspects of being engaged and feeling comfortable in school. Factor 2 contained 18 items from the SSWQ, YEPS, and the SAPS measures. The second factor contained all of the SAPS items, which did not load strongly onto any other factors. Additionally, the SSWQ items loading on the second factor were all from the Academic Efficacy subscale and the YEPS item measured problems with focusing on tasks. This factor appeared to capture problems with school-based outcomes. Factor 3 contained 8 items from the SSWQ measure, along with the entirety of the Joy of Learning and the Educational Purpose subscales. This third factor reflects a conceptual measurement of a student's belief of how important they view their school activities and whether or not they enjoy them. Factor 4 contained 8 items, all from the YEPS measure, suggesting this factor captures externalizing problems. Finally, Factor 5 contained 4 items from the SSWQ measure, all from the School Connectedness subscale. Overall, 6 items cross-loaded onto more than one factor (i.e., SSWQ2, SSWQ6, SSWQ10, SSWQ14, YEPS1, and YEPS7).

Constrained 6-Factor Model. A 6-factor model was run to compare the unconstrained model with a structure consisting of one additional latent variable, given some of the measures could be understood as representing multiple latent variables that

might be represented within the EFA (e.g., the SSWQ has four subscales). Factor 1 was moderately positively correlated with Factor 2 (.481), Factor 4 (.577), and Factor 6 (.374). A moderate negative correlation was found between Factor 1 and Factor 3 (-.663) and Factor 5 (-.383). Factor 2 was moderately positively correlated with Factor 4 (.572), and Factor 6 (.593). Factor 2 was moderately negatively correlated with Factor 3 (-.493) and Factor 5 (-.588). Factor 3 was moderately positively correlated with Factor 5 (.559), and moderately negatively correlated with Factor 4 (-.531), and a small negative correlation was found with Factor 6 (-.298). Factor 4 was moderately positively correlated with Factor 6 (.393). Factor 4 was moderately negatively correlated with Factor 5 (-.283). Factor 5 was moderately negatively correlated with Factor 6 (-.135).

Factor 1 contained five negative loading items from the SSWQ and all 7 items from the SAPS. Four of the items derived from the Academic Efficacy subscale (SSWQ4, SSWQ8, SSWQ12, SSWQ16) and one item was from the Emotional Problems subscale (SSWQ11). Factor 1 also contained all seven positively loading items from the SAPS measure. This factor seems to be best characterized as a measure of both school problems and positive skills. Factor 2 contained all 10 items of the YIPS and one item from the YEPS (YEPS1), reflecting a measure of internalizing problems. Factor 3 contained 9 total items, 8 from the SSWQ and one from the YIPS measures. The 8 SSWQ items were from the Emotional Problems subscale (SSWQ3, SSWQ7, SSQ11, SSWQ15) and the Joy of Learning Subscale (SSWQ1, SSWQ5, SSWQ9, SSWQ13). The one YIPS item was YIPS2, and it was negatively loaded onto the factor. This factor seems to capture both perception and engagement in school as well as emotional wellbeing. Factor 4 contained 7 items, all from the YEPS measure (YEPS1, YEPS3,

YEPS4, YEPS5, YEPS6, YEPS8, YEPS10), reflecting externalizing behaviors. Factor 5 included four items from the SSWQ School Connectedness subscale (SSWQ2, SSWQ6, SSWQ10, SSWQ16) and thus represented that construct only. Finally, Factor 6 contained 4 total items, 1 from the SSWQ (SSWQ11), 2 from the YEPS (YEPS6, YEPS9), and 1 from the SAPS (SAPS1). This final factor indicated a broad mix of more serious conduct problems, inattention, and school problems.

Constrained 4-Factor Model. A 4-factor model was then forced to compare to the unconstrained five factor model, as items form four distinct measures (i.e., SSWQ, YIPS, YEPS, and SAPS) that were intended to represent different overarching constructs were included in the EFA. Factor 1 was strongly positively correlated with Factor 2 (0.52) and Factor 4 (0.538), and moderately negatively correlated with Factor 3 (-0.481). Factor 2 was strongly positively correlated with Factor 4 (0.594) and strongly negatively correlated with Factor 3 (-0.595). Finally, Factor 3 was moderately negatively correlated with Factor 4 (-0.440). Factor 1 contained items from the SSWQ School Connectedness subscale, all of the YIPS items, and three items from the YEPS measure. The YEPS items loading onto this factor measure problems with attention and impulsivity. The items of this factor seemed to capture internal thoughts and feelings about the student's perceived sense of their school performance and how supported they feel in school. Factor 2 contained all four items from the Academic Efficacy subscale of the SSWQ, one item from the YEPS scale, and all of the SAPS items. This factor appeared to measure academic progress and skills needed to reach these outcomes. Factor 3 contained most items from the SSWQ measure, with the exception of three items. This factor would best be characterized as a measure of overall student wellbeing. Finally, Factor 4 contained

most items from the YEPS measure, with the exception of one item measuring inattention. This factor conceptually appeared to represent problems with externalizing problems. In total, seven items cross-loaded onto more than one factor (i.e., SSWQ2, SSWQ6, SSWQ8, SSWQ10, SSWQ14, YEPS1, YEPS7).

Constrained 3-Factor Model. A 3-factor model was also forced to evaluate whether items from the four distinct measures (i.e., SSWQ, YIPS, YEPS, and SAPS) may be better represented by a simplified structure. Moderate to strong factor loadings were found among the factors of the 3-factor model. Factor 1 yielded a strong positive correlation with Factor 2 (0.518), and a moderate negative correlation with Factor 3 (-0.413). Factor 2 was strongly negatively correlated with Factor 3 (-0.571). Ten items cross-loaded onto more than one factor (i.e., SSWQ2, SSWQ4, SSWQ6, SSWQ8, SSWQ10, SSWQ14, SSWQ16, YEPS1, YEPS3, YEPS9). Factor 1 again contained all four items from the School Connectedness subscale and one item from the Academic Efficacy subscale, all of the YIPS items, and select items from the YEPS measure that represented evaluating and managing emotions and attention. These items, when taken together, measure feelings of connectedness to school, presence of internalizing problems, and some select observable behaviors related to emotion regulation. Overall, this factor seemed to capture a student's presence of internalizing problems and thoughts and feelings about school. Factor 2 contained the items of the SSWQ Academic Efficacy subscale, the remaining YEPS items, and all of the SAPS items. This factor measures academic outcomes, externalizing problems, and problems with school activities. Overall, it appears to measure the presence of problems that negatively impact educational functioning. Factor 3, yielded a moderate negative correlation with Factor 1 (-0.413) and

Factor 2 (-0.571). Eight items cross-loaded on factor 3 and another factor (i.e., SSWQ2, SSWQ4, SSWQ6, SSWQ8, SSWQ10, SSWQ12, SSWQ14, SSWQ16). This factor contained the items from the SSWQ School Connectedness and Academic Efficacy subscales. This factor seems to measure overall of school wellbeing including both feelings of inclusion and acceptance in school, as well as positive academic outcomes.

Constrained 2-Factor Model. A 2-factor model was forced to again evaluate the empirical and conceptual model fit or a potentially more parsimonious structure. Factor 1 and 2 yielded strong negative correlations (-.663). Factor 1 was comprised of the SSWQ Joy of Learning, Educational Purpose, and the Academic Efficacy subscales, all of the SAPS items, and three items of the YEPS measure. The YEPS items measure inattention and problems following directions. Factor 2 contained items from the SSWQ School Connectedness subscale, all of the YIPS items, and five items from the YEPS measure. Conceptually, it appeared Factor 1 measured the presence of academic, social, and behavioral problems, whereas Factor 2 measured the presence of feelings of connectedness and internalizing problems. The YEPS7 item cross-loaded onto both factors.

Constrained 1-Factor Model. Finally, a 1-factor model was constrained to see how well all of the items might represent a single unified latent variable. The 1 factor model contained all 43 items comprising the SSWQ, YIPS, YEPS, and SAPS measures. Notably, all of the SSWQ items loaded negatively onto the factor, with the remaining items loading positively onto the factor. Factor loadings were all moderate, ranging from .332 to .675. This unidimensional factor could most likely be seen as a broad indicator of student psychosocial functioning.

EFA Model Refinement. After forcing the several constrained models, the next stage of the EFA process was to identify which of the evaluated factor models suggested the strongest empirical and conceptual base for use as an integrated screener model that could be further refined. The unconstrained EFA yielded a 5-factor model, however, the distribution of the items across different factors was highly skewed: Factors 1 and 2 contained 18 items, Factors 3 and 4 contained 8 items, and the Factor 5 contained only four items. The four items of Factor 5 were the items of the SSWQ School Connectedness subscale that also loaded onto Factor 1. Given that Factor 5 contained only cross-loading items with other factors, it is unlikely that the concept this factor represents is truly unique among the factors. A 6-factor model was forced and similarly to the 5 Factor model, yielded factors with drastically different numbers of items loading onto the factors. Factor 5 and 6 contained four items, all of which cross-loaded onto other factors. Although the factors yielded moderate to strong fit indices, the disproportionality of the number of items among the factors suggests this model is not the best fit for the data. The 4-factor model yielded moderate to strong fit indices and the same six items cross-loading onto more than one factor. Compared to the 5-factor model, the 4-factor model contained a more even distribution of the items across factors. The 3-factor model contained 10 cross-loading items, and the 2-factor model contained one cross-loaded item. The high number of cross-loadings suggests the 3-factor model is not as strong as the other factor models. Although the 2-factor model yielded the fewest cross-loadings, there was no clear conceptual differentiation between the factors based on the items that each factor contained. The information gained from the 2-factor model and the 1-factor

model would also be difficult data to interpret and use to inform screening and potential interventions.

Ultimately, given the 4-factor model yielded stronger factor correlations, a reasonable number of cross-loadings, and was a more simplified and nuanced theoretical model fit for the items, we selected this model for further refinement. Additional iterations of EFAs were performed with this four-factor model to evaluate the goodness of fit of different item sets and factor representations of the model using the set of criteria discussed above (see the Method section) and to refine the model to a simple structure that best balanced empirical and theoretical considerations.

EFA Refinement 1. During the first iteration of model refinement, the following cross-loading items were removed: SSWQ2, SSWQ6, SSWQ10, and SSWQ14. The item YEPS7 was considered for removal due to cross loading; however, the item taps into a unique construct (i.e., focus and attention problems) among these items and was retained to consider in later iterations. Results from this first iteration of 4-factor model refinement indicated that Factor 1 contained all of the items of the YIPS, and two items from the YEPS. This factor emerged as a more direct representation of internalizing problems compared with previous models. Factor 2 contained the four items of the SSWQ Academic Efficacy subscale, YEPS7, and all the SAPS items. This factor contained items that represented more coherently academic competence and problems compared with previous models. The items of Factor 3 contained eight items of the SSWQ Joy of Learning and Educational Purpose subscales. Taken together, these subscales represented a student's perception of how important schools is and how much they enjoy learning. Factor 4 contained most of the items of the YEPS, with the exception

of YEPS7 and YEPS9, suggesting it to be a general representation of externalizing behavior problems.

EFA Refinement 2. During the second iteration of model refinement, item YEPS1 was removed due to weak factor loading (.358) and YEPS7 was removed due to continued cross-loadings. The resulting factors reflected similar item loadings and theory-consistent variables as the previous iteration. Factor 1 contained all 10 items of the YIPS and YEPS9, again suggesting this factor as a measure of internalizing problems. Factor 2 contained four negatively loading SSWQ items (i.e., SSWQ4, SSWQ8, SSWQ12, and SSWQ16) and all seven of the positively loading SAPS items, again suggesting this factor represented academic competence and problems. Factor 3 contained the same items as the previous iteration, with this factor again measuring student perception of the purpose of school and enjoyment of learning activities. Factor 4 contained the YEPS2, YEPS3, YEPS4, YEPS5, YEPS6, YEPS8, and YEPS10, again reflecting this measure as an evaluation of externalizing behavior problems.

EFA Refinement 3. Considering the SSWQ items in Factor 2 from the second iteration had stronger loadings and were also wellbeing indicators versus the problem indicators of the SAPS, we chose to remove the 7 SAPS items so the factor would more purely represent academic competence. We also removed SSWQ11 because it cross-loaded onto Factors 2 and 3 in the previous iteration. Results from this third iteration showed that Factor 1 again contained all 10 of the YIPS items and YEPS9, Factor 2 again contained the SSWQ Joy of Learning and Educational Purpose subscales (i.e., SSWQ1, SSWQ3, SSWQ5, SSWQ7, SSWQ9, SSWQ11, SSWQ13, SSWQ15), Factor 3 contained SSWQ items mostly from the Academic Efficacy subscale (SSWQ4, SSWQ8, SSWQ11,

SSWQ12, and SSWQ16), and Factor 4 again contained YEPS items indicating externalizing problems (YEPS2, YEPS3, YEPS4, YEPS5, YEPS6, YEPS8 and YEPS10).

EFA Refinement 4. In the final model refinement, both YEPS_2 (0.314) and YEPS_9 (0.355) were removed as they were weaker loading items (less than the 0.5 cutoff for a strongly loading item). Results showed that, again, Factor 1 contained all 10 of the YIPS items and YEPS9; Factor 2 contained SSWQ1, SSWQ3, SSWQ5, SSWQ7, SSWQ9, SSWQ13, SSWQ15; Factor 3 contained items SSWQ4, SSWQ8, SSWQ12, and SSWQ16; and Factor 4 contained YEPS2, YEPS3, YEPS4, YEPS5, YEPS6, YEPS8, and YEPS10. These factors continued to clearly represent the same latent variables as noted in the previous two refinements: internalizing problems (Factor 1), academic engagement (Factor 2), academic efficacy (Factor 3), and externalizing problems (Factor 4), respectively. Factor 1 was moderately negatively correlated with Factor 2 (-0.474) and had a small negative correlation with Factor 3 (-0.298). Factor 1 was moderately positively correlated with Factor 4 (0.476). Factor 2 was strongly positively correlated with Factor 3 (0.626) and moderately negatively correlated with Factor 4 (-0.489). There was a moderate negative correlation between Factor 4 and Factor 3 (-0.440). The factor loadings were all moderate to strong (0.517–0.917) across factors, with no cross-loadings.

EFA Model Reduction. Using the four-factor model yielded from EFA refinement iteration 4, the process of model reduction based on theory and structure was then considered. The goal of model reduction was the identify a simple structure, whereas the purpose of model reduction was to balance and reduce this simple structure to align with the intended use of the items as a integrated mental health screener in schools. The

refined four-factor model consisted of the following factor structure: Factor 1 (SSWQ4, SSWQ8, SSWQ12, and SSWQ16), Factor 2 (SSWQ1, SSWQ2, SSWQ5, SSWQ7, SSWQ9, SSWQ13, and SSWQ15), Factor 3 (YIPS1, YIPS2, YIPS3, YIPS4, YIPS5, YIPS6, YIPS7, YIPS8, YIPS9, and YIPS10), and Factor 4 (YEPS3, YEPS4, YEPS5, YEPS6, YEPS8, and YEPS10). Since Factor 1 contained only 4 strongly loaded items and considering at least 3 items are necessary to adequately represent a latent variable, our intention was to reduce the number of items loading onto Factor 2, Factor 3, and Factor 4 to 4-items as well. This reduction plan would balance the representation of each factor within the overall measurement model and would still allow for enough items per factor to adequately represent the latent variables.

Factor 2 Reduction. Factor 2 contained seven items (i.e., SSWQ1, SSWQ3, SSWQ5, SSWQ7, SSWQ9, SSWQ13, and SSWQ15) that appeared to measure a latent variable of school engagement. According to educational research into models of student engagement, there are three primary forms of engagement: cognitive, behavioral, and emotional (Li & Lerner, 2013). The items SSWQ1, SSWQ5, SSWQ9, and SSWQ13 were from the Joy of Learning subscale of the SSWQ, whereas the items SSWQ3, SSWQ7, and SSWQ15 were from the Educational Purpose subscale. There are not clear cognitive, behavioral, and emotional delineations for these items; however, using Bloom's taxonomy of categorizing educational goals can help to explain different levels of engagement (Conklin, 2005). Although Bloom's taxonomy was originally used to describe educational goals, recent research has expanded the usage of the hierarchy to describe key processes of learning and using skills in increasing levels of complexity. According to Bloom's taxonomy, in order to achieve higher levels of mastery or skill, it

would require the more fundamental skills. Therefore, the items of this domain that represent the highest complexity of engagement are likely inclusive of the pre-requisite skills.

In order to balance construct representation of student engagement, two items that measure educational purpose (cognitive) and two items that measure joy of learning (emotional) were selected. The items SSWQ3 ("I feel like the things I do at school are important"), SSWQ7 ("I think school matters and should be taken seriously"), and SSWQ15 ("I believe things I learn at school will help me in my life") all seem to reflect prioritization and purpose for school. Among these items, SSWQ3 and SSWQ15 require higher-order skills such as long-term commitment, goal setting, and planning for the future. These items are a reflection of a higher level of purpose than the SSWQ7 item. Therefore, SSWQ7 is conceptually less complex than the other items and would not provide as rich interpretative information as SSWQ3 and SSWQ15. The items SSWQ1 ("I get excited about learning new things in class"), SSWQ5 ("I am really interested in the things I am doing in school"), SSWQ9 ("I enjoy working on class projects and assignments"), and SSWQ13 ("I feel happy when I am working and learning at school") all match with emotional domains of engagement. SSWQ5 and SSWQ9 include aspects of being interested and finding joy in school-based activities and likely lead to higher engagement. These two items capture a higher complexity of emotional engagement than SSWQ1 and SSWQ13. The final 4 items of Factor 2 were thus selected: SSWQ3, SSWQ5, SSWQ9, and SSWQ15.

Factor 3 Reduction. The items of Factor 3 were all from the YIPS and represented varying aspects of internalizing problems. Conceptually, the items YIPS1,

YIPS3, YIPS7 represent problems primarily related to anxiety, whereas items YIPS2, YIPS6, and YIPS7 reflect problems with depression. In order to reduce redundancy, four items representing the most unique aspects of internalizing problems were selected. YIPS1 ("I feel nervous or afraid") seemed the most direct representation of anxiety and item YIPS8 ("I do not really enjoy doing anything anymore") is an essential depression symptom. An additional internalizing indicator shared by both anxiety and depression is somatization. Both items, YIPS5 ("I have uncomfortable and tense feelings in my body" and YIPS10 ("I have headaches, stomachaches, or other pains") evaluate somatic symptoms; however, YIPS5 was considered to cover a broader range of somatic symptoms and was therefore retained. Finally, YIPS4 measures a unique construct in youth/adolescent internalizing problems presentations: irritability. Since YIPS4 indicates a transdiagnostic symptom that can indicate a variety of internalizing problems, it was retained. The final 4 items for Factor 3 were thus selected: YIPS1, YIPS8, YIPS5, and YIPS_4.

Factor 4 Reduction. Factor 4 included items from the YEPS, which is a measure of externalizing problems. Within this measure are items that indicate behaviors such as impulsivity (YEPS5), inattention (YEPS7, YEPS9), anger (YEPS1, YEPS3), rule breaking (YEPS4, YEPS10), and more severe conduct problems (YEPS6). Following the same logic used for retaining items in Factor 3, items were selected to represent the most unique aspects of externalizing problems. The item YEPS5 ("I talk a lot and interrupt others when they are talking") measuring impulsivity, which is a trans-diagnostic behavior problem that is lower in severity but high in occurrence. The item YEPS6 ("I say or do mean things to hurt other people") is an indicator of more severe conduct

problems that would warrant further investigation as a critical item, but which is likely to be endorsed at lower levels. Its inclusion in the measure will help to identify potential behavior problems that require more intensive intervention. After identifying these two key items for retention, the goal was to then choose two items to best capture the range of behavior problems from the remaining items. A common concern voiced by teachers and parents is that youth struggle to follow classroom or home rules. As a behavioral indicator, including it in the measure will likely capture students struggling in supervised environments. To measure rule breaking, the item YEPS4 ("I break rules whenever I feel like it") was retained because it had slightly higher loadings than the similar item YEPS10 ("I choose not to follow directions and don't listen to adults") and reflected a comparison that was more concrete than some of the other items. Finally, the item YEPS3 ("I fight and argue with other people") was retained because it was deemed to be more amenable to self-observation than YEPS1 ("I lose my temper and get angry with other people").

Optimal EFA Model. Results for the final, optimal EFA model, which consisted of 16 items representing 4 factors, are presented in Table 4. Factor 1 represented Academic Efficacy; Factor 2 represented School Engagement; Factor 3 represented Internalizing Problems; and Factor 4 represented Externalizing Problems. Factor 1 was strongly positively correlated with Factor 2 (0.634) and moderately negatively correlated with Factor 3 (-0.309) and Factor 4 (-0.459). Factor 2 was moderately negatively correlated with Factor 3 (-0.426) and Factor 4 (-0.543). Factor 3 was moderately positively correlated with Factor 4 (0.537). The loadings for the final, optimal factor model yielded 1 moderate and 15 strong factor loadings (0.487–0.925). Once the final

factor model was established resulting from the EFA, descriptive statistics and bivariate correlations were conducted on observed scores derived from the new resulting scales. Results from descriptive statistics (see Table 5) provided a full range of scores of minimum and maximum responses (4-16) and an average interitem correlation ranging from 0.40-0.70. Internal consistency reliability estimates for Factor 1 were strong: Cronbach's α = .90, McDonald's ω = .90, average interitem correlation = .70. Estimates were moderate to strong for Factor 2: Cronbach's α = .81, McDonald's ω = .81, average interitem correlation = .52. Factor 3 yielded moderate reliability statistics: Cronbach's α = .78, McDonald's ω = .78, average interitem correlation = .47. Finally, the reliability statistics for Factor 4 were moderate: Cronbach's α = .75, McDonald's ω = .73, average interitem correlation = .40.

Table 4. EFA Standardized Factor Loadings

Item	Factor 1_AE	Factor 2_SE	Factor 3_IP	Factor 4_EP	Uniqueness
SSWQ_16	**0.925**	-0.11	-0.009	0.05	0.273
SSWQ_4	**0.84**	0	-0.004	-0.011	0.286
SSWQ_12	**0.836**	0.005	-0.014	0.003	0.292
SSWQ_8	**0.749**	0.123	0.048	-0.039	0.314
SSWQ_9	0.098	**0.606**	-0.019	0.004	0.548
SSWQ_3	-0.087	**0.838**	-0.003	0.019	0.384
SSWQ_15	-0.017	**0.74**	0.022	0.017	0.488
SSWQ_5	0.009	**0.73**	0.023	-0.005	0.469
YIPS_1	-0.025	0.045	**0.675**	-0.064	0.589
YIPS_8	-0.082	-0.119	**0.487**	0.133	0.569
YIPS_4	0.048	0.021	**0.735**	0.04	0.461
YIPS_5	0.032	0.004	**0.825**	-0.052	0.369
YEPS_4	-0.045	-0.04	-0.092	**0.689**	0.523
YEPS_3	0.064	-0.01	0.077	**0.676**	0.518
YEPS_5	0	0.035	0.02	**0.558**	0.696
YEPS_6	0	0.031	-0.032	**0.644**	0.619

Note. AE = Academic Efficacy; SE = School Engagement; IP = Internalizing Problems; EP = Externalizing Problems.

Table 5. Scale-Level Descriptive and Reliability Statistics for Reduced Screening Measures

Scale	Mean	Median	Min	Max	Skew	Kurt	ω	α	AIC
Factor 1_AE	12.64	13	4	16	-.60	-0.47	0.90	0.90	0.70
Factor 2_SE	10.56	11	4	16	-.04	-0.74	0.81	0.81	0.52
Factor 3_IP	7.02	6	4	16	1.00	0.55	0.78	0.78	0.47
Factor 4_EP	5.25	5	4	16	2.23	6.57	0.75	0.73	0.40

Note. Min = Minimum, Max = Maximum, Skew = Skewness, Kurt = Kurtosis, ω = McDonald's ω, α = Cronbach's α, AIC = Average Interitem Correlation; Factor 1_AE = Academic Efficacy, Factor 2_SE= School Engagement, Factor 3 _IP= Internalizing Problems, Factor 4_EP= Externalizing Problems.

Sample 2 Results

CFA of the Independent Measurement Models

A CFA was conducted with an ordinal estimator on the independent measures to evaluate their structural properties as school-based screeners. The SAPS was excluded from these analyses because the outcome of the previous study resulted in excluding these items from the integrated measurement model. Thus, there was no reason to test its independent structural validity with the present sample. The CFA of the SSWQ suggested a strong global model fit: $c^2 = 320.935$, $df = 98$, $p < .001$; CFI = .995; RMSEA (90% CI: 0.033, 0.042) = 0.038 and SRMR = 0.041. Standard estimates of the factor loadings were strong (0.555–0.800). Results of the YIPS also suggested a strong model fit: $c^2 = 43.728$, $df = 35$, $p < .001$; CFI = .999; RMSEA (90% CI: 0.000, 0.023) = 0.012 and SRMR = 0.028. The standard estimates of the YIPS factor loadings were all strong as well (0.525–

0.711). Finally, the resulting CFA of the YEPS yielded adequate but attenuated model fit: $c^2 = 227.927$, $df = 35$, $p < .001$; CFI = .955; RMSEA (90% CI: 0.051, 0.065) = 0.58 and SRMR = 0.093. Standard estimates of the YEPS factor loadings were small to strong (0.132–0.662).

CFA of the Integrated Screening Model

In order to evaluate the structural properties of the measurement model resulting from EFA with Sample 1, a CFA was conducted using an ordinal estimator on the second dataset. Specifically, the integrated 16-item measure resulting from EFA was tested via CFA as a correlated-factors model. The resulting global model fit indices indicated a strong model fit with the data of the integrated screener: $c^2 = 226.632$, $df = 98$, $p < .001$; CFI = .994; RMSEA (90% CI: 0.024, -0.033) = 0.028; and SRMR = 0.039. Standard estimates of the factor loadings were small to strong (0.155-0.817; see Table 6). The covariance between factors represents expected relationships, where the problems scales were negatively correlated with the positive wellbeing factors. Factor 1–Academic Efficacy yielded a moderate positive covariance with Factor 2–School Engagement (0.593) and was moderately negatively correlated with Factor 3–Internalizing Problems (-.434) and Factor 4–Externalizing Problems (-.396). Similarly, the positively oriented Factor 2–School Connectedness scale was moderately negatively related with the problems scales: Factor 3–Internalizing Problems (-.567) and Factor 4–Externalizing Problems (-.471). The problems scales, Factor 3–Internalizing Problems and Factor 4–Externalizing Problems, yielded a strong positive covariance (.625). Full loadings from this CFA model are provided in Table 7 below. Scale descriptives for the observed scores derived from this measurement model are provided in Table 6.

Table 6. CFA Standardized Factor Loadings

Factor	Indicator	Symbol	Std. Est.	Std. Error	z-value	*p*	95% Lower	95% Upper
Factor 1_AE	SSWQ_4	λ11	.873	0.015	50.387	< .001	.740	.799
	SSWQ_8	λ12	.918	0.015	51.443	< .001	.734	.792
	SSWQ_12	λ13	.883	0.015	49.134	< .001	.711	.770
	SSWQ_16	λ14	.817	0.018	38.911	< .001	.669	.740
Factor 2_SE	SSWQ_3	λ21	.748	0.019	36.504	< .001	.658	.732
	SSWQ_5	λ22	.790	0.018	37.210	< .001	.645	.716
	SSWQ_9	λ23	.780	0.019	37.754	< .001	.671	.745
	SSWQ_15	λ24	.702	0.021	31.125	< .001	.617	.700
Factor 3_IP	YIPS_1	λ31	.549	0.025	18.871	< .001	.422	.520
	YIPS_4	λ32	.702	0.025	25.681	< .001	.584	.680
	YIPS_5	λ33	.758	0.024	28.742	< .001	.631	.723
	YIPS_8	λ34	.891	0.025	31.291	< .001	.721	.817
Factor 4_EP	YEPS_3	λ41	.683	0.029	15.406	< .001	.384	.496
	YEPS_4	λ42	.694	0.027	14.370	< .001	.333	.439
	YEPS_5	λ43	.383	0.024	9.788	< .001	.185	.278
	YEPS_6	λ44	.514	0.022	9.048	< .001	.155	.241

Note. Std. Est = standardized estimate, Std. Error = standard error, CI = confidence interval; Factor 1_AE = Academic Efficacy, Factor 2_SE = School Engagement, Factor 3 _IP= Internalizing Problems, Factor 4_EP= Externalizing Problems.

Table 7. Scale-Level Descriptive and Reliability Statistics for Sample 2

Scale	Mean	Median	Range	Skew	Kurt	ω	α	AIC
Factor 1_AE	12.64	13	12.00	-.60	-0.47	0.90	0.90	0.70
Factor 2_SE	10.56	11	12.00	-.04	-0.74	0.81	0.81	0.52
Factor 3_IP	7.02	6	12.00	1.00	0.55	0.78	0.78	0.47
Factor 4_EP	5.25	5	12.00	2.23	6.57	0.75	0.73	0.40

Note. Skew = Skewness, Kur t= Kurtosis, ω = McDonald's ω, α = Cronbach's α, AIC = Average Interitem Correlation; Factor 1_AE= Academic Efficacy, Factor 2_SE= School Engagement, Factor 3 _IP= Internalizing Problems, Factor 4_EP= Externalizing Problems.

Correlations

The correlation matrix in Table 8 reports the relationships (e.g., convergent and discriminant) between each of the independent measures and scales from the integrated screener measure (resulting from EFA with Sample 1). Results from the bivariate correlations supported expected convergent and divergent relationships among the original measures/subscales and the reduced integrated screener scales. Moderate to strong positive correlations were found between the subscales of the SSWQ. This suggests that the wellbeing indicators of overall student wellbeing are highly related. Additionally, moderate to strong negative correlations were found between the wellbeing indicators of the SSWQ and the problems indicators of the YIPS and the YEPS. These relationships are also consistent with theoretical considerations that emotional and behavioral distress is associated with decreased positive school performance.

Table 8. Correlations for Original Screening Measures and New Integrated Screening Measure

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. SW											
2. JOL	.836	—									
3. SC	.758	.518	—								
4. EP	.838	.669	.482	—							
5. AE	.762	.495	.395	.543	—						
6. YIPS	-.498	-.391	-.576	-.336	-.277	—					
7. YEPS	-.503	-.395	-.382	-.422	-.406	.569	—				
8. SAPS		-.46									

	-.609		-.369	-.431	-.684	.496	.581	—			
9. F1–AE	.762	.495	.395	.543	1.00	-.277	-.406	-.684	—		
10. F2–SE	.848	.870	.500	.869	.488	-.378	-.400	-.437	.488	—	
11. F3–IP	-.430	-.323	-.520	-.274	-.244	.932	.511	.448	-.244	-.305	—
12. F4–EP	-.407	-.323	-.299	-.370	-.308	.407	.866	.440	-.308	-.334	.358

Note. SW= Student Wellbeing total scale of the SSWQ; JOL = Joy of Learning subscales of the SSWQ; SC = School Connectedness subscales of SSWQ; EP = Emotional Problems subscales of SSWQ; AC = Academic Efficacy subscales of SSWQ; YIPS = Youth Internalizing Problems Screener; YEPS = Youth Externalizing Problems Screener; SAPS = Subjective Academic Problems Scale; F1–AE = Factor 1–Academic Efficacy. F2–SE = Factor 2: School Engagement; F3–IP = Factor 3–Internalizing Problems; F4–EP = Factor 4: Externalizing Problems.
All correlations are significant at the $p < .001$ level.

The correlation table above also outlines theory consistent relationships between the original subscales and the TWSST subscales. Strong correlations were found between the YIPS total measure and the TWSST Internalizing Problems, as well as the YEPS total measure and the TWSST Externalizing Problems. Strong correlations were found between the overall SSWQ Student Wellbeing scale, the Academic Efficacy SSWQ subscale and the TWSST Academic Efficacy subscale. Additionally, the Joy of Learning, School Connectedness, and Educational Purpose SSWQ subscales were moderately correlated with the TWSST Academic Efficacy subscale. (Note that the correlation between the two versions of the Academic Efficacy scales is 1.0 because they consist of the same 4 items; they are presented in the Table 6 twice for interpretation convenience.) The SSWQ total scale, Joy of Learning, and Educational Purpose subscales were strongly associated with the TWSST School Engagement subscale. Expected moderate to strong negative correlations were found between the YIPS and YEPS total scale, and the Academic Efficacy and School Engagement TWSST subscales.

Discussion

Current estimates indicate that approximately 46% of adolescents experience symptoms of a mental illness (Merikangas et al., 2010), yet only around half of those diagnosed with a psychiatric condition actually receive treatment (Costello et al., 2014). When left untreated, mental health problems have drastic negative impacts on social, emotional, and academic functioning for children and adolescents. Research suggests schools are often the only service providers for student behavioral and emotional mental health services (Burns et al., 1995). Therefore, it is critical that schools effectively identify those students who are experiencing mental health concerns in order to triage and coordinate care. Research in the field of school-based behavioral and mental health indicates that universal screening streamlines the identification and intervention process when compared to traditional referral-based systems (Lipari et al., 2016; Tilly, 2008). Among the plethora of existing screening tools, few provide a comprehensive evaluation of a student's academic, emotional, and behavioral functioning. Even fewer tools exist that assess student strengths as well as problems. The purpose of the present study was to evaluate the viability of an integrated screening model comprised of items from 4 stand-alone screeners (i.e., SSWQ, YIPS, YEPS, and SAPS) that were intended to measure distinct yet related constructs: student wellbeing, internalizing problems, externalizing problems, and academic problems. The goal of this integrated measure is to aid schools and practitioners to conduct complete mental health screening in a cost-effective, feasible, and empirically supported way. This will yield valuable information about student functioning and help schools to make decisions regarding tiered interventions and explore the impact of mental health on students' educational performance.

Key Study Findings

In both samples, confirmatory factor analysis of the SSWQ (student wellbeing), YIPS (internalizing problems), YEPS (externalizing), and the SAPS (academic problems) yielded adequate structural properties as independent measures for use as school-based screeners. Additionally, expected theoretical relationships were found between the measures. The problem-oriented measures, the YIPS, YEPS, and SAPS were all negatively correlated with the SSWQ which is a wellbeing indicator. Of note, strong negative correlations were found between the SAPS and the SSWQ Total Wellbeing and Academic Efficacy subscales. This suggests that the measures accurately assess the domains they represent and are useful as school screening tools, and suggests they could function as an integrated tool. This supports previous research that shows that including measures of wellbeing explains greater overall variance in student mental health outcomes (Kim et al., 2014).

This study also used exploratory factor analysis of the combined, integrated protocol consisting of the SSWQ, YIPS, YEPS, and SAPS to see if there could be a resulting latent structure that aligns with the four domains of the independent measures (student wellbeing, internalizing problems, externalizing problems, academic problems). After forcing multiple constrained models, the 4-factor model was selected for further refinement. Compared to the other forced factor models, the 4-factor model contained relatively stronger factor correlations, reasonable cross-loadings, and was the most simplified and nuanced model fit. In the EFA refinement process, any cross-loading items were removed. In the third EFA refinement, the seven SAPS were removed in favor of retaining the cross-loading SSWQ items. The SSWQ items not only yielded stronger item

loadings, but were also the only items that measured positive wellbeing. Since wellbeing indicators not only provide a more comprehensive view of functioning (Kamphaus et al., 2010), but also increase the respondent's positive experience while taking the survey (Smith et al., 2007), the SSWQ items were retained. As the goal was to find the most simplified and balanced measurement model, the integrated model was then reduced to contain 4 items across each of the factors. Items were selected considering their factor loadings and theoretical considerations.

The factors of the reduced measurement model were evaluated given theoretical and conceptual considerations in order to separate them and identify the most relevant factor and subscale names. Both Factor 1 and Factor 2 of the new measure contained items from the SSWQ. The authors of the SSWQ also explored literature that addressed this construct and found 16 distinct subconstructs of student wellbeing. They further narrowed these constructs into the four domains that resulted in the SSWQ subscales. Factor 1 is comprised of the four items from the SSWQ Academic Efficacy subscale SSWQ 4: I am a successful student, SSWQ 8: I do good work at school, SSWQ 12: I do well on my class assignments, SSWQ 16: I get good grades in my classes. The theoretical construct of the SSWQ, is foundationally based on the metaconstruct, "youths' self-perceptions of healthy and successful living at school" (Renshaw et al 2015). The items in Factor 1 are all items of the "Academic Efficacy" subscale, which the authors described as, "appraising one's academic behaviors as effectively meeting environmental demands" (Renshaw et al 2015). This construct contains elements of educational satisfaction (e.g, Heubner & McCullogh, 2000), meaningful participation (Jennings & Greenberg, 2009), and self-efficacy (e.g., Høigaard, Kovac, Øverby, & Haugen, 2014). As there were no

new items or any dropped items from the original SSWQ subscale, the factor delineation of “Academic Efficacy” was retained. Including a measure of a student’s evaluation of their own strengths can help to predict their overall functioning (Epstein, 1999), increase engagement (Antaramian et al., 2010), social and academic skills (Suldo & Shaffer 2008), and even physical health (Renshaw & Cohen, 2014).

Factor 2 contains the following items: SSWQ 3: I feel like the things I do at school are important, SSWQ 5: I am really interested in the things I am doing at school, SSWQ 9: I enjoy working on class projects and assignments, and SSWQ 15: I believe things I learn at school will help me in life. The items SSWQ 3 and SSWQ 15 are from the Educational Purpose subscale, and the items SSWQ 5 and SSWQ 9 are from the Joy of Learning subscale. While the items in Factor 1 are predominantly focused on a student’s ability to meet the output expectations of school, Factor 2 items focus more on the student’s evaluation of the importance and excitement regarding the work that they are doing. Research into the factors that impact academic performance have found that a student’s motivations, goals, and purpose is strongly connected with higher outcomes (Elliot and Thrash, 2001; Woodcock et al., 202). For the purpose of this research, engagement is therefore defined as the extent to which an individual sees their education activities as enjoyable, meaningful, and important. By identifying Factor 2 as School Engagement, researchers and practitioners will be able to better isolate this subscale to assess their level of true engagement in their learning, not only their outcomes. The combination of assessing wellbeing indicators of both Academic Efficacy and School Engagement will provide meaningful insight into a student’s overall school experience in

a way that better informs student support and intervention planning (Dowdy et al. 2010; Eklund et al. 2009; Smith et al., 2007).

The items in Factor 3 contains items from the YIPS, a measure of youth internalizing problems developed using the diagnostic criteria for Depressive Disorders and Anxiety Disorder outlined in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5; American Psychiatric Association, 2013) and frequently used self-report scales of adolescent internalizing problems. As discussed in the previous section of this article, the items retained represented both the constructs of anxiety and depression. The items retained in Factor 3 included the items YIPS 1: I feel nervous or afraid, YIPS 4: I get bothered by things that didn't bother me before, YIPS 5: I have uncomfortable and tense feelings in my body, and YIPS 8: I do not really enjoy doing anything anymore. In order to further streamline the measure. These items are best described as internalizing problems, which research defines as intense and distressing internal experiences (e.g., thoughts and feelings) (Forms, Abad, & Kirchner, 2011). Therefore, the most useful and theoretically supported name for this factor is Internalizing Problems.

The items in factor 4 consisted of items from the YEPS measure, which underwent the same development process as the YIPS. The YEPS represents aspects of externalizing problems, which are described as intense and stressing overt or public behaviors (e.g., physical and verbal actions). This factor contains the items YEPS 3: I fight and argue with other people, YEPS 4: I break rules whenever I feel like, YEPS 5: I talk a lot and interrupt others when they are talking and the YEPS 6: I say or do mean things to hurt other people. To be consistent with the current research and conceptualization of these

behaviors for practitioners, Factor 4 is best described as Externalizing Problems. Identifying student risk for internalizing and externalizing problems captures a broad array of behavioral and mental health problems. This is crucial, as untreated mental health problems are linked to lower standardized testing scores, overall GPA, and retention rates (Bussing et al., 2012; Cunningham et al., 2013; DeSocio & Hootman, 2004; Bailey et al., 2012). By addressing mental health problems, students are less likely to engage in risk-taking behaviors and more likely to see academic gains (Joe et al., 2009).

Implications for Practice

The goal of this measure is to act as a stand-alone screening tool to help identify the strengths and challenges students are experiencing in order to inform interventions and meaningful conversations with students. In order to provide the most comprehensive snap-shot of student functioning in school, this measure evaluates aspects of positive beliefs and behaviors as well as common internalizing and externalizing behavioral problems. It is a screening tool to evaluate total student wellbeing. Therefore, the following title is the most appropriate description of the content and aims of the measure: Total Wellbeing School Screening Tool (TWSST). The TWSST is a promising alternative to the traditional referral-based system for identifying at-risk students. Using the aggregated results of a whole-school screening, at-risk students may be identified and can then be matched to the appropriate level of intervention. This tool may therefore support data-driven decisions that help schools to improve their identification, referral, and intervention systems.

As discussed in this study, the integrated screening tool, the TWSST has strong empirical support as a screening tool. It contains 16 items, compared to 36 items of the

full versions of the YIPS, YEPS, and SSWQ. One of common barriers to screening implementation is that the measures are often lengthy and require significant time to administer. Streamlining the measure into a short cohesive measure will reduce the time burden on both schools and respondents. The four factors of the TWSST provides a glimpse of how a student feels about school, their success academically, the presence of commonly interfering behaviors, and symptoms of anxiety and depression. As discussed, there are no complete mental health screening tools that also assess academic performance. Although the Academic Efficacy domain is not a discrete report of school performance, it does provide self-report information about a student's perception of their educational progress. The TWSST also provides the students an opportunity to take time and acknowledge their skills and strengths. Not only are students able to reflect on their own skills but including strengths questions in a screening tool communicates to students that the schools are invested in their positive wellbeing and want to encourage their strengths. Additionally, the Internalizing Problems and Externalizing Problems allow students an opportunity to recognize and communicate their own distress. The most common psychological problems experienced by youth and adolescents is anxiety and depression. While the TWSST does not provide extensive detail about a student's internal experiences, results can help identify those at risk for more serious problems that may require more targeted assessment or intervention. As a complete tool, the TWSST can identify patterns and student trends and offers schools valuable information to guide evidence-based decisions regarding tiered services of interventions.

Limitations and Future Directions

While the initial validation of the TWSST suggest it has promise as a complete mental health screening tool, further validation is required to evaluate its the generalizability of its value across samples and situations. This study was conducted with a localized and heterogenous sample. To further evaluate the generalizability of the TWSST, additional validation studies should be conducted with a larger and more representative student population. While the theoretical considerations support that the items of the TWSST are meaningful markers of strengths and problems, this study cannot determine the extent that item responses correlate with traditional school-based outcomes. Further study could include the administration of the TWSST and validation with school-based outcomes (e.g., attendance, conduct referrals, high school completion status, grades, standardized testing scores). Beyond school outcomes, exploring the ability of the TWSST to predict more serious mental health concerns would also be beneficial. For example, conducting additional research into the correlation between the items of the TWSST and targeted anxiety or depression measures would provide critical information regarding the utility of the measure.

Conclusion

The goal of this study was to explore the empirical benefits of an integrated complete mental health screening tool versus the original independent measures to provide additional evidence that may support implementation of universal screening approaches. Results of the EFA yielded an empirically strong integrated assessment tool of complete mental health with strong theoretical construct representation in only 16 items. The TWSST evaluates four domains covering both student strengths and problems: Academic Efficacy, School Engagement, Internalizing Problems, and Externalizing

Problems. Combined, these domains provided a snapshot of overall student social, emotional, behavioral, and academic functioning which can be used to directly inform prevention and intervention planning. The TWSST is a promising tool for schools to use in addressing drastically increasingly mental health problems and to support overall student success. However, further research is needed to explore evidence supporting the structural and criterion validity of this measure prior to recommending its use in schools.

Chapter III Paper 2

Background, Rationale, and Purpose of Present Study

Background and Rationale

One of the biggest challenges facing schools, researchers, and public health stakeholders is the steady rise of youth and adolescent mental health problems. Research indicates that a vast majority of adolescents (46%) ages 14-18 will experience symptoms of mental illness (Merikangas et al., 2010). Youth mental health problems have additionally been correlated with more global functioning impacts such as decreased motivation, academic challenges, and interpersonal problems (Catalano et al., 2004). When left untreated, youth mental health problems can cause a host of short and long-term problems. Individuals diagnosed with comorbid anxiety and depression the risk are at a higher risk of suicide attempts, recurrence of symptoms, more frequent and intense impairments, and higher utilization of mental health services (Birmaher et al., 1996; Ezpeleta et al., 2006). Current estimates indicate that 25% to 50% of youth diagnosed with depression meet criteria of anxiety, and 10% to 15% of youth with a primary anxiety diagnosis meet criteria for depression (Daley, 2006; Axelson & Birmaher, 2001; Costello et al., 2003). Since youth with comorbid anxiety and depression diagnoses are at-risk for significant negative long-term effects, it is imperative that clinicians and researchers have a comprehensive understanding of the central mechanisms of the disorders to inform diagnosis and treatment.

Although a significant number of youth are experiencing anxiety or depression, only approximately half of adolescents ultimately diagnosed with a form of psychiatric

disorder received treatment (Costello et al., 2014). Similarly to the varying rates of service utilization, access to treatment rates vary by study and measurement methods and current estimates are provided to clarify that many students who would benefit from services do not receive them. This presents a serious issue for schools and mental health service providers working with youth and adolescent populations. One of the goals of current mental health research and practice is to increase the availability and accessibility of identification and treatment services for children and adolescents experiencing mental health challenges. Given that schools are often the de facto service providers for behavioral and emotional interventions for youth of all ages, evaluating mental health identification and treatment delivery in schools is a crucial area of research (Burns et al., 2005).

School-Based Mental Health Services

Although there is some variation in the exact percentages of students accessing school-based services, schools are a common service setting for children, especially those from underserved populations (Duong et al., 2021). According to the meta-analysis conducted by Duong and colleagues, the majority of the community population accessed mental health services in schools (7.28%). For those with elevated symptoms or psychiatric diagnoses the service rates are as follows: 22.10% schools, 20.56% outpatient settings, 9.93% primary care, 9.05% inpatient, 7.90% child welfare, and 4.50% juvenile justice. Additional estimates indicate around 23.6% of students received mental health interventions in school settings while 22.8% accessed them via mental health settings (Costello et al., 2014). Although there is some variability in service-access by setting, factors of symptom severity and socioeconomic standing impact service utilization

(Burns et al., 2005; Duong et al., 2021). As schools are often the primary, or only, mental health service setting for adolescents it is imperative that schools address common issues of identification and treatment.

A current limitation of behavioral mental health services in schools is the access to high-quality and evidence-based screening tools (Lipari et al., 2016) and student identification models (Strein et al., 2003). The traditional school identification model begins with a teacher, parent, or other staff identifying a student and sharing this information with a team of school professionals to determine the necessary next steps (Lloyd et al., 1991). The majority of these referrals are usually completed by general education teachers for issues concerning disruptive behaviors. Lloyd et al. (1991) found that 79% of general-education teacher referrals were for disruptive behaviors or related behavioral problems. This form of identification and referral leads to the under identification of students identifying as female (Wehmeyer & Schwartz, 2001), those experiencing more internalizing or covert symptoms (Tilly, 2008), and the overidentification of students from specific racial groups (Ahram et al., 2011; Hosp & Reschly, 2003; Jasper & Bouck, 2013; MacMillan & Reschly, 1998). Another limitation of the referral-based identification system is that this model depends on the presence of more observable behaviors. This requires that the problems progress beyond the initial symptom presentation, which makes early identification and prevention nearly impossible (Dowdy et al., 2010; Eklund et al., 2009; Rones & Hoagwood, 2000; Wagner et al., 2005). Given the limitations of traditional forms of identification of student mental health problems, researchers are exploring and developing alternative identification models.

Research is exploring the effectiveness of alternative student identification models and tools to better support mental health service delivery in schools. Currently, schools used multi-tiered systems of support (MTSS) to guide their student identification and intervention planning, especially with regard to academic functioning (Eagle et al., 2015). Within the academic MTSS framework, schools conduct whole-school and grade-level screening (via curriculum-based assessments) for targets like reading fluency or math operations (Schwean & Rodger, 2013). Students who fall below established benchmarks are identified as struggling as a result of these screenings and provided with follow-up supports to improve their academic functioning and content mastery. Research has shown that academic screening results in lower disproportional referrals for students of color for special education services (VanDerHeyden et al., 2003).

While many schools use an MTSS approach for screening and supporting students' academic functioning, very few schools conduct universal or grade-level screenings of all students' mental health functioning. Currently, only around an estimated 2–15% of U.S. schools conduct universal mental health screenings as part of an MTSS approach (Bruhn et al. 2014; Evans et al., 2005; Romer & McIntosh, 2005). Alternative models of student identification focus on the early identification of student mental health problems through the use of universal screening (Dowdy et al., 2014). Universal screening, which is the process of evaluating the level of risk of all students for emotional and behavioral problems (Glovers & Albers, 2007), has the potential to address many of the challenges and limitations of traditional referral-based identification systems (Eklund et al., 2009).

Universal Mental Health Screening in Schools

Universal screening tools have the potential to improve the equitable and early identification of students experiencing complex mental health challenges and address issues of service delivery more systematically. One of the major limitations of the traditional referral models is that they often under-identify students experiencing internalizing problems (e.g., anxiety, depression, low self-esteem; Weist et al., 2007) and those with sub-clinical presentations (Flett & Hewitt, 2013). These students may be unnoticed or not access services due to characterological patterns like perfectionism (Flett & Hewitt, 2013), avoidance of thoughts and behaviors, or concealment of experiences due to stigma (Hartman et al., 2013). Current screening tools focus primarily on the presence of problems. However, recent research suggests that a more multidimensional view of student behavioral, emotional, and academic functioning may be more informative (Moore et al., 2015).

These multidimensional screening models assess for the presence of positive skills or strengths as well as problems, allowing for more informative data that can be used for informing future service delivery (Furlong et al., 2014; LeBuffe & Shapiro, 2004). According to a study by Kim et al. (2014), measures that included strengths assessments explained 32% of the variance of overall wellbeing when compared to measures of deficits that explained 8% of the variance. These screening models, which are often referred to as *dual-factor* (Suldo & Shaffer, 2008) or *two-continua* (Keyes, 2005) or *complete mental health* (Moore et al., 2015), conceptualize mental health as a combination of both psychological distress or problems as well as adaptive social-emotional strengths or subjective wellbeing. Not only do strengths-inclusive screening

models provide useful information regarding overall functioning, but they have also been connected to higher levels of student engagement (Antaramian et al., 2010), social functioning and academic attainment (Suldo & Shaffer 2008), and physical health (Renshaw & Cohen, 2014). This conceptual shift reflects recent research that the presence or absence problems does not solely predict long-term positive outcomes. Specifically, overall wellbeing has been shown to make unique contributions to occupation or career success, prosocial behaviors, successful interpersonal relationships (Lyubomirsky et al., 2005), physical health (Pressman & Cohen, 2005), and self-efficacy or self-esteem (Huebner, 2004). Although preliminary research supports the inclusion of strengths-based measures of student functioning, further research is needed to inform the utility and selection of measurement tools for operationalizing complete mental health screening protocols in schools.

Operationalizing Complete Mental Health Screening

Operationalizing complete mental health screening protocols requires a theoretical framework for both the psychopathology/problem dimension and the strengths/wellbeing dimension. The psychopathology/problem dimension is typically easier to operationalize as there is a strong research base in this area. In child and adolescent mental health literature, behavioral and emotional problems are often separated into two domains: *internalizing* (i.e., disturbance in thought patterns or mood; e.g., anxiety or depression) and *externalizing* (i.e., disruptive or defiant behaviors; e.g., oppositional defiant disorder). Research suggests that, given the high rates of comorbidity of anxiety and depression in youth and adolescent populations, conceptualizing mental health problems within a broad dimensional approach consisting of internalizing and externalizing

problems is a more useful approach as opposed to distinct diagnostic classifications (Cantwell, 1996). Although there are cognitive, behavioral, and affective features of many internalizing problems, research suggests that there may be more significant commonalities between anxiety and depression (Zahn-Waxler et al., 2000). This conceptual approach of categorizing internalizing disorders inclusive of symptomology of common disorders like anxiety and depression has the potential to streamline screening protocols and identify students for services targeting the general features of a problem rather than a specific diagnosis. Most mental health screeners used in schools target broad internalizing problems (Stiffler & Dever, 2015). However, further research is needed to evaluate whether the use of measures targeting internalizing disorders broadly has the same utility as separate measures of diagnosis-specific mental health problems.

The strengths/wellbeing dimension of complete mental health screening has been operationalized in a variety of ways. The World Health Organization (WHO) suggested updating the definition of mental health to include strengths, describing mental health as "a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (2004, p. 12). Previous research has primarily operationalized the wellbeing dimension using different subjective indicators drawn from positive psychology, including positive affect and life satisfaction (e.g., Suldo & Shaffer, 2008). However, others have used composite variables that represent overall resilience or social-emotional functioning (e.g., Furlong et al., 2014). When thinking about screening specifically, others have recommended using more context-specific indicators that represent student wellbeing specifically within the school setting (e.g., Renshaw et al.,

2015). The important thing to note here is that there is far more agreement about how to operationalize the negative dimension of mental health in screening models compared to the positive dimension.

Purpose of the Present Study

Paper 2 further evaluated the technical adequacy of the combined, integrated complete mental health screening protocol from Paper 1. This study collected new data using online survey panels and separate the data into two split-halves. Additionally, this study expanded on the previous study by exploring the predictive validity of the screening tools, both as individual measures and as an integrated assessment battery, in relation to traditional clinical measures of anxiety and depression. In doing so, this study aimed to further establish the construct convergence/ divergence of the school screening tools to predict clinical levels of anxiety and depression problems. If predictive validity can be established, this study may further inform the use of completing mental health universal screening within a multi-tiered system of supports. The research questions are as follows:

1. Do confirmatory factor analyses of the SSWQ (student wellbeing), YIPS (internalizing problems), and the YEPS (externalizing) yield adequate structural properties as independent measures for use as school-based screeners?
2. Do confirmatory factor analyses of the abbreviated complete mental health screening model (yielded from EFA in Paper 1) yield adequate structural properties as an integrated school-based screener?

3. Do theory consistent relationships exist between commonly used clinical measures of adolescent anxiety and depression and the domains assessed by the independent screeners and the integrated, abbreviated screening battery?
4. Do the abbreviated and integrated complete mental health screening protocol (yielded from EFA in Paper 1) have differential predictive validity related to clinical levels of anxiety and depression when compared to the individual screening measures?

Methods

Participants and Data Collection

The present study collected new data via self-report methods using the same screeners used in Paper 1 (i.e., YIPS, YEPS, and SSWQ) as well additional measures traditionally use for measuring anxiety and depression symptomology. Data was collected via electronic survey administration at one time point during the second half of the academic school year. For the sample to be generalizable and provide specific information regarding symptom presentation of anxiety/depression, purposive sampling was conducted using an online survey panel to ensure the resulting sample is racially/ethnically representative of current U.S. youth. Additional demographic information was obtained; however, participants were not retained or dismissed form the study based on their demographic information. Participants received monetary compensations for the completion of the survey. Participant eligibility criteria included being currently enrolled in a secondary school setting (Grades 6–12). Criterion-based rules of sample size suggest that 330 participants is adequate if there are high correlations

among the variables (Comrey & Lee, 1992; Tabachnik & Fidell, 2001). Other guidelines suggest the ratio of the number of subjects per variable of interest be 5-10 participants per variable (Hatcher, 1994; Nunnally, 1978). Based on these ratio considerations, this study aimed at a sample of 250-350 subjects. One change from the previous study is the elimination of the SAPS measure from the study given it was excluded during the model refinement process of paper 1.

Measures

Demographic Questionnaire

According to best practice when formulating demographic questionnaires, participants self-identified their gender identity, sexual orientation, race or ethnicity, age, and school grade and setting.

Student Subjective Wellbeing Questionnaire (SSWQ)

The SSWQ (Renshaw et al., 2015) is a 16-item self-report measure that evaluates four domains of school-specific student wellbeing: academic efficiency, school connectedness, joy of learning, and educational purpose. The four domains comprised together also yield an overall student subjective wellbeing total score. According to the measure developers, the SSWQ takes 3 minutes to complete, has a 3rd-4th grade readability, and is suggested for use with students ages 11-18. The measure is free to use and can be downloaded in an electronic version on the Open Science Framework. The SSWQ items are positively worded to reflect student perceptions of their functioning (e.g., “I feel like I belong at my school” and “I feel it is important to do well in my

classes"). Responses are presented in a relative frequency of experience format ranging from 1-4 (1 = Almost Never, 4 = Almost Always). Score interpretations are provided for each of the subscales mirroring the response format, representing lower of higher relative frequencies of wellbeing. Although these scores are not true cut off scores to determine level of risk or specific problem, higher scores indicate more positive wellbeing while lower scores indicate lower wellbeing. Previous research shows the SSWQ has adequate factor structure, internal consistency reliability, and convergent/ discriminant validity to support its use as a school-based screening tool (Renshaw et al., 2015; Zadworna et al., 2022).

Youth Internalizing Problems Screener (YIPS)

The YIPS (Renshaw & Cook, 2018b) is a 10-item, self-report measure of the presence of internalizing problems presented in relative frequency of experience format ranging from 1-4 (same as the SSWQ). The items reflect a variety of internalizing problems associated with domains of anxiety (e.g. "I feel nervous or afraid") and depression (e.g., "I feel worthless or lonely when I'm around other people"). The measure yields a total score that can be used to assess the respondents' level of risk associated for internalizing mental health problems. Preliminary research suggests that a cut-off score of 21 represents a higher or lower risk for internalizing problems. The YIPS measure developers suggest using local norming protocols as no nationally representative normative-level data currently exists. Previous research shows the YIPS has adequate factor structure, internal consistency reliability, and convergent/ discriminant validity to support its use as a school-based screening tool (Renshaw & Cook, 2018b; Arslan & Renshaw, 2019).

Youth Externalizing Problems Scale (YEPS)

The YEPS (Renshaw & Cook, 2019) is a 10-item self-report measure of student externalizing problems, intended for use a screening and research tool in school settings. The measure contains items that assess a variety of behavioral problem domains such as aggression (e.g., "I fight and argue with other people"), inattention (e.g., "I get distracted by the little things happening around me"), and impulsivity (e.g., "I talk a lot and interrupt others when they are talking"). Responses are presented in relative frequency of experience format ranging from 1-4 (1 = Almost Never, 4 = Almost Always). Similar to the YIPS, currently there is no normative data is available for the YEPS to inform cutoff scores. Therefore, the developers suggest using local norming approaches to assess relative risk specific to context of the administration. Generally, the higher the overall score suggests the greater level of student's presence of externalizing problems. Previous research shows the YEPS has adequate factor structure, internal consistency reliability, and convergent/ discriminant validity to support its use as a school-based screening tool (Renshaw & Cook, 2019).

Generalized Anxiety Disorder Screener (GAD-7)

The GAD-7 is brief measure of generalized anxiety disorder developed using the Diagnostic Statistical Manual Fourth Edition description of generalized anxiety disorder in clinical mental health settings (Spitzer, 2006). Studies indicate the measure has adequate internal consistency, reliability, and convergent validity with other measures of anxiety (Spitzer et al., 2006). The self-report measure was initially validated in adult populations, however additional studies have asserted the use of the GAD-7 with

adolescents (Mossman et al., 2017). The measure is a 7-item self-report scale prompting the respondent to reflect on statements about their anxiety symptoms over the past two weeks. The responses are problem-oriented, “Not being able to stop or control worrying”, and “Trouble relaxing”. The responses are presented in a Likert-type scale 0-3 (0=Not at all, 3=Nearly every day). The items are added together to yield an overall total score and cut-off scores are calculated (0-4: minimal anxiety, 5–9: mild anxiety 10–14: moderate anxiety 15–21: severe anxiety). Additionally, the respondents indicated the degree to which their symptoms have impacted their work, daily tasks, and interpersonal relationships.

Patient Health Questionnaire (PHQ-9)

The PHQ-9 is a 10-item depression screening tool developed to identify individuals at-risk for major depressive disorder (Kroenke et al., 2001). Studies have shown the PHQ-9 has high sensitivity and specificity with adult (Kroenke et al., 2001; Wittkampf et al., 2007) and adolescent populations (Richardson et al., 2010). The PHQ-9 also provides symptom severity qualifications (1-4 Minimal depression, 5-9 Mild depression, 10-14 Moderate depression, 15-19 Moderately severe depression, 20-27 Severe depression). The items of the measure reflect the presence of depression related problems such as; “Feeling down, depressed, or hopeless” and “Feeling bad about yourself or that you are a failure or have let yourself or your family down”. The measure contains 9 items specifically related to depression symptomology and 1 item that assesses the level of impairment these problems have caused the individual.

Data Analyses

Preliminary Analyses

First, a visual analysis of the data identified any outliers or mis-labeled or mis-identified responses in the data set. Variables of the data set were re-coded into a more user-friendly manner (e.g., calculating values for subscales and total scores). There were no missing data points in the data set. Upon visual inspection, there were two outliers in the "Duration" (8413 and 6510 seconds), the total time each individual took to complete the measure, and were further evaluated, and were therefore removed. The total dataset included 388 data points after the removal of the two "Duration" outliers. Descriptive statistics were then run to assess the distributions, and internal consistency reliabilities. Demographics can be found in Table 1.

Table 1. Participant Demographics.

Demographic	Frequency	Percent
Race/Ethnicity		
White	241	62.11
Two or more races	15	3.87
Asian or Asian American	9	2.32
Hispanic or Latinx or Spanish origin	70	18.04
African American or Black	41	10.57
American Indian or Alaska Native or Indigenous or First Nation	7	1.80
Native Hawaiian or other Pacific Islander	1	0.26
Arab or Middle Eastern	1	0.26
I identify differently from these choices	3	0.77
Gender		
Male	189	48.71
Female	195	50.26
Two-spirited	2	0.51
Non-binary	2	0.51
Grade		
12	179	46.13
11	50	12.89
10	41	10.57
9	42	10.83

8	31	7.99
7	22	5.67
6	23	5.93

Primary Analyses

Confirmatory Factor Analysis (CFA). In order to evaluate the psychometrics of the measurement model resulting from EFA from paper 1, a CFA was conducted to evaluate the model fit. CFA was conducted on each of the full independent measures and the integrated model from paper 1. Specifically, the integrated measure resulting from EFA was tested as one model and compared with the measurement models for the independent measures in the current data-set. The goal of the CFA was to evaluate the latent structure of the variables of the independent measures (Beauducel & Whittmann, 2005). Best practice suggests evaluating the model fit by examining the chi-squared, root mean square error approximation (RMSEA), standardized root mean square residual (SRMR), and the comparative fit index (CFI) (Kline 2011). Any chi-squared value that is closer to 0 would indicate a stronger model fit. Additionally, any RMSEA of 0.6 and SRMR value of 0.8 or higher indicate adequate model fit. The CFI explores any discrepancies between the experimental model and the data set, with any value of .95 or higher suggesting stronger model fit. A separate CFA was conducted on the SSWQ, YIPS, and the YEPS to affirm their fit indices and compare with the new integrated measurement model. Standardized factor loadings were also evaluated to consider the patterns and strength of item responses in representing each factor within each measure.

Correlations. Correlation analyses were conducted in order to evaluate the strength and direction of the relationships between different constructs among the

original measures as well as the TWSST. First, the correlations were run on the original measures, SSWQ, YIPS, and YEPS, to explore their convergent and divergent relationships. Additional correlation analyses were conducted on the original measures and the TWSST factors to explore their convergent and divergent relationships as well. Any correlation values closer to 0 suggest a weaker correlation, and those closer to 1 are stronger. Evaluating the positive or negative directionality of the relationships provided information regarding convergent and divergent relationships.

Receiver Operating Characteristic (ROC) Curve Analysis. The second phase of analyses included using a ROC curve analysis and a regression-based approach to compare the predictive validity of the independent and integrated screening measures for differentiating youth grouped as having non-clinical-level and clinical-level symptoms of anxiety and depression, based on the PHQ-9 and GAD-7 cutoff scores for determining elevated symptoms. The GAD7 was used as the dependent variable that indicates positive anxiety risk. The PHQ9 was selected as the dependent variable to identify positive depression risk. The area under the curve (AUC) resulting from ROC analysis provides information regarding the ability of a given measure to identify the true positive risk for dependent variables (sensitivity) and the false negative risk for a dependent variable (specificity). Any AUC value of 0.5 or lower has no real discriminative ability, 0.7–0.8 suggests acceptable ability, 0.8–09 is excellent, and any value of 0.9 or higher suggests exceptional discriminative ability. The AUC of the independent variables (the original measures and TWSST factors) with the highest AUC, anything above 0.6, were selected for further examination to determine the cutoff scores. Cutoff points were selected based

on a balance between the highest Youden's index, sensitivity, and specificity. Higher specificity will be prioritized over higher sensitivity.

Prior to statistical analysis, the participant's scores on the GAD-7 and PHQ-9 were transformed into positive or negative "risk" cases. These "risk" cases indicate participants with clinical-level symptoms of anxiety and depression, based on the PHQ-9 and GAD-7 cutoff scores for symptom severity. A total score of 10 or higher on the GAD-7 falls in the moderate to severe anxiety severity range, and therefore the score of 10 was retained as the cutoff score for "risk" for anxiety. On the PHQ-9, a total score of 10 or higher falls in the moderate to severe depression range and was also therefore retained as the "risk" for depression cutoff. Frequencies for anxiety risk cut off indicated 264 (68%) participants did not meet the cut-off score and 124 (32%) did meet the cut-off score for anxiety. Additionally, frequencies for the depression risk cutoff indicated 183 participants (47%) did not meet the cutoff for depression risk, and 205 (53%) did meet the cutoff for depression risk.

Results

Phase 1 Results

CFA for Independent Measurement Models

A CFA was conducted on each of the independent measures using an ordinal estimator to explore their utility as school-based screeners. Data-model fit indices were evaluated to test model quality, including chi-square test, the Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized

Root Mean Squared Residual (SRMR). To assert latent construct reliability, an indicator of internal consistency, H ≥ .70 will be considered acceptable (Mueller & Hancock, 2008).

Results from CFA of the SSWQ suggest strong model fit: $c^2 = 49.799$, $df = 98$, $p = 1.000$; CFI = 1.000; RMSEA (90% CI: 0.000-0.000) = 0.000 and SRMR = 0.029. Standard estimates of the SSWQ factor loadings were strong (0.679-0.897). A strong global model fit was found for the YIPS: $c^2 = 22.550$, $df = 35$, $p = 0.949$; CFI = 1.000; RMSEA (90% CI: 0.000-0.003) = 0.000 and SRMR = 0.033. Standard estimates of the YIPS factor loadings were strong (0.660–0.837). Again, a CFA of the YEPS yielded a strong global model fit: $c^2 = 70.025$, $df = 35$, $p = <.001$; CFI = .990; RMSEA (90% CI: 0.033-0.068) = 0.051 and SRMR = 0.059. Standard estimates of the YEPS factor loadings were strong (0.639–0.769).

Correlations

The study then evaluated the correlations of the original versions of the SSWQ, YIPS, and YEPS scores (see Table 3). Strong positive correlations were found between the YEPS and YIPS total (.779), suggesting that both internalizing and externalizing problems are closely related. Both the YEPS and YIPS yielded small negative correlations with the wellbeing indicators of the SSWQ measure. There were minimally notable differences among the correlations between the YEPS and the YIPS and the SSWQ subscales. The correlations ranged from –.117 to –.224. The YIPS yielded a slightly higher negative correlation with the SSWQ_SC subscale (-.224). This may suggest that higher internalizing problems is more closely related to lower levels of school connectedness. The correlations among the SSWQ subscales were all strongly

positively correlated, ranging from .727 (SSWQ_AE and SSWQ_SC) to .935 (SSWQ_JOL and SSWQ_Total). This is consistent with the prediction that the positive wellbeing indicators are all strongly correlated with each other. The bookends of the correlation range suggest that academics and school connectedness are relatively less strongly correlated than other school-based wellbeing indicators. SSWQ_JOL and the SSWQ_Total were highly correlated, suggesting that joy of learning and overall wellbeing are very highly correlated.

CFA for Integrated Measurement Model

Additionally, a CFA was conducted on the TWSST integrated battery containing items from the independent measures. The following results were found and suggest a strong data–model fit: $c^2 = 65.635$, $df = 98$, $p = 0.995$; CFI = 1.000; RMSEA (90% CI: 0.000-0.000) = 0.000 and SRMR = 0.038. Standard estimates of the TWSST factor loadings were strong (0.585-0.868). The covariance between the factors indicated theoretically consistent relationships among the factors. Factor 1- Academic Efficacy and Factor 2- School Engagement are both positive wellbeing scales, and factor 3- Internalizing Problems and Factor 4- Externalizing Problems are the negative, problem-oriented scales. Factor 1 was strongly positively correlated with Factor 2 (.876), and there was a small negative correlation with Factor 3 (-.162) and Factor 4 (-.179). Factor 2 also yielded a small negative covariance with Factors 3 (-.141) and 4 (-.134). Factors 3 and 4 yielded a strong positive correlation (.711). Full loadings from this CFA model are provided in Table 2 below. The reliability and descriptive analyses of the TWSST factors yielded adequate results. Full scale descriptives for the TWSST can be found Table 2.

Table 2. CFA Standardized Factor Loadings

							95% Confidence Interval	
Factor	Indicator	Symbol	Estimate	Std. Error	z-value	p	Lower	Upper
Factor 1	SSWQ-4	λ11	.836	0.034	24.957	< .001	.770	.902
	SSWQ-8	λ12	.809	0.031	25.697	< .001	.748	.871
	SSWQ-12	λ13	.811	0.031	26.178	< .001	.751	.872
	SSWQ-16	λ14	.785	0.033	23.672	< .001	.720	.851
Factor 2	SSWQ-3	λ21	.838	0.034	24.827	< .001	.772	.905
	SSWQ-5	λ22	.838	0.032	26.341	< .001	.775	.900
	SSWQ-9	λ23	.818	0.036	22.968	< .001	.748	.888
	SSWQ-15	λ24	.794	0.035	22.729	< .001	.726	.862
Factor 3	YIPS-1	λ31	.585	0.047	12.354	< .001	.493	.678
	YIPS-4	λ32	.771	0.046	16.644	< .001	.680	.862
	YIPS-5	λ33	.835	0.038	21.701	< .001	.760	.911
	YIPS-8	λ34	.868	0.039	22.117	< .001	.791	.945
Factor 4	YEPS- 3	λ41	.714	0.046	15.466	< .001	.623	.804
	YEPS- 4	λ42	.776	0.046	16.825	< .001	.686	.867
	YEPS-5	λ43	.662	0.048	13.916	< .001	.569	.755
	YEPS-6	λ44	.747	0.046	16.122	< .001	.656	.838

Note. Std. Est = standardized estimate, Std. Error = standard error, Factor 1 = Academic Efficacy, Factor 2 = School Engagement, Factor 3 = Internalizing Problems, Factor 4 = Externalizing Problems.

Table 3. Scale-Level Descriptive and Reliability Statistics for TWSST Scales

Scale	Mean	Median	Range	Skew	Kurt	ω	α	AIC
Factor 1_AE	12.13	12	12	-0.492	-0.822	0.914	0.914	0.728
Factor 2_SE	11.04	11	12	-0.081	-1.049	0.885	0.884	0.657
Factor 3_IP	7.93	7	12	0.789	-0.193	0.872	0.869	0.624
Factor 4_EP	7.05	6	12	1.073	0.330	0.850	0.849	0.584

Note. Skew = Skewness, Kurt= Kurtosis, ω = McDonald's ω, α = Cronbach's α, AIC = Average Interitem Correlation; Factor 1_AE = Academic Efficacy, Factor 2_SE = School Engagement, Factor 3 _IP = Internalizing Problems, Factor 4_EP = Externalizing Problems.

Correlations

Finally, bivariate correlations explored the relationship between the independent measures and the new factors of the integrated measure and the convergent validity of the integrated measure and the GAD-7 and PHQ-9 (see Table 4). Among the TWSST factors themselves, strong positive correlations were found between Factor 1_AE and Factor 2_SE (.788). This suggests that academic efficacy and school engagement are highly correlated. This is not unlikely given both tap into school-specific constructs. There was a small negative correlation between Factor 1_AE and Factor 3_IP (-.140) and Factor 4_EP (-.159). Similarly, there was a small negative correlation between Factor 2_SE and Factor 3_IP (-.119) and Factor 4_EP (-.116). Additionally, there were strong positive correlations between Factor 3_IP and Factor 4_EP (.611). Both internalizing and externalizing problems are strongly correlated, which suggests that youth experiencing one of these problems is more likely to experience the other as well. Identifying the cross-section of youth experiencing both internalizing and externalizing symptoms within

the population would also indicate those youth that are experiencing significantly higher risk for problems.

Regarding correlations with the full-length independent measures, Factor 1–Academic Efficacy yielded moderate positive correlations with the SSWQ Joy of Learning, SSWQ School Connectedness, and the SSWQ Educational Purpose subscales and strong positive correlation was found with the SSWQ Total (see Table 4). A small negative correlation was found between Factor 1–Academic Efficacy and the YEPS and YIPS total scales. Factor 2–School Engagement yielded strong positive correlations with the SSWQ Joy of Learning, SSWQ School Connectedness, and the SSWQ Educational Purpose, and a moderate positive correlation with the SSWQ Academic Efficacy subscale (see Table 4). Both Factor 3–Internalizing Problems and Factor 4–Externalizing Problems yielded small negative correlations with all SSWQ subscales and SSWQ total score. Factor 3–Internalizing Problems was strongly positively correlated with the YIPS total, and moderately positively correlated with the YEPS total. Factor 4–Externalizing Problems was strongly positively correlated with the YEPS total, and moderately positively correlated with the YIPS total (see Table 4).

Phase 2 results

Overall Discrimination Ability. First, logistic regression was performed on the TWSST scores as predictors of anxiety risk. The logistics regression for Factor 1–Academic Efficacy predicting GAD-7 risk yielded an AUC value of .580, suggesting this factor has no discrimination ability for anxiety risk. Additionally, Factor 2–School Engagement predicting GAD-7 risk showed no discrimination ability, with AUC = .554. Factor 3–Internalizing Problems yielded stronger performance, with moderate

discrimination ability for anxiety risk, AUC = .895. Finally, Factor 4–Externalizing Problems predicting GAD-7 again yielded moderate discrimination ability, AUC = .772.

Next, logistic regression was performed on the four TWSST scores as predictors of depression risk. Factor 1–Academic Efficacy predicting PHQ-9 risk yielded a low discrimination ability, with AUC = .642 Results of regression for Factor 2–School Engagement predicting PHQ-9 risk again yielded low discrimination ability, AUC = 0.60. Both Factor 3 and Factor 4 yielded stronger discrimination ability predicting depression risk. Factor 3–Internalizing Problems predicting PHQ-9 risk yielded strong discrimination ability, with AUC = .905. Finally, Factor 4–Externalizing Problems yielded a moderate discrimination ability, AUC = .818.

Following, logistic regression was performed on the total independent measures (YIPS, YEPS, and SSWQ) and the GAD-7 and PHQ-9 to compare their discriminative ability to that of the TWSST factors. According to the results of the logistic regression of the YIPS predicting GAD-7 risk, the full measure had high discriminative ability, AUC = .910. The YEPS yielded moderate discriminative ability on GAD-7 risk, with AUC = .824

Table 4. *Pearson's Correlations Between All Study Measures*

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. JOL	—										
2. SC	.817***	—									
3. EP	.837***	.784***	—								
4. AE	.770***	.727***	.794***	—							
5. Factor 1	.770***	.727***	.794***	1.000***	—						
6. Factor 2	.951***	.837***	.915***	.788***	.788***	—					
7. Factor 3	-.100*	-.191***	-.113*	-.140**	-.140**	-.119*	—				
8. Factor 4	-.074	-.098	-.161**	-.159**	-.159**	-.116*	.611***	—			
9. YEPS	-.117*	-.154**	-.172***	-.186***	-.186***	-.151**	.728***	.929***	—		
10. YIPS	-.135**	-.224***	-.146**	-.177***	-.177***	-.158**	.963***	.662***	.779***	—	
11. SSWQ	.935***	.908***	.929***	.896***	.896***	.952***	-.148**	-.133**	-.171***	-.186***	—

Note. JOL = Joy of Learning subscales of the SSWQ; SC = School Connectedness subscales of SSWQ; EP = Educational Purpose subscales of SSWQ; AE = Academic Efficacy subscales of SSWQ; Factor 1 = Factor 1 Academic Efficacy; Factor 2 = Factor 2 School Engagement; Factor 3 = Factor 3 Internalizing Problems; Factor 4 = Factor 4 Externalizing Problems; YEPS = Youth externalizing Problems Scale total scale; YIPS = Youth Internalizing Problems Scale total scale; SAPS = Subjective Academic Problems Scalee total scale; SW = Student Wellbeing total scale of the SSWQ.
*p< .05, **p< .01, ***p < .001.

The logistical regression of the YIPS on PHQ-9 risk yielded high discriminative ability, AUC = .918. And the regression analysis for the YEPS predicting PHQ-9 risk showed a moderate discriminative ability, AUC = .854. Finally, the SSWQ yielded poor discriminative ability for both GAD-7 and PHQ-9 risk, AUC = .571 and .634, respectively.

Cutoff Score Discrimination Ability. After evaluating AUC values, the TWSST Factor 3- Internalizing Problems and Factor 4- Externalizing Problems were selected for further examination in order to determine the cut-off scores for each regarding anxiety and depression risk classifications on the PHQ-9 and GAD-7, respectively. Optimal cutoff scores were determined by identifying the score with the highest Youden's *J* values for each model. Results of all ROC curve analyses for identify cutoff points for the TWSST factors can be found in Table 5. ROC curve analysis of Factor 3- Internalizing Problems and the GAD-7 indicated a cutpoint of 9 with good sensitivity (.81), good specificity (.86), excellent NPV (.91), and adequate PPV (.73). Results of the ROC analysis for Factor 4- Externalizing Problems and the GAD-7 provided three cutpoints with poor to adequate sensitivity (0.52–0.74), adequate to good specificity (0.87-0.69), poor to adequate PPV (0.65–0.53), and adequate NPV (0.80–0.85). Result suggest Factor 4 has less discrimination ability than Factor 3, and a cutpoint was not selected. Analysis of Factor 3- Internalizing Problems and the PHQ-9 yielded three potential cutpoints (7, 8, 9) with adequate to good sensitivity (0.64–0.90), good to excellent specificity (0.96–0.75), good to excellent PPV (0.95–0.80), and good NPV (0.7–-0.87). Sensitivity was maximized, and therefore the cutpoint of 7 was selected (sensitivity= 0.90, specificity= 0.75). Finally, ROC curve analysis was run on Factor 4- Externalizing Problems and the

PHQ-9. Results suggested three possible cutpoints with poor to adequate sensitivity (0.58–0.82), poor to adequate specificity (0.88–0.68), adequate PPV (0.84–0.74), and poor to adequate NPV (0.65–0.78). The cutpoint of 6 yields the most promising sensitivity (0.82) and specificity (0.68).

Table 5. Potential Cutoff Scores for Predicting Anxiety and Depression Risk Classification

Factor + Risk	Cutpoint	Sens. (%)	Spec. (%)	PPV (%)	NPV (%)	Youden's *J*
Factor 3 IP + ANX	9	81.45%	85.61%	72.66%	90.76%	0.671
Factor 4 EP + ANX	7	74.19%	68.94%	52.87%	85.05%	0.431
	8	63.71%	76.52%	56.03%	81.78%	0.402
	9	52.42%	86.74%	65%	79.51%	0.392
Factor 3 IP + DEP	7	89.76%	75.41%	80.35%	86.79%	0.652
	8	78.05%	85.79%	86.02%	77.72%	0.638
	9	64.39%	96.17%	94.96%	70.68%	0.606
Factor 4 EP + DEP	6	82.44%	68.31%	74.45%	77.64%	0.507
	7	68.78%	81.97%	81.03%	70.09%	0.507
	8	58.05%	87.98%	84.40%	65.18%	0.460

Note. Factor + ANX/DEP = TWSST Factors and Anxiety or Depression; Factor 3 IP + ANX = Factor 3 Internalizing Problems and anxiety risk; Factor 4 EP + ANX = Factor 4 Externalizing Problems and anxiety risk; Factor 3 IP + DEP = Factor 3 Internalizing Problems and depression risk; Factor 4 EP + DEP = Factor 4 Externalizing Problems and depression risk.

Next, ROC curve analyses were performed on the original YIPS Total and YEPS Total independent measures to compare their discrimination ability compared to the shortened versions included in the TWSST. Results of the ROC curve analysis of the YIPS Total and the GAD-7 suggested three cutpoints (12, 13, 14) with adequate

sensitivity (0.83–0.86), adequate specificity (0.88–0.81), poor to adequate PPV (0.76–0.68), and excellent NPV (0.92–0.93). There was no significant difference between the sensitivity and specificity among the three cutpoints. The YIPS Total and PHQ–9 analysis provided five cutpoints (8, 9, 10, 11, 12) with adequate to excellent sensitivity (0.71-0.92), adequate to excellent specificity (0.94–0.72), adequate to excellent PPV (0.92–0.79), and adequate NPV (0.74–0.89). The cutpoint of 10 yielded the highest adequate balance between sensitivity (0.83) and specificity (0.83). The analysis of the YEPS Total and the GAD-7 yielded eight potential cutpoints (7, 8, 9, 10, 11, 12, 13, 14), with poor to excellent sensitivity (0.56–0.90), poor to adequate specificity (0.88–0.55), poor PPV (0.69–0.48), and adequate to excellent NPV (0.81–0.92). The cutpoint of 9 yielded a sensitivity of 0.81 and a specificity of 0.65, and the cutpoint of 10 yielded a sensitivity of 0.77 and a specificity of 0.71. Finally, ROC curve analysis of the YEPS Total and the PHQ-9 resulted in four cutpoints (7, 8, 9, 10 with adequate sensitivity (0.70–0.85), poor to adequate specificity (0.85–0.69), adequate PPV (0.84–0.75), and adequate NPV (0.71–0.81). To best balance sensitivity and specificity, the cutpoint of 8 was selected (sensitivity = 81.95, specificity = 74.32).

A comparison of the discriminative ability of the TWSST factors and the YIPS Total and YEPS Total on anxiety and depression was then explored. Specifically, a comparison of the sensitivity and specificity of the competing models was compared to evaluate the extent of their discriminative abilities. Based on the ROC curve analyses, Factor 3- Internalizing Problems and the YIPS Total yielded no meaningful differences in their sensitivity or specificity, suggesting both models are adequate at predicting anxiety risk. Factor 4- Externalizing Problems yielded a slightly higher specificity (0.90) and

comparable sensitivity (0.75) to the YEPS Total (sensitivity= 0.77, specificity= 0.71) for anxiety risk, suggesting a slight advantage for the briefer scale. With regard to depression risk, the ROC analysis of Factor 3- Internalizing Problems had a higher sensitivity (0.90) compared to the YIPS Total (.83). However, the YIPS Total produced a slightly higher specificity (0.83) compared to Factor 3- Internalizing Problems (0.75). Finally, Factor 4- Externalizing Problems and YEPS Total yielded the same sensitivity (0.82) for depression risk, although the YEPS Total had a slightly higher specificity (0.74) compared to Factor 4- Externalizing Problems (0.68), suggesting a slight advantage for the full-length measure. In summary, there were no substantive differences in the discriminative ability of the TWSST factors when compared to the YIPS Total and YEPS Total to predict anxiety and depression risk, although slight advantages were observed depending on the analysis. Given the TWSST factors contain only four items each, compared to the ten items of the YEPS Total and YIPS Total, the TWSST is a promising tool to predict risk for anxiety and depression.

Discussion

The goal of this study was to explore the ability for the integrated TWSST battery to function not only as an independent measure of student problems and wellbeing, but also provide useful information regarding risk for anxiety and depression. Current estimates suggests that around 46% of adolescents will exhibit symptoms of a mental health disorder (Merikangas et al., 2010). When left untreated, mental illness is correlated with decreased social and academic functioning, and higher risk for risky behaviors and interpersonal problems (Birmaher et al., 1996; Ezpeleta et al., 2006). For those diagnosed

with comorbid disorders, their risk is even greater. Around half of youth diagnosed with depression also meet criteria for anxiety, and those with a primary anxiety disorder at up to 15% more likely to meet criteria for depression (Daley, 2006; Axelson & Birmaher, 2001; Costello et al., 2003). Additionally, individuals diagnosed with both anxiety and depression are at a higher risk for suicide, worsening of negative symptoms, and utilization of more intensive mental/behavioral health services (Birmaher et al., 1996; Ezpeleta et al., 2006). Unfortunately, only around half of those with symptoms of anxiety or depression ever receive a formal diagnosis (Costello et al., 2014).

Many of those that do receive diagnosis and treatment, are receiving them in K-12 public school settings (Burns et al., 2005). A study exploring service utilization identified the two highest behavioral health service settings for youth and adolescents were schools (22.10%) and outpatient settings (20.56%) (Duong et al., 2021). For those from underserved populations, they are increasingly more likely to only receive services from school, rather than in a specialized outpatient setting (Duong et al., 2021). The first step in triaging behavioral and mental health in schools is to swiftly and accurately identify those within the school population that are at the greatest risk. Universal screening tools evaluate the risk for problems and the strengths for an entire school population in a way that not only streamlines the identification process (Glovers & Albers, 2007), but also provides more rich and useful information than traditional referral-based systems (Eklund et al., 2009). By using a complete screening tool that identifies strengths and problems in a short and succinct process, schools have the opportunity to streamline triage and intervention in a highly effective way.

Given the high occurrence rates and global impact of anxiety and depression in youth and adolescent populations, targeting these psychiatric symptoms is also critical. To do this, schools need complete mental health screening tools that not only provide information about academic and social functioning, but also risk for anxiety and depression. This study first conducted a Confirmatory Factor analysis to explore their abilities as screening tools. Results suggest that each of the original independent measures (SSWQ, YIPS, and YEPS) all have strong psychometric properties. This supports the use of the items from the independent measures as a framework for the integrated TWSST battery. The SAPS was removed from this study as it was removed from the integrated battery during the EFA process of paper 1. Additionally, the CFA of the new integrated TWSST measure also yielded strong model fit indices and factor loadings, suggesting it is an empirically valid measurement tool. Additionally, expected theoretical relationships were found among the independent measures, the new factors of the TWSST. Next this study explored the convergent validity of the original independent measures and the integrated TWSST measure with both the GAD-7 and PHQ-9. The GAD7 is a common screening tool used in a variety of settings to determine risk for anxiety. The PHQ9 is also a widely used screening measure to explore risk for depression. As expected, among the independent measures, the YIPS had the highest discrimination ability for depression and anxiety classifications based on the theoretical constructs assessed by the YIPS. While the other independent measures (i.e., YEPS, SAPS, SSWQ) may assess related and overlapping constructs with the GAD-7 and the PHQ-9, the YIPS contains more theory-consistent content with the GAD-7 and the PHQ-9.

Using logistic regression, cutpoints were selected for anxiety and depression risk on the GAD-7 and PHQ-9. The area under the curve (AUC) values were used to identify the predictive ability of the TWSST factors and the full versions of the SSWQ, YIPS, and YEPS measures to determine anxiety and depression risk. Factor 1 Academic Efficacy and Factor 2 School Engagement yielded low predictive ability to determine anxiety and depression. Factor 3 Internalizing Problems yielded moderate discriminative ability to identify anxiety risk, and strong discriminative ability to predict depression risk. Factor 4 Externalizing Problems yielded moderate discrimination ability for anxiety and depression risk. With regard to the total measures, the YIPS had strong discriminative ability for anxiety and depression risk. The YEPS had moderate discriminative ability for anxiety and high discriminative ability for depression. The SSWQ yielded poor discriminative ability to predict anxiety and depression risk.

Factor 3–Internalizing Problems and Factor 4–Externalizing Problems were selected for further examination given their relatively stronger discriminative ability compared to the other TWSST factors. ROC curve analysis of Factor 3–Internalizing Problems and the GAD-7 yielded a cutpoint of 9 with good sensitivity (.81), good specificity (.86), excellent NPV (.91), and adequate PPV (.73). The cutpoint of 7 was selected given its excellent sensitivity (.90) and good specificity (.75) for Factor 3–Internalizing Problems and the PHQ-9. Factor 4–Externalizing Problems yielded a lower than acceptable discrimination ability for anxiety and, thus, a cutpoint was not selected. ROC analysis of Factor 4–Externalizing Problems and PHQ-9 yielded a cutpoint of 6 with moderate sensitivity (0.82) and poor specificity (0.68). When compared to the full measures, the simplified TWSST Factor 3–Internalizing Problems yielded similar

discriminative ability to predict anxiety risk on the GAD-7 when compared to the YIPS total measure. Interestingly, the YEPS total measure yield slightly stronger specificity, but slightly lower sensitivity to identify depression risk on the PHQ-9 when compared to the TWSST Factor 4 –Externalizing Problems. Given the TWSST factors for internalizing and externalizing problems are significantly shorter than the full YIPS and YEPS measures, with only 4 items compared to 10 items, and that they retain acceptable predictive abilities, they appear to be feasible and promising screening tools for identifying both anxiety and depression risk.

This study explored the predictive validity of the TWSST, specifically factors 3 and 4, to predict anxiety and depression risk. While empirical evidence supports the predictive validity of Factor 3 and Factor 4 on the variable of interest, the study did not find the same for Factors 1 and 2 or the TWSST total score.

Implications for Practice

The goal of this study was to explore the psychometric properties of the integrated TWSST measure as a universal screening tool, and to evaluate its ability to identify risk for anxiety and depression. CFA confirmed that the TWSST model has adequate empirical support as a school screening tool to identify students for strengths related to self-perception of their academic efficacy, experiences related to school engagement, as well as potential problems with internalizing and externalizing behaviors. When considering the criteria for selecting a screening tool, it is important that the tool provide relevant and useful information in a brief and feasible fashion. When conducting screening in schools, it is important to measure school specific domains that can be balanced with broader mental health domains (Renshaw et al., 2015). The TWSST

contains two factors that measure academic efficacy and school connectedness, both which are highly contextualized to the school setting. The other two factors of the TWSST, Factor 3–Internalizing Problems and Factor 4–Externalizing Problems, provide information regarding disturbances in mood or disruptive behaviors related to broader mental health domains. The TWSST therefore balances specificity with breadth as a screener. Moreover, ROC curve analyses indicated that two subscales of the TWSST are capable of adequately identifying individuals who are at risk for anxiety and depression. This suggest that scores from the TWSST may be used for multiple purposes, including identifying students who may be at risk for more significant mental health concerns.

In practice, schools would administer the TWSST to the entire student body as a universal screener. The results will indicate students with lower and higher school-based competencies (Academic Efficacy and School Engagement subscales) and those with lower and higher mood and behavior problems (Internalizing Problems and Externalizing Problems subscales). This information can then be used to inform the selection and implementation of both universal prevention as well as targeted or tiered interventions. By using aggregate school-level data, schools can select whole-school supports that are focused on the strengths and problems of their student population. This may be implementing or augmenting existing positive-behavior support or school climate supports. Disaggregating results at the grade level, trends may appear in the data that will prompt schools to provide class-level social-emotional-learning interventions or behavior supports. Finally, at the individual level, individuals at higher risk for anxiety or depression can be selected for further assessment and targeted small group or individualized interventions to address potential mental health risks.

Limitations and Future Directions

This current study provides preliminary support for the TWSST as a strong option for schools to conduct complete mental health screening. The results also indicated that the TWSST can successfully identify respondents who are at high risk for anxiety and depression. The TWSST is a self-report measure and is therefore limited to the population that it can be used with (i.e., older children and adolescents who are capable of self-reporting). An additional informant-report format of the TWSST would increase its ability to be used in lower elementary populations. While this study provides continuing support for the validity of the of the TWSST as a school screening tool, there is limited information regarding the connection to meaningful school outcomes. Further study should evaluate the TWSST responses and their correlation with common school outcomes such as conduct or behavioral referrals, attendance, work completion, attrition rates, and standardized testing. It is possible that wellbeing indicators are more closely correlated with other variables of interest, such as the previously stated outcome measures. Additionally, further research into the connection between wellbeing indicators and outcomes will help explore the differential benefits of complete health screening versus problems-oriented screening. Research is also needed to further validate the TWSST with larger and more diverse samples of students to see if results in the present study hold across settings and populations.

Conclusion

The aim of this study was to explore empirical evidence to support the TWSST as a universal screening tool. Results suggest the TWSST has strong factor structure and

reliability, indicating it warrants further research and use. An additional aim of this study was to explore the TWSST's ability to identify those at risk for anxiety and depression based on commonly used screening tools in clinical settings. ROC curve analyses confirmed that the TWSST is able to identify youth at risk for anxiety and depression with adequate empirical support. While further research is needed to expand the TWSST's generalizability, it appears to be a promising tool for schools to use to make evidenced-based decision regarding student well-being and mental health.

Chapter IV Study Conclusion

The goal of this multi-paper dissertation was to evaluate existing measures used for school-based screening and to compare their performance to a shorter, integrated screening tool. Schools use school-based screeners to identify students at risk for a variety of problems that will negatively impact their educational functioning. Among these, behavioral mental health problems are linked to decreased motivation, behavioral problems, social or emotional challenges, and lower academic progress (Costello et. al., 2004). Prevalence rates in youth and adolescent populations indicate that the most common mental health diagnoses are anxiety and depression (Bisko et al., 2022). Of those who are diagnosed, access to quality interventions remains a constant struggle. The field of school-based mental health is comprised of interdisciplinary professionals and researchers aimed at addressing mental health problems in school settings. Recently, school-based mental health has begun to explore the use of universal screening tools as a way to improve identification and intervention procedures (Glovers & Albers, 2007). A universal screening protocol includes the selection of high quality and contextually useful

measures, implementing them to the entire student body, and then interpreting the results in order to inform treatment (Dowdy et al., 2015; Costello, 1996). This model of screening fits well within an early-identification model and is a more effective alternative to traditional referral-based methods of identification (Strein et al., 2003). Recent research has explored the benefits of *complete mental health screening* as a more comprehensive and useful form of assessment. Complete mental health screenings include not only measures that evaluate the presence of problems, but also evaluate an individual's strengths. Research has suggested that screening models that include measures of strengths, or positive wellbeing indicators, help to destigmatize mental health and better explain overall functioning (Epstein, 1999, Antaramian et al., 2010, Suldo & Shaffer 2008, Kim et al., 2014).

The purpose of paper 1 was to explore the empirical support for an integrated screening tool derived from 4 validated independent screeners (i.e., SSWQ, YIPS, YEPS, and SAPS). These measures were initially evaluated to assess separate, yet connected, constructs within a school setting. The measures evaluate overall student wellbeing (SSWQ), internalizing problems (YIPS), externalizing problems (YEPS), and academic problems (SAPS). The intent of the new integrated measure would be to evaluate all of these constructs in a simplified and more streamlined way. In doing so the resulting measure would support schools in implementing universal complete mental health screening by decreasing the number of tools needed, lower the burden of reporting, and providing useful information. In both samples of the study, confirmatory factor analysis indicated the independent measures have adequate structural properties and are strong school-based screeners. Results of the exploratory factor analysis yielded a new 16-item

integrated measure with adequate structural properties as well. The resulting measure was comprised of four factors: Academic Efficacy, School Engagement, Internalizing Problems, and Externalizing Problems. Taken together, these factors comprise a n evaluation of over wellbeing and the measure was therefore named the Total Wellbeing School Screening Tool (TWSST).

Paper 2 continued the validation work of paper 1 by conduction confirmatory factor analyses on the independent screening tools and the TWSST. Results again indicated the measures all retain adequate structural properties as measurement models and are useful and effective school-based screening tools. Additionally, this study aimed at comparing the TWSST's ability to identify individuals at risk for anxiety and depression compared to commonly used measure of these constructs. The GAD-7 was selected as the predictor for anxiety risk, and the PHQ-9 for depression risk. Using logistic regression and ROC curve analyses, this study explored the ability of the TWSST to predict risk/no risk for anxiety and depression. Factor 3 Internalizing Problems and Factor 4 Externalizing Problems of the TWSST yielded the strongest discrimination ability of all the TWSST factors. The ROC curve analysis of Factor 3–Internalizing Problems and the anxiety measure, GAD-7, yielded a cutpoint of 9 with good sensitivity (.81), good specificity (.86), excellent NPV (.91), and adequate PPV (.73). For the depression risk predictor, the PHQ-9, the cutpoint of 7 was selected given its excellent sensitivity (.90) and good specificity (.75). ROC analysis of Factor 4–Externalizing Problems and PHQ-9 yielded a cutpoint of 6 with moderate sensitivity (0.82) and poor specificity (0.68). The discrimination ability of Factor 3 and 4 of the TWSST was then compared to full original measures, the YIPS and the YEPS. The TWSST factors

performed similarly to the full measures in their ability to predict risk/no risk for anxiety and depression. The benefits of the TWSST factors are that they contain only 4 items each, when compared to the 10 items of the original measures.

Taken together, paper 1 and paper 2 further support the use of the selected independent screening tools as valid and psychometrically strong measures for use in schools. Additionally, both studies explored the structural integrity of the new TWSST measurement model. Results indicate the measure is a promising tool for use as a complete mental health screening tool, with an ability to predict risk for anxiety and depression. Further research should further validate the TWSST in additional populations to further assert its generalizability. Additionally, it is unknown the extent of which the TWSST corresponds to outcomes of interest. Studies could evaluate the TWSST in relation to outcomes such as attendance, graduation, rates, conduct referrals, grades, or standardized testing. One particular area of interest would be to explore how the wellbeing indicators included in the TWSST correspond to overall student functioning and other measures of overall wellbeing (i.e., life satisfaction).

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CURRIUCULUM VITAE

Stephanie Vinal

Education

Ph.D. (anticipated 2024)	**Utah State University, Logan, UT** School Psychology *Advisor: Tyler Renshaw Ph.D., LP., NCSP*
Ed.S. 2022	**Utah State University, Logan, UT** School Psychology *Advisor: Tyler Renshaw Ph.D., LP., NCSP*
M.Ed 2016	**Boston University, Boston, MA** Curriculum and Teaching Concentration in Special Education (Moderate Disabilities)
B.A. 2014	**Roanoke College, Salem, VA** Majors: Literary Studies & Spanish

Clinical Experience

09/2022-
06/2023

Doctoral Psychology Intern
University of Utah, Hunstman Mental Health Institute
Supervisor: Brian Augustyn, PhD., LP

- Youth, adolescent, and adult populations experiencing severe mental health crises in an inpatient and partial hospitalization setting
- Conducted individual, group, and family psychotherapy groups
- Provided short-term stabilization services, differential **diagnostic** clarification, and case conceptualization to guide future treatment
- Experience assessing intellectual, cognitive, psycho-educational, affective, personality and behavioral functioning across the developmental lifespan
- Provided training to mental health and psychiatry trainees regarding concepts of psychology (e.g., behavioral activation, CBT, and DBT)
- Participated in DBT-consultation groups and interdisciplinary rounds
- Member of leadership team that developed a family caregiver support forum for community members and clinical trainees

09/2022-
06/2023

Graduate Student Clinician
Utah State University, Counseling and Psychological Services

Supervisor: Charley Bentley, PhD., LP

- Young adult population of college students
- Conducted diagnostic psychological intakes for concerns including eating disorders, anxiety, depression, identity considerations, and interpersonal conflict
- Provided individual psychotherapy using interpersonal **therapy,** ACT, CBT, DBT, and process-based treatment approaches
- Mental health promotion presentations: suicide awareness and response training for college students

05/2022-
06/2023

Graduate Student Clinician
Utah Center for Evidence-Based Treatment
Supervisor: Kimberly Applewhite, Psy.D, LP

- Adult populations with parenting concerns, personality disorders, depression, body dysmorphia, and anxiety
- Conducted diagnostic psychological intakes for youth, adolescent, and adult clients
- Provided individual psychotherapy services using ACT, DBT, CBT, and Process-Based Therapy
- Presented case conceptualizations and experiential exercises during consultation team meetings

08/2020-
10/2022

Graduate Student Clinician
Behavioral Health Clinic, Sorenson Center for Clinical Excellence
Supervisor: Shelley Upton, PhD., LP & Sara Boghosian, PhD., LP

- Adolescent and child clients at university community clinic
- Provided group-based DBT skills sessions for adolescents via telehealth and in-person
- Conducted diagnostic intakes and developed assessment plans
- Administered, scored, and interpreted cognitive, achievement, and neuropsychological assessments
- Provided integrated reports for families and clients with Diagnostic classification and treatment recommendations

08/2020-
08/2022

Graduate Student Clinician
Integrated Assessment Division, Sorenson Center for Clinical Excellence
Supervisor: Maryellen McClain Verdoes, Ph.D., NCSP, LP and Shelley Upton, PhD., LP

- Adult, adolescent, and child clients at university community clinic
- Neuropsychological assessments to assess ASD (ADOS-2, CARS-2, ASRS, SRS, SCQ), intellectual disabilities (WISC-V, WAIS-IV, Bayley-4, Stanford-Binet) and other neurodevelopmental disabilities (e.g., ADHD)
- Diagnostic assessment and integrated report writing including intervention planning and related services

- Consulted with multidisciplinary team including clinical psychologists, social workers, speech and language pathologists
- Feedback sessions communication diagnostic classifications and treatment options; in-person and via telehealth

07/2019-
08/2020

Graduate Student Clinician
Avalon Hills Eating Disorder Specialists, Logan UT
Supervisor: Tera Lensegrav-Benson, Ph.D.

- Adolescent and adult populations in residential treatment setting
- Primary presenting concern was eating disorders; comorbidities included GAD, OCD, PTSD, depression, self-harm, and problematic substance use.
- Provided group therapy (ACT, DBT, process), individual therapy (mindfulness skills training, exposures, behavioral activation), and family co-therapy
- Provided milieu-based therapy in residential, experiential, and exposure settings

08/2019 –
08/2021

Graduate Student School-Based Clinician
Logan City School District, Logan, UT
Supervisor: Dr. Tyler Renshaw, Ph.D., LP., NCSP

- Elementary, middle school, and high school populations
- Established systematic school-wide mental health screening for students and led interdisciplinary mental health team
- Provided individual and group psychotherapy (DBT, CBT, TF-CBT), crisis intervention, and class wide and schoolwide interventions
- Facilitated communication between family, school-staff, and clients to create comprehensive treatment plans (home visits, phone interviews, & in-person meetings)
- Conducted evidenced-based systematic functional behavioral assessments targeting severe social and emotional behaviors
- Conducted intake interviews, suicide risk screenings and safety plans, and routine outcome monitoring for treatment cases

08/2019 -
05/2020

School Psychology Practicum Student
Cache County School District, UT
Supervisors: Joe Cottrell, Ed.S. & Megan Heyborne, Ph.D., L.P

- Administered standardized cognitive and academic assessments to inform special education eligibility determination
- Consulted with various team members during interdisciplinary team meetings to evaluate interventions and report on treatment progress
- Reported on various assessment findings (cognitive, social-emotional, behavioral, & functional) to inform differential

diagnosis
- Collected weekly progress monitoring data to inform intervention planning and adaptation

09/2018 - 04/2019 **Social-Emotional Skills Group Facilitator**
Edith Bowen Laboratory School, Logan, UT
Supervisor: Tyler Renshaw, Ph.D., NCSP
- Provided evidenced-based social and emotional skills-based training to improve subjective wellbeing and educational performance
- Consulted with parents, teachers, and administrators to inform classroom and home-based interventions for group participants
- Collected self-reports and teacher rating scales monitoring student behaviors to inform interventions

Research Experience

09//2018 – 08/2019 present **Graduate Student Researcher**
Utah State University, Logan, Utah
S*upervisor: Tyler Renshaw, Ph.D., LP., NCSP*
- Conducted systematic reviews of Dialectal Behavioral Therapy interventions with youth and adolescents
- Reviewed meta-analyses and systematic reviews of Acceptance and Commitment Therapy research
- Literature reviews for studies exploring academic, social, and emotional wellbeing
- Collected school-wide teacher ratings and student self-reports of various mental health indicators
- Compiled reports, indicated trends, and identified levels of need based on cut-off scores to inform school mental health interventions
- Supported the preparation of publications and presentations for national conferences

09/2018 – 09/2019 **Principal Investigator, Doctoral Dissertation**
Utah State University, Logan, Utah
S*upervisor: Tyler Renshaw, Ph.D., LP., NCSP*
- Multiple paper dissertation exploring the use of complete mental health screening using adolescent self-reports

09/2018 – 08/2022 **Principal Investigator, Master's Thesis**
Utah State University, Logan, Utah
S*upervisor: Tyler Renshaw, Ph.D., LP., NCSP*
- The initial development and validation of a CASEL (Collaboration for Social Emotional Learning) aligned teacher-rater measure of student social-emotional learning competencies

06/2017 – 08/2017 **Research and Policy Fellow**
The Rennie Center for Education Research & Policy, Boston, MA

- Conduct qualitative research synthesis to identify trends and use improvement science recommendations to present information to practitioners
- Research evidence-based practices to address various educational challenges with emphasis on high needs areas and vulnerable populations (e.g., racial diversity in educator workforce, educational leadership, and student-centered learning)
- Collaborate with researcher and stakeholders to discuss contextually relevant key issues in education and their relationship to state level and national policy

Publications

Peer-Reviewed Journal Articles

Vinal, S. A., & Renshaw, T. L. (under review). Starting from scratch: Toward a new measure of social-emotional competence. PsyArXiv preprint: https://psyarxiv.com/e46xq

Weeks, S. N., Renshaw, T. L., **Vinal, S. A.** (2021). Minority stress as a multidimensional predictor of LGB+ adolescents' mental health outcomes. Advance online publication. *Journal of Homosexuality*. http://dx.doi.org/10.1080/00918369.2021.2006000

Book Chapters

Renshaw, T. L., Barr, J., Farley, C., Franzmann, T. K., **Vinal, S.,** & Weeks, S. N. (in press). Mindfulness-based curricula for classrooms and schools. In Renshaw, T. L., & Jimerson, S. R. (Eds.), *Mindfulness for improving mental health in schools*. Oxford University Press.

Renshaw, T. L., Weeks, S. N., Roberson, A. J., & **Vinal, S.** (2022). ACT in schools: A multitiered, prevention-oriented approach. In M. P. Twohig, M. E. Levin, & J. M. Peterson (Eds.), *Oxford handbook of acceptance and commitment therapy*. Oxford. PsyArXiv preprint: https://psyarxiv.com/ar3m8

Academic Presentation Experience

Poster Presentations

02/2022 Weeks, S. N., **Vinal, S**., & Renshaw, T. L. (2022, February). *Multidimensional predictors of sexual minority adolescents' mental health outcomes.* Paper presented at the annual convention of the National Association of School Psychologists, Boston, MA.

02/2022 **Vinal, S**., & Renshaw, T. L. (2021, October). *Initial development of a CASEL-aligned measure.* Poster presented at the Annual Conference for Advancing School Mental health [virtual].

02/2022 Farley, C., Renshaw, T. L., Barr, J., & **Vinal, S**. (2020, February). *Toward a systematic review of mindfulness-based interventions with parents.* Poster presented at the annual convention of the National Association of School Psychologists, Baltimore, MD.

02/2020 **Vinal, S**., & Renshaw, T. L., Weeks, S., & Franzmann, K. (2020, February). *Toward a systematic review of behavioral activation with youth.* Poster presented at the annual convention of the National Association of School Psychologists, Baltimore, MD.

11/2019 **Vinal, S**. A., Renshaw, T.L. (2019, November). *Systematic Review of Behavioral Activation with Youth: Upshot of the Evidence and Implications for School Mental Health*. Poster Presented at the Annual Conference for Advancing School Mental Health, Austin, TX.

Outreach and Professional Development Presentations

12/2023 **Vinal, S. (December, 2023).** *Emotion-Focused De-escalation for Trainees.* Training in de-escalation techniques for mental health and medical trainees HMHI- University of Utah, in Salt Lake City, UT.

10/2023 **Vinal, S. (October, 2023).** *Introduction to Behavioral Activation.* Overview of behavioral activation for psychiatry fellows at HMHI-University of Utah, in Salt Lake City, UT.

04/2022 **Vinal, S. (April, 2019).** *USU Helps: Suicide Awareness.* Suicide prevention training for college students at Utah State University.

02/2022 **Vinal, S. (February, 2019).** *USU Helps: Suicide Awareness.* Suicide prevention training for college students at Utah State University.

11/2019 **Vinal, S**. A., Renshaw, T.L. (2019, November). *Mental Health Screening in Schools.* Topic and training presented to elementary school teachers and support staff in Logan, UT.

11/2019 **Vinal, S**. A. (2019, November). *Understanding Stress.* Topic and coping skills presented to college students at Utah State University, in Logan, UT.

06/2019 **Vinal, S**. A. (2019, June). *Understanding Stress.* Topic and coping skills presented to middle school students at Utah State University, in Logan, UT.

Clinical Fellowship

08/21 - 06/22 **Utah Regional Leadership Education in Neurodevelopmental and Related Disabilities (URLEND) Long Term Trainee**
Logan, UT
Completed 300 hours of didactic training, clinical activities, interdisciplinary observations, and leadership projects specific to children with special health care needs. Collaborated with a primary care community clinic to improve their service delivery to diverse clients. Provided resources and psychoeducation to Latinx families

regarding autism and social skills.

Teaching Experience

09/2019 – present
Graduate Teaching Assistant
Utah State University, Logan, UT
- Developed rubrics and feedback templates to communicate student performance
- Mentored advanced undergraduate students to develop research ideas and design hypothetical studies
- Guest lecture presenting on topics such as social-emotional learning, study strategies, benefits of accessing behavioral mental health services
- Classes: Introduction to Psychology, Research Methods, Social Psychology, Psychological Statistics

09/2016 – 05/2018
Reading Interventionist
New Bedford High School, New Bedford, MA
- Design intensive, year-long, phonetic and skill-based reading intervention curriculum utilizing state standards in order to increase student reading proficiency
- Incorporate social-emotional curricula based on state standards and contextualized student needs

09/2014 – 05/2016
Founding Special Education Teacher
City on a Hill Charter Public School, New Bedford, MA
- Create course daily lessons and scope sequence aligned to the Massachusetts Curriculum Standards for Science, Civics, and English contents
- Develop and implement individualized education plans (IEP) and functional behavioral assessments for students with disabilities in accordance with federal and state guidelines

Service

10/23 - 12/23 **Committee Member,** Planning committee member for a special caregiver mental health forum
11/20 - 05/21 **Volunteer,** Top Sports; adaptive recreation for children with special needs
06/19 - 06/20 **Student Representative,** School Psychology, Utah State University
06/19 - 06/20 **President, USU Student Affiliates of School Psychology,** Utah State University

Certified Trainings

October 2022 Praxis Utah School Psychologist (5402) Licensing Exam
July 2021 ADOS-2 Virtual Introductory/Clinical Workshop Module 1-4, Toddler
October 2019 Module

	H.I.P.A.A. certified
April 2019	Acceptance and Commitment Therapy: Single Session Interventions
March 2019	LGBTQ+ Ally Training
September 2019	Question, Persuade, and Refer (QPR) Training for suicide prevention
September 2018	FERPA training for confidentiality in schools
September 2018	Collaborative Institutional Training Initiative (CITI) training for ethical research

Current Professional Organization Membership

Utah Association of School Psychologists
National Association of School Psychology
Association for Psychological Science
Student Affiliates of School Psychology, American Psychological Association

Honors and Awards

2014 - 2016	**Segal AmeriCorps Education Award** *Boston University – Boston, MA*
2016 - 2018	**South Coast Alumni Fellowship** *Teach For America – New Bedford, MA*
2011 - 2014	**Dean's List** *Roanoke College – Salem, VA*