The Effects 21st Century Skills on Behavioral Disengagement in Sacramento High Schools

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Abstract
Using a sample of 2,541 students attending 25 high schools in Sacramento, California, this study examines the association between students' 21st century skills and their level of behavioral disengagement at school. Behavioral disengagement pertains to problem behaviors at school such as poor attendance, truancy, tardiness, and disciplinary problems and has been linked to dropout and poor academic performance. 21st century skills encompass a range of non-cognitive skills, dispositions, and types of school engagement, many of which have been linked to educational trajectories, career success, and long-term well-being. The results show that a range of 21st century skills are associated with behavioral disengagement, accounting for 20 percent its variance. Furthermore, ethnic/racial, gender, and socioeconomic differences were found with male and underserved groups having higher levels of behavioral disengagement. However, controlling for 21st century skills reduced the magnitudes of the demographic differences by 25-30 percent. Finally, the socioeconomic composition and emotional engagement composition of the school were associated with behavioral disengagement, which underscores the importance of peer influences and the social context of the school to students' school behaviors.

There is a worldwide effort to improve educational attainment both at the secondary and postsecondary levels. Graduation rates from high school or upper secondary reached 84 percent among OECD countries in 2012, an increase of 8 percentage points since 2000 (OECD Table A2.1a and A2.2a). In the U.S., high school graduation rates improved from 70 percent to 79 percent, placing it behind many other countries with which it must compete in the international economy. To bolster its high school graduation rate, the U.S. has launched a nationwide effort, known as the GradNation campaign, to raise awareness, secure funding, and identify effective strategies, with a goal of reaching a 90 percent graduation rate by 2020 (GradNation: http://gradnation.americaspromise.org/).

A substantial amount of research has been undertaken to identify the factors that may promote or impede students' progress toward high school graduation, as well as their overall performance in school (e.g., grades, test scores, etc.). The literature has identified two types of factors: 1) individual factors associated with students; and, 2) institutional factors associated with the three major contexts that influence students—families, schools, and communities.

Individual factors include a range of behaviors, attitudes, and skills, with recent attention focusing on an array of overlapping constructs labeled as "non-cognitive" skills (Kautz & Heckman, 2014), 21st century skills (National Research Council, 2012), or social and emotional skills (OECD, 2015). Of these, school behaviors are most closely related to successful performance in school, particularly academic behaviors such as attending school, going to class, and doing homework (Farrington et al., 2012). Conversely, opposing behaviors such as absenteeism, truancy, and failing to complete school work have been referred to using terms such as problem behaviors (Palardy, Rumberger, & Butler, 2015) and deviant behaviors (see chapter 1 of this volume). Recent research indicates there are substantial socioeconomic and ethnic/racial

differences in these school behaviors that may contribute to demographic gaps in school performance (Palardy, Rumberger, & Butler, 2015).

School behavior is captured in the concept of engagement. A 2004 report by the National Research Council, *Engaging Schools: Fostering High School Students' Motivation to Learn,* concluded that engagement involved both observable behaviors (actively participating in class, completing work, taking challenging classes) and unobservable behaviors (effort, attention, problem solving, and the use of metacognitive strategies), as well as emotions (interest, enthusiasm, and pride in success). Fredricks, Blumenfeld, and Paris (2004) also suggest a broader concept of engagement with three dimensions: (1) *behavioral disengagement,* which represents behaviors that demonstrate students' attachment and involvement in both the academic and social aspects of school, such as doing homework and participating in extracurricular activities like athletics or student government; (2) *emotional engagement,* which refers to students' affective reactions to their experiences in school and in their classes, such as whether they are happy or bored; and (3) *cognitive engagement,* which represents mental behaviors that contribute to learning, such as trying hard and expending effort on academic tasks.

While individual factors clearly contribute to school performance, these factors and students' experiences more generally are shaped by three settings or contexts where youths spend their time: families, schools, and communities. Increasingly, social scientists have come to realize the importance of these settings in shaping child and adolescent development. In psychology, for example, Bronfenbrenner's influential book *The Ecology of Human Development* (1979) helped to focus the attention of psychologists on how the various contexts of the family, schools, peer groups, and communities shape all aspects of adolescent development—physical, psychological, cognitive, and social—as well as how the relationship between context and development changes over time (Bronfenbrenner, 1979; Lerner &

Galambos, 1998; Steinberg & Morris, 2001). The importance of context was further emphasized by the National Research Council Panel on High-Risk Youth in its 1993 report *Losing Generations: Adolescents in High-risk Settings*, which argued that too much emphasis had been placed on high-risk youth and their families, and not enough on the high-risk settings in which they live and go to school.

The importance of schools in fostering student achievement was first brought to widespread attention in the U.S. by famed sociologist James Coleman in the 1966 study known as the Coleman Report (Coleman et al., 1966). In one of the largest studies of schooling ever undertaken in the U.S., Coleman concluded that schools had relatively little impact on student achievement compared to the background of the students who attend them: "The social composition of the student body is more highly related to achievement, independent of the student's own social background, than is any school factor" (Coleman, 1990, p. 119).

Since that time, literally hundreds of studies have been conducted to determine both the extent to which schools affect student performance and the factors that contribute to that performance. The current consensus is consistent with the conclusion of economist Eric Hanushek more than 30 years ago: "Teachers and schools differ dramatically in their effectiveness" (Hanushek, 1986, p. 1159). The focus of research is to determine which factors contribute to those differences and to design and implement improvement strategies based on the research findings.

At the high school level, a wide variety of contextual factors have been shown to predict various aspects of performance as measured by test scores, attrition, graduation, and college attendance (Lee & Smith, 2001; Palardy, 2013; Rumberger & Palardy, 2005a, 2005b; Upadyaya & Salmela-Aro, 2013). These factors can be categorized into four major areas: (1) *composition*, such as the characteristics of the students (e.g., socioeconomic status, academic preparation); (2)

structure, such as size and location; (3) *resources*, such as textbooks and physical, fiscal, and human resources; and (4) *practices and processes*, such as instructional practices, disciplinary procedures, and the overall school climate. The first three categories are often referred to as school inputs since they are largely "given" to a school and therefore are not alterable by the school itself. In contrast, schools can and do have a fair amount of control over school processes, which makes them of particular interest to school practitioners and policymakers in their efforts to improve schools.

Drawing on the International Study of City Youth (ISCY) data from the city of Sacramento, this study focuses on the association between 21st century skills and deviant behaviors reflected in the concept of behavioral disengagement. The term "21st century skills" is used broadly to include a range of student dispositions, types of school engagement, and intra- and inter-personal skills, which we discuss with greater details in the following sections. These 21st century skills may operate at both the individual student level and at the school level as compositional effects that represent characteristics of the student body.

This study addresses the following research questions:

1. *Does the level of student behavioral disengagement vary among schools?* Addressing this is a first step in establishing that aspects of schools may impact student behavioral disengagement.

2. *A) Are there differences in behavioral disengagement among demographic groups, and if so; B) Do any differences vary across schools, and; C) Do 21st century skills mediate group differences?* Group differences are a necessary precursor to potential inequality; B) and C) probe whether differences are due to school effects or to individual background.

3. *Do student composition measures of 21st century skills and SES contribute to behavioral disengagement?*

Literature Review

Behavioral, Emotional, and Cognitive (dis)Engagement

A large body of research has investigated the role of student behaviors and behavioral disengagement in fostering school success. One of the challenges in identifying and reviewing this research is the different ways that investigators have defined and measured disengagement and its underlying components or measures, which have ranged from very broad measures to very narrow and specific ones. The broadest conceptualization and corresponding measures are for a single construct of what is typically labeled "school engagement,", or conversely, disengagement (e.g., Lee & Smith, 1995). A more detailed conceptualization and corresponding measures include the three aspects of emotional, behavioral, and cognitive engagement described earlier (Fredricks, Blumenfeld, & Paris, 2004). A still more detailed conceptualization might differentiate between academic and social behaviors (Farrington et al., 2012). Finally, the most detailed conceptualization may focus on specific behaviors, such as failing to complete homework or school work, being absent from school, skipping class, or getting into altercations with fellow students or teachers.

Another challenge is that social behaviors and behavioral disengagement are often embedded in models as mediators between other student characteristics, such as prior achievement, and various measures of school performance, such as grades, test scores, and school dropout rate (Li, Lerner, & Lerner, 2010; National Research Council, Committee on Increasing High School Students' Engagement and Motivation to Learn, 2004; Upadyaya & Salmela-Aro, 2013). As a result, they can serve both as dependent and independent variables in such models. This review will focus on their role as dependent variables. That is, we are interested in identifying the factors that predict social behaviors and behavioral disengagement. Both student-level and school-level factors have been shown to be important predictors.

One broad category of student-level factors encompasses beliefs, attitudes, and values. The 2004 NRC report identified three attitudinal variables that mediate the influence of school context on engagement: students' beliefs about their *competence* and *control* (*I can*), their *values* and *goals* (*I want to*), and their sense of *social connectedness* or *belonging* (*I belong*). One study estimated a structural equation model (SEM) of dropping out based on the NRC report using data from a national longitudinal study of tenth grade students who were tracked for two years (Rotermund, 2010). The study found that only two tenth grade factors directly influenced dropping out in high school: student achievement and behavioral disengagement (absent, late, skipping classes, or getting into trouble). Both behavioral disengagement and cognitive engagement (works hard, puts forth effort) influenced dropping out through their effects on grades, while affective engagement (likes school, finds classes interesting and challenging) affected both cognitive and behavioral disengagement. Finally, three attitudinal antecedents—perceived competence, valuing school, and a sense of belonging—influenced the three dimensions of engagement. Another study found that students who exhibited higher levels of teacher-reported oppositional behaviors (e.g., fighting, temper tantrums) reported lower levels of behavioral (academic) and emotional engagement (Archambault, Vandenbossche-Makombo, & Fraser, 2017).

Demographic Differences

Research reveals demographic differences in some specific behaviors used as measures of engagement. Absences is one such measure. Rates of chronic absenteeism (defined as missing 15 days or more during the 2013-14 school year) in U.S. high schools were 9.3 percent of Asian students and 17.3 percent for White students, compared to 23.4 percent for Black students, 21.2 percent for Hispanic students, and 27.6 percent for Native American students (U.S. Department of Education Office of Civil Rights, 2016). Demographic differences have

also been noted for school suspensions. School suspension rates during the 2011-12 school year were 1.5 percent for Asian students and 4.3 percent for White students, compared to 15.4 percent for Black students, 5.9 percent for Hispanic students, and 7.8 percent for Native American students (Musu-Gillette, 2017, Table 13.4). Suspension rates were also higher for males than for females. Other studies have also found that girls tend to have higher levels of behavioral and overall engagement than boys (Upadyaya & Salmela-Aro, 2013).

School Compositional Effects on Behavioral Disengagement and Peer Influences

A number of school-level factors have been shown to influence behavioral disengagement and social behaviors. One of the most important is the social composition of the student body. The social composition of students in a school can influence student achievement above and beyond the effects of students' own backgrounds and characteristics (Coleman, et al, 1966; Gamoran, 1992). Compositional effects can influence student outcomes either directly (through the influence of classmates and peers on aspirations, motivation, and behavior) or indirectly (through the association with other school factors, such as school resources) (Liu, Van Damme, Gielen, & Van Den Noortgate, 2015). For example, schools with a high concentration of disadvantaged students may receive less funding or have less qualified teachers than schools with more advantaged students (U.S. Commission on Civil Rights, 2018). Peer influences of students' immediate friends in or out of school—which are measured at the student level—may be more consequential than the characteristics of the overall student body (Li et al., 2010; Li, Lynch, Kalvin, Liu, & Lerner, 2011; Palardy, 2013).

While a sizeable research literature exists on the impact of the social composition of high schools—particularly the racial, ethnic, and socioeconomic composition—on such school performance outcomes as test scores, grades, and graduation rates (for example, Rumberger & Palardy, 2005a, 2005b), only a handful of studies have linked socioeconomic status (SES)

composition to problem behaviors (Demanet & Van Houtte, 2011, 2014; Eitle & Eitle, 2003; Palardy, Rumberger, & Butler, 2015; Stretesky & Hogan, 2005), and even fewer have linked SES composition with student engagement. One study found that the SES and the ethnic composition of high schools had no significant effect of the academic engagement of students, but the school SES did mediate the relationship between individual SES and academic engagement: the effects of individual SES were higher in high-SES schools than in low-SES schools (Lee & Smith, 1995). The study found that smaller schools, private schools, and schools undertaking reform practices had higher levels of student engagement.

A number of studies have investigated school compositional effects on one particular student behavior: attendance or truancy (unexcused absence). A study of homeless students in California attending 111 schools found that a number of school factors—school truancy and average school reading and math proficiency rates—influenced student attendance, suspensions, test-taking behaviors, and test scores (Stone & Uretsky, 2016). School truancy captures the social behavior of the student body, while test scores capture the academic proficiency of the study body. Another study found that students attending schools with high concentrations of homelessness had poorer attendance and reading test scores (Fantuzzo, LeBoeuf, & Rouse, 2014). A third study, based on a sample of 342 ninth-grade students from a Southern California suburban high school, found that truancy was explained both by peer selection (choosing friends who are similar) and peer influence (becoming more like your friends) (Rambaran et al., 2017).

Another study, perhaps closest to the topic of the current one, used a nationally representative and longitudinal sample of over 10,000 tenth graders attending over 500 American public high schools to examine the effects of various measures of school composition (socioeconomic, linguistic, and ethnic/racial) on behavioral disengagement (Palardy, Rumberger, & Butler, 2015). The results show that one school composition effect was strongly associated

with behavioral disengagement—the proportion of the student body that is Black—even after controlling for the student's own demographic and linguistic background (native English or not) and other measures of school composition (e.g., school SES and linguistic composition). Furthermore, peer influences like having a friend who dropped out and friends' attendance rates, study habits, grades, and college expectations substantially mediated the effect of proportion Black, as did school practices designed to reduce disorder and encourage academic engagement.

Methods

Data

The data for this paper come from the International Study of City Youth (ISCY). ISCY is a study designed to compare how well school systems in major cities of different industrialized countries in Europe, North America, and Australasia are preparing young people for college and careers. While sharing common goals, nations differ in the way they approach the organization of secondary schools, the programs they provide, and the requirements they place on graduation. The cities participating in the study are Bergen, Barcelona, Montreal, Melbourne, Ghent, Wroclaw, Turku, Bordeaux, Reykjavik, San Diego, Santa Barbara, Sacramento, Santiago, and Tijuana.

Researchers in each city collected data on cohorts of 10th grade students beginning in 2013-2014. The students were drawn from a representative sample of schools in each city in order to facilitate student-level and school-level analysis. The students are being followed up over the subsequent five years to track their post-school activities. Re-contact items will collect information on program and course choices, education and work experiences, and activities, as well as education and career plans, attitudes towards school, perceptions of instructional quality, academic self-esteem, and views about social institutions and citizenship.

In the base year, students took a computerized online Programme for International Student Assessment (PISA)-based test that assessed reading and math skills and completed a questionnaire that measured an array of non-cognitive skills, as well as plans, views, and outlooks. Teachers and principals were also surveyed to collect information on social and pedagogical challenges faced by the schools, the characteristics of students, the school climate, the success profile of the school in terms of academic results, and particular programs or activities that schools offer to improve learning and transition outcomes for their students.

This study is based on data from a sample of schools in and around the city of Sacramento, California, which serves as the state capital and had a population of 495,234 in 2016. Together, there are five school districts with schools within the city limits of Sacramento or its suburbs. We recruited all five districts to participate in our study; four agreed. District staff were responsible for recruiting schools within their districts. The project staff provided recruitment materials to district staff, including letters of introduction to students, parents, teachers, and school administrators, and permission forms. Participation was uneven, with only some schools and students electing to participate. The final sample consisted of 25 schools (18 traditional, 3 alternative schools, 2 charter schools, 1 magnet school, and 1 private school) and 2,541 students. The within-school samples ranged from 2 to 309 students. The final sample is fairly representative of the entire 10th grade population in the four districts in terms of race/ethnicity, with an underrepresentation of Whites and Blacks and an overrepresentation of Asians and multiracial students (see Table 1).

Measures

One of the key goals of the student survey was to create a series of non-cognitive factors related to student performance in school. These factors were developed inductively and deductively based on a framework created by ISCY researchers (see Figure 1) using quantitative

analysis of data from the baseline ISCY Student Survey, supported by a review of current literature on 21st century skills and engagement, and using the various existing taxonomies or models of skills as guides. Twelve scales for measuring the constructs of 21st century skills, academic dispositions, and student engagement were developed from 45 survey items using principal component analysis. A list of the 45 variables used to measure the twelve 21st century skills and the results of the principal component analysis is provided in Table 1 (for more information, see Lamb, Jackson, & Rumberger, 2015). An additional composite measure was created for socioeconomic status (Ganzeboom et al., 1992). All the composite measures were standardized across the entire international dataset with a grand mean of zero and a standard deviation of one.

Outcome Variable

The outcome variable of this study is behavioral disengagement, one of the 12 measures created in the survey. Higher values point towards more disengagement. Behavioral disengagement was constructed from student survey responses to the following question: This school year, how many times (four categories from none to 5 or more times) have you done any of the following things?

- Skipped a class without permission

- Been absent from school for a day without permission

- Been in trouble with a teacher because of your behavior

- Arrived late at school

- Get in trouble frequently at school

Student Variables

While school compositional effects are the primary focus, statistically controlling for student effects is essential for obtaining relatively unbiased estimates of school compositional

effects for two reasons. First, by definition, school composition effects are above and beyond the effect of individual student characteristics. For example, the effect of school SES is above and beyond the effect of the students' own SES. Hence, controlling for the student effect is necessary. Second, student inputs in terms of academic and demographic background vary considerably across schools, and research shows that across a range of student outcomes, school effects depend in part on the academic and demographic backgrounds of the students attending the schools (Borman & Dowling, 2010; Palardy, 2013; Palardy, Rumberger, & Butler, 2015; Rumberger & Palardy, 2005b). Hence, controlling for student inputs serves the purpose of equating schools on student inputs, so the remaining school variance is mostly due to school factors.

In addition to improving the school effects estimates, student variables are also used to address research question 2 on whether there are differences in behavioral disengagement among demographic groups and, if so, whether 21st century skills mediate those differences. To that end, demographic variables measuring student race/ethnicity, SES, and gender are used in addition to the 12 scales measuring the 21st century skills mentioned earlier.

School Variables: Student Composition

Our school variables measure student body composition. They were created by aggregating the student variables to school means. For example, mean SES is the average socioeconomic status of students at each school. Similarly, we also created a variable for proportion underrepresented minority (UM) at the school. Further, we include a variable based on data collected from the State of California that measures the rate of suspensions at each school. This is a potential relevant measure in that recent research has documented that disciplinary practices vary considerably across schools and tend to be more severe at schools serving low-SES and high-UM student populations, which can have a detrimental impact on

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student attitudes and behaviors (Rumberger & Losen, 2016). Finally, we include the school means of each ISCY 21st century skills variable. See Table 2 for a lists all the variables used in this study along with their corresponding descriptive statistics and variable labels.

Statistical Models

Because students are nested in schools and the primary objective of this study is to understand how school context impacts student behavioral disengagement, multilevel models (also known as hierarchical linear models) were used. Nested data violate the assumption of statistical independence. Consequently, analyses of nested data using regular linear regression can result in biased coefficient and standard error estimates. Multilevel models are designed for analyzing nested data and are highly suitable for studying school effects in that they alleviate these statistical concerns and provide the opportunity to model the dependencies in the data, which, in this case, are school effects (Raudenbush & Bryk, 2002). The substantive focus in the present study is on modeling school level effects on student level outcomes—specifically, the effects of school context on students' behavioral disengagement. The level 1 model or student level model uses behavioral disengagement as the dependent variable. The level-two model or school-level model uses mean behavioral disengagement as the dependent variable.

Conceptual Framework and Model Building

The basic conceptual framework guiding this study is that school context impacts student behavioral and academic outcomes. The ISCY skills framework (see Figure 1) describes how various forms of student engagement are related to cognitive skills (as measured by test scores) and achievement (as measured by student self-assessment and teacher assessment), but it does not explicitly show the role of school context on student behavioral disengagement.

Five sequential models were fit to the data to address the research questions. First, the unconditional model was fit as a baseline model to compare subsequent models and to estimate

the intraclass correlation coefficient (ICC) for behavioral disengagement based on the portion of the variance that is between schools (as opposed to the variance between students attending the same schools). This addresses research question 1. Second, the Student Demographics model was fit to estimate demographic group differences in behavioral disengagement. Third, we tested whether demographic group differences varied across schools. That is, we fit the multilevel model with cross-level interaction effects for the demographic variables. To that end, the demographic variables were tested one at a time because our moderate sample size provided limited statistical power of fitting more than one random slope. Fourth, the Student 21st Century Skills Model was fit, which includes both demographic and 21st century skills variables, to estimate the degree to which demographic group differences are mediated by 21st century skills. Models 2 and 3 address research question 2. The final model is the School model, which includes all the student variables and measures of school composition. This addresses research question 3. Because there were a substantial number of school variables, we first tested them one at a time for statistical significance and then added all the significant variables. Finally, we reduced the model by removing non-significant measures one at a time.

Results

This section draws on the results of the analysis to address the research questions of the study.

1: *Does the level of student behavioral disengagement vary among schools?*

The Unconditional Model results in Table 4 address this question. Mean behavioral disengagement varies significantly among the sample of schools used in this study. Specifically, about 6 percent of the variance in behavioral disengagement is between schools and 94 percent is among students attending the same school. This figure is lower than that of some other studies

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that found about 13 percent of the variance in engagement or disengagement is between schools (Lee & Smith, 1993; Quint, S., Black, & Stephens, 2005).

The research literature on school effects finds that approximately 10 to 20 percent of the variance in achievement outcomes are typically between schools, while the rest is among students attending the same schools. This suggests that 10 to 20 percent of the variance in student achievement is due to differences in various aspects of the schools, such as the academic and demographic backgrounds of the students, the level of resources available to the school (e.g., per-pupil expenditures), contextual elements of the school (e.g., the mean socioeconomic status of the student body), and school practices (e.g., the curriculum and academic press) (Lee & Smith, 1999). However, other research findings suggest that when the school sample is drawn from a smaller geographic region (e.g., a large city as opposed to a national sample), the ICC tends to be smaller (see study of six school districts: Rumberger & Willms, 1992). That is likely due to lesser variation among schools from a small geographic region on a range of factors. For example, schools in the same district tend have more similar curricula, per-pupil expenditures, and student inputs in terms of their academic and demographic background characteristics. For this reason, ICCs based on a sample of schools from a large city are expected to be at the low end of the ICC range (i.e., about 10 percent).

Far less research has been conducted on behavioral than achievement outcomes. As a result, there is no consensus on the expected ICC for behavioral outcomes. However, the results from some recent studies suggest it is smaller than for achievement outcomes. For example, using a nationally representative sample of students and high schools, a recent study found an ICC of 0.19 for achievement and 0.14 for school behaviors (Palardy, Rumberger, & Butler, 2015). Another study also found a lower ICC for an engagement outcome versus achievement outcomes (Lee & Smith, 1993). We therefore expected the ICC of behavioral disengagement in

the present study to be considerably below 0.14, given that our sample of schools is drawn from a large city. As described above, the results of the Unconditional Model shown in Table 4 confirm this expectation (i.e., the behavioral disengagement ICC is 0.06).

Given this rather small percentage of variance in behavioral disengagement that is between schools, some may wonder whether it merits examination of compositional effects. To that concern, we have two responses. First, the proportion of the variance between schools is highly significant ($p < 0.01$), indicating it is highly unlikely that this effect is due to chance. Yet, one may argue that even though the effect is significant, it may not be large enough to matter. To address that, we converted the ICC into an effect size (ES), which expresses the total school effect in units of standard deviations. The ICC can be roughly interpreted as the school effect on behavioral disengagement and is measured in units of variance, which can be converted to standard deviations by taking the square root. Hence, the school effect size on student behavioral disengagement is approximately 0.25 (square root of 0.06). While that is a moderately small effect based on Cohen's guidelines (Cohen, 1988), it is not small when compared with other very expensive interventions in education, such as class size reduction (ES of approximately 0.18 for 16 students compared with 26 students; see Finn & Achilles, 1999). From this analysis, we conclude that the ICC of 0.06 for behavioral disengagement is large enough to merit further investigation of school composition.

2a: *Are there differences in behavioral disengagement among demographic groups?*

This question pertains to whether behavioral disengagement differs across ethnic or gender groups or is associated with SES. The Student Demographics model results in Table 4 address this question. Note that those results are from the multilevel regression model, which controls for the other variables in the model. For example, the effect for "Male" (0.067) is the male mean minus the female mean on behavioral disengagement for students attending the same

schools, controlling for the other student demographic variables in the model (i.e., ethnicity and SES). The behavioral disengagement outcome was standardized to have a mean of zero and standard deviation of 1.0 in the international ISCY sample. Hence, the effects are in units of standard deviations of behavioral disengagement for the international ISCY sample, which can be interpreted as an effect size (ES). (Note: This only applies to effects for the student predictors; the coefficients for the school effects are not in units of effect size.)

The demographics model results in Table 3 show that male students have significantly higher levels of behavioral disengagement, on average (ES = 0.067), compared with females of similar SES and ethnic background attending the same school. Furthermore, compared with White students, Black and Latino students have significantly higher levels of behavioral disengagement (ES = 0.336 and 0.260), whereas Asian students have significantly lower levels (ES = -0.200). These findings show that level of behavioral disengagement differs across demographic groupings, consistent with the research cited earlier. Near the bottom of Table 4 for the Demographics model, we see that the set of demographic variables accounted for just 4.4 percent of the variance among students attending the same schools, but nearly 40 percent of the variance among schools. Those figures accentuate the fact that school intakes on demographics tend to vary substantially in American schools and account for a significant portion of differences in school outcomes, a finding consistent with those of Coleman et al. (1966) more than 50 years earlier.

2b: *Do any demographic group differences vary across schools?*

To address this question, we tested each significant demographic effect separately in the multilevel model. The demographic groups were tested one at a time because the moderate size of our school sample provided limited statistical power for estimating more than one random slope at a time. Despite our careful approach, none of the demographic effects varied

significantly across schools. This indicates that the demographic differences in behavioral

disengagement are uniform across schools and suggests that school differences play at best a

minor role in the demographic differences in Sacramento high schools.

2c: *Do 21st Century Skills mediate group differences on behavioral disengagement?*

To address this question, we fit the Student 21st Century Skills Model (see Table 4). The

answer to this question can be inferred by comparing of the Student Demographics and Student

21st Century Skills Models. The results show that 21st century skills reduce the magnitude of

the demographic group differences in behavioral disengagement and therefore mediate the

effects. For example, compared with White students, the effects of Black, Asian, and Latino

students were reduced by 27 percent, 52 percent, and 9 percent, respectively, and the male

gender effect was actually reversed in sign from 0.067 to -0.022. Similarly, the SES effect was

reduced by 26 percent. These findings indicate that a substantial portion of the demographic

group differences in behavioral disengagement are due to group differences in 21st century

skills. At the bottom of Table 4, we see that 21st century skills account for 19.9 percent of the

student variance and 31.0 percent of the school variance compared with the Demographics

model. This shows that 21st century skills account for far more variance among students at the

same school compared with demographics, but they also account for a substantial portion of the

between-school variance.

3: *What student composition factors at schools contribute to behavioral disengagement?*

Four of the 18 school variables considered (22 percent) were statistically significant

predictors of behavioral disengagement, including Mean SES (coefficient = -0.213, ES = -0.089),

Mean Emotional Disengagement (coefficient = -0.693, ES = -0.201), Mean Hope (coefficient =

0.478, ES = 0.120), and Mean Purpose (coefficient = 0.592; ES = 0.160). This set of school

variables accounts for an additional 65 percent of the variance in between-school behavioral disengagement compared with the Student 21st Century Model.

These results support the premise that student composition remains an important influence on student behavioral disengagement even after controlling for the effects of individual-level factors. Given that the research literature on mean school SES shows it is associated with a range of student outcomes (e.g., Coleman et al., 1966; Palardy, 2013, 2015; Rumberger, 2011; Rumberger & Palardy, 2005a, 2005b), a significant effect was expected and merits additional exploration. To that end, Table 5 shows the school means for the variables used in this study group by low-, medium-, and high-SES school contexts. (Note that with the exception of Percent UM, all variables are standardized to a mean of zero and standard deviation of 1.0.) Low-SES schools are defined as being in the bottom quintile of schools in terms of the mean student SES of the school, whereas high-SES schools are those in the top quintile. The table reveals the differences in peer composition that may be contributing to the school SES effect. Students attending low SES high schools have peers with systematically lesser developed 21st century skills; in many cases, the difference is greater than 1.0 standard deviation (i.e., Percent UM, mean SES, mean Behavioral Disengagement, mean Collaboration, mean Self-efficacy, mean Communication, and mean Conscientiousness). Although many of those differences are not statistically different—due in part to the low statistical power of the school sample (n=25)—it is worth noting that the Sacramento sample is relatively homogeneous on school SES compared to a national sample of high schools, which reduces the magnitudes of the differences between low- and high-SES schools.

The relatively strong effect of mean emotional engagement is also not surprising: students who attend schools where more students are emotionally engaged (i.e., they like school) are better behaved. What is surprising is the positive effects of mean hope and mean purpose,

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and we have no related literature to provide insight on this. These effects suggest that after controlling for one's own level of Hope, Purpose, SES, and 21st century skills, having school peers higher on Hope and Purpose compared with students at other schools tends to have a detrimental effect on one's behavioral disengagement. In other words, a school context of having overly optimistic peers is associated with slacking off (high behavioral disengagement). This might represent a variation of the big-fish-little-pond-effect (BFLPE), whereby students' self-concept is diminished by attending schools with high-achieving peers (Dai & Rinn, 2008; Marsh et al., 2008). In this case, attending schools with more hopeful peers may reduce students' individual hope and increase their disengagement.

Discussion

This study investigated the individual-level and school-level factors that predict the behavioral disengagement of high school students attending 25 high schools in the city of Sacramento. We focused on behavioral disengagement because previous research has shown that it is a significant predictor of high school performance (grades) and whether students drop out of school (Rotermund, 2010). We also focused on the role of school factors, particularly the social composition of students, because previous research has also found that schools in the US.. vary widely in the social background of students they enroll (e.g., socioeconomic status, race/ethnicity, immigrant status) and that these differences contribute to widespread differences in school outcomes (Rumberger & Palardy, 2005a, 2005b).

The results of our study yield a number of findings that are generally consistent with previous studies, although relatively few studies have investigated behavioral disengagement as a dependent variable. First, we found that the variance in behavioral disengagement is due to both individual and school effects. That is, although most of the variability in behavioral

disengagement occurs among students, there are also significant, albeit small, differences due to schools.

Second, we found that there are differences in behavioral disengagement related to student demographics. Specifically, boys had higher levels than girls, Black and Latino students had higher levels that White and Asian students, and low SES students had higher levels than high SES students.

Third, we found that a number of other student-level non-cognitive factors predicted behavioral engagement: belonging, collaboration, cognitive engagement, hope, purpose, self-control, and conscientiousness all had significant, negative effects on behavioral disengagement, while creativity and communication had significant, positive effects on behavioral disengagement. In addition, these 21st century skills were found to mediate demographic group differences in behavioral disengagement. That is, the magnitude of the demographic group differences on behavioral disengagement were reduced substantially by controlling for 21st century skills. This finding suggests that reducing group differences in 21st century skills may also reduce group differences in behavioral disengagement. Moreover, because previous research has found that behavioral disengagement is predictive of academic achievement and educational attainment (Rotermund, 2010), reducing group differences in 21st century skills may also reduce demographic achievement gaps and educational attainment gaps. Also, the fact that various attitudes, behaviors, and skills are related to each other is consistent with both conceptual models of how they relate to each other and to school performance (Ngaoka et al., 2015) and empirical studies that estimate the size and significance of the interdependence (Rotermund, 2010).

Fourth, above and beyond the extensive number of individual-level effects of demographics and various non-cognitive factors that were controlled in our models, we found

that some of those factors also have compositional or school-level effects. The strongest of these was emotional engagement (ES = -0.201). This effect suggests that students who attend schools where their peers have a greater tendency to be emotionally engaged are more likely to be well-behaved (i.e., have lower levels of behavioral disengagement) (Battistich & Hom, 1997; Demanet &Van Houtte, 2012).

In contrast to the findings for the effects of emotional engagement, students attending schools where their classmates tend to be more hopeful about their future or feel a greater sense of purpose about their educational endeavors at school tend to have higher levels of behavioral disengagement. These findings were not expected and indeed seem inconsistent with the ISCY conceptual framework. Furthermore, we were not able to locate empirical research that would help reconcile these findings. The closest we came was to speculate that the finding was a variation of the big-fish-little-pond-effect whereby individual students' self-concept is diminished by attending schools with high-achieving students (Dai & Rinn, 2008; Marsh et al., 2008). Future research is needed to cross-validate these results and to develop an understanding of the school mechanisms that lead to these contrary effects.

The findings for mean SES were fully expected. That is because mean SES is perhaps the most salient school effect and the most widely established school composition effect that has been found to be associated with a range of student outcomes, including achievement, drop out, college attendance, and college choice (i.e., whether to enroll in the most reputable or most convenient post-secondary institution) (Palardy, 2015; Rumberger & Palardy, 2005b). The effect size for mean SES estimated in this study (-0.089) is similar to that of a recent study that used a national sample of 10th graders and a similar measure of behavioral disengagement (Palardy, Rumberger, & Butler, 2015), which adds credence to this finding. Past research has established that mean SES impacts education outcomes through two general mechanisms. First, SES-based

peer influences tend to have a positive effect in high SES schools where peers tend to have

enriched educational capital to share, but a negative effect in the low SES school context.

Second, school practices are often associated with school SES; high SES schools tend to have a

greater academic press, and low SES schools tend to focus more on order and discipline (Lee &

Smith, 1999; Palardy, 2013; Rumberger & Palardy, 2005a).

Limitations

The data used in this study have a few limitations. First, like most correlational studies,

even with extensive statistical controls, the results cannot be considered causal effects. This is

particularly the case because the data was collected in a single wave rather than longitudinally,

which can help pin-point change in the outcome that occurred while students were enrolled in a

particular school. A second limitation is that the Sacramento sample includes 25 schools, which

is slightly below the recommended number for studying school effects (Snijders & Bosker,

2012). This sample size limitation is less serious than it could be, as it does not seem to reflect a

sampling bias because the demographics of the sample reflect the demographics of the

population (see Table 2). Instead, the small school sample raises concern about low statistical

power, which tends to undermine the significance of statistical effects, leading to false negative

findings. It may also impact the accuracy of the variance estimates. Third, the data were

collected from a sample of schools from four districts located within a relatively small

geographic area. Inferences from this sample to other geographic areas should be made with

caution, particularly other areas with different educational policies and practices and different

student inputs. We believe that the results are applicable to schools located in other large

districts in the State of California and potentially to other similar districts in the U.S. However,

the results may differ considerable in other ISCY cities. Finally, the ISCY survey focuses on

21st century skills, but the Sacramento data do not include measures of school practices or direct

measures of peer influences, which previous research indicates are key mediating mechanisms for school contextual effects (Palardy, 2013; Palardy, Rumberger, & Butler, 2015).

Implications to Education Policy

The findings of this study have implications to educational policy for reducing gaps in educational outcomes across demographic groups and for raising behavioral disengagement. The results indicate that ethnic/racial and socioeconomic differences in behavioral disengagement are primarily due to differences among students rather than to school effects, at least in Sacramento high schools. Furthermore, approximately 25 percent of the demographic gaps in behavioral disengagement were mediated by students' 21st century skills, and approximately 20 percent of the overall variance in behavioral disengagement was accounted for by students' 21st century skills. In addition, past research has shown that behavioral disengagement is predictive of academic performance, which suggests that reducing demographic gaps in 21st century skills is expected to result in reductions in demographic gaps in academic performance. Therefore, policies and interventions for improving 21st century skills are recommended, particularly among low-SES and underrepresented minority students. There are, in fact, a growing number of programs both inside and outside of the U.S. that have proven effects on improving students' socio-emotional skills.

The results show that school context also impacted students' behavioral disengagement. While school effects account for only 6 percent of the variance in student behavioral disengagement, that still adds up to a sizeable effect. Two specific measures of school composition effects—mean school SES and emotional engagement—stand out in terms of their effect size and connection with the research literature and therefore are most worthy of policy considerations. Of the two, mean school emotional engagement, which is essentially the collective value the student body perceives in the schooling they are receiving, has the larger

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association with behavioral disengagement and is something that teachers and other school personnel can likely impact. Therefore, local school policies and practices for improving emotional engagement are recommended.

Socioeconomic composition is perhaps the most studied aspect of all measures of school context, and research has documented its association with a range of student outcomes. That body of research suggests that some part of the effect of school SES can be mediated by school policies and practices, such as a school-wide focus on academics and fair and effective disciplinary practices, but the greater part of its effect is due to peer influences (see Palardy, 2013, for an overview of this topic). The policy remedy for addressing peer influences is challenging because it likely involves changing school peers to create schools that are similar in terms of students' socioeconomic backgrounds. Policy interventions that can be implemented immediately at the district and across local districts are adjusting school boundaries so that school catchments include socioeconomically diverse neighborhoods and providing incentives for low-SES students to attend high-SES schools outside of their home neighborhood (e.g., free transportation or admission to a special program). The key elements of these interventions are that they are minimally disruptive to students and relatively cost-effective. Past federal efforts to reduce school segregation focused heavily on forced busing, which proved to be very unpopular, highly disruptive to students, and ultimately counterproductive (e.g., leading to "white flight" and higher levels of school segregation) (Clotfelter, 2004). Longer-term policies that encourage neighborhood socioeconomic integration may also be necessary in the U.S. where neighborhoods are highly segregated, and some recent research suggests are becoming even more segregated as affluent families tend to select neighborhoods that feed into high-SES schools—neighborhoods that are inaccessible to many low-SES families (Orfield & Frankenberg, 2013). That trend must

be reversed if schools are to become more equitable in terms of student composition and peer influences.

Summary

This study contributes to the research literature in several ways. First, the results establish that a range of students' 21st century skills are negatively associated with their level of behavioral disengagement. Approximately 20 percent of the variance in students' behavioral disengagement is accounted for by students' 21st century skills. Second, the results show there are ethnic/racial, gender, and socioeconomic differences in behavioral disengagement with male and underserved populations having higher levels. Furthermore, those demographic differences are mediated be students' 21st century skills. That is, statistically controlling for students' 21st century skills reduced the magnitude of the demographic differences approximately 25 to 30 percent. Third, the study helps to establish the degree to which individual differences versus school effects contribute to students' behavioral disengagement. The results suggest behavioral disengagement is predominately the result of individual differences among students and that schools play a relatively minor role, accounting for 6 percent of the variance. Similarly, while ethnic/racial, gender, and socioeconomic differences in the level of behavioral disengagement were found, there was no evidence that schools contributed to those differences. However, these findings of limited school effects may be partially due to the limited geographic sample used in the study, which resulted in greater homogeneity among schools (i.e., all schools are in Sacramento, California). Finally, four measures of student composition were associated with behavioral disengagement including mean SES and three measures of 21st century skills. This finding is consistent with the extensive literature on the importance of the characteristics of school peers and the social context to educational outcomes.

Table 1: Results of principal component analysis for ISCY Student Survey with construct labels

	Purpose	Behavioral disengagement	Cognitive engagement	Emotional engagement	Conscientiousness	Belonging	Hope	Self-efficacy	Collaboration	Communication	Creativity	Self-Management
Working hard in school matters for success in the workforce	.88											
What we learn in class is necessary for success in the future	.80											
School teaches me valuable skills	.74											
My classes give me useful preparation for what I plan to do in life	.70											
Skipped a class without permission		.85										
Been absent from school for a day without permission		.82										
Been in trouble with a teacher because of behavior		.47										
Arrived late at school		.66										
I get into trouble frequently at school		.27										
In class, I try to work as hard as possible			.83									
In class, I put in my best effort			.81									
In class, I keep working even if the material is difficult			.79									
School is often a waste of time				.31								
I get a feeling of satisfaction from what I do in class				-.39								
High level of interest in school work				-.31								
I find most school work boring				.56								
Hours of homework					.45							
I always try to do my best					.88							
I always get work in on time					.80							
I persevere with a job until it is done					.74							
I am a hard working student					.70							
I feel safe at school						-.64						
I will leave this school with good memories						-.61						
Happy with life at school						-.66						
I like being at school						-.65						
I am confident of finding a good job when I finish my studies							-.50					
Happy with future							-.53					
There is little that can prevent me from reaching my goals							-.68					
Right now I see myself as being pretty successful as a student								-.52				
I can think of many ways to reach my current goals								-.75				
There are lots of ways around any problem that I am facing now								-.79				
I am confident of doing well in school								-.53				
I understand how others are feeling									.66			
I get along well with others									.66			
I work well in groups									.65			
I treat others fairly									.55			
I take time to help others									.49			
I express ideas clearly in oral presentations										-.71		
I express ideas clearly in written text										-.61		
I am good at getting ideas across in discussions										-.74		
I am good at leading others										-.60		
I like to think of new ways to do things											-.67	
I am good at coming up with new ideas											-.63	
I am easily distracted in class												.68
I tend to be lazy												.77
I tend to leave things to the last minute												.78
Cronbach's Alpha	.81	.70	.82	.71	.69	.74	.71	.78	.77	.74	.68	.70

Reproduced from Lamb, Jackson, & Rumberger (2015).

Table 2: Sample and Population Race/Ethnicity of Tenth Grade Students, 2013-14

	County	4 Districts	ISCY Sample
Hispanic or Latino of Any Race	27.9%	30.3%	33.7%
American Indian or Alaska Native, Not Hispanic	1.0%	0.7%	0.7%
Asian, Not Hispanic	13.5%	18.0%	24.7%
Pacific Islander, Not Hispanic	1.4%	1.7%	3.5%
Filipino, Not Hispanic	2.9%	3.7%	0.0%
African American, Not Hispanic	14.2%	18.3%	11.4%
White, Not Hispanic	34.7%	22.2%	14.7%
Two or More Races, Not Hispanic	3.9%	4.3%	11.4%
Not Reported	0.6%	0.7%	12.3%
	100.0%	100.0%	100.0%
Sample size	17,951	11,155	2,541

Table 3: Variable Descriptions

Variable Name	Mean	SD	Variable Label
Student			
Black	0.10**	---	African American race
Asian	0.22**	---	Asian American race
Latino	0.32**	---	Latino ethnic group
Other	0.14**	---	American Indian or Pacific Islander
Male	0.45**	---	Indicator of male gender
SES	-0.11	0.87**	ISCY PA
Belonging	-0.13**	0.91**	ISCY PA
Collaboration	-0.01	0.97**	ISCY PA
Creativity	0.14**	0.92**	ISCY PA
Cognitive Engagement	0.20**	0.97**	ISCY PA
Behavioral Disengagement	0.09**	0.94**	ISCY PA
Emotional Engagement	-0.13**	0.93**	ISCY PA
Hope	0.07*	0.90**	ISCY PA
Purpose	0.04	0.97**	ISCY PA
Self-efficacy	0.23**	0.93**	ISCY PA
Self-control	-0.04†	0.93**	ISCY PA
Communication	0.00	0.95**	ISCY PA
Conscientiousness	0.18**	0.95**	ISCY PA
School			
Percent UM	0.51**	0.19**	Percent Black or Hispanic
Mean SES	-0.22**	0.42**	Mean of ISCY SES
Mean Belonging	-0.13*	0.39*	Mean of Belonging
Mean Collaboration	-0.03	0.23 *	Mean of Collaboration
Mean Creativity	0.17**	0.23†	Mean of Creativity
Mean Cognitive Engagement	0.21**	0.31 *	Mean of Cognitive Engagement
Mean Behavioral Disengagement	-0.15†	0.39*	Mean of Behavioral Disengagement
Mean Emotional Engagement	-0.15*	0.29†	Mean of Emotional Engagement
Mean Hope	0.05	0.25**	Mean of Hope
Mean Purpose	0.04	0.27**	Mean of Purpose
Mean Self-efficacy	0.20**	0.27 *	Mean of Self-efficacy
Mean Self-control	-0.09†	0.23 †	Mean of Self-control
Mean Communication	-0.09	0.43*	Mean of Communication
Mean Conscientiousness	0.13†	0.34*	Mean of Conscientiousness
Suspension Rate (%)	7.27**	4.90**	Percent suspended annually
Enrollment	1086.39**	629.28**	Number of students enrolled at the school

† = p<0.10; * = p<0.05; **= p<0.01. ISCY PA: Scale score constructed using principal component analysis of ISCY data (see Table 1 for results).

Table 4: Behavioral Disengagement Outcome

Variables	Unconditional	Student Demographics	Student 21st Century Skills	School
Fixed Effects				
Student				
Black	----	0.336**	0.245*	0.247*
Asian	----	-0.200**	-0.095	-0.096
Latino	----	0.260**	0.237**	0.243**
Other	----	0.126	-0.087	0.085
Male	----	0.067*	-0.022	-0.028
SES	----	-0.073*	-0.054†	-0.046
Belonging	----	----	-0.089**	-0.089**
Collaboration	----	----	-0.064**	-0.075**
Creativity	----	----	0.133**	0.128**
Cognitive Engagement	----	----	-0.150**	-0.152**
Emotional Engagement	----	----	-0.020	-0.021
Hope	----	----	0.059†	0.057
Purpose	----	----	-0.052*	-0.052*
Self-efficacy	----	----	-0.015	-0.013
Self-control	----	----	-0.103**	-0.102**
Communication	----	----	0.043†	0.043†
Conscientiousness	----	----	-0.204**	-0.202**
School				
Intercept	0.093†	-0.069	0.010	-0.151
Percent UM	----	----	----	NS
Mean SES	----	----	----	-0.213**
Mean Belonging	----	----	----	NS
Mean Collaboration	----	----	----	NS
Mean Creativity	----	----	----	NS
Mean Cognitive Engagement	----	----	----	NS
Mean Emotional Engagement	----	----	----	-0.693**
Mean Hope	----	----	----	0.478*
Mean Purpose	----	----	----	0.592*
Mean Self-efficacy	----	----	----	NS
Mean Self-control	----	----	----	NS
Mean Communication	----	----	----	NS
Mean Conscientiousness	----	----	----	NS
Mean Belonging	----	----	----	NS
Mean Collaboration	----	----	----	NS
Mean Creativity	----	----	----	NS
Cognitive Engagement	----	----	----	NS
Mean Emotional Engagement	----	----	----	NS
Random Effects				
Student	0.845**	0.808** (4.4%)	0.647** (19.9%)	0.647** (0%)
School	0.048**	0.029** (39.6%)	0.020** (31.0%)	0.007** (65.0%)
ICC	0.057	----	----	----
Model Fit				
X^2	6,824.982	6,702.922	6,138.152	6,122.610
Number of parameters	3	11	22	26
X^2 change and LRT	----	122.060**	564.770**	15.542**

† = $p<0.10$; * = $p<0.05$; **= $p<0.01$. LRT = likelihood ratio test, which tests for change in the model χ^2 per change in number of parameters compared with the previous model. Mean School measures of Achievement, Reading, and Math are omitted because they are conceived of as outcomes rather than predictors of 21st Century Skills. The numbers within the parentheses for the random effects are the % of variance explained compared with the previous model. For the School Model, NS indicates that the variable was removed due to non-significance. This was necessary due to the small school sample size. The reduction approach was to remove the least significant predictor one at a time.

Table 5: Student Composition (School Means) by Low-, Medium-, and High-SES School Groupings

Variables	Low School SES	Medium School SES	High School SES
Percent UM**	61.88	55.14	29.00
Mean SES**	-1.28	-0.03	1.35
Behavioral Disengagement*	1.02	-0.13	-0.63
Mean Belonging	0.02	-0.19	0.56
Mean Collaboration*	-0.54	-0.13	0.92
Mean Creativity	0.58	-0.28	0.27
Mean Cognitive Engagement	0.18	-0.24	0.55
Mean Emotional Engagement	-0.34	0.01	0.32
Mean Hope	-0.19	-0.10	0.49
Mean Purpose	0.03	-0.11	0.32
Mean Self-efficacy	-0.67	0.01	0.65
Mean Self-control	-0.31	-0.04	0.44
Mean Communication†	-0.92	0.17	0.42
Mean Conscientiousness†	-0.62	-0.08	0.86

** = $p<0.01$; * = $p<0.05$; † = $p<0.10$. Note that all school variables were standardized to a mean of zero and standard deviation of 1.0 for ease of interpretation. Therefore, differences in means across groupings are in units of standard deviations. For example, mean Behavioral Disengagement for Low-SES schools is -1.02 standard deviations below the mean for all schools and 1.65 standard deviations below the mean for high-SES schools (-1.02 - 0.63 = -1.65).

Figure 1: ISCY 21st Century Skills Framework Developed by Lamb, Jackson, and Rumberger (2015).
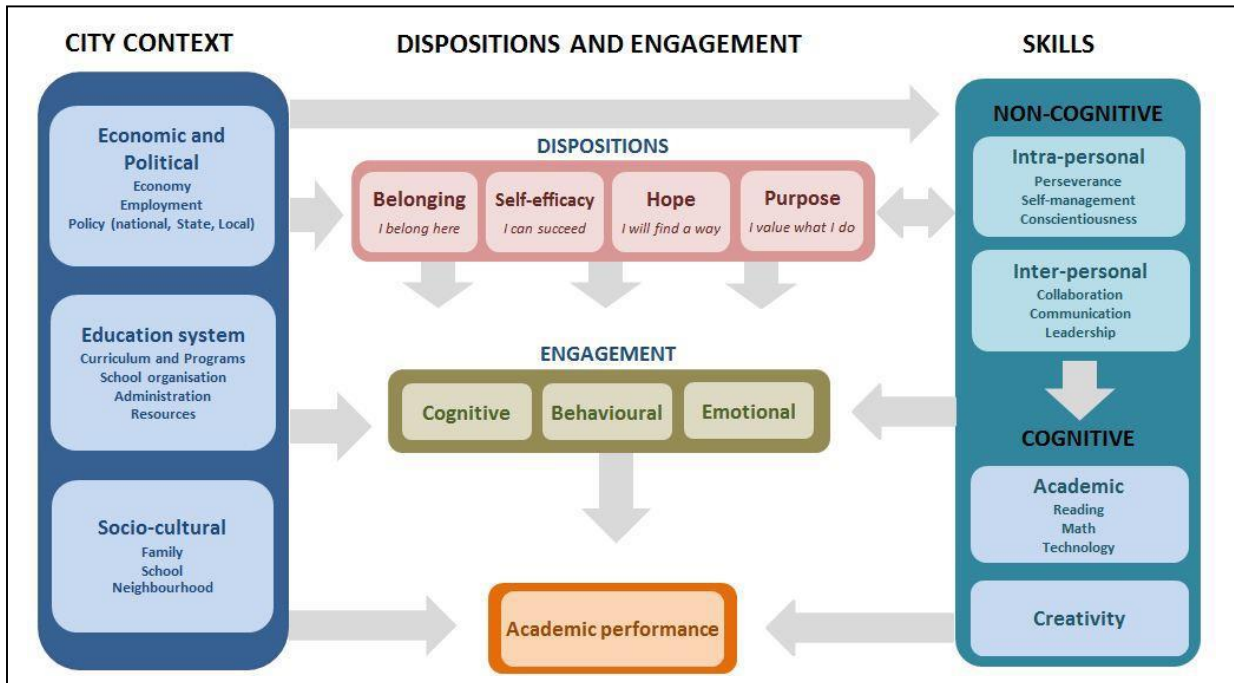
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