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Use of Social Emotional Learning Skills to Predict Future Academic Success and Progress Toward Graduation

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Use of Social Emotional Learning Skills to Predict Future Academic Success and Progress Toward Graduation

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This study evaluated the degree to which a range of social emotional learning skills—academic self-efficacy, academic motivation, social connections, importance of school, and managing psychological and emotional distress and academic stress—could be used as an indicator of future academic outcomes. Using a sample of 4,797 from a large urban school district, we found that high school students classified as performing in the lowest 25% of their grade reported lower social emotional skills than students classified in the top 25% of academic performers by the end of the 8th grade. Two variables, perceived importance of attending college and psychological and physical stress, accounted for nearly 26% of the variance in cumulative high school GPA after controlling for 9th-grade GPA. Finally, the results indicated that a combination of 5 social emotional learning subscales effectively discriminated between students making positive progress towards high school graduation and those identified as having dropped out of or failed more than 14% of their courses.

Middle and high schools optimize youth development when educators personalize educational and social emotional learning opportunities for the changing needs of youth (Battistich, 2010; Deci & Ryan, 2002; Eccles & Roeser, 2010; Lapan, Gysbers, & Petroski, 2001). Social emotional learning is the ability to acquire and apply the knowledge and skills necessary to comprehend, manage, and articulate social and emotional information that is associated with social behaviors such as maintaining positive relationships, recognizing emotions, and making

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responsible decisions (Crick & Dodge, 1994; Elias et al., 1997; Nowicki & Mitchell, 1998). School-based efforts to promote and enhance social emotional learning skills are built on an understanding that academic success and better school performance emerge in the context of supportive relationships (Eisenberg, 2006; Guerra & Bradshaw, 2008; Masten & Coatsworth, 1998; Weissberg & Greenberg, 1998). However, in response to an increasingly depersonalized learning environment, many youth disengage from middle and high school, evidenced by lower academic achievement, higher absenteeism, and increased behavior disruptions, all of which too often culminate in leaving school (Alexander, Entwisle, & Kabbani, 2001; Balfanz, Bridgeland, Moore, & Fox, 2010; Eccles et al., 1993; Rumberger, 1995).

In their longitudinal study of Philadelphia schools, Neild and her colleagues identified four early-warning indicators of dropout risk (Neild, Balfanz, & Herzog, 2007). These indicators included receiving a final grade of F in either mathematics or English, attendance below 80%, and evidence of disruptive behavior. Subsequent research in a large urban school district found that creating an on-time to graduate indicator consisting of grades and credits accumulated was a good predictor of who was likely to graduate with 93% of those identified in the ninth grade as on track eventually graduating, but 50% of those ninth graders identified as not on track eventually dropped out of school (Carl, Richardson, Cheng, Kim, & Meyer, 2013). Carl et al. (2013), however, identified two problems with the early warning indicator methodology. One problem was that nearly 30% of the students who graduated received cumulative math grade point averages below 1.0 and an additional 30% averaged 2.0 and below across their math courses. Although these students did graduate from high school, they did not possess the college and career readiness skills to enter and succeed in a postsecondary setting. The second issue was that accounting for both credits and quality GPA as a “total quality credits” indicator, they concluded that “predicting dropouts is more complex for some students, and may even be driven by external or non-academic factors” (Carl et al., 2013, p. 21).

In a subsequent study, Neild and colleagues evaluated whether two nonacademic factors—student’s self-reported academic and social engagement—contributed to models estimating future dropout risk (Neild, Stoner-Eby, & Furstenberg, 2008). Although the results indicated that academic, social, and teacher engagement were associated with dropout risk, a logistic regression analysis indicated that once academic engagement was entered into the model, social and teacher engagement were no longer significant predictors.

Creating early warning systems that help schools more effectively support all youth to stay on track toward graduation and prepare youth who graduate college- and career-ready (Achieve, 2010) has important economic implications. For society, the numbers of youth and the estimated 6.7 million out-of-school nonworking young adults aged 16–24 are expected to reduce the tax base directly by $1.56 trillion and cost society, in aggregate, $4.75 trillion (Belfield, Levin, & Rosen, 2012). The economic stakes of high school success and successfully entering postsecondary educational or vocational training as a means to increasing both personal earnings and occupational opportunities are paramount (Neild & Boccanfuso, 2010). Through this lens, states are beginning to frame high school success as a foundation for their future economic outlook as retirement numbers far outnumber the future supply of high school graduates (Sullivan, 2012).

The purpose of this study was to investigate whether assessing nonacademic factors, such as social emotional learning skills, could also offer an early warning system strategy for identifying students who are currently or in the future likely to become at risk. Understanding whether
and how social emotional learning skills predict future academic performance and dropout risk, schools are in a better position to use assessment strategies to design personalized intervention strategies. Furthermore, the aim of this study was to evaluate whether middle school students’ ratings on a range of social emotional learning areas could serve as an early warning system for differentiating high and low academic performers in high school. The remainder of the literature review provides a rationale for the social emotional learning constructs being used in the study and evidence for their construct, concurrent, and predictive validity.

SOCIAL EMOTIONAL LEARNING CONSTRUCTS

Social emotional learning is the ability to acquire and apply the knowledge and skills necessary to comprehend, manage, and articulate social and emotional information, associated with social behaviors such as maintaining positive relationships, recognizing emotions, and making responsible decisions (Bierman, 2004; Crick & Dodge, 1994; Elias et al., 1997; Nowicki & Mitchell, 1998). A recent meta-analysis of over 200 teacher-led schools found that classroom strategies designed to promote social emotional learning skills contributed to higher academic outcomes, better connections to school, and positive behavior (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Specific social emotional learning skills that were found to affect educational outcomes included self-efficacy, decision-making and problem-solving skills, and stress and health management. The six social emotional learning skill areas in this study include self-efficacy, motivation, social connections, perceived importance or utility of education, psychological and emotional distress, and academic stress (Bandura, 1986; Cohen & Wills, 1985; Dohrenwend & Dohrenwend, 1974; Eccles & Wigfield, 2002; Egeland, Carlson, & Sroufe, 1993; Hobfoll, 1989; Ryan & Deci, 2002; Werner & Smith, 1992).

**Academic self-efficacy** refers to perceived competence in performing a range of academic activities needed to be successful within a school setting (Solberg et al., 1998; Solberg, O’Brien, Villarreal, Kennel, & Davis, 1993). According to Bandura (1986, 1997), self-efficacy refers to perceived ability to successfully perform a task or behavior. As a construct, academic self-efficacy has been consistently found to be associated with a range of academic outcomes (Schunk & Pajares, 2009) and meta-analysis has established an average medium effect size between academic self-efficacy and school outcomes (Multon, Brown, & Lent, 1991; Schunk & Pajares, 2009).

**Academic motivation** was defined with respect to whether students are motivated to attend school because it is perceived as a relevant, meaningful, and/or enjoyable learning experience—what is referred to as autonomous motivation (Close & Solberg, 2008; Ryan & Deci, 2002, 2008). Autonomous motivation refers to engaging in an activity because of its perceived meaningfulness and relevance. It has been well established that youth develop self-determination (i.e., intrinsic motivation and stronger competence beliefs) when educators create a personalized, caring, and relational classroom environment in which the youth receive choices and engage in autonomy-supportive interactions (Deci, Schwartz, Sheinman, & Ryan, 1981).

Social connections were conceptualized as the perceived availability of three relational connections—family, peers, and teachers. From diathesis-stress research, it has been well established that high levels of stress are associated with increases in psychological and emotional distress that is mediated and moderated by social support systems (Cohen & Wills, 1985;
Dohrenwend & Dohrenwend, 1974). In a recent study of anxiety among African American youth, Lewis, Byrd, and Ollendick (2012) found that stress was associated with increased anxiety and availability of social support was associated with lower anxiety.

Importance of school was used to indicate the degree to which students perceive their current school and future college education as having strong utility for helping them achieve their desired life and career goals (Eccles & Wigfield, 2002). Perceived importance of school is conceptualized as a subjective task value that contributes to both expectations for school success and achievement-related actions and choices (Wigfield, Tonks, & Klauda, 2009). Research has demonstrated that youth gain better course outcomes when they perceive the subject matter as relevant to and supportive of future life goals (Eccles, 2005; Harackiewicz, Durik, Barron, Linnenbrink-Gracia, & Tauer, 2008; Hulleman, Godes, Hendricks, & Harackiewicz, 2010; Hulleman & Harackiewicz, 2009). Perceived relevance and importance of the subject matter are not only important in motivating youth to succeed in their coursework, but also are malleable to classroom-based interventions. For example, Hulleman and Harackiewicz (2009) randomly assigned high school students to receive a utility-enhancing intervention whereby they would explore how science courses are important to helping them achieve desired life goals. They found that students with a history of low academic performance in science reported higher perceived relevance and end-of-term grades than youth in either the control condition or who entered the class with a better science academic history.

Psychological and emotional distress is conceptualized as an absence of positive affect or the presence of unpleasant emotions, which affect level of functioning (Suldo, Gormley, DuPaul, & Anderson-Butcher, 2014). Literature has highlighted the risk of coexistence among emotional, psychological, and academic dimensions in which a student with problems in one domain is more inclined to concurrently have difficulties in other domains, such as academic performance. In contrast, youth with positive academic outcomes and minimal psychological distress tend to be better adjusted (Valdez, Lambert, & Ialongo, 2011). Furthermore, literature has demonstrated that students with low stress were more likely to continue their education and had a higher GPA than those that experienced higher levels of stress (Dornbusch, Mont-Reynaud, Ritter, Chen, & Steinberg, 1991; Gillock & Reyes, 1999; Windle & Windle, 1996). A subsequent longitudinal study, in which student mental health was examined by well-being and psychological distress indicators, found that students with a combination of low well-being and elevated psychological distress were most at risk for descending GPA (Suldo, Thalji, & Ferron, 2011).

Academic stress is conceptualized according to Hobfoll’s (1989) conservation of resources model. This model posits that an activity is perceived as stressful by people who do not feel they have the skills, or emotional or time resources, needed to effectively manage a given activity. Academic stress was operationalized in terms of the perceived difficulty youth reported having experienced in completing a range of academic activities.

In previous research, these social emotional learning constructs were evaluated in relation to one another and academic outcomes using structural equation modeling. Close and Solberg (2008) demonstrated that students reporting stronger relational connections with teachers and peers reported school as being more relevant, meaningful, and enjoyable. Perceived relevance was associated with higher reported academic self-efficacy, which was subsequently associated with better reported health management. The combination of academic motivation, academic self-efficacy, and health management was associated with recording better academic outcomes.
during their initial entry into the ninth grade. Gillis (2011) extended this research by showing that academic self-efficacy mediates the relationship between motivation and academic stress and that perceived importance of education was predicted by a combination of academic self-efficacy and motivation. This study extends this previous research by examining whether and how social emotional learning skills can serve as an early warning indicator for future academic success. Specifically, this study assessed whether: (a) social emotional learning skills assessed at the end of middle school can effectively predict future high school academic success and (b) a subset of social emotional learning skills could serve as an early warning indicator for future dropout risk. The potential significance of this study is that social emotional learning skills may offer schools an early warning indicator of whether and why students may become at risk for future school failure.

METHOD

Participants

A total of 4,797 students were surveyed during the summer prior to beginning the ninth grade as part of a summer transition-to-high-school program in a large western urban school district. The total sample represents three annual cohorts. A total of 1,830 students participated in Cohort 1 beginning in 2007; 1,728 participated in Cohort 2 beginning in 2008, and 1,214 participated in Cohort 3 beginning in 2009. A total of 35% of the students were Latino, 11% were African American, 10% White, 1% American Indian, and 2% Asian or Pacific Islander, and the remaining were either not identified or identified as more than one race or ethnicity. For gender, 51% were identified as women.

Measures

Academic self-efficacy. This measure is a 22-item scale that assesses the degree to which an individual believes he or she can successfully perform a number of academic and school-related tasks (Gillis & Sedivy, 2008). Responses range from 1 (not at all confident) to 5 (extremely confident), with higher scores indicating greater belief in the ability to perform academic and school-related tasks. Principal components analysis using a national sample of students (Gillis & Sedivy, 2008) identified three subscales: (a) social, (b) classroom, and (c) test taking. Internal consistency coefficients for the subscales and the total scale using Cronbach’s alpha were .79, .83, .69, and .91, respectively.

Academic motivation. This measure is a 15-item scale that assesses the reasons students attend school (Close & Solberg, 2008). It was derived using self-determination theory (Deci & Ryan, 1985), which delineates two dimensions of internal motivation: performing a task because it is perceived as meaningful and performing a task because it is deemed enjoyable. Students indicate the extent to which they agree with a series of statements using a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Principal components (Gillis & Sedivy, 2008) and confirmatory factor analysis (Solberg, Howard, Gresham, & Carter, 2012) using a national
sample of students identified two internal control subscales: (a) attending school because it is deemed enjoyable (enjoy school), and (b) attending school because it is deemed meaningful (meaningfulness of school). Solberg et al. (2012) report internal consistency was .64 (enjoy school) and .77 (meaningfulness of school), and the total scale was .79.

**Social connections.** This measure consists of 16 items that relate to the perceived availability of support from teachers, family, and peers. The items were modeled after the Social Provision Scale (Russell & Cutrona, 1984), which assesses perceived availability of family support. Students evaluated the degree to which they perceived availability of support using a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Principal components analysis using a national sample of students (Gillis & Sedivy, 2008) identified three subscales: (a) family support, (b) teacher connections, and (c) peer connections. The three subscales and the scale composite score were found to have adequate internal consistency, with coefficients of .80, .81, .76, respectively, and .84 for the total scale.

**Importance of school.** This measure consists of 10 items that ask about individuals’ beliefs about the importance of education in achieving their life goals. Students rated the importance of each item using a scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items were analyzed using principal components analysis (Gillis & Sedivy, 2008) and two subscales were identified: (a) importance of school, and (b) importance of college. The two subscales and the scale composite score were found to have adequate internal consistency: .84 (school), .90 (college), and .92 (total scale).

**Psychological and emotional distress.** This 23-item scale assesses how often an individual experiences emotional-psychological and physical health-related concerns (Gillis & Sedivy, 2008). Individuals provide responses on this measure to a series of statements indicating how often they have experienced each health-related concern during the past month, using a scale ranging from 1 (never) to 5 (always). Principal components analysis using a national sample of students (Gillis & Sedivy, 2008) identified five subscales: (a) agitation, (b) eating problems, (c) feeling blue, (d) sleeping problems, and (e) physical problems. Each of the subscales and the total composite scale demonstrated adequate reliability, with alpha coefficients of .86, .83, .85, .86, .75, and .95, respectively.

**Academic stress.** This 22-item scale assesses how often an individual experiences difficulties completing a variety of academic-related tasks (Gillis & Sedivy, 2008). On this measure, students evaluate the stressfulness of a series of tasks by indicating the degree of difficulty they experience, with scores ranging from 1 (not at all difficult) to 5 (extremely difficult). Principal components analysis using a national sample of students (Gillis & Sedivy, 2008) identified three subscales: (a) academic, (b) social, and (c) financial. The three subscales and the scale composite score were found to have adequate internal consistency, with coefficients of .86, .86, .88, and .94, respectively.

**Dependent variables.** Three indicators of academic progress in high school were employed as dependent variables. Cumulative grade point average (GPA), measured on a scale of 1 to 5, corresponded to traditional course grades in all subjects (1 = F, 4 = A, 5 = Advanced
Second, a composite index of high school performance, *academic success*, was created based on early warning indicators by Balfanz et al. (2010), using district-provided data for attendance, suspension reports, and cumulative grade point averages for students across each of the three cohorts. Each indicator was standardized separately by cohort, and the average of the nonmissing standardized values was computed in order that all three cohorts could be combined. Because the indicator for behavior reports is a negative value with higher numbers indicating more incidents, the average for behavior reports was multiplied by $-1$ to create a score that reflected better behavior. Once average standardized ratings were computed separately for attendance, behavior reports, and grades, the average of these three composites was generated to create a single indicator of high school performance, with higher $z$-scores representing more success. Students from the 2007 cohort had standardized scores from 3 academic years averaged, the 2008 cohort had 2 years of standardized scores averaged, and the 2009 cohort had 1 year of standardized scores averaged. Finally, the academic-success indicator was divided into quartiles with the upper 25% of the distribution comprising the high-success group and students falling in the lower 25% of the distribution comprising the low-success group. Dividing the high school success indicator into quartiles resulted in a total of 835 students scoring below the 25th percentile (low-success group) and 1,001 students scoring above the 75th percentile (high-success group).

A dichotomous dependent variable, *progress toward graduation*, was generated using the ratio of credits earned to credits attempted. Students were classified as not making progress toward graduation if they had failed 14% or more of their courses or if the district had identified them as having dropped out. A total of 4.1% of the sample was identified by the district as having dropped out. The total number of students classified as not making progress towards graduation was 2,096 or 45.6% of the total sample.

*Missing data.* Approximately 8% of cases were missing values for one or more dependent variables. Missing values were not imputed for dependent variables; cases with missing data for a dependent variable were dropped from the analysis involving that dependent variable. Missing items within social emotional subscales ranged from 0.8% to 3.7% of cases, depending upon the subscale. In those cases, if two or more items were answered, the mean of the answered items was substituted for missing items within the subscale. If fewer than two of the items for a scale were complete, the case was dropped from analysis.

**RESULTS**

**Social Emotional Learning Skills Predicting Academic Success**

Table 1 reports the means and correlations among the variables. In order to evaluate whether a student’s reported measures on the Success Highways (Gillis & Sedivy, 2008) 18 social emotional learning subscales were associated with established measures of academic success, a one-way multivariate analysis of variance was conducted using high or low academic success as the independent variable and the 18 social emotional learning subscales as the dependent variable. First, a significant main effect was found, Wilks’ Lambda = .835, $F(18, 1817) = 19.88,$
The univariate tests reported in Table 2 indicated that students in the high-success group achieved significantly higher social emotional learning skills than students in the low-success group for all 18 subscales. The results indicated, therefore, that as an early warning indicator of future academic performance, each of the 18 social emotional learning subscales was able to effectively differentiate between students classified in the high and low academic-success groups.

The second analysis employed multiple regression and path analysis to determine the percent of variance in cumulative GPA attributable to the measured social emotional variables. Bivariate correlations among the independent variables (Table 1) were examined to identify variables with correlations greater than $r = .3$ that would contribute to multicollinearity if used together in a regression analysis. The data set was then randomly divided into two equal-sized sets, A and B, with A designated the exploratory data set and B the confirmatory data set. In the exploratory data set, two variables, importance of college, and psychological and emotional stress, emerged as the highest social-emotional bivariate correlates of cumulative GPA ($r = .24, r = .18$ respectively). The remaining independent variables were omitted to avoid multicollinearity. In combination in a multiple-regression analysis, they explained 6.9% of the variance in cumulative GPA ($R = .263, R^2 = .069, p < .001$). Path analysis was used to determine the unique variance in cumulative GPA associated with importance of college and psychological and emotional stress, controlling for first-year GPA (Figure 1). The path coefficients were .000 for stress, and .375 ($p < .001$) for importance of college, the latter accounting for 14.1% of variance in cumulative GPA not associated with Year 1 GPA or stress. The same analysis conducted with the confirmatory data set yielded path coefficients shown in parentheses in Figure 1. Both importance of college and stress were significant predictors of cumulative GPA after controlling for first-year GPA, and together accounted for 25.9% of the variance in cumulative GPA ($R = .509, R^2 = .259, p < .001$).

### Table 1

<table>
<thead>
<tr>
<th>Measure</th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
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<td>4. Physical symptoms</td>
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<td>5. Academic stress</td>
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<tr>
<td>6. Progress toward graduation</td>
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<tr>
<td>$M$</td>
<td>4.43</td>
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<td>4.14</td>
<td>1.92</td>
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<td>$SD$</td>
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<td>0.64</td>
<td>0.59</td>
<td>0.83</td>
<td>0.79</td>
<td>0.50</td>
</tr>
</tbody>
</table>

**$p < .01$.**

$p < .000, \eta^2 = .17$. The univariate tests reported in Table 2 indicated that students in the high-success group achieved significantly higher social emotional learning skills than students in the low-success group for all 18 subscales. The results indicated, therefore, that as an early warning indicator of future academic performance, each of the 18 social emotional learning subscales was able to effectively differentiate between students classified in the high and low academic-success groups.

Social Emotional Learning Skills Predicting Progress Toward Graduation

Discriminant analysis was used to determine whether a subset of social emotional learning skills could effectively predict whether students would be likely to make successful progression.
towards graduation or whether they would become at risk for dropping out of high school. As in the previous analysis, the sample was randomly divided in half with one half designated as Sample A for exploratory purpose and the other as Sample B for confirmatory cross-validation. As part of the exploratory phase, an examination of the correlation matrix was conducted with Sample A to reduce the number of subscales and the multicollinearity among them prior to conducting the discriminant analysis, but a decision was made to retain one subscale from each of the six constructs to test the full theoretical model. The subscale from each of the six social emotional learning skills with the highest correlation with the dependent variable (progress towards graduation) was included in the discriminant analysis. A confirmatory cross-validation analysis was then conducted by applying the discriminant equation generated from Sample A with Sample B.

In the exploratory phase, the six subscales that were selected for entry into the discriminant analysis included: importance of college, meaningful motivation to attend school, classroom confidence, family connections, physical symptoms of distress (negative), and academic stress (negative). The initial discriminant analysis with Sample A indicated that family connections was negatively associated with progress toward graduation, which is not consistent with previous research and was, therefore, deemed to have resulted from multicollinearity. Family

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Low Mean</th>
<th>Std. Error</th>
<th>High Mean</th>
<th>Std. Error</th>
<th>F Statistic</th>
<th>Eta Squared</th>
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<td>Importance of school</td>
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<td>4.035</td>
<td>0.02</td>
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<td>0.021</td>
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<td>0.01</td>
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<td>4.349</td>
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<td>41.41***</td>
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<td>4.455</td>
<td>0.023</td>
<td>26.73***</td>
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<td>Academic stress</td>
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<td>1.888</td>
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</tr>
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<td>Financial stress</td>
<td>1.884</td>
<td>0.029</td>
<td>1.557</td>
<td>0.026</td>
<td>71.19***</td>
<td>0.04</td>
</tr>
<tr>
<td>Distress</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleeping problems</td>
<td>2.279</td>
<td>0.035</td>
<td>2.025</td>
<td>0.032</td>
<td>29.15***</td>
<td>0.02</td>
</tr>
<tr>
<td>Feeling blue</td>
<td>2.187</td>
<td>0.034</td>
<td>1.918</td>
<td>0.031</td>
<td>34.73***</td>
<td>0.02</td>
</tr>
<tr>
<td>Agitation</td>
<td>2.283</td>
<td>0.029</td>
<td>1.838</td>
<td>0.027</td>
<td>124.82***</td>
<td>0.06</td>
</tr>
<tr>
<td>Eating problems</td>
<td>2.057</td>
<td>0.032</td>
<td>1.773</td>
<td>0.029</td>
<td>42.322***</td>
<td>0.02</td>
</tr>
<tr>
<td>Physical symptoms</td>
<td>2.053</td>
<td>0.028</td>
<td>1.77</td>
<td>0.026</td>
<td>54.23***</td>
<td>0.03</td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enjoy school</td>
<td>3.467</td>
<td>0.026</td>
<td>3.691</td>
<td>0.024</td>
<td>40.42***</td>
<td>0.02</td>
</tr>
<tr>
<td>Meaningfulness</td>
<td>3.581</td>
<td>0.021</td>
<td>3.855</td>
<td>0.02</td>
<td>88.41***</td>
<td>0.05</td>
</tr>
</tbody>
</table>

***p < 0.001.
connections was, therefore, dropped from the analysis and a five-predictor discriminant analysis was conducted which yielded a small effect size (canonical correlation $D^{2}28$ explaining 5.2% of the variance in progress towards graduation) and a significant fit (Wilks' Lambda $D^{2}948$,

$x^{2}90.753$,

$p<.001$), indicating that the model including these five variables was able to significantly discriminate between the two groups. A positive cutoff score of 0.10 was selected to yield a higher hit rate for failing students (balanced by a lower hit rate for students on track for graduation).

The unstandardized discriminant function generated in the exploratory phase was then used to compute a predicted score for each student in Subsample B:

$$\hat{Y} = .812 \text{ (imp of college)} + .335 \text{ (meaningful motivation)} + .205 \text{ (classroom conf)} - .252 \text{ (physical symptoms)} - .508 \text{ (academic stress)} - 4.124$$

The same cutoff score of 0.10 was then used in a confirmatory analysis used to predict membership in progress toward graduation and correctly predicted 60.5% of students not making progress and 56.5% of students making progress. This provides strong evidence that the prediction formula is stable, and not dependent on a particular sample of students ($x^{2}47.82$,

$p<.001$).

**DISCUSSION**

Early detection of students who may become at risk for performing poorly in high school, who may be at risk for dropping out of school, or both, continues as a critical issue with recent
estimates that nearly 39 million youth aged between 16 and 24 years old are out of school and not employed (Belfield et al., 2012). This study evaluated the degree to which social emotional learning skills could be used as an indicator of future academic outcomes in three complementary ways. First, a composite of academic success was created using indicators identified by Balfanz et al. (2010) related to attendance, behavior, and course performance. We found that eighth-grade indicators of social emotional learning subsequently differentiated between students in the top 25% and bottom 25% academically in high school. Second, path analysis was employed to predict cumulative high school GPA by first separating the entire data set into two equal-sized random samples, and using the first to conduct an exploratory analysis based on observed correlations and the second as a confirmatory analysis involving the same variables. In both analyses, perceived importance of college was a significant predictor of cumulative GPA after controlling for GPA in the first year of high school. Third, a measure of progress toward graduation was generated using a combination of the percentage of high school courses passed and whether the district had designated the student had dropped out of school. We found that a combination of five social emotional learning subscales effectively discriminated between students making positive progress towards high school graduation and those identified as having dropped out or failed more than 14% of their courses. These social emotional learning subscales included importance of college, meaningful motivation, classroom self-efficacy, physical symptoms, and academic stress.

Each of the social emotional learning skills selected for the study are malleable and, therefore, one of the implications of this research is that response to intervention (Duffy, 2007) strategies could use social emotional learning skills assessment to tailor the types of tiered prevention efforts being offered to students. The underlying logic is that improving social emotional skills will enhance academic performance by helping students become more self-regulated and engaged learners (Zimmerman, 2011) who perceive the relevance of their education for achieving future goals (Hulleman et al., 2010; Hulleman & Harackiewicz, 2009). In particular, the study supports the importance of helping students to articulate future goals, including attending college. The study also supports a strategy of assessing the social emotional learning of middle and high school students and offering tailored intervention strategies to address areas identified as low. Such opportunities could be implemented in small-group settings unless additional information indicates that one-on-one services are advisable.

Caution should be made in generalizing from the results of this correlational study. The sample represents one school district, and, although the district did find that the program participants matched were representative of the school population, replication with other school districts is needed. Also, social emotional learning was assessed using self-report data, and therefore all limitations associated with traditional survey research are warranted. Future research could also evaluate whether the same or a different pattern of social emotional learning subscales are predictive of progress toward graduation for students from different racial and ethnic backgrounds, for students from different income levels, and for students with disabilities.

REFERENCES


