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Not Just Robo-Students: Why Full Engagement Matters and How Schools Can Promote It

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Abstract

Research has long linked academic engagement to positive social, psychological, and physical developmental outcomes; however, qualitative studies in high-performing schools find that some students who work hard in school may be compromising their mental and physical health in the pursuit of top grades. Such research calls for closer and more contextualized examinations of the concept of engagement. This study examines academic engagement in a sample of 6,294 students (54% female; 44% White, 34% Asian, and 22% other racial or ethnic background) attending 15 high-achieving schools. Findings show that two-thirds of students at these schools are not regularly "fully engaged" in their academic schoolwork; that is, they do not regularly report high levels of affective, behavioral and cognitive engagement. Although most students report working hard, few enjoy their schoolwork and find it valuable. This lack of full engagement, particularly the absence of affective and cognitive engagement, is associated with more frequent school stress, higher rates of cheating, and greater internalizing, externalizing, and physical symptoms of stress. The study also finds that full engagement is strongly related to positive teacher-student relationships. Implications for practice and future research are discussed.

Not Just Robo-Students:

Why Full Engagement Matters and How Schools Can Promote It

Introduction

For decades, research has shown that student engagement in learning declines steeply as students advance through school. In schools around the country, the smiling, enthusiastic faces of first graders often give way to the blank stares of high school seniors. In high-performing high schools, however, it may be more difficult to discern true levels of engagement versus disengagement. In these schools, where most of the students aspire to attend four-year colleges and where test scores on state and national tests are high, students have become adept at appearing fully engaged even when that is not the case. As Denise Pope (2001) documented in her ethnographic study of academically successful students, these students may raise their hands regularly, though they do not know the answers, to give the impression that they are following the class discussion, and they may seem to be paying close attention and taking dutiful notes, while in reality they are multi-tasking and completing their homework for a different class. In cases such as these, teachers may not be able to determine which students, if any, are truly engaged with learning.

In these high-performing schools, many of the students refer to themselves as "robo-students" and explain that school is a matter of going through the motions, "doing the lesson" (Jimenez-Alexandre, Rodriguez & Duschl, 2000) or "doing school" (Pope, 2001). In order to keep up with their heavy workloads, these students go through school on auto-pilot, moving from one assignment to the other with little time for reflection. Although they garner high grades and appear academically successful, students privately concede that they do not actually learn or retain the intended material (Pope, 2001; Galloway, Pope, & Osberg, 2007). Authentic, meaningful engagement in these schools may be more rare than we might expect, given the high levels of achievement the students and schools boast, and given the well-known links between engagement and school success (Connell & Wellborn, 1991; Csikzentmihalyi & Larson, 1984; Hutchinson, 2003; Klem & Connell, 2004; Marks, 2000).

In this article, we seek to understand the prevalence, the effects, and the causes of being a robo-student in a high-performing school. We are guided by the following four research questions: In high-performing schools, how often are students fully engaged in their schoolwork and classes? What, if any, demographic variables are associated with full engagement? Do students who experience full engagement more frequently differ from those who experience engagement more rarely in terms of their school stress, academic integrity, mental health, physical

wellbeing or achievement levels? And finally, if there are strong differences across schools in overall levels of student engagement, what school-level policies or practices might account for these differing rates? Although our inquiry is purposefully limited to high-performing schools, we believe our findings have broad-ranging implications because high-performing schools are often held up as models for other schools to emulate.

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Academic Engagement: What is Known

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Engagement in Secondary Schools: How Common Is It?

Research has found that student engagement in high school classrooms in the U.S. is relatively rare (Shernoff, 2010; Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003; Marks, 1995; Skinner, Furrer, Marchand, & Kindermann, 2008). By some estimates, as many as "40 to 60 percent of high school students are chronically disengaged; they are inattentive, exert little effort, do not complete tasks, and claim to be bored" (National Research Council, 2004, p. 18). When looking back on their senior year of high school, a record number of college freshmen (42.8%) report having frequently felt bored in class (Sax, Hurtado, Lindholm, Astin, Korn, & Mahoney, 2004), and the latest report from the High School Survey of Student Engagement shows that 66% of students are bored at least every day in class in high school (Yazzie-Mintz, 2010). The most common explanation students cited for their boredom was the material not being interesting (81%); however, more than one-third (35%) pointed to their lack of interaction with their teacher, and one-third (33%) highlighted the lack of challenge in their assignments as a cause of their boredom (Yazzie-Mintz, 2010). These findings suggest that more interactive teaching, coupled with more relevant and rigorous curricula, might be effective antidotes to the prevalence of disengagement in secondary school.

Even in schools with appropriately challenging curricula, however, disengagement may be common. Despite experiencing a rigorous college preparatory curriculum linked to purposeful classroom work designed to solicit active participation, the high-achieving students Lambert (2007) studied at Central High School reported minimal or moderate levels of behavioral, emotional, and cognitive engagement, lower even than national averages. In her case study of students at a high-performing public high school, known for its innovative curricular programs, Pope (2001) similarly found that students only rarely were cognitively and affectively engaged in their classes or schoolwork. This research highlights the need to develop a more nuanced understanding of engagement that will help us understand the situated nature of its relationship to achievement.

Research on engagement traditionally has considered questions not just of contextual differences, but also of individual differences. Researchers consistently find that females are more engaged in school than males (Lewis, Heubner, Malone & Valois, 2011; Woolley & Bowen, 2007; Yazzie-Mintz, 2010), and that younger students are more engaged than older students (Skinner, Furrer, Marchand & Kinderman, 2008; Marks, 1995). The research that considers ethnicity in relation to engagement is less consistent. While some studies find no racial differences (Marks, 2000; Smerdon, 1999), others find higher engagement levels among students of color than among white students (Johnson, Crosnoe, & Elder, 2001; Shernoff & Schmidt, 2008; Uekawa, 2007). In her qualitative examination of "doing school," Pope presents portraits of students from various racial and ethnic backgrounds (White, Asian, and Latino), all of whom exhibited signs of disengagement. Questions about the ubiquity of "doing school" behavior among different racial and ethnic groups remain open for future research.

Outcomes Associated with Engagement

Engagement has been much-heralded in the literature as an important driver of school achievement as well as a critical antecedent to understanding material and acquiring new skills (Akey, 2006; Connell & Wellborn, 1991; Marks, 2000; Newmann, 1992). In addition, engagement has been found to be a protective factor, buffering youth from risk behaviors and unhealthy outcomes. Studies find that engaged students are less likely to abuse drugs and alcohol (Guo, Hawkins, Hill & Abbott, 2001; Shochet, Dadds, Ham & Montague, 2006) and less likely to experience internalizing symptoms, including depression (Li, Bebiroglu, Phelps, Lerner & Lerner, 2008; Li & Lerner, 2011; Mylant, Ide, Cuevas, & Meehan, 2002; Shochet, et al., 2006.) Engagement also has been linked to well-being and life satisfaction (Lewis, Huebner, Malone & Valois, 2011). Because it has been associated so strongly with valued academic and non-academic outcomes, engagement has attracted growing attention from educators, policymakers, and philanthropists seeking to invest in reform strategies.

In light of the many positive outcomes associated with engagement, our research delves more deeply into describing the different types of engagement, their effects, and their antecedents. Specifically, our work seeks to confirm and build on the findings from an earlier study of 1,669 students in three high-performing schools, which found that lower levels of engagement in school were associated with poorer mental and physical health outcomes (Conner & Pope, forthcoming). In this study, we considerably expand our sample size to 15 schools and 6,294 students. We do include the data from the earlier study in this expanded follow-up analysis. We also take into

account additional dependent variables that have received little attention in the literature, such as rates of cheating, and additional independent variables, such as school context features.

Contextual Factors that Promote Engagement

A large number of studies concentrate on what teachers can do to promote student engagement in their classrooms (Dolezal, Welsh, Pressley, & Vincent, 2003; Nuthall & Alton-Lee, 1990; Turner et al., 1998). Researchers tend to agree that teachers' provision of structure (clear goals and immediate feedback; Shernoff & Csikszentmihalyi, 2009), autonomy-support (student voice and choice; Reeve, Jang, Carrell, Jeon & Barch, 2004); and opportunities for involvement (caring, supportive relationships; Connell & Wellborn, 1991; Skinner, Furrer, Marchand & Kindermann, 2008), facilitate student engagement. The concept of involvement has been a particular area of focus among researchers, who also refer to it variously as warmth (Skinner et al., 2008), teacher support (Brewster & Bowen, 2004; Kalil & Ziol-Guest, 2008), and positive student-teacher relationships (Roorda, Koomen, Spilt, & Oort, 2011). In a meta-analysis of more than 92 articles describing 99 studies, Roorda et al. (2011) found positive associations between strong teacher-student relationships and both engagement and achievement, though the correlations with engagement were stronger than those with achievement.

Other school-level factors that have been found to influence student engagement include school size and class size, the curricular and pedagogical approach, the school schedule, and student-voice initiatives. Several scholars have noted the organizational structure of school size as significant in terms of student engagement; higher student engagement is found in smaller schools with smaller class sizes (Wehlage, & Smith, 1992; Finn, & Voelkl, 1993; Fredricks, Blumenfeld, & Paris, 2004; Lambert, 2007). One explanation for this finding may be that smaller schools increase student engagement through the mechanism of teacher-student relationships. In smaller schools, it may be easier for teachers to get to know their students on a more personal basis. Other research has found that student engagement increases when students feel that the curriculum is relevant to their lives (Wehlage, & Smith, 1992; Yazzie-Mintz, 2007; Yonezawa, Jones, & Joselowsky, 2009), and when the teaching is more interactive than traditional chalk and talk, and involves hands-on learning or project-based learning (Belland, Ertmer, & Simons, 2006; Brush & Saye, 2008; Lattimer & Riordan, 2011). A growing body of research has investigated how switching from a traditional seven period day to a block or modified schedule impacts student achievement, and some studies have proposed engagement as a mediating mechanism (Ullrich & Yeamen, 1999; Williams, 2011). Block scheduling also may impact pedagogy; it is believed that block scheduling may create more opportunities for project-based

learning than traditional fifty minute periods. In their review of the literature on block scheduling, Zepeda and Mayers (2005) concluded that most studies found that students' perceptions of block scheduling were positive. Hurley (1997), for example, found that students believe block scheduling allows more time for in-depth learning and increased individual attention from teachers. Finally, district- and school-level policies that provide opportunities for a critical student voice in schools can lead to increased student engagement (Yonezawa, Jones, & Joselowsky, 2009). Joselowsky and Aseltine (2009) examined the ways in which two school districts implemented district and school level policies to incorporate student voice in their schools and districts. The policies ranged from mandating student governments in high schools, to hiring a district "student-voice specialist," to creating student advisory councils (Joselowsky, & Aseltine, 2009). Scholars have proposed that initiatives like these, which provide opportunities for students and staff to work together, facilitate student involvement in policies affecting their education, and create opportunities for an authentic, critical student voice to be heard, lead to increases in student engagement (Fredricks, Blumenfeld, & Paris, 2004; Yonezawa, Jones, & Joselowsky, 2009). Clearly, there are many mechanisms that researchers believe promote student engagement. Few studies, however, have considered all such factors at once and sought to examine whether some might matter more than others.

Conceptual Framework: Defining Engagement

Our conceptualization of engagement blends two traditions in this field. The first tradition, popular with school teachers and administrators, proposes various "types" of engagement, which can be used to classify students (Connell & Wellborn, 1991; Nystrand & Gamoran, 1991; Schlechty, 2002). Schlechty, for example, identifies five types of engagement: 1) Engagement - Work has clear meaning to the student; 2) Strategic compliance - Student associates work with extrinsic results that are of value; 3) Ritual compliance - Student expends whatever effort is necessary to avoid negative consequences; 4) Retreatism - Student is disengaged from the task and expends little or no energy to comply; and 5) Rebellion - Student refuses to do the assigned tasks. This typology is recommended for district administrators, teachers, and principals to use during "classroom walk-throughs," and it has been used by hundreds of school districts across the country, including becoming deeply embedded in such districts as Canton Local Schools in Ohio and Fife School District in Washington State (S. Rucker, personal communication, March 3, 2013).

The second tradition, increasingly favored by scholars, recognizes engagement as a multidimensional construct, with affective, behavioral and cognitive components (Fredricks, Blumenfeld, & Paris, 2004, Jimerson,

Campos, & Greif, 2003). In this article, we define *affective* engagement as experiencing interest and enjoyment, *behavioral* engagement as working hard and exerting mental effort, and *cognitive* engagement as valuing and caring about the work. Our definition of cognitive engagement was shaped by Fredricks, Blumenfeld and Paris's (2004) discussion of cognitive engagement as psychological investment, drawing from the literature on school engagement as well as literature on motivational constructs such as learning goals (Dweck & Elliot, 1983) mastery goals (Ames, 1992; Meece, Anderman & Anderman, 2006) and intrinsic motivation to learn (Harter, 1981). Fredricks, Blumenfeld, and Paris caution that researchers must be careful to distinguish cognitive engagement from behavioral engagement with respect to effort. When it comes to engagement *in learning,* effort may be more profitably understood as behaviors, such as spending time, thinking hard about a topic, even using specific mental strategies. Meanwhile, cognitive engagement can be understood as the reasons for using these strategies or investing the effort in the first place. As Fredricks, Blumenfeld, and Paris note, "Students may be both highly strategic and highly invested in learning; they may be strategic only when it is necessary to get good grades, not because they are motivated to learn; or they may be motivated to learn but lack skills or knowledge about how or when to use strategies" (p. 64). Our conceptualizations of cognitive and behavioral engagement help tease apart these distinctions. The three dimensions of engagement capture students' feelings, behaviors, and attitudes.

Guided by these two distinct traditions, we measure the three dimensions of engagement separately and then synthesize across them to identify various profiles of engagement. This approach has the dual advantage of using categories or types that are recognizable to teachers and administrators, while enabling close examination of both the internal and external dynamics of engagement. The internal dynamics refer to the ways in which the three dimensions of engagement interact with one another, while the external dynamics concern how the dimensions respond to contextual conditions and facilitate the development of other outcomes of interest, such as student wellbeing (Skinner, Furrer, Marchand, & Kinderman, 2008).

Theoretically, then, if engagement consists of three different components, and if each of these components is considered to be either present or not present, seven unique types of engagement become possible. These types, listed in the first column of Table 1 below, include purposeful, full, rational, busy, pleasurable, mental and recreational engagement (Conner, 2007). Busily engaged students come the closest to robo-students in that they consistently work hard and put in effort; however, they rarely, if ever, enjoy their work or find it meaningful and valuable. Their engagement, then, is limited to compliance, and it parallels what Nystrand and Gamoran (1991)

identify as procedural engagement, in which students do what is expected of them, exerting effort in going through the motions, without becoming deeply immersed or substantively engaged in the work. It also resembles Schlechty's (2002) ritual engagement and Connell and Wellborn's (1991) "ritualistic" student, who "simply goes through the motions in class. He doesn't cause any serious problems. He simply does his schoolwork in order to get it done, without any interest or enjoyment" (p. 57). Students who are not engaged on any dimension can be considered "not at all engaged." One limitation of this conceptualization of engagement is that it is based on the premise that a certain dimension of engagement can be either present or not present; however, engagement and its dimensions do not operate like a light-switch, flipped to either the "on" or the "off" position. Instead, engagement is graduated and fluid. Not only can it change over time in response to contextual considerations, but also it can vary in its intensity across points in time. Furthermore, qualitative differences in the degree of engagement can occur along any of the dimensions of engagement discussed above. Nonetheless, the typology proposed in Table 1 can be useful for identifying different trends in the data, guiding interpretation of cluster analysis results, and comparing students based on the frequency with which they experience the various dimensions of engagement.

Hypotheses

Based on prior literature, we formulated hypotheses linked to our research questions. Our first hypothesis was that in our sample of high-performing schools, full engagement would be quite rare, while busy engagement would be prevalent. Second, we expected that if we did find full engagement, it would be more common among younger students than their older counterparts, and among females as opposed to males. We did not expect to find significant differences by ethnicity. Our third set of hypotheses, based again on the assumption that we would find some fully engaged students, predicted that these fully engaged students would have better mental health, stronger physical health, and greater academic integrity than their busily engaged peers. We also expected that both groups would show commensurate levels of achievement. Our fourth set of hypotheses concerned school-level factors that might account for different patterns of student engagement. We expected that schools with smaller class sizes, more progressive curricula and opportunities for hands-on learning, block or modified block scheduling, and more opportunities for student voice in school decision making would have larger shares of fully engaged students (and higher levels of affective, behavioral, cognitive engagement) than schools with larger class sizes, more traditional curricula, pedagogy, and bell schedules, and fewer opportunities for student voice.

Methods

Procedure

Fifteen high-performing middle and high schools applied to administer the Stanford Survey of Adolescent School Experiences, due to concerns they had about their students' experiences with stress. Thirteen of these schools chose to administer the survey to their entire student body, and two of the schools used a random selection process to identify between 40-60% of their student body for participation in the study. Consent rates ranged from 46% of the target population to 90%. Nine of the schools had consent rates above 75%, and only two schools had consent rates below 50% (49% and 46% of target population). The parents of those invited to participate received consent forms explaining the study. Students with active parent consent and self assent completed a 40-minute online survey during the school day. Staff at the school sites administered the survey. They read a common script to students prior to the survey administration, and project researchers were available to answer student questions during this time. As discussed in more detail below, in addition to the survey data, we also solicited detailed information from school administrators at select schools, including data on class size, the school schedule, teachers' pedagogical approaches, and opportunities for student voice. All school names in this article are pseudonyms.

Participants

The sample included 6,294 adolescent participants, attending 15 different high-performing schools, 11 of which were private; however, public school students constituted 63% of the sample. These schools can be considered high-performing insofar as the vast majority of their graduates (82% and above) go on to attend four-year colleges and universities; furthermore, the public schools' test scores are consistently among the highest in the state. For the past three years, all four of the public schools earned rankings of 10 on a 10 point state "academic performance index" scale. Three of the private schools were single-sex schools, one all-male and the other two, all-female. The mean age of participants was 15.3 (SD=1.56), and the grade distribution was as follows: 9% middle schoolers; 26% 9th graders, 23% 10th graders, 22% 11th graders; 20% 12th graders. The sample was 54% female and 44% white, with the remainder of students reporting their ethnicity as Asian (34%), Hispanic (6%), African-American (4%), Native American (1%), or multi-ethnic (12%). The majority of students reported that their parents were married (82%). Table 2 includes the demographic makeup of the participating schools. As can be seen in this table, the student bodies of the private schools are mostly White, with two exceptions, Bookson and Santa Teresa, where fewer than 50% of the students self-identify as White. Of the four public schools, two have majority White student bodies (Garver and Alma), while the other two have majority Asian student bodies (Martin Luther King and

Mountaintop). Close to one-third of the students at Martin Luther King and Mountaintop report that English is not their native language.

Measures

Participants completed the Stanford Survey of Adolescent School Experiences, which examined students' perceptions of teacher support as well as their experiences with school engagement, health, and academic integrity. Most items were Likert-type, rated from 1 to 5. (See Table 3 for scale descriptions, means, ranges, and standard deviations.) The majority of scales on the survey were selected based on their common use and high reliability in numerous research studies. We also gathered demographic data and course-taking data.

Engagement. The affective, behavioral, and cognitive dimensions of engagement were each measured separately. The affective scale ($\alpha = .82$) included three items designed to tap students' levels of interest in and enjoyment of schoolwork. Students were asked, for example, how often they found their schoolwork interesting. The behavioral scale ($\alpha = .79$) consisted of four items relating to effort, hard work, mental exertion and the completion of assignments. Sample items included "How often do you try as hard as you can in school?" and "How often do you pay attention in your classes." The cognitive scale ($\alpha = .87$) included four items measuring students' attitudes towards their schoolwork, its value and importance. For example, students were asked, "How often do you find your schoolwork meaningful?" All items were adapted from previously validated scales of engagement (Marks, 2000) and intrinsic motivation (McAuley, Duncan, & Tammen, 1989).

Achievement. Achievement was measured by students' self-reported grade point averages. Although some studies raise questions about the reliability of student self-reports (Kuncel, Crede, & Thomas, 2005), other research has demonstrated that students' self-reports can provide accurate and valid indicators of their performance (Wigfield & Wagner, 2005).

Academic Worry. The academic worries scale was comprised of 9 items developed by West & Wood (1970) that asked students to report how much they worry about academic-related issues, such as taking tests or completing school assignments. For example, students were asked "How often do you worry about taking tests?" and "How much do you worry about getting into the college of your choice?" Reliability analysis yielded an alpha of .85 for these 9 items.

Academic Integrity. The academic integrity scale, adapted from a scale developed by McCabe & Trevino (1993), measures students' self-reported cheating. We asked students to report how often since coming to their

school they had engaged in one of thirteen forms of cheating behavior, including receiving unpermitted help on an assignment, getting test questions ahead of time, copying work from someone else, and getting an extension by using a false excuse. Answer choices ranged on a three point scale from "Never" to "More than once." Reliability analysis produced an alpha of .86 for this scale.

Mental Health. Mental health was measured by 8 items, asking students to report how often they had experienced symptoms of externalizing and internalizing problems in the month prior to the survey. Externalizing problems ($\alpha = .82$) included feelings of anger and an uncontrollable temper, while internalizing problems ($\alpha = .87$) included feelings of hopelessness, sadness, and despondency. Sample items included: "During the last month, how often have you felt like you couldn't control your temper?" and "During the last month, how often have you felt very sad?" The items on this scale were drawn from the Symptoms Checklist (SCL-90-R) validated by Derogatis, Rickets and Rock (1976).

Physical Health. We asked students to report whether they had or had not experienced a set of stress-related physical symptoms in the 30 days prior to the survey, including headaches, exhaustion, weight loss, weight gain, sweating, difficulty sleeping, and stomach problems. We then summed each student's responses to get a total physical health score.

Teacher Support. To gauge students' perceptions of support, we used a nine-item scale devised by Eccles, Blumenfeld, Harold & Wigfield (1990) that asked students to estimate how many of their teachers they believed "really care for students," "value and listen to students' ideas," and "try to get to know students personally." We refer to this scale as the teacher support scale ($\alpha = .84$).

School Context. We collected information on each of our schools through an interview with a school administrator, usually a principal or head of school, and a follow-up interview with a consultant who worked closely at the school during the year in which the survey was taken. We also sought confirmation using school profiles, school websites, and state-reports for the public schools. We asked respondents to share the average size of English classes at the school as well as the average size of each grade. We then asked a series of questions about the daily schedule to ascertain whether they followed a traditional 7 period bell schedule, a modified block schedule, or a full block schedule. We asked about the number of periods per day, their length, and any other alternative structures the school might have in place, such as a mid-day break, weekly advisory meetings, or whole school meeting time. Next, we asked the respondents to describe the curriculum and pedagogy at their school. In addition to asking about

the prevalence of AP or IB courses, we asked the respondents to characterize the kind of teaching we would see if we walked into a classroom at their school, and the frequency with which teachers use project-based learning and college-preparatory style lectures. Finally, we asked respondents to describe the main activities of the student government and to discuss student involvement and representation on school committees. We also asked "How, if at all, are students' perspectives on the learning environment solicited? And "How, if at all, are students involved in school decision-making processes?"

Analytic Plan

Cluster analysis was conducted to examine the relationships among the three dimensions of engagement. Using a clustering-by-cases procedure and Ward's method with Euclidean squared difference, we performed a hierarchical cluster analysis with affective engagement, behavioral engagement, and cognitive engagement as the clustering variables. Because these dimensions shared the same scales and because Euclidean squared difference places progressively greater weight on objects that are further apart, we determined that this would be the most appropriate clustering technique. Using SPSS, we applied the equation $distance(x,y) = \Sigma_i (x_i - y_i)^2$ (Hill & Lewicki, 2007). We then ran the cluster analysis with a three cluster solution, allowing for 10 iterations. As discussed in more detail in the results below, this analysis yielded three types of engagement: *fully engaged* had high affective, behavioral, and cognitive engagement scores; *busily engaged* had high behavioral, but low affective and cognitive scores; *reluctantly engaged* had moderate behavioral scores and low affective and cognitive scores.

We confirmed that these clusters made sense in two ways. First, we conducted k-means cluster analyses, allowing for three, four and five cluster solutions as well. The three groups that emerged from the k-means cluster could also be interpreted as fully engaged, busily engaged, and reluctantly engaged. In both the four and five cluster solutions, these same groupings held. The additional clusters that were generated when we allowed for more solutions were conceptually similar to pre-existing clusters. For example, the four cluster solution had the fully engaged and the busily engaged clusters, as well as two clusters that would be considered reluctantly engaged (one was rarely affectively and cognitively engaged and sometimes behaviorally engaged, while the other was sometimes engaged on all three dimensions.) In addition to these two types of reluctant engagement, and a fully engaged cluster, the five cluster solution yielded two variations of busy engagement: students who often work hard, but only occasionally or rarely report affective or cognitive engagement.

Second, we randomly split the sample into two halves, and ran both the hierarchical analyses, using Ward's method, and the k-means clustering technique. After we examined the agglomeration tables, the dendrograms, and the interpretability of the solutions, we verified that both half samples were best represented by the parsimonious three cluster solution (Kumar & Homer, 2013).

We also ran descriptive and inferential statistical analyses, including ANOVAs and chi-square tests, to identify patterns and determine significant results in the data. Finally, we engaged in multiple linear regression analyses. One set of regressions examined student-level internalizing symptoms, externalizing symptoms, cheating, and physical health as dependent variables of interest, with engagement types as the independent variables, while another set used school factors as the independent variables and the three engagement dimensions as the dependent variables.

<div align="center">**Results**</div>

In this group of students from high-achieving schools, 65% of whom reported a grade point average (GPA) of 3.5 or higher, our results show high rates of academic stress: 67% of our sample reports that they are often or always stressed by their schoolwork. Most of the students (91%) report having cheated on their schoolwork at least once since coming to their current school. Mean scores for cheating, academic worries, physical health, internalizing symptoms, externalizing symptoms are presented in Table 3 alongside the results for each dimension of engagement. This table shows that on average in the month prior to taking the survey, students in these schools report experiencing one to two instances of extreme anger, several episodes of depression or intense unhappiness because of grades, and two physical symptoms of school-related stress, such as headaches and exhaustion. These two symptoms were indicated by 51% and 62% of the respondents respectively.

Turning to engagement, overall we find that average rates of behavioral engagement far exceed those of cognitive engagement, and affective engagement remains relatively rare. While 17% of the sample reports that they are often or always affectively engaged in their schoolwork, 84% reports being often or always behaviorally engaged, and 42% reports being often or always cognitively engaged. The mean scores presented in Table 3 further corroborate these results, suggesting that on average, students in this sample are often behaviorally engaged (mean of 4.0), but only sometimes affectively or cognitively engaged in their schoolwork (means of 2.8 and 3.2 respectively).

The cluster analyses reveal three different types of overall engagement within the sample. (See Table 5). We label these groups "reluctantly engaged," "busily engaged," and "fully engaged." The "reluctantly engaged" students, who post relatively low scores on all three dimensions of engagement, comprise 21% of the sample ($n = 1336$). Though they sometimes work hard, they rarely enjoy or value their schoolwork. These students are to be distinguished from "not at all engaged" students because they do sometimes work hard. This was the only "type" of engagement to emerge from our empirical analysis that did not match those presented in Table 1. Because this typology assumed dichotomous states of engagement, rather than gradients of engagement, it did not capture the possibility of reluctant engagement. The other two clusters, however, do fit within types identified in Table 1. The busily engaged, who score high on the behavioral factor, but low on the affective and cognitive dimensions, make up 48% of the sample ($n = 2989$). These students usually work hard in school, but they only occasionally enjoy the work or find it meaningful or important. The remainder of the sample (31%, $n= 1969$) can be considered fully engaged, with high scores on all three factors. These students regularly enjoy schoolwork, exert effort, and value the assignments they are given. Although the largest share of the participants tend to be behaviorally engaged, the fully engaged and the reluctantly engaged groups also claim large numbers of students.

In terms of individual differences, chi-square analyses confirm two of our three hypotheses. More females than expected are fully engaged (33%), and fewer males than expected fall into this category (26%). Furthermore, more males (28%) and fewer females (17%) than expected report being reluctantly engaged, $\chi^2 (2, 5{,}374) = 97.04$, $p < .000$. This result aligns with our expectations. Turning to students' grade levels, we find more middle school students and 9th graders and fewer 10th, 11th, and 12th graders than expected report being fully engaged, $\chi^2 (14, 5992) = 198.78$, $p < .000$. Again, this result is in keeping with our hypothesis which assumed full engagement would be more common among younger students than older students. With respect to ethnicity, we find, contrary to our expectations, that more White students (33%) and fewer Asian (30%) and non-Asian students of color (30%) than expected report full engagement, $\chi^2 (2, 5931) = 6.53$, $p < .05$.

All of our outcomes of interest relate significantly to the three dimensions of engagement (see Table 4) and students' engagement types (see Table 6), with one exception: cognitive engagement is not related significantly to academic worries. Fully engaged students achieve significantly higher GPAs, take significantly more advanced courses, cheat significantly less, and experience significantly less academic worry and significantly fewer internalizing, externalizing, and physical symptoms of stress than students in the two other engagement profiles.

Students who are reluctantly engaged cheat the most, report the lowest GPAs, and fare the least well in terms of mental and physical health, though they worry about their grades, school, and their prospects of college acceptance significantly less often than the busily engaged students. Indeed, effect sizes for academic worry were small ($\eta^2 = .01$); however, the effect sizes for internalizing and externalizing problems and achievement were medium ($\eta^2 = .05$; $\eta^2 = 06$; and $\eta^2 = .07$ respectively), and the effect sizes for cheating were large ($\eta^2 = .12$). Although they appear to be suffering more than their fully engaged peers, the achievement of the behaviorally and reluctantly engaged students is still not terribly worrisome: 60% report GPAs of 3.5 or higher and 86% reporting GPAs of 3.0 or higher. In other words, earning high grades may come with fewer costs for the fully engaged students than for their less engaged counterparts.

Regression analyses with each of our dependent variables of interest (cheating, internalizing problems, externalizing problems, physical health) reveal significant associations with engagement profiles (captured using dummy variables), after controlling for gender, grade level, school type, academic worry, and academic achievement. (See Table 7). These associations were all in the expected directions, with full engagement associated with better outcomes.

Turning to our fourth research question, which focused on school differences, we find more fully engaged students than expected in private school contexts and fewer than expected in the public schools, $\chi^2 (2, 6294) = 263.75$, $p < .000$. We probed this finding further by considering how school type (private or public) related to each dimension of engagement separately. Regression analyses suggested that whether a school is public or private is not significantly associated with behavioral engagement, though it is linked with affective and cognitive engagement. (See Table 8).

We then examined the relationships between teacher support and engagement types and between teacher support and the three engagement dimensions: affective, behavioral and cognitive. First, ANOVA results suggest that fully engaged students report significantly higher levels of teacher support, with a mean of 4.06, than both busily engaged students and reluctantly engaged students, whose mean scores on this construct are 3.59 and 3.09 respectively, $F(2, 6265) = 1112.90$, $p < .000$. We then ran separate regressions for each dimension of engagement here so that we could determine whether teacher support matters differently to affective, behavioral or cognitive engagement. Holding school type as well as individual factors like gender, grade level, achievement, and school worries as constants, we find that teacher support is strongly associated with each of the three dimensions of

engagement. The more of their teachers that the students believe care about them, the more affective, behavioral, and cognitive engagement they report. (See Table 8). Adding teacher support to these regressions substantially improved the explanatory power of the models, increasing the R^2 from .08 to .26 for affective engagement, from .19 to .27 for behavioral engagement, and from .07 to .27 for cognitive engagement.

Finally, using ANOVA techniques, we identified the three schools with the highest and the lowest levels of affective and cognitive engagement, since behavioral engagement remained fairly consistent across our sample: most students at each of the schools reported that they frequently work hard on their schoolwork. Interestingly, the tails of the distribution for both affective and cognitive engagement looked quite similar. Bookson School, Albert School, and United School posted among the highest means, differing significantly from the schools in the lowest mean categories, while Alma High School and Martin Luther King High School posted among the lowest means and differed significantly from the schools in the highest mean categories. Joining Alma and Martin Luther King in the lowest quartile for affective engagement was Santa Teresa School, and joining them in the lowest cognitive engagement category was Mountaintop High School. (See Table 9).

We then examined differences in school factors across these two tails. Bookson School, Albert School, and United School are private schools, whereas Alma, Martin Luther King and Mountaintop are public schools. This difference might signal differences in school size and curriculum. In fact, we do find considerably smaller English classes in two of the three schools at the high ends of affective and cognitive engagement, with enrollment in the teens. Class sizes swell to 32 or higher at three of the low-ranking schools; however, Santa Teresa School, a private school, with one of the lowest affective engagement means had class sizes that were quite similar to those at Bookson School, a school with one of the highest mean scores for affective engagement. (See Table 9).

Curricular differences are even less pronounced across the two sets of schools. All schools offer Advanced Placement classes, and over 50% of the students who took the survey in each of the schools indicated enrollment in one or more AP or honors courses. Administrators at four schools, two in the low group and two in the high group, characterize the pedagogy teachers use as "traditional," consisting primarily of college-prep style lectures. Three indicate that project-based learning is rare or limited to "some classes." Meanwhile, Santa Teresa School and Albert School, which sit on the opposite tails from one another on affective engagement, both characterize the teaching in their school as more progressive, with innovative courses and curricular approaches, heavy engagement in project-based learning, and a de-emphasis on lecture.

Finally, the schools do not differ from one another along clear fault lines in terms of the opportunities they provide for student voice. All schools have student governments; however, only the student governments at Albert School and United School deal with substantive issues of school policy and the conditions affecting teaching and learning. The other schools' student governments, including that of Bookson School, focus on social activities, such as planning prom and orchestrating rallies or special dress-up days. All but two schools, Bookson and Santa Teresa, which sit at opposite ends on the affective engagement distribution, include students on school-wide decision-making committees and task forces; however, only one school, Mountain Top High School, where students post among the lowest cognitive engagement scores, endows these students with voting rights. United School, a school with highly engaged students, does allow students on *some* committees to have voting authority. Thus, contrary to our hypotheses, school factors in this study, such as class size, curriculum, and opportunities for student voice, are not consistently associated with either high or low rates of affective and cognitive engagement.

Discussion

Current research suggests that many students in schools these days are bored and disengaged (National Research Council, 2004; Yazzie-Mintz, 2010), and that even students in high-performing schools may be simply "going through the motions" instead of engaging fully with the concepts and lessons in their classes (Pope, 2001). While engagement is regarded widely as a powerful antecedent of academic achievement (Akey, 2006; Connell & Wellborn, 1991; Marks, 2000), and many consider it to be a protective factor for student health and wellbeing (Lewis, Huebner, Malone & Valois, 2011), few researchers have examined the causes and effects of full engagement, where students are engaged behaviorally, affectively, and cognitively with their schoolwork, relative to other types of academic engagement. This study examines various patterns of student engagement in the context of high-performing middle and high schools using an engagement typology. We discuss who is engaged in these schools, how often, and to what extent, and we show connections between the dimensions of engagement and student achievement, health, and integrity. Overall, we find that students in our sample of high-performing schools have high GPA's, matched by equally high rates of stress, cheating, and internalizing and externalizing symptoms. The vast majority of the students in this sample (84%) report that they often or always work hard on their schoolwork; however, few of these students are fully engaged. Their lack of full engagement is associated with more frequent school stress, higher rates of cheating, and greater internalizing, externalizing, and physical symptoms of stress. In essence, we find that simply working hard, achieving, and getting high grades is not enough for students to

thrive. In this discussion section, we reflect on these findings and offer implications for practice and further research.

Though most of the students in these high-performing schools report high grade point averages and appear to be succeeding on traditional measures of academic achievement, we find relatively few students at these schools report being fully engaged in their schoolwork; that is, regularly working hard, enjoying the work, and finding it valuable. In fact, our results show that less than one-third of the participants are regularly fully engaged in their schoolwork. The remaining two-thirds reveal patterns of behavior consistent with robo-students (Pope, 2001): they have high levels of behavioral engagement, but considerably lower levels of affective and cognitive engagement. This result is not particularly surprising in light of Pope's earlier work, and it confirms our initial hypothesis that full engagement would be rare and busy engagement would be common in this sample. Nonetheless, it is interesting that so few types of engagement listed in our typology emerged among the participants. For example, even when we forced six solutions, no cluster reflected "purposeful engagement" (high behavioral and high cognitive, but low affective engagement), and none of the clusters of engagement that emerged through our analysis corresponded to the "not at all engaged" type. In order to find such a group, we had to run a ten cluster solution, which is hardly parsimonious, and even then, the cluster only consisted of 217 students, less than 3% of our sample. This finding is specific to our particular sample of students in high-performing schools, and we must be careful not to generalize from these findings to all middle and high school students, especially when so much of the literature finds any kind of engagement, including behavioral, to be rare in nationally representative samples (Shernoff, 2010; Marks, 1995; Skinner, Furrer, Marchand, & Kindermann, 2008; Yazzie-Mintz, 2010).

Despite the uniqueness of our sample, our findings do align with some of the extant research that examines the relationship between individual factors and engagement, confirming two of our three hypotheses in this domain. First, echoing other work that finds engagement plummets as students grow older (Skinner, Furrer, Marchand & Kinderman, 2008; Marks, 1995), we find that full engagement is more common among younger students than older students, with 10th grade marking the point at which full engagement begins to decline. Second, consistent with previous scholarship that suggests females have higher rates of engagement than males (Lewis, Heubner, Malone & Valois, 2011; Woolley & Bowen, 2007; Yazzie-Mintz, 2010), we find that females are more likely than males to be fully engaged and less likely than males to be reluctantly engaged. Surprisingly, we did find that fewer Asian students and non-Asian students of color reported full engagement than expected, while more White students than

expected exemplified this engagement type. Future research that considers how both cultural norms and race-based treatment shape engagement patterns in these particular school settings could help illuminate these findings.

Our third set of hypotheses predicted that fully engaged students would fare better than their counterparts with respect to mental health, physical health, academic integrity, and academic achievement; and our results largely bear out these expectations. Fully engaged students are more likely to have reported never having cheated, while the reluctantly and busily engaged students are more likely to report having cheated at least one time. Where fully engaged students on average report feeling sad or depressed one or two times a month, reluctantly and busily engaged students on average report internalizing symptoms "a few times" a month. And while fully engaged students report two physical symptoms due to stress in the past month, busily and reluctantly engaged students are more likely to report closer to three such symptoms. Many of the adolescents in our sample suffer from high levels of academic anxiety. In fact, 67% report that they often or always are stressed by schoolwork; however, those who are more fully engaged have more positive outcomes on all of our measures. This research confirms earlier findings in a smaller sample of schools about the relationships among engagement, mental health, and physical health (Conner & Pope, forthcoming), and it is consistent with work that emphasizes the protective benefits of engagement to students' health and wellbeing (Li, Bebiroglu, Phelps, Lerner & Lerner, 2008; Lewis, Huebner, Malone & Valois, 2011; Li & Lerner, 2011; Mylant, Ide, Cuevas, & Meehan, 2002; Shochet, et al., 2006). More research is needed to learn about the relationship between full engagement and students' positive health outcomes, especially which comes "first." For instance, full engagement may lead to more positive health outcomes, but it is also possible that healthy students may be more able than their peers to engage more fully in their coursework. Longitudinal, as opposed to cross-sectional research, would help to demonstrate causality.

Our fourth set of hypotheses addressed the relationships we expected to find between engagement, teacher support, and other school-level policies and practices. While many of our findings map onto extant research, suggesting that teacher care and support are linked with student engagement (Connell & Wellborn, 1991; Roorda et al., 2011; Skinner, Furrer, Marchand & Kindermann, 2008), we also learn that, in this unique sample of schools, traditional, lecture-based teaching does not necessarily stymie full engagement. The case of Bookson School further suggests that engagement can be strong even in the context of moderate size classes (27 students), a traditional 6-period bell schedule, lecture-driven pedagogy, and a lack of opportunities for student voice in school-wide decision

making. Despite these limitations, students at this school reported high levels of teacher support, suggesting that this construct may be the most important school-based factor driving engagement.

Implications

Our findings raise considerations for practice, policy, and future research. If, as our results suggest, the affective and cognitive dimensions of engagement correlate significantly with positive outcomes, schools may want to invest in professional development to help teachers make learning more interesting and enjoyable for students, thereby promoting affective engagement. They may want to encourage educators to be more intentional and transparent about the value of their assignments and help students find more meaning in the work that they do, thereby encouraging cognitive engagement. Similarly, teachers may want to demonstrate concern for students' wellbeing by soliciting students' ideas, trying to get to know students personally, and offering additional help when needed. These expressions of concern demonstrate "involvement" and can foster not only strong teacher-student relationships, but also a sense of belonging, which has been found to be a key antecedent of student school engagement (Connell & Wellborn, 1991; Fredricks, Blumenfeld & Paris, 2004; Skinner, Furrer, Marchand & Kindermann, 2008). While it may not be possible for principals or teachers to limit class sizes to the low numbers we saw at Albert School and United School, the two schools with the highest levels of full engagement, teachers at schools with larger class sizes should pay attention to how they convey care and support for students. Do they express concern and interest in students in ways that students notice and find meaningful? Even with class sizes of 27 students and 50 minute periods, Bookson School teachers appeared to find ways to develop strong relationships with their students. It may be, however, that Bookson School is an anomaly, an outlier. More data on school-level structures, policies, and practices, like those we considered, would better help researchers to discern and test contextual factors affecting engagement.

Limitations and Contributions

Several limitations mark our study. For example, we did not include a measure of socioeconomic status, consent rates varied across schools, and our sample was heavily skewed towards public school students. Furthermore, we rely exclusively on self-reporting, which may be problematic for such items as students' self-reported grade point average (Kuncel, Crede, & Thomas, 2005). Social desirability factors may compel some students to under-report their mental or physical health symptoms and cheating rates. We suggest that future

research try to triangulate across data sources, using teacher or parent perspectives and school records when possible to enhance the validity of the data.

We also recognize limitations in both our data and our analytic approach with regard to school factors. Our school measures of curriculum, pedagogy and student voice may not have been as robust as they could have been had they been assessed through observations and interviews with multiple school stakeholders, including students and teachers, as well as administrators. Perhaps this is one reason we found so few clear school-level results. Furthermore, our analyses of the role of school-level factors would have been enhanced by hierarchical linear modeling (HLM) techniques that capture the fixed effects of schools. The call for HLM points to another limitation of the present study. Although we know that engagement is contextually dependent and that different classrooms can elicit very different responses from and feelings in students, our measures of engagement reside at the school-level, asking students to generalize across classrooms. It would be useful to conduct a similar study of engagement at the classroom level to further test the relationships among engagement types and non-academic outcomes, while controlling for the fixed effects not just of schools, but also of classrooms. We also recommend that future work consider expanding the sample to include non high-performing schools, so that these patterns can be explored in diverse school contexts as well.

Our engagement variables are limited in other respects as well. For example, our measure of cognitive engagement asks students to what extent they find their schoolwork meaningful and valuable, but not why. It could be that students find the work meaningful for instrumental or extrinsic reasons: these assignments will help them do well on the AP exam, which will look good on their transcript and help them get into college. Alternatively, students may find their schoolwork valuable for more intrinsic reasons—the assignments enable them to refine skills or to develop understandings that they feel will help them to become educated and active contributors to their communities. Future studies might employ more discriminating measures of cognitive engagement that may overlap more explicitly with goal theory and motivation research (Meece, Anderman & Anderman, 2006). Similarly, our measure of behavioral engagement captures effort and mental exertion, but not the specific strategies students use when working on an assignment. A more robust measure of behavioral engagement might draw more directly from the literature on strategic learning and self-regulation (Corno & Madinach, 1983; Zimmerman, 1990). Merging constructs from the field of motivation research with those in the present study could generate richer, more powerful data.

Despite these limitations, this study makes important contributions to the scholarship of engagement. Not only does it address patterns of engagement in a sample that has received little attention from scholars, that of the high-performing school, but it also offers a conceptual framework, outlined in Table 1, which combines the two dominant traditions in the engagement literature: accounting for the unique dimensions of engagement and proposing various engagement types. In this study, we draw on this framework to model a technique for attending to the three dimensions of engagement simultaneously as well as separately. We consider both the dimensions and the engagement types as they relate to outcomes of interest, such as student wellbeing and academic integrity, and as they relate to antecedent contextual factors. Future studies that adopt and build on such methods will further advance the field, especially if they are able to test and refine the conceptual framework proposed in Table 1.

Conclusion

It seems clear that schools should not aspire to produce more robo-students, students who suffer from high stress and simply go through the motions of learning, cutting corners along the way and only remembering ideas and information in the short-term to perform well on tests. This study highlights the positive outcomes associated with full engagement: healthier, better adjusted students who are less likely to cheat. Since extant research finds that students who are healthier are better able to learn—not just to achieve high grades, but actually to retain and use knowledge and critical thinking skills (National Research Council, 2004; Schultz, 1998), it may be that *full* engagement plays a key part in a cycle of learning, achievement, and healthy youth development. As researchers continue to build our understanding of the complex nature of student engagement and its relationships not only to student learning and wellbeing, but also to school structures and practices, we will strengthen our ability to support the positive growth and development of youth in all settings.

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Table 1. Typology of Engagement

Engagement Type	Enjoy **Affective**	Put in effort **Behavioral**	See value **Cognitive**	Example
Purposefully engaged		✓	✓	A student studies hard for a calculus test because he knows that understanding the material and doing well on the test are important to achieving his future goals; he does not enjoy the studying however.
Fully engaged	✓	✓	✓	A student enjoys creating a documentary film project with her peers because she cares deeply about the topic, and she sees the assignment as a worthwhile use of her time. She spends a lot of time and effort working on this project.
Rationally engaged			✓	A student sees the importance of learning about global warming in Earth Science class, but he is not willing to exert effort required to concentrate and take notes because he finds the teachers' lecture to be excruciatingly boring.
Busily engaged		✓		A student works hard to get her homework completed accurately, though she does not particularly care about the material or the questions. Nor does she see their relevance to her interests and aspirations. She finds the prefabricated worksheets she must complete to be boring and monotonous.
Pleasurably engaged	✓			A student enjoys listening to his teacher relay stories about World War I; however, he does not value this topic or see it as relevant. He does not take notes; he does not concentrate on the details the teacher shares, and he allows his mind to wander occasionally.
Mentally engaged	✓		✓	A student enjoys working on her project in art class and she cares about mastering the technique; however, it is the day before spring break and she is not putting a lot of thought or effort into her project. She is just trying to get it done quickly so the class can have a party.
Recreationally engaged	✓	✓		A student works hard to help his group-mates score more points than any other group during a game in class; he is thinking hard and reviewing his notes carefully to find the correct answers, and he is having fun with his peers, enjoying the game and the friendly competition; however, when asked if he values either the material the class is reviewing or the skills he may be developing by playing the game, he says "No. They are not connected to my larger goals."

Table 2. Features and Demographic Makeup of the Participating Schools

School Name	Private	High School or Middle School	N	Percent Asian	Percent White	Percent Other Race or Ethnicity	Percent Female	Percent English is native language
Martin Luther King	No	High	1057	75	11	14	56	67
United	Yes	High	304	15	67	18	58	100
Pelton	Yes	Both	223	17	67	16	52	100
Bookson	Yes	High	421	25	48	27	0	100
Albert M.S.	Yes	Middle	132	9	64	27	55	100
Albert H.S.	Yes	High	230	19	55	26	54	100
Burton	Yes	Middle	83	17	68	16	100	100
Hastings	Yes	Middle	145	14	66	21	100	100
Garver	No	High	320	27	56	17	58	91
Macedo Day	Yes	Middle	85	5	82	13	49	100
Alma	No	High	1806	24	55	22	52	84
Lunar Valley	Yes	Middle	96	2	81	17	45	85
Marconi	Yes	Middle	77	3	81	17	56	91
Mountaintop	No	High	554	65	12	23	53	66
Santa Teresa	Yes	High	398	11	31	58	54	86

Table 3. Summary of Dependent Variables with Descriptive Statistics

Variable	Description	Mean	*SD*
Grade Point Average [a]	Self-reported grade point average	3.55	.54
Academic Integrity [b]	How often student has engaged in cheating practices in high school	1.50	.43
Academic Worry [c]	How often student worries about such things as grades and test performance	3.49	.80
Internalizing Symptoms [c]	How frequently student has felt sad, depressed or hopeless in the last month	2.48	1.08
Externalizing Symptoms [c]	How frequently student has felt angry or violent in the last month	2.07	1.02
Physical Health [d]	How many physical symptoms of school stress (headaches, weight gain, exhaustion) student has experienced in the last month	2.43	1.79
Affective Engagement [c]	How often student finds schoolwork interesting, enjoyable, and fun	2.80	.76
Behavioral Engagement [c]	How often student works hard and puts effort into schoolwork	4.00	.66
Cognitive Engagement [c]	How often student finds schoolwork meaningful and valuable	3.20	.83

Note. Ranges: [a] = 1-4.5, [b] =1-3, [c] =1-5 [d] =0-7

Table 4. *Bivariate Correlations among Engagement, Mental Health Symptoms, Physical Symptoms of Stress, Academic Integrity, and School Worries*

	1	2	3	4	5	6	7	8
1. Affective Engagement	---	.43**	.66**	-.24**	-.24**	-.29**	-.10**	-.17**
2. Behavioral Engagement		---	.47**	-.15**	-.22**	-.41**	.16**	-.07**
3. Cognitive Engagement			---	-.22**	-.23**	-.31**	.01	-.18**
4. Internalizing Symptoms				---	.64**	.19**	.44**	.52**
5. Externalizing Symptoms					---	.25**	.27**	.40**
6. Cheating						---	.08***	.21**
7. School Worries							---	.36**
8. Total physical stress								---

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

Table 5. Mean Scores on Three Dimensions of Engagement by Clusters

	Cluster 1: Reluctantly engaged (*n* = 1336)	Cluster 2: Busily engaged (*n* =2989)	Cluster 3: Fully engaged (*n* = 1969)	*df*	*F*	η^2	*p*
Affective mean	1.92	2.68	3.56	2, 6291	4749.23	.60	.000
Behavioral mean	3.32	4.01	4.42	2, 6291	1701.93	.35	.000
Cognitive mean	2.11	3.13	4.04	2, 6291	6713.2	.68	.000

Note: On the scale, answer choices were keyed in the following way: 1 never; 2 rare; 3 sometimes; 4 often, and 5 always.

Table 6. One-way ANOVA Results Comparing Mental Health, Physical Health, and Academic Outcomes by Engagement Type

	Reluctantly engaged	Busily engaged	Fully engaged	df	F	η^2	p
Grade Point Average	3.31 [c]	3.56 [b]	3.70 [a]	2, 4032	144.24	.07	.000
Advanced Courses	1.89 [b]	2.05 [a]	2.17 [a]	2, 5399	11.15		.000
Academic Integrity	1.75 [c]	1.51 [b]	1.32 [a]	2, 6262	441.59	.12	.000
Academic Worry	3.43 [a]	3.57 [b]	3.42 [a]	2, 6282	28.24	.01	.000
Internalizing Symptoms	2.85 [c]	2.51 [b]	2.17 [a]	2, 5846	157.7	.05	.000
Externalizing Symptoms	2.48 [c]	2.07 [b]	1.79 [a]	2, 5848	178.20	.06	.000
Physical Health	2.91 [b]	2.44 [b]	2.08 [a]	2, 5970	83.76	.03	.000

Note. The superscript letters, a, b, and c, reflect the groupings that emerge when Tukey's post-hoc analysis is conducted. Within each row, an engagement

grouping differs significantly from the other groups with which it does not share a superscript letter. A group does not differ significantly from any group with

which it shares a letter.

Table 7. Regression Analyses with Engagement Types and Outcomes of Interest

	Academic Integrity		Internalizing Symptoms		Externalizing Symptoms		Physical Health	
	β	t	β	t	β	t	β	t
Gender (0 = male)	-.07	-4.61***	.17	11.28***	-.02	-.89	.23	14.69***
Middle School (0=no; 1= yes)	-.08	-5.03***	-.02	1.42	.02	1.01	-.04	-2.6**
Ninth grade (0=no; 1= yes)	-.26	-13.75***	-.08	-4.43***	.03	1.26	-.09	-4.61***
Tenth grade (0=no; 1= yes)	-.16	-8.23***	-.02	-.93	.02	.73	-.03	-1.81
Eleventh grade (0=no; 1= yes)	-.04	-2.12*	.02	1.15	.02	.90	-.00	-.08
School type (0=private)	.11	7.29***	-.08	-5.00***	-.01	-.36	.03	1.64
Academic Worry	.05	3.13**	.40	26.67***	.26	15.60***	.31	20.00***
GPA	-.16	-9.88***	-.08	-5.51***	-.09	-5.70***	-.05	-3.19***
Full engagement	-.16	-9.72***	-.10	-6.37***	-.09	-5.41***	-.06	-3.38***
Reluctant engagement	.16	9.46***	.16	10.37***	.17	9.87***	.13	8.00***
Adjusted R²		.21		.28		.13		.21
F		93.00***		133.41***		53.14***		92.31***

Note. * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; .The comparison group for each grade level is 12th grade. The comparison group for full engagement and reluctant

engagement is busy engagement.

Table 8. Regression Analyses for Each Engagement Dimension

	Affective Engagement		Behavioral Engagement		Cognitive Engagement	
	β	t	β	t	β	t
Gender (0=male)	.10	6.61***	.17	11.56***	.04	2.58**
Grade level	.01	.61	-.10	-7.20***	-.06	-4.00***
GPA	.14	9.42***	.27	18.65***	.13	8.74***
Academic Worry	-.004	-.24	.22	14.92***	.11	7.58***
School Type (0=private)	-.08	-5.12***	-.00	-.12	-.04	-3.07**
Teacher Support	.44	29.12***	.30	19.72***	.49	33.14***
Adjusted R²	.259		.270		.289	
F	208.24***		219.06***		241.04***	

Note. ** = $p \leq .01$; *** = $p \leq .001$

Table 9. Class Size, Teaching Approach, and Student Voice Opportunities by Tail Engagement Distributions

	Affective Engagement	Cognitive Engagement	Public or Private	English Class Size/ Grade Size	Number of Periods/ Minutes	Teaching Approach	Student Voice
Martin Luther King	2.58 [e]	3.09 [de]	Public	34 / 500	6/53	More lecture-based	On committees
Alma	2.66 [de]	3.02 [e]	Public	32-33 / 600	6/56	(no response)	On committees
Santa Teresa	2.74 [de]	3.20 [de]	Private	25-28 / 160	5/60 (block)	More project-based	Not on committees
Mountain Top	2.77 [de]	3.17 [de]	Public	35 / 345	7/51 (mod. block)	More lecture-based	On committees, with voting rights
Bookson	2.99 [b]	3.47 [ab]	Private	27 / 415	6/50	More lecture-based	Not on committees
Albert	3.14 [ab]	3.41 [ab]	Private	18 / 75	4-5/50-85 (mod. block)	More project-based	On committees
United	3.22 [a]	3.62 [a]	Private	15 / 94	4-6/varies (mod. block)	More lecture-based	On committees, some voting rights
	$F (9, 5,457) =$ 39.81 $p < .000$	$F (9, 5,457) =$ 28.16 $p <. 000$					

Note. The superscript letters, a, b, c, d, and e reflect the groupings that emerge when Tukey's post-hoc analysis is conducted. Within each column, a school's engagement score differs significantly from that of the other schools with which it does not share a superscript letter. A school does not differ significantly from any school with which it shares a letter.