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Identifying High School Freshmen with Signs of Emotional or Academic Risk:

Screening Methods Appropriate for Students in Accelerated Courses

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Abstract

High school freshmen in accelerated courses have known risk and resiliency factors that should be considered within systematic efforts to monitor and promote student academic and emotional well-being. This study created and evaluated a multi-method approach to identify students in Advanced Placement (AP) or International Baccalaureate (IB) courses with signs of risk mid-year in terms of stress, affective engagement, and academic performance. A total of 304 ninth grade students enrolled in AP/IB coursework and five AP/IB teachers at two public high schools in a Southeastern state took part in the screening. Using the researcher-developed screening approach, a total of 117 students (38.5%) met criteria for risk in at least one academic or emotional area. These results were compared to those obtained using a teacher nomination form, which had been developed collaboratively by the teachers and researchers, that specified signs of emotional and academic risk. The teacher nomination procedure resulted in the identification of 39.3% of the at-risk student population (average sensitivity rate = 35.7% across teachers). Sensitivity of teacher nominations was higher when identifying academic risk (average = 59.9%) as compared to emotional risk (average = 27.9% and 39.6% of students with low school satisfaction and high stress, respectively). Findings support the collection of data from students (surveys of stress and school satisfaction) and school records (course grades) when identifying AP/IB students to consider for targeted services within a multi-tiered system of supports.

**Identifying High School Freshmen with Signs of Emotional or Academic Risk:
Screening Methods Appropriate for Students in Accelerated Courses**

To best support students' academic, behavioral, and social-emotional needs in a preventative and systematic manner, schools have increasingly organized service delivery into a multi-tiered system of supports (MTSS). MTSS ensures that students are identified early when they show any signs of risk and receive services matched to intensity of need. Often referred to as population-based school mental health services, MTSS addressing social-emotional needs includes prevention, universal screenings to identify students at-risk, and intervention services (Doll, Cummings, & Chapla, 2014). Applications of MTSS at the high school level, and tailored to students in accelerated curricula (e.g., Advanced Placement, International Baccalaureate) in particular, are lacking. This paper describes and evaluates a multi-method approach to identifying such students who show signs of academic or emotional risk mid-freshmen year in order to provide these students with supports intended to promote emotional well-being and success in their accelerated courses.

Importance of Screening within a Multi-Tiered System of Supports for Mental Health

Population-based school mental health services are often the only avenue for youth to receive needed services for social-emotional concerns. Only one in every four youth in the U.S. with a diagnosable psychiatric disorder reports receiving services within community or clinic-based settings (Merikangas et al., 2010). Symptomatic youth are more likely to turn to school-based rather than community-based services (Slade, 2002). School settings are a particularly feasible setting to offer preventive or early intervention services for youth who are experiencing challenges with typical life transitions and/or signs of mental health problems that, if left untreated, may cause significant distress and necessitate more intensive intervention.

Preventative mental health treatments for at-risk adolescents, utilizing time-limited, evidence-based interventions, can reduce symptomology for students targeted for elevated levels of depression (Brent et al., 2015; Rodhe, Stice, Shaw, & Gau, 2015), trauma (Stein, Jaycox, Kataoka et al., 2003) and externalizing behaviors (Simonsen, Myers, & Briere, 2011). Such targeted interventions use screening procedures to identify students displaying elevated *risk factors* or *symptoms* and are in need of additional supports. When determining which students may benefit most from prevention services, schools can conduct universal screenings – structured assessment of all students in a given population – to guide decision-making for which students need more intensive assessment and treatments (Albers & Kettler, 2014).

Screening for Risk among High School Students in Accelerated Curricula

School-based mental health models that use a MTSS approach are designed to meet the unique needs of specialized populations (Christner, Mennuti, & Whitaker, 2009). One population that has received less attention in terms of school mental health services is students in Advanced Placement (AP) classes or International Baccalaureate (IB) programs (hereafter referred to as “AP/IB”). AP/IB are becoming increasingly widespread accelerated curricular options in high school settings (Bunnell, 2011; Doherty, 2009; Jeong, 2009; Spalding, Eden, & Heppner; 2012). AP/IB coursework provides students identified as high-achieving or gifted with appropriately-challenging curricula that may be credited by institutions of higher learning for college credit (see College Board, 2018, and IBO, 2018, for program details).

Students in AP/IB have likely been understudied when it comes to school mental health services because their typical history of academic achievement has been equated with less of a need for social-emotional supports (Suldo, Gormley, DuPaul, & Anderson-Butcher, 2014). However, this population’s frequency of mental health problems – such as diminished life

satisfaction and elevated psychopathology symptoms – is on par with levels documented among general samples of youth in the U.S. (Suldo, Shaunessy-Dedrick, Ferron, & Dedrick, 2018).

Comparisons of mean levels of mental health among subgroups of students in (a) AP classes, (b) the IB program, or (c) general education indicate that AP/IB students manifest levels of internalizing problems that are similar to their peers in general education, as indexed by comprehensive measures of psychopathology or narrowband measures of anxiety (Suldo & Shaunessy-Dedrick, 2013a). Thus, despite the academic success that led to their pursuit of college-level coursework, AP/IB students are likely to have typical rates of need for mental health services, albeit services tailored to their particular experiences in accelerated curricula.

A unique risk factor that differentiates AP/IB students from their peers in general education is the heightened risk of experiencing stress due to school-related challenges inherent to their rigorous curricular expectations (Neihart et al., 2002; Suldo, Shaunessy, & Hardesty, 2008; Suldo & Shaunessy-Dedrick, 2013a). High levels of stress can have a cascading negative effect, as elevated stress predisposes youth to turn to ineffective coping responses such as rumination, which puts youth at higher risk for psychopathology (Compas, Orosan, & Grant, 1993). A synthesis of prospective studies found robust support that elevated stress predicted increases in psychopathology, particularly internalizing problems (Grant, Compas, Thurm, McMahon, & Gipson, 2004). For students in elite college preparatory schools, a population that shares some characteristics with youth in accelerated high school curricula, increasing levels of stress co-occur with decreasing levels of life satisfaction (Feld & Shusterman, 2015) and higher levels of psychopathology (Suldo et al., 2008). The latter study of IB students revealed considerable overlap between self-reported perceived stress and internalizing symptoms of psychopathology ($r = .72$; whereas $r = .40$ with externalizing problems).

In order to develop a screening tool that efficiently and accurately identifies AP/IB students who are at-risk, it is important to examine factors that are associated with AP/IB student success. Recent research of over 2300 AP/IB students explored resiliency factors relevant to the academic and emotional success of students in a high-stress curricular context (Suldo et al., 2018). In addition to highlighting the importance of specific coping strategies students use to manage their academic demands, Suldo et al. (2018) found higher levels of achievement motivation (i.e., drive to learn and achieve) and student engagement (cognitive, behavioral, and affective) predicted more positive mental health and academic outcomes. In particular, motivation and affective engagement (i.e., satisfaction with one's AP/IB program combined with positive feelings about one's school and teachers) yielded significant, unique effects on higher life satisfaction, lower psychopathology, and lower school burnout. Using a motivational conceptualization of classroom engagement and disaffection, affective/emotional engagement is reflected in experiences of positive emotions such as enthusiasm, interest, enjoyment, satisfaction, and pride (Skinner, Furrer, Marchand, & Kindermann, 2008). To that end, *school satisfaction*, which reflects feelings of happiness in the school domain, may be a valuable indicator of belongingness and affective engagement. The value of school satisfaction is supported by longitudinal studies that document significant prospective relationships with adolescents' mental health including social-emotional strengths and symptoms of internalizing problems (Lester, Waters, & Cross, 2013; Moffa, Dowdy, & Furlong, 2016).

In sum, perceived stress and affective engagement are factors that have emerged as salient to AP/IB students' success, especially in the emotional health domain. One way to identify AP/IB students at-risk for diminished emotional and academic success is through direct assessments of those outcomes (e.g., clinical levels of mental health problems, academic failure

as indicated by withdrawal from AP/IB programming). A more preventative approach could involve assessment of the most salient risk factors: elevated stress, low affective engagement, and/or early signs of struggles in courses as indicated by below par grades in the first semester of high school. Armed with this knowledge of the unique risk factors for AP/IB student success, educators can create specialized screening procedures for this growing high school population.

Common Sources of Information in School-Based Screening

When designing universal screening procedures for any population, schools have several methods to consider. Each method has strengths and limitations that pertain to accuracy and feasibility. Regarding the latter, the least invasive and readily available method involves data housed in school records, such as review of office discipline referrals (ODRs) to identify students in need of additional services. However, AP/IB students experience far fewer ODRs and school absences than high school students in general education (Suldo & Shaunessy-Dedrick, 2013a). Given the importance of a relatively high grade point average (GPA; e.g., ≥ 3.0) to students' initial placement in accelerated classes, the more appropriate school records to access may be grades earned in 9th grade AP/IB classes. Students with higher ability and achievement levels tend to be especially accurate reporters of their course grades (Schwartz & Beaver, 2015).

Another commonly used identification method is referrals from concerned teachers, parents, and students. Referral methods are natural avenues for students to be recommended for participation in special education and to receive other supports, such as social-emotional interventions. Limitations include the reactive nature of when referrals are ultimately triggered, and systematic errors in accuracy. Eklund and Dowdy (2014) found that students who have higher academic performance are missed in referral methods more often than when rating scales are used in screening procedures to identify at-risk students. Such bias against high-achieving

youth suggests rating scales may be preferable to referrals when the target population involves students in accelerated courses.

Rating scales completed by students or informants (e.g., teachers, parents) afford a systematic look at the functioning of all students in a target group to determine whom should be connected to services. The most appropriate source(s) of information on behavior varies by student age. Parents often are preferred raters of the behavior of younger students. With regard to adolescents, students are generally judged to be the most accurate and reliable informant of multiple forms of mental health problems, including internalizing, covert externalizing, and substance use behaviors (Levitt, Saka, Romanelli, & Hoagwood, 2007). Particularly during the middle and high school years, when teachers serve multiple section of classes (thereby reducing familiarity with a typical student and increasing the time needed to rate all students) and youth may be less likely to spontaneously disclose mental health difficulties to adults, youth appear the best option to provide ratings of their own emotional status (Raines, Dever, Kamphaus & Roach, 2012). Rating scales often flag more students as at-risk compared to ODRs and teacher nomination methods (Miller et al., 2015), likely leading to the identification of more high-achieving students who could be missed by traditional school referral methods (Eklund & Dowdy, 2014). Challenges to incorporating rating scales in screenings pertain to logistical and ethical issues to be navigated in order to gather, score, and interpret potentially sensitive data from a large number of stakeholders. In addition to securing parental consent and valid ratings for each eligible student, educators must determine a cut score that appropriately designates a student as showing significant risk beyond the norm seen in the target population, but ideally does not identify more students as at-risk than can be supported by available mental health staff (i.e., a serviceable base rate; Kilgus & Eklund, 2016).

Teacher nominations represent a screening procedure that is arguably less time-intensive than gathering supplemental ratings for each student; instead, teachers systematically consider all of their eligible students, and ‘nominate’ or identify which student(s) they believe are at-risk on the basis of demonstrating a given set of social-emotional-behavioral symptoms. As an example of efficiency, the *Systematic Screening for Behavior Disorders* (SSBD-2; Walker, Severson, & Feil, 2014) starts with a teacher nomination procedure within a multiple-gating screening procedure whereby teachers complete rating scales for only the top three students nominated as at-risk for internalizing or externalizing problems. Strengths of teacher nominations involve the low cost, ready access to teachers, and potential accuracy, as teachers are assumed to be valid informants of aberrant behavior given their familiarity with large samples of youth in an academic and social setting. Alas, the accuracy of teacher identification is far from perfect with regard to emotional risk; only a quarter to half of students with internalizing problems (verified via repeat self-report of symptoms or through diagnostic interview) are correctly identified as such in nomination procedures (Auger, 2004; Cunningham & Suldo, 2014; Moor et al., 2007). It is possible that improved accuracy follows the specification of clear manifestations of risk being made available to the teacher participants. On the other hand, it may be the case that a sizeable proportion of students with internalizing behavior will often fall under the teacher’s radar due to students’ concealment of obvious symptoms or lack of awareness by busy educators without psychological training.

Screening for internalizing problems. When identifying students with emotional concerns, some of the more easily accessed screening methods such as review of ODR data and referrals from educators may result in an over-identification of students with externalizing concerns and under-identification of students with internalizing symptoms (Splett, George, et al.,

2018). In a discussion of MTSS for internalizing forms of mental health problems, Weist and colleagues (2018) underscore the need for early, targeted interventions (i.e., Tier 2 supports) for students with specific risk factors (for instance, elevated stress) or “who screen positive on indicators that suggest risk of internalizing concerns but for whom functioning is not yet significantly impaired” (p. 178). When comparing students identified by traditional school referral methods to peers identified through use of teacher rating scales to gather data on all students, students identified through universal screening but missed by school referral tended to have less severe levels of symptoms and less academic risk (Splett, Trainor, et al., 2018). Thus, rating scales appear especially relevant to identifying students with moderate levels of internalizing symptoms, in particular those without academic deficits.

There are a handful of student self-report rating scales that are relatively brief (i.e., < 25 items) and measure internalizing symptoms, including the *Behavioral Assessment System for Children, Third Edition- Behavioral and Emotional Screening System* (BASC-3 BESS; Reynolds & Kamphaus, 2015), the *Behavior Intervention Monitoring and Assessment System* (BIMAS; McDougal, Bardos, & Meier, 2011) and the *Strengths and Difficulties Questionnaire* (SDQ; Goodman 1997). The SDQ is available for free in the public domain, whereas the BESS and BIMAS are commercially available and require schools to pay per rating form. Although the number of psychometrically sound screening measures is growing, existing omnibus rating scales of symptoms do not necessarily assess the risk factors most salient for AP/IB youth (stress and disaffection with school) or match the targeted supports most appropriate for that population. For AP/IB students, interventions focused on stress management and student engagement may be most appropriate, given the population’s unique risk and protective factors.

Aims of Current Study

The present project aimed to create a multi-method, usable, and accessible approach to identifying AP/IB ninth grade students who were at-risk for academic or emotional challenges, with the intent to provide Tier 2 supports focused on stress management and school engagement during students' second semester of high school. Research questions included:

1. What is the proportion of AP/IB students in 9th grade that demonstrate risk on factors most salient to AP/IB student success—perceived stress, affective engagement, and academic performance—as indicated by student report of emotional factors and school records of grades earned in first semester classes?
2. How accurate are teacher nominations in identifying those students who demonstrated risk on stress or affective engagement per self-report, or academic performance per school records?
3. How accurate is student self-report of first semester course grades in identifying those students who demonstrated risk on academic performance per school records?

In the first semester of high school, the sample examined in this study took part in a research-based Tier 1 intervention to build skills in engagement and coping with academic stress through a 10-12 lesson social-emotional learning (SEL) program delivered weekly through students' IB Inquiry Skills or AP Human Geography class. Given their participation in a universal support tailored to their curricular experiences, we hypothesized that 15-20% of students would demonstrate risk on the emotional factors targeted in the SEL program in line with the notion that core instruction is expected to meet the needs of about 80% of students (NASDE, 2005). Similarly, we hypothesized that 15-20% of students would be at risk academically, which is lower than the 24% identification rate for academic risk (i.e., GPA < 3.0) yielded in prior research with a large sample of AP/IB students in grades 9-12 without such systematic supports

(Suldo et al., 2018). Given the internalizing nature of the targets, we hypothesized teacher nominations would be less accurate in identifying students with emotional risk (e.g., miss rates > 50%; Auger, 2004; Moor et al., 2007), compared to identifying students with academic risk given their knowledge of academic performance in at least their class. Most students in AP/IB are acutely aware of their academic performance given the importance of course grades for entry and retention in AP/IB and the salience of GPA to students' future goals, like college admission. Thus, we hypothesized that students would be highly accurate reporters of their grades.

Method

Sample

Participants come from two public high schools (hereafter referred to as School A and School B) from a university-district partnership in a Southeastern state. Details on the School Directory Information of the National Center for Educational Statistics (NCES) indicate that School A is in a large city locale, serving 1,639 students (52.0% female; 43.9% eligible for free or reduced-price lunch; 46.8% White, 22.8% Hispanic, 14.5% Black, 7.4% Asian, 8.2% multiracial, <1% Native Hawaiian/Pacific Islander, <1% American Indian/Alaska Native). School B is in a large suburb locale, serving 2,355 students (51.3% female; 21.2% eligible for free or reduced-price lunch; 63.1% White, 23.6% Hispanic, 6.3 % Black, 2.4% Asian, 4.2% multiracial, <1% Native Hawaiian/Pacific Islander, <1% American Indian/Alaska Native).

Students. There were 495 students in 9th grade in School A; 163 of these students in the IB Inquiry Skills course were the student population of interest in this study. Of the 613 students in 9th grade in School B, the 193 taking AP Human Geography were targeted for this study. In total 356 AP/IB 9th grade students were targeted; parent consent to participate in the evaluation of the larger MTSS was received for 332 students (93.3%) in August 2016. By the mid-year

screening in January 2017, 10 students had left the IB program and 3 students dropped the AP Human Geography class. Parents of the remaining 319 AP/IB participants received a “notification of screening” letter explaining that AP/IB freshmen would complete a short survey on stress and feelings about school and that students’ ratings would be part of the data reviewed to determine which students would be offered Tier 2 support. Parents were asked to return the form within one week if they wished to refuse their child’s participation in the screening. Thirteen (11 from School A, 2 from School B) of 319 students (4.1%) were excluded from the screening due to return of the parent notification form.

Two students were absent during the screening period, resulting in a final sample of 304 students (59.2% female; 53.3% White, 23.0% Hispanic, 2.6% Black, 7.9% Asian, 7.9% multiracial, <1% Native Hawaiian/Pacific Islander, <1% American Indian/Alaska Native, 1% other ethnic identity, 3.3% unknown [did not report]; 43.8% IB [$n = 133$ students], 56.3% AP [$n = 171$]). Of note, accelerated programs were initially established to challenge advanced students and continue to be recognized as an appropriate high school curriculum for gifted and high achieving students (Colangelo, Assouline, & Gross, 2004). The demographic features of our sample are consistent with other research findings indicating that Black students in particular are underrepresented in AP and IB (Kolluri, 2018; Wildhagen, 2014). Parent educational attainment was examined as an indicator of SES; 74.4% and 82.9% of mothers and fathers, respectively, had a college degree or beyond, suggesting a relatively affluent sample. No data on eligibility for free or reduced-price lunch were collected from these youth.

Teachers. Five teachers took part in this study. The three teachers from School A taught a total of seven sections of IB Inquiry Skills, and two teachers from School B taught a total of nine sections of AP Human Geography. Three teachers were male (60% of teacher sample); four

were Caucasian (80%) and the fifth was Hispanic (20%). On average, the participants had been teaching high school for 12 years (range = 8 – 20 years). To maximize the likelihood of teacher sensitivity to student risk, we involved teachers who (a) observed their students participate in the Tier 1 intervention, (b) collaborated in the development of the nomination form, and (c) understood the screening data would be used to select students for Tier 2 supports.

Procedure

The screening was embedded within a MTSS implemented to support AP/IB freshmen in the two partner schools. The supports were developed through an iterative collaboration between university-based researchers (manuscript authors) and the district from which the two schools were drawn. In the university-school partnership, faculty in school psychology and gifted education and school psychology trainees partnered with district educators to design and carry out the universal and selective supports for AP/IB freshmen.

Tier 1. All 356 freshmen enrolled in AP/IB at the start of the school year were exposed to a SEL program as part of their school’s commitment to supporting AP/IB students during the transition to high school. This universal support provided in the fall semester (September-December 2016) entailed a 10 to 12 lesson, research-based SEL program delivered weekly by university-based interventionists during AP Human Geography or IB Inquiry Skills. The new curriculum—referred to as the Advancing Coping and Engagement (ACE) program (for a description, see [authors, in press])—involved direct instruction in, and rehearsal of, skills pertinent to coping (e.g., responding to school stress through time and task management strategies and cognitive reappraisal) and engagement (e.g., forming relationships with teachers, generating positive feelings about one’s school and academic program). These topics were emphasized because they are skills AP/IB students can apply across their high school

coursework and address targets empirically linked to the academic and emotional success of AP/IB students (Suldo et al., 2018). This service modality mimics other types of Tier 1 mental health supports in that it resulted from school-community teaming to select lessons from a manualized SEL curriculum that can be integrated into classwide instruction to provide a strong foundation for all students (Weist et al., 2018). Classroom teachers are the intended end-users of the ACE program. The five teachers were present for the majority of lessons, and assisted primarily with behavior management and occasionally with comments relevant to lesson content.

Tier 2. The mid-year screening process (described below) identified youth in need of additional supports based on mid-year review of student academic and emotional well-being data. The Tier 2 intervention was provided in the spring semester (February-April 2017), and entailed 1-2 individual “coaching” meetings with the university-based interventionist. This service modality mimics other types of Tier 2 supports for students at-risk for internalizing problems in that it is targeted, time-limited, and builds upon skills that are taught in Tier 1 and relevant to student mental health (Weist et al., 2018). This new Tier 2 intervention—referred to as Motivation, Assessment, and Planning (MAP) meetings (for a description, see [authors, in press])—is unique in that it was specifically developed to target the academic and emotional stressors (e.g., low school satisfaction, high level of stress, subpar grades) faced by AP/IB students. Using a motivational interviewing approach, students reflect on their current levels of coping and engagement as compared to a large normative sample of AP/IB participants, identify targets for improvement, and create an action plan to ultimately lessen their stress and improve emotional well-being and/or academic success in AP/IB and beyond. School psychologists, school counselors, and other qualified school mental health professionals are the intended end-users of the MAP meetings.

Screening. In January 2017, 304 participants completed the 1-page paper-and-pencil 16-item screening survey (measures of stress, school satisfaction, and fall academic performance, described below) during their AP/IB class. The introduction and administration of the survey spanned 5-10 minutes. Survey data were entered into an Excel spreadsheet during the same school day. Researchers returned to ask some students to respond to skipped items as needed and to administer the survey to previously absent students.

During the same week that student survey data were collected, a research team member met with the classroom teacher to collect teacher nomination data. The researcher first explained the purpose of the screening:

To identify students who at mid-year, show or report signs of academic or emotional risk in AP/IB and thus may benefit from brief, individualized support to address academic or emotional challenges in AP/IB. *Academic risk:* GPA < 3.0, grades of C or lower in AP/IB classes. *Emotional risk:* elevated stress, negative feelings about schooling experiences.

The handout summarized the supports offered through the Tier 2 intervention and noted that the eligibility process involved a review of data from student report of emotional health, academic records, and educator nominations.

Teachers were then given the three-page nomination form. The first page included instructions for use and descriptions of 14 behavioral examples of academic or emotional challenges common among AP/IB youth (see Appendix for full list). On the bottom of the form, teachers could write in additional signs of student risk they considered while nominating students; no teachers utilized this option. The second page included an example nomination form with hypothetical student names to illustrate a completed Educator Identification form. The third

page provided a roster listing eligible students in the teacher's AP/IB class. By each student's name teachers were asked to check *yes* (student shows signs of risk) or *no* (student does not show signs of risk) based on the 14 behavioral examples provided on page one. Teachers also had the option to indicate if they did "*not know student well enough to judge*" the student's risk status (e.g., student is new to class), but no teacher selected this option. Teachers completed the nomination form for a given class section while the research team administered the student surveys. In one instance, a researcher returned to the teacher who marked "yes" for few students (3 of 72) and encouraged her to reconsider her roster with the aim of identifying additional students who showed any of the signs listed on the first page. The teacher examined her roster but did not change her original responses, noting that any additional students who she felt demonstrated any signs of academic or emotional challenges had already withdrawn from the IB program, or did not have permission to participate in the screening ($n = 1$ student); thus, those students names did not appear on the list of students eligible to nominate.

Measures and Indicators Used in the Screening

Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). Students completed a six-item version of the PSS that included only the non reverse-scored items, so that all items indicated greater stress. Respondents indicated how often in the last month they experienced various aspects of stress, using a five-point response scale: (1) *Never*, (2) *Almost Never*, (3) *Sometimes*, (4) *Fairly Often*, and (5) *Very Often*. A sample question from the PSS states, "In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?" The PSS has yielded excellent internal reliability in prior research with AP/IB students ($\alpha = .91$; Suldo et al., 2008), as well as among samples of adolescents not drawn from specialized curricula ($\alpha = .82 - .88$; Bluth, Campo, Futch, & Gaylord, 2017; Galla,

2016). Support for construct validity is provided by a strong relationship between PSS scores and frequency of stress related to academic requirements ($r = .53$; Suldo et al., 2015), increased depressive symptomatology ($r = .68$; Galla, 2016), and reduced life satisfaction ($r = -.54$; Galla, 2016). In the current study, $\alpha = .85$ for the PSS.

School Satisfaction scale of the Multidimensional Student Life Satisfaction Scale (MSLSS; Huebner, 1994). The MSLSS is a self-report measure of life satisfaction in different domains, including family, friends, living environment, self, and school. The school satisfaction scale, consisting of eight items, such as “I look forward to going to school,” was used as part of the screening procedures. Respondents indicate how over the past several weeks they have felt and thought about school using a six-point response scale: (1) *Strongly Disagree*, (2) *Disagree*, (3) *Mildly Disagree*, (4) *Mildly Agree*, (5) *Agree*, and (6) *Strongly Agree*. The school satisfaction scale has been used in previous studies as a proxy of student school belonging (Moffa, Dowdy, & Furlong, 2016) and yielded high internal consistency ($\alpha = .84$) and inverse correlations with internalizing problems among secondary students (Gini, Marino, Pozzoli, & Holt, 2018). Regarding construct validity, Huebner (1994) reported a strong, positive relationship ($r = .68$) between school satisfaction scores and the Quality of School Life Scale (Epstein & McPartland, 1976). In the current study, $\alpha = .86$ for school satisfaction.

Teacher nomination form. The nomination form was created one month before data collection through a collaboration between the university-based research team (which included experts in the fields of school psychology, gifted education, measurement design, and educational statistics), the assistant principal, and school psychologist at each school, and the five AP/IB teachers. Researchers held a total of four focus groups across the two school sites. At each site, one focus group was held with teachers and one focus group was held with the

assistant principal responsible for AP/IB and the school psychologist. At the start of each focus group, the researchers described the upcoming selective intervention goal (i.e., help students reflect on and further develop healthy coping and engagement practices that are linked to emotional and academic success in AP/IB courses), intended population (i.e., students who, mid-year, show or report signs of academic or emotional challenges in AP/IB), and the eligibility process (i.e., screening with student self-report of emotional health, review of academic records, and educator nominations). Focus group participants were asked “*When you think about your current students who need or may most benefit from additional support, what characterizes these students, in terms of academic performance, emotional health, or concerns expressed by parents or classmates?*” Educators reflected upon their experiences, recalling the behaviors demonstrated by students they taught previously who ultimately earned failing grades, dropped the course, and/or reported considerable emotional distress during the course.

After a discussion of risk signs, the researchers presented a draft nomination form that included eight signs of emotional challenges related to school-related stress. Signs of challenges included features reflecting elevated stress levels (e.g., Difficulty coping effectively with academic demands), poor student engagement (e.g., Makes negative statements about AP/IB or school), as well as overt manifestations of academic problems (e.g., Poor test, quiz, and exam grades) or emotional challenges (e.g., Seems unhappy during class). To verify accuracy of the risk signs in the first draft of the education nomination form, participants provided additional feedback to the clarity and relevance of these signs and offered additional ways that students appear at-risk for emotional or academic challenges. This discussion generated six more signs indicative of problematic responses to stress (e.g., Gives up or stops trying on schoolwork), academic engagement (e.g., Does not seem to take schoolwork seriously), emotional health (e.g.,

Expresses extreme or frequent worry about performance on assignments or exams), and academic performance (e.g., Misses class). Some of the original eight signs were modified to be more descriptive. For instance, “tearful” was added to “Seems unhappy during class.” Other signs were reworded for relevance to the classroom. For instance, “Avoids or withdraws from social situations” was changed to “Appears lonely or socially isolated (no friends in AP/IB).” There was considerable overlap between focus groups with regard to signs generated, with the final group indicating that the compiled list of 14 signs (see Appendix) developed during the focus group meetings was exhaustive.

Academic performance. School administrators accessed student participants’ fall 2016 report cards and provided the research team with students’ unweighted fall semester GPA, and the grade earned in IB Biology (School A) or AP Human Geography (School B). School administrators indicated IB Biology would be a better indicator of academic risk than the grade earned in IB Inquiry Skills because of the larger distribution of grades in the Biology course. The Inquiry Skills class typically produced a grade distribution with most grades being A or B. In regular grade-level wide meetings in which student performance in the IB program was discussed, teachers learned of their students’ progress in other IB course, supporting the assumed familiarity of Inquiry Skills teachers with students’ performance in Biology and other courses.

The task of gathering end-of-course grade information from school records and merging data from school records with data from student ratings of emotional well-being might be supplanted by reliance on student self-report of academic performance if the latter is highly accurate. To examine agreement between data from school records and student self-report, students were asked about the grades they earned during the first semester of 9th grade. At the bottom of the 1-page form that included the PSS and MSLSS school satisfaction items, students

answered two questions: “What was your unweighted GPA from fall 2016 (e.g., 3.25)?” and “What grade did you earn in AP Human Geography [IB Biology]?”

Overview of Analyses

Students were dichotomized into two groups (at-risk or not) in each of three domains: stress, engagement, and academic performance. At-risk due to high perceived stress was defined as PSS score > 3.6 . Low affective engagement (school satisfaction) corresponded to a MSLSS score < 3.4 . At-risk due to academic performance was based on semester GPA and grade earned in AP Human Geography or IB Biology. The former estimates overall progress across courses, and the latter indicates performance in rigorous accelerated coursework in particular. Given the high correlation between these variables ($r = .76$), we created a combined academic risk status variable. Students were dichotomized into two academic risk groups: (1) “at-risk academically” = unweighted fall semester GPA < 3.0 or grade of C, D, or F in designated AP/IB course, or (2) “not at-risk academically” = GPA ≥ 3.0 and grade of A or B in AP/IB course.

Although these cut scores for academic and emotional risk might seem atypical for a general sample of high school students, they were selected for conceptual and empirical reasons. In the current sample, 15-16% of students were identified as at-risk on each indicator, which is similar to a T score of 60 (one SD above the sample mean). For the PSS (scores ranging from 1-5), a response option of 3 corresponds to “*Sometimes*” and a 4 to “*fairly often*”; a mean score above 3.6 is closer to experiencing stress frequently rather than infrequently. This cut score is also higher than the average PSS score reported mid-year by previous samples of high school students in AP or IB (e.g., $M = 2.77$ to 3.09) and general education ($M = 2.57$ to 2.75 ; Suldo & Shaunessy-Dedrick, 2013a; Suldo & Shaunessy-Dedrick, 2013b).

On the MSLSS (scores ranging from 1-6), responses of 1 (*strongly disagree*) – 3 (*mildly*

disagree) indicate that a student disagrees with a statement reflecting positive feelings about school; a mean score below 3.4 is closer to dissatisfaction with school as opposed to satisfaction with school. This cut score is also lower than the average school satisfaction score reported mid-year by previous samples of high school students in AP or IB (e.g., $M = 3.93$ to 4.13) and general education ($M = 3.80$ to 4.00 ; Shaunessy, Suldo, Hardesty, & Shaffer, 2006; Suldo & Shaunessy-Dedrick, 2013a). Our cut scores for elevated levels of stress, low satisfaction with school, and below average course grades match the signs of underachievement cited in the literature on gifted youth, which includes students taking AP/IB classes. Gifted students who are identified as “underachievers” often report negative attitudes towards school and their teachers, low academic self-perceptions, and low self-regulatory skills (Siegle & McCoach, 2018).

Behavioral indicators of gifted underachievement can include failure to complete assignments or produce high quality work, which results in lower course grades than expected for a student of their abilities (McCall, 1994; Siegle & McCoach, 2018). Educators and parents of high achieving youth similarly report lack of motivation, poor academic self-perceptions, and low work completion among their top concerns for student’s behavior at school and at home (Siegle & McCoach, 2018). The academic cut scores also had good face validity among our sample of AP/IB educators, families, and students, who shared that grades of A or B are generally expected in accord with prerequisite performance needed for permission to take more college-level classes in high school, and to ultimately be competitive for college admission as well as earn the IB diploma. To illustrate, in a large, diverse sample of AP/IB students in grades 9 – 12, the mean unweighted GPA for a semester of courses was 3.29 (Suldo et al., 2018).

A composite risk variable was created that differentiated students with any risk (at-risk levels of stress, engagement, academic performance, or a combination of 2 or 3 risk factors) from

those students with no risk factors. This dichotomized risk composite variable was compared to teacher nomination status (“yes” or “no” at-risk for diminished success in AP/IB). Accuracy of teacher nominations was evaluated in terms of specificity and sensitivity. Diagnostic efficiency statistics (Landau, Milich, & Widiger, 1991) were calculated with regard to true positive rate (percentage of students identified with risk based on grades earned per report cards or self-report of stress or school satisfaction, and correctly identified as at-risk by teachers), false negative rate (proportion of at-risk students *missed* by teacher nominations), false positive rate (percentage of students without risk per survey and school records, but teachers *misidentify* as at-risk), and true negative rate (proportion of students without risk per data from surveys or school records, that teachers did not nominate as at-risk). Additional estimates were made for positive predictive value (percent of the teacher nominated students who were identified with risk based on grades and self-report) and negative predictive value (percent of the students not nominated by the teacher who were not identified with risk based on grades and self-report).

The proportion of true positives and proportion of false negatives for each area of risk (i.e., stress, engagement, academic performance) was then examined. For students at risk in a particular area (e.g., stress), we determined the proportion identified as at risk by the teacher (true positives) and the proportion missed by the teacher (false negatives). Because teachers made nominations for students at risk for diminished success in AP/IB and did not make specific nominations for risk of stress, engagement, and academic performance, we were not able to estimate area specific (i.e., stress, engagement, academic performance) true negative or false positive rates.

In addition to computing the diagnostic efficiency statistics for each teacher, differences between teachers were tested using Pearson’s χ^2 , and across-teacher average values were

obtained. These average values, as well as corresponding confidence intervals, were obtained by using generalized mixed linear models with a binary probability distribution, a logit link function, a random effect for teacher, and Kenward-Roger degrees of freedom (to account for the small sample size).

Results

Descriptive Statistics for Indicators in Screening

The sample evidenced considerable diversity on academic and mental health measures. Regarding the latter, the mean score for school satisfaction was 4.29 ($SD = 0.84$; range = 1.88 to 6.00), and the mean level of perceived stress was 2.67 ($SD = 0.87$; range = 1.00 to 5.00). These mean values are comparable to the average scores seen in research with other samples of AP/IB students (Suldo & Shaunessy-Dedrick, 2013a; 2013b). On academic outcomes, the mean GPA for courses completed in the fall 2016 semester was 3.57 ($SD = 0.38$; range = 2.31 to 4.00). A closer look at grades earned in either AP Human Geography or IB Biology revealed that the average grade was in the B range ($M = 3.19$, $SD = 0.78$; range = 0 to 4.00) and the distribution was as follows: A (39.5%), B (42.4%), C (16.5%), D (1.3%), and F (0.3%).

The mean number of eligible students presented per teacher on the educator nomination form was 61 ($SD = 26.5$) and ranged from 20 students (i.e., 1 section of AP/IB freshmen) to 93 students (i.e., 5 sections of AP/IB freshmen). Teachers nominated an average of 26.3% of students on their roster(s) as at-risk; percentage nominated ranged between 4.2% (i.e., teacher who nominated 3 of 72 students in her 4 sections) and 40.0% (i.e., teacher who nominated 8 of 20 students in his 1 section) for a given teacher. A total of 76 students (25.0% of the sample) were nominated by teachers as at-risk.

Prevalence of Risk among AP/IB Freshmen

Using the aforementioned cut scores, 117 of the 304 students (38.5%) screened had risk in at least one area (stress, engagement, or academic performance). Most of students identified as at-risk had elevations in only one area ($n = 84$ with 1 risk factor, $n = 27$ with 2 risk factors, and $n = 6$ with 3 risk factors). The proportion of students identified as at-risk in each area is presented in Table 1. The small overlap between risk indicators is notable. A minority of students who met criteria for emotional risk also demonstrated academic risk and vice versa. Specifically, 21 students were identified as at-risk on academic performance *and* emotional well-being (either stress or school satisfaction), which corresponded to 34.4% of the 61 students at-risk on academic performance and 27.3% of the 77 students at-risk on either stress or school satisfaction. An examination of risk prevalence as a function of classroom teacher and student gender revealed relatively comparable base rates of any risk. Specifically, 25.0%, 35.9%, 36.6%, 39.8%, and 44.0% of students across sections taught by a given teacher were at-risk in at least one area. Also, 36.3% of boys and 40.0% of girls were at-risk in at least one area.

Student report of academic performance. The correlation between values obtained from student report and school records was strong for both unweighted fall semester GPA ($r = .74, p < .001$) and end-of-semester grade in the specified AP or IB course ($r = .85, p < .001$). However, there were sizable numbers of inconsistencies around the cut points used by schools to identify risk. With respect to GPA, only 11 of 23 students (47.8%) whose school records indicated earned unweighted fall semester GPA < 3.0 also self-reported a GPA < 3.0 , and an additional 10 students underestimated their GPA as < 3.0 when in fact school records indicated GPA ≥ 3.0 . With respect to AP/IB course grade, 35 of the 55 students (63.6%) whose school records indicated a grade of C, D, or F in the designated AP/IB course also self-reported a grade of C or below, and an additional 5 students underestimated their grade as C or below when in

fact school records indicated a grade of A or B. In sum, between 36.4% ($n = 20$) and 52.2% ($n = 12$) of students with academic risk would be missed, and 2.0% ($n = 5$) to 3.6% ($n = 10$) of students without academic risk would be misidentified, if student self-report of AP/IB course grade and GPA, respectively, was used instead of gathering information on academic performance indicators from school records. For the remainder of this study, all analyses of academic performance utilized data from school records rather than self-report.

Bivariate Relationships between Indicators

Table 2 presents correlations between the indicators of student success (when analyzed in their continuous form) in the emotional and academic domains, and with teacher nominations (0 = not at-risk; 1 = yes at-risk). The correlation between the two aspects of emotional well-being was moderate ($r = -.31$). The correlations between academic and emotional risk indicators were small in magnitude and not statistically significant ($r = -.19$ between GPA and stress). Teacher nominations were correlated in the expected directions with academic risk, both GPA ($r = -.35$) and course grade ($r = -.45$), but not significantly related to either indicator of emotional risk.

Teacher Identification of Students with Any Emotional or Academic Risk

True positive rate. As displayed in Table 3, 46 of the 117 students with any emotional or academic risk were nominated by their teachers as at-risk. There was a significant effect of teacher on proportion of students with any academic or emotional risk who were nominated as at-risk, $\chi^2 = 29.49$, $p < .001$. As shown in Table 3, sensitivity rates were relatively low for 2 teachers (3.1% and 26.7%) as compared to 57.1%, 59.5%, and 60.0% for the remaining three teachers. The average sensitivity rate was 35.7%, and a 95% confidence interval yielded a lower limit of 7.3% and an upper limit of 79.7%. The wide confidence interval is reflective of the uncertainty that stems from a small sample of teachers, who varied substantially in their

individual sensitivity.

False negative rate. Seventy-one of the 117 students who demonstrated risk in terms of stress, engagement, or academic performance were not nominated by their teachers as at-risk. The average miss rate was 64.3% (95% CI = 20.3 - 92.7).

True negative rate. One hundred fifty-seven of the 187 students without emotional or academic risk were not nominated by their teachers as at-risk. There was not a significant effect of teacher on proportion of students without any academic or emotional risk who were not nominated as at-risk, $\chi^2 = 7.86, p = .10$. As shown in Table 3, all teachers' true negative rate ranged from 66.7% to 95.0%, with a median of 80.8%. The average specificity rate was 83.5%. Thus, teachers correctly identified approximately 84% of students who did *not* have risk per rating scale or school records by *intentionally not* nominating them (95% CI = 64.4 – 93.4).

False positive rate. Thirty of the 187 students whose self-reports and grades corresponded to low risk were identified by their teachers as at-risk. The average misidentified rate was 16.5% (95% CI = 6.6 – 35.6).

Teacher Identification of Students with Elevated Stress

True positive rate. As shown in Table 3, 15 of the 46 students who reported elevated stress were also nominated by their teachers as demonstrating risk. There was a significant effect of teacher on proportion of students with stress who were nominated as at-risk, $\chi^2 = 19.80, p = .0005$. A review of the teacher-specific proportions presented in Table 3 illustrates that sensitivity rates ranged from 5.6% to 100% across teachers, with a median of 40.0% true positives. The average sensitivity rate was 39.6%. A 95% confidence interval yielded a lower limit of 4.7% and an upper limit of 89.8%.

False negative rate. Thirty-one of the 46 students who reported elevated stress levels

were not nominated by their teachers as demonstrating risk. The average miss rate was 60.4% (95% CI = 10.2 – 95.1).

Teacher Identification of Students with Low School Satisfaction

True positive rate. As summarized in Table 3, 14 of the 49 students who reported low school satisfaction were also nominated by their teachers as demonstrating risk. There was not a significant effect of teacher on proportion of students with at-risk school satisfaction who were nominated as at-risk, $\chi^2 = 7.48$, $p = .11$. As shown in Table 3, no teacher achieved a true positive rate greater than 50%, with a median of 36.4% true positives. The average sensitivity was 27.9% (95% CI = 7.1 – 66.2).

False negative rate. Thirty-five of the 49 students who reported low school satisfaction were not nominated by their teachers as demonstrating risk. The average false negative rate was 72.1% (95% CI = 33.8 – 92.9).

Teacher Identification of Students with Low Academic Performance

True positive rate. As summarized in Table 3, 37 of the 61 students whose school records indicated grades below expectations were also nominated by their teachers as demonstrating risk. There was a significant effect of teacher on proportion of students with at-risk academic performance who were nominated as at-risk, $\chi^2 = 22.63$, $p < .001$. As shown in Table 3, one teacher demonstrated particularly low sensitivity to academic risk (7.1% true positive) whereas the remaining four correctly identified between 66.7% and 100% of their students who were at-risk due to academic performance. The average true positive rate was 59.9% (95% CI = 12.7 – 93.8).

False negative rate. Twenty-four of the 61 students with academic risk were not nominated by their teachers as at-risk. The average miss rate was 40.1% (95% CI = 6.1 – 87.3).

Post-Hoc Analyses

Additional analyses were conducted to determine whether students who emerged as at-risk on student report of stress and school satisfaction or report cards but were *not* identified by their teachers as at-risk differed from their counterparts who were accurately identified based on student characteristics (i.e., severity of emotional or academic risk, student gender). To determine if the true positive rate (and miss rate) depended on student characteristics, generalized mixed models were estimated, which included the student characteristics one at a time, while accounting for the nesting of students within teachers.

Risk: Any emotional or academic indicator. Teachers were more likely to nominate students who demonstrated risk, and thus less likely to miss students, when the student received a lower grade in AP Human Geology or IB Biology, $t(115) = -4.22, p < .001$. For example, among the students who had demonstrated risk, the predicted probability of nomination for students with a grade of C was .61, whereas the predicted probability for students with a grade of B was .25. Similarly, teachers were less likely to miss students when the student had lower GPAs, $t(115) = -3.21, p = .0017$. For example, among the students who had demonstrated risk, the predicted probability of nomination for students with a GPA of 2.0 was .87, whereas the predicted probability for students with a GPA of 3.0 was .51. In addition, teachers were less likely to miss students when the students had a higher level of school satisfaction, $t(115) = 2.54, p = .0125$. For example, among the students who had demonstrated risk, the predicted probability of nomination for students with a MSLSS score of 3 was .24, whereas the predicted probability for students with a MSLSS score of 5 was .53. No significant difference was found based on the student's gender, $t(115) = -1.18, p = .24$, or level of perceived stress, $t(115) = -0.77, p = .44$.

Risk: Stress. Students with stress were more likely to be nominated by teachers when

their GPA was lower, $t(44) = -2.57, p = .0135$ (predicted probability of nomination for students with GPAs of 2 and 3 were .99 and .73, respectively) and when the student had a low grade, $t(44) = -2.59, p = .0128$ (predicted probability of nomination for students with grades of C and B were .77 and .37, respectively). No significant differences in the probability of nomination were found based on the student's gender, $t(44) = 1.03, p = .31$, perceived stress, $t(44) = -0.29, p = .78$, or school satisfaction, $t(44) = -0.24, p = .81$.

Risk: School satisfaction. Students with at-risk school satisfaction were more likely to be nominated by teachers when their GPA was lower, $t(47) = -2.67, p = .010$ (predicted probability of nomination for students with GPAs of 2 and 3 were .96 and .56, respectively) and when the student had a low grade, $t(44) = -2.83, p = .007$ (predicted probability of nomination for students with a grades of C and B were .76 and .22, respectively). No significant differences in the probability of nomination were found based on the student's gender, $t(47) = -1.39, p = .17$, perceived stress, $t(47) = 0.49, p = .63$, or school satisfaction, $t(47) = 0.87, p = .39$.

Risk: Academic performance. The probability of teacher nomination of students with at-risk academic performance was not found to differ with student gender, $t(59) = -1.22, p = .23$. Similarly, no significant differences were found for perceived stress, $t(59) = 0.80, p = .43$, school satisfaction, $t(59) = 1.11, p = .27$, GPA, $t(59) = 1.24, p = .22$, or course grade, $t(59) = -0.94, p = .35$.

Discussion

This study aimed to advance a multi-method, usable, and accessible approach for identifying AP/IB youth who demonstrate signs of academic or emotional challenges early in their high school career. The screening was embedded in a MTSS for student mental health that included a universal SEL curriculum intended to build 9th grade AP/IB students' skills in stress

management and engagement. Following that Tier 1 classroom-based support, students showing signs of risk during the screening process were offered individualized, time-limited Tier 2 support matched to the targets of the universal support and screening—stress/coping and student engagement. This study found that using student self-report of academic performance and teacher nomination of students at-risk would result in substantial miss rates of students identified as at risk emotionally or academically compared to student self-report of stress and school satisfaction, and academic performance data from school records.

Prevalence of Risk among AP/IB Freshmen

Base rates of emotional and academic risk among freshmen in accelerated curriculum are understudied. We first examined the proportion of students with risk on factors most salient to AP/IB student success, specifically perceived stress, affective engagement (school satisfaction), and academic performance in the first semester of high school. In general the 304 AP/IB students who participated in the screening process were functioning well across the three indicators, with the average student reporting s/he experiences mild satisfaction with school, and sometimes feels stressed. Academically they were also strong, with the average grade in AP Human Geography and IB Biology falling in the B range. Yet, approximately 39% of AP/IB freshmen who received Tier 1 services to develop social-emotional skills still showed signs of academic risk (GPA < 3.0, grade of C or lower in AP or IB class) or emotional risk (elevated stress, negative feelings about school). Across the risk factors, 15% of AP/IB students screened were at-risk for high stress, 16% for low school satisfaction, and 20% for below par course grades. These prevalence rates of risk were on target with hypotheses (e.g., 15 – 20% of students identified per risk factor), but the low associations across types of risk led to a higher overall identification rate than one might expect among a group of students who took part in a research-based universal support with core

instruction in the targets relevant to the specific student population.

As expected within a 3-tier prevention framework, the universal screening process identified a sizeable proportion of AP/IB students with signs of risk, thus a subset of students to be further considered for early intervention. The relatively high total percentage (i.e., 38.5% of freshmen with at least one risk factor, in comparison to a more typically expected 20% of students in need of more intensive supports beyond the Tier 1 curriculum) may be in part a function of the diverse targets assessed and potentially liberal cut scores for “risk” used in this study. While the screening process might yield a base rate of risk that could be challenging to serve with typical school resources (Kilgus & Eklund, 2016), the measures and cut scores are appropriate for normative levels of emotional and academic well-being in this unique population. Traditional school screening methods often measure symptoms of psychopathology rather than precursors of problems like stress stemming from academic demands and school satisfaction, both pertinent risk factors for AP/IB youth (Suldo et al., 2008; Suldo et al., 2018). Likewise, academic risk levels are considerably different among AP/IB youth as compared to their general education peers. Case in point, regulations for the award of the IB Diploma specify that students cannot have more than three grades of C (or lower) across their IB coursework (IBO, 2016). Whereas schools commonly flag a student for being at-risk (e.g., for school dropout) if they are failing a class, a C or lower is a better indicator of risk (e.g., for withdrawal from accelerated courses) for AP/IB students. Identification of 9th grade AP/IB students with early signs of emotional or academic risk provides an opportunity for Tier 2 supports to prevent further problems. Research on prevention services indicates it is more cost-effective to provide services *before* youth experience clinically significant crises as opposed to more intensive Tier 3 services (Cooney, Kratochwill, & Small, 2010).

Accuracy of Teacher Nominations

With efficiency in mind, a primary aim of this study was to examine the accuracy of teacher nominations in identifying those students who demonstrated risk on emotional factors (stress, school satisfaction) or academic performance. Our results suggest teachers suspect fewer students experience signs of academic or emotional problems as 25% of the sample was nominated by teachers as at-risk whereas about 39% of students emerged as at-risk based on self-report of emotional indicators and school academic records. Related to their tendency to not over-nominate, teachers demonstrated relatively high accuracy in terms of specificity; 84% of students without elevated risk on academic or emotional indicators were also not indicated as at-risk by their teachers. Such specificity is helpful as to avoid unnecessary resource allocation to students who do not need extra supports. However, as nominated students are further considered for Tier 2 supports, they can be ruled out, if appropriate, as additional data become available.

In any screening procedure, sensitivity is often weighted more heavily than specificity, given the high stakes involved in inadvertently excluding a student from further consideration for supports that may indeed be warranted. This study found that AP/IB teachers correctly identified only 39% of students with emotional or academic risk. If the teacher nomination method had been relied on as the sole way to identify students for Tier 2 supports, about 61% of students with elevated stress, low school satisfaction, or substandard academic performance would have been missed, particularly those students with emotional risk vs. academic risk. Kilgus and colleagues' (2016) study of the accuracy of teacher nominations for elementary and middle school students also found lower sensitivity rates associated with emotional risk in comparison to academic or social risk, in part because teachers tended to nominate fewer students as showing emotional risk; sensitivity remained less than adequate even after they changed directions on the

nomination form to identify a minimum number of students in each risk category (i.e., emotional, academic, social). Similarly, an examination of the symptom profiles of high school students referred for intervention by school personnel due to “exhibiting the most severe behavioral, emotional, or school problems” (p. 100) concluded that educator nominations under-identify students with internalizing forms of problems (Splett, George, et al., 2018).

The current study found teacher and student characteristics were related to the accuracy of the nomination procedure. Regarding teacher effects, we found significant variability among teachers in their sensitivity rates, with a given teacher identifying from 3% to 60% of his or her students who had any form of risk. Regarding student effects, at-risk students whose teachers nominated them as such were more likely to be students who had lower academic performance; students with elevated stress or low emotional engagement who had relatively higher grades were less likely to be on teachers’ radars for showing signs of emotional risk. These findings are similar to Splett, Trainor, and colleagues’ (2018) finding that traditional school referral mechanisms were more likely to identify students with lower course grades. In that comparison of elementary school students who were already receiving school-based interventions to students identified as at-risk through universal screening with rating scales, Splett et al. also found gender and symptom severity were associated with school identification of risk, with males and students with higher internalizing or externalizing problem scores being more likely to receive interventions. In contrast, the current study of high school students found males and students with especially high stress levels were not particularly likely to be nominated by teachers as demonstrating academic or emotional challenges. Rather than detecting the most symptomatic students, students with particularly low school satisfaction were *less* likely to be detected by teachers as demonstrating signs of risk, perhaps because student disaffection with school

precludes teachers from having sufficient familiarity with the student to detect problems.

The associations between teacher nomination status and students' continuous scores on indicators used to assess emotional and academic status revealed no relationship with student report of stress or school satisfaction, but moderate correlations in the expected direction with school grades. The tendency for AP/IB teachers to equate academic underachievement with risk is consistent with previous research conducted both with gifted and non-gifted students, finding that students with lower achievement may be more likely to be identified as at risk academically compared to students with higher academic indicators (Eklund & Dowdy, 2014).

Regarding sensitivity to academic risk, teachers identified on average about 60% of students deemed at-risk due to academic performance (GPA < 3.0 or grade in a rigorous AP/IB course a "C" or below at the end of the first semester). The relatively high accuracy with which teachers identified students with below par academic performance is not surprising given teachers frequently collect and examine indicators of achievement. In spite of such familiarity with students' academic performance in their class, sensitivity to academic risk varied significantly between teachers and only one teacher's nominations were 100% in agreement with risk as determined by school records. Another teacher greatly underestimated the number of students in her class with academic challenges, identifying only 7% of students who ultimately met criteria for at-risk academic performance.

In comparison to identifying academic risk, teachers in this study were less accurate in identifying those students in their AP/IB class(s) who were struggling emotionally, identifying on average only 28% of students with low affective engagement (school satisfaction) and 40% of students with elevated stress. These findings provide modest support for the sensitivity of teacher nominations in identifying high school students with internalizing forms of risk. The modest

sensitivity to low school satisfaction was consistent across teachers, with no teacher correctly identifying more than half of his/her students who actually reported negative feelings about school. In contrast, sensitivity to detection of student stress varied significantly across teacher, with two teachers with particularly low sensitivity (< 15%) and two teachers with particularly high sensitivity (> 78%). All teachers in this study were present for a SEL curriculum delivered in their classroom that explicitly focused on student stress and affective engagement, which may have facilitated the high sensitivity to student stress demonstrated by some teachers. Additional research is warranted to explore factors related to attitudes and skills that may contribute to instances of high miss rates. Many secondary teachers report low confidence in their own ability to accurately identify students with internalizing problems (Papandrea & Winefield, 2011), perhaps due to the emphasis on academic success in the classroom. The poor sensitivity of teacher nominations to detecting AP/IB students at risk due to low school satisfaction or elevated stress mirrors findings from prior studies that found teacher nomination procedures catch less than half of students who experience internalizing symptoms of mental health distress (Auger, 2004; Cunningham & Suldo, 2014; Moor et al., 2007). Preservice training or professional development may include too little information on student affective needs, such as signs of stress or disconnect from school.

Accuracy of Student Report of Academic Performance

We hypothesized that AP/IB students would be able to accurately report their end-of-course grades, which might permit a more efficient screening process with fewer pieces of data needing to be gathered by the school. However, the results indicated that freshmen, especially those performing in the C range, are an unreliable source of academic information. If student self-report of AP/IB course grade and GPA had been relied on as the sole way to identify

students for further consideration for tiered supports, between 36% and 52% of students with academic risk (per actual report cards) would have been missed. Schwartz and Beaver (2015) similarly found that high school students tend to over-report their GPA—by about one-half letter grade on average—although inflated self-reported grades are more common among adolescents with lower achievement and cognitive ability. In the current study, GPA values from student self-report and school records were correlated reflecting that AP/IB students indeed have a general idea of their end of semester grades, but when it comes to making decisions based on dichotomized indicators that require accuracy around the cut point, gathering information from school records appears warranted regardless of the effort needed to obtain and organize the data.

Limitations and Directions for Future Research

Conclusions from this first study of different ways to systematically identify high school students in accelerated courses with early signs of academic or emotional risk are tempered by setting-specific features. Participants were drawn from only two high schools. Base rates of risk and accuracy of methods other than student report (of stress and school satisfaction) and school records (of academic performance) should be investigated in a larger sample of schools, programs, teachers, and students. Further, this screening study was embedded in a larger research project, in which all teachers participated in a universal SEL curricula that addressed the correlates of AP/IB student success, including stress management and student engagement. This Tier 1 support may have influenced how teachers understood and viewed student stress and affective engagement, perhaps contributing to an overestimation of the sensitivity of teacher nominations. Teachers without such exposure to social-emotional factors relevant to AP/IB student success may perform differently on similar screening procedures. Future studies might explore the extent to which teacher sensitivity to student risk increases as a function of (a)

exposure to affective needs of AP/IB students, (b) routine monitoring of student emotional status including internalizing behavior, and/or (c) familiarity with the nomination procedure.

The misidentification rate (14% of students) yielded in this study suggests that teacher nominations might add unique information about the pool of students in need of further consideration by school teams. Future research might explore what led teachers to nominate students without high stress, low school satisfaction, or below par grades as at-risk for emotional or academic challenges. Perhaps knowledge of a student's family situation or other environmental stressor led a teacher to feel a student warrants consideration for targeted supports (even if outside the scope of planned supports geared toward AP/IB student success). Adding teacher nominations to a multi-method screening that also includes data from students and records might also be beneficial to increasing teacher buy-in to the overall screening process.

In this study, it was not possible to calculate all possible conditional probability indices because the teacher nomination form did not ask teachers to evaluate students for challenges in discrete areas (e.g., stress, school, academic performance) separately. Future studies might consider asking teachers to nominate which students demonstrate signs of emotional risk, academic risk, or both. Additionally, we involved teachers, administrators, and school psychologists—but not students—in the creation of the screening procedures, such as the content and structure of the educator nomination form and selection of academic course to monitor. Future research could explore student acceptability of the targets examined, data sources used, and overarching purpose (e.g., link to Tier 2 support) within a mid-year screening. In this study, students were informed of the purpose of screening before being asked to complete the survey, but the research staff did not query the validity of students' specific responses. In contrast, researcher bias could have been introduced into teachers' nomination accuracy by encouraging

the teacher with a particularly low nomination base rate to reconsider her class roster.

Conclusion and Implications

Grounded in evidence-based practices and data-based decision making, MTSS emphasizes prevention, screening, and early intervention so that students may receive appropriate services *before* they have the chance to fail (Sailor, Doolittle, Bradley, & Danielson, 2009). The methods described and evaluated in this study illustrate how to assess specific risk factors that predict diminished success, in order to identify AP/IB freshmen for targeted support. Results provide preliminary support for a screening procedure that incorporates data from (a) student self-report of stress and affective engagement (school satisfaction), and (b) school records of first semester GPA and grade in an AP or IB course that discriminates satisfactory from below par performance in accelerated curricula. Given the sizeable proportions of at-risk students missed in the teacher nomination procedure, especially those with emotional challenges (high stress, low school satisfaction), findings do not lend strong support for bypassing the collection of data from students when the construct of interest is internalizing in nature. Also, findings support the need to collect additional data on academic performance from school records, as students were only moderately accurate in self-reporting grades. The effort needed to gather data from multiple methods is justified by the ability to offer targeted supports to all AP/IB students with emotional and academic needs early in their high school career.

Compliance with Ethical Standards

Research involving human participants and/or animals. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional committee and with the 1964 Helsinki declaration and its later amendments. This article does not contain any studies with animals performed by any of the authors.

Informed consent. Informed consent was obtained from all individual participants included in the study.

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Table 1

Proportion of Freshmen in Advanced Placement and International Baccalaureate Courses with Risk on Dichotomized Emotional and Academic Indicator (N = 304)

Risk Indicator (Dichotomized)	No Risk		At-Risk	
	<i>N</i>	%	<i>N</i>	%
Stress (PSS > 3.6)	258	84.87	46	15.13
School Satisfaction (MSLSS < 3.4)	255	83.88	49	16.12
Academic Performance	243	79.90	61	20.10
GPA (< 3.0)	281	92.43	23	7.57
AP/IB Course Grade (C, D, or F)	249	81.91	55	18.09

Note. GPA = unweighted semester GPA. PSS = Perceived Stress Scale. MSLSS = Multidimensional Students Life Satisfaction Scale. AP = Advanced Placement. IB = International Baccalaureate.

Table 2

Correlations between Indicators of Student Risk (Continuous Scores) and Teacher Nomination Status

Indicator	Teacher Nomination	Stress	School Satisfaction	Semester GPA
Stress	.02			
School Satisfaction	-.03	-.31**		
Semester GPA	-.35**	-.19**	.11	
Course Grade	-.45**	-.09	.05	.76**

Note. GPA = unweighted semester GPA. Stress, school satisfaction, GPA, and course grade were continuously scaled. Teacher nomination variable coded as 0 = not at-risk, 1 = yes at-risk.

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

Table 3

Accuracy of Teachers in Identifying Students with Emotional or Academic Risk

Risk Indicator (Dichotomized)	Sensitivity	Specificity	PPV	NPV
Any Risk Total (<i>N</i> = 304)	39.32	83.96	60.53	68.86
Female (<i>N</i> = 180)	44.44	84.26	65.31	69.47
Teacher 1 (<i>N</i> = 72)	3.13	95.00	33.33	55.07
Teacher 2 (<i>N</i> = 20)	60.00	66.67	37.50	83.33
Teacher 3 (<i>N</i> = 41)	26.67	80.77	44.44	65.63
Teacher 4 (<i>N</i> = 93)	59.46	85.71	73.33	76.19
Teacher 5 (<i>N</i> = 78)	57.14	80.00	61.54	76.92
Stress Total (<i>N</i> = 304)	32.61			
Female (<i>N</i> = 180)	31.43			
Teacher 1 (<i>N</i> = 72)	5.56			
Teacher 2 (<i>N</i> = 20)	100.00			
Teacher 3 (<i>N</i> = 41)	14.29			
Teacher 4 (<i>N</i> = 93)	40.00			
Teacher 5 (<i>N</i> = 78)	77.78			
School Satisfaction Total (<i>N</i> = 304)	28.57			
Female (<i>N</i> = 180)	37.04			
Teacher 1 (<i>N</i> = 72)	0.00			
Teacher 2 (<i>N</i> = 20)	50.00			
Teacher 3 (<i>N</i> = 41)	25.00			
Teacher 4 (<i>N</i> = 93)	36.36			
Teacher 5 (<i>N</i> = 78)	42.86			
Academic Risk Total (<i>N</i> = 304)	60.66			
Female (<i>N</i> = 180)	66.67			
Teacher 1 (<i>N</i> = 72)	7.14			
Teacher 2 (<i>N</i> = 20)	100.00			
Teacher 3 (<i>N</i> = 41)	66.67			
Teacher 4 (<i>N</i> = 93)	80.77			
Teacher 5 (<i>N</i> = 78)	71.43			

Note. PPV = Positive Predictive Value. NPV = Negative Predictive Value. Female refers to student gender.

Appendix: Educator Nomination Form

We are identifying students with signs of academic or emotional risk. Those students will be offered additional supports intended to help them be successful in AP/IB.

Directions: Please review the attached list of eligible 9th grade students in your AP/IB class. Then, identify the participating students that, based on your knowledge of this student and his/her typical behavior, demonstrate academic or emotional challenges in AP/IB. Example student behaviors that may indicate academic or emotional risk are listed below. You may check “yes” for as few or as many students as you feel fit the criteria below for being at-risk for diminished success in AP/IB.

Please do not discuss your thoughts on this list with any colleagues; please complete this form independently by checking “yes,” or circling the names, for the students who are demonstrating academic or emotional challenges. Thank you!

At-Risk for Diminished Success in AP/IB:	
Examples of Signs of Academic or Emotional Challenges in AP/IB	
Poor test, quiz, and exam grades	Appears burnt out on schoolwork
Does not turn in assignments on time (may make frequent requests for extended time)	Seems unhappy during class (e.g., tearful)
Seems disinterested during class	Makes negative statements about AP/IB or school
Difficulty coping effectively with academic demands	Appears lonely or socially isolated (no friends in AP/IB)
Gives up or stops trying on schoolwork	Expresses extreme or frequent worry about performance on assignments or exams
Expresses frequent or extreme self-doubt about ability to achieve in AP/IB	Complains excessively about workload or particular assignments
Does not seem to take schoolwork seriously (e.g., plays around during class)	Misses class (e.g., signs in and out of school, skips school, stays in bathroom during class)
Other: _____	