Leveraging Promise Neighborhood Data to Explore Student Outcomes

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Abstract

This study leverages statewide longitudinal tracking data with Promise Neighborhood life skills survey metrics to investigate how non-cognitive abilities measured in adolescence foster long-term student outcomes. The analysis explores associations between 7th through 9th grade life skills (e.g., risks of substance use, effective communication strategies, and self-control skills) and later educational and adulthood outcomes using Statewide Longitudinal Data Systems data. After controlling for prior academic ability, gender, race, and various contextual factors, regression models indicated strong, positive associations between adolescent life skills, proficiency in Algebra I and English II, and college enrollment.

Non-Cognitive Competences and Student Outcomes

There is a need for policy-relevant research to clarify how PreK–12 competencies shape both academic achievement and long-term success. While math and reading remain strong predictors, less is known about non-cognitive skills such as social-emotional learning (SEL), 21st-century skills, and life skills, now widely integrated into U.S. schools (e.g., Sorrenti et al., 2025). Evidence links SEL competencies, such as self-management, to improved academic performance, though most studies focus on short-term outcomes (e.g., Durlak et

al., 2022). Expanding our understanding of long-term gains may necessitate the strategic use of existing datasets. Building on approaches used by economists to establish how psychological constructs measured in adolescence map to college and adult accomplishments (e.g., Adamecz et al., 2024), Statewide Longitudinal Data Systems (SLDS) offer promise for policy-focused, educational research as they track public school students across time and institutions, spanning early childhood through K–12, into higher education, and in some cases into the workforce. Yet, because SLDS rarely capture non-cognitive competencies, triangulating them with complementary sources is necessary. Partnerships with state agencies, researchers, and community organizations offer opportunities for the rigorous integration of data for applied educational research (e.g., Conaway et al., 2015).

This study leverages data from two Southeastern Promise Neighborhoods, an SLDS, and a university research center to examine how adolescent life skills relate to educational and life course outcomes, including Algebra I and English II proficiency, high school graduation, postsecondary enrollment and attainment, workforce earnings and SNAP receipt three years after high school graduation. Promise Neighborhoods provide cradle-to-career support in low-income districts, but we are unaware of prior research that has tracked non-cognitive metrics from these initiatives longitudinally. In this study, life skills intervention data were drawn from the Botvin LifeSkills Middle School Program, a three-year

intervention for grades 7–9 designed to reduce substance use risks and strengthen protective factors.

Methods

This retrospective cohort study utilized the Botvin LifeSkills' Middle School Health survey (National Health Promotion Associates, 2019) data from 7th-9th graders in two Mississippi Promise Communities from 2016 to 2020. Student data from pre-intervention surveys were linked to educational outcomes contained in the Mississippi Statewide Longitudinal Data System.

The analysis concentrated on three life skills variables that in this study demonstrated significant relationships with student outcomes: anti-drug knowledge, life-skills knowledge, and self-control skills. The two knowledge scales included multiple True/False items: 13 for anti-drug and 19 for life skills. The self-control variable was assessed using two items rated on a five-point Likert scale. Educational outcomes included the first recorded attempt of high school English II and Algebra I state tests (taken no earlier than the 9th grade) and postsecondary enrollment within one year of high school graduation. Findings on high school graduation, postsecondary degree attainment, workforce earnings, and SNAP receipt were excluded from the analysis, as they did not show significant associations with life skills competencies.

Logistic regression models were used to assess the associations between SEL indicators and educational outcomes. Robust standard errors were used for

all models to address heteroskedasticity. Fixed effects for two variables were included to control for unobserved effects: test school and test year fixed effects for test scores and high school graduation for postsecondary enrollment. This study received exempt review approval from the research institute's IRB.

Results

The analysis included 723 students with complete data for baseline and English II outcomes, 722 for Algebra I, and 550 high school graduates for postsecondary enrollment (Table 1). The sample was predominantly Black, mostly 7th graders, and largely from low-income families. Parents generally had low education levels; fewer than one-third of students lived with both parents. About 6.2% had absenteeism rates over 10%. Among the 550 students who graduated from high school, nearly half (49.0%) enrolled in a postsecondary institution.

As shown in Table 2, students with better anti-drug knowledge (one SD higher) were 48% more likely to perform well in English II, 28% more likely to perform well in Algebra I, and 30% more likely to enroll in postsecondary institutions compared to those with lower knowledge. Moreover, the odds of achieving proficiency in English II were 2.50 times higher for students with better life skills knowledge, and 1.64 times higher for Algebra I. Further, students with higher self-control skills had 1.38 times greater odds of performing well in English II compared to those with lower self-control.

Other variables also showed significant associations with educational outcomes. For example, SNAP receipt at baseline was negatively associated with academic outcomes in nearly all models. Moreover, for postsecondary enrollment, gender, grade, and parents' education level are strong predictors across all models. For instance, students with parents holding a bachelor's degree or higher were more likely to enroll in postsecondary education than those whose parents did not.

Discussion

The present analysis of adolescent life skills revealed subsequent links to high school proficiency in English and Math, even after accounting for prior achievement, socio-demographic characteristics, and contextual influences. These results underscore the importance of prioritizing non-cognitive skills training in low-income, rural districts and among middle school students, where there are declines in school engagement and performance. However, we did not find significant impacts on post-graduation outcomes.

The findings highlight the utility of Promise Neighborhood non-cognitive ability metrics for examining student outcomes longitudinally, expanding our understanding of how non-cognitive research contributes to long-term success. Although this analysis identified associations primarily with high school achievement and post-secondary enrollment, the pairing of Promise Neighborhood and SLDS data produces robust student-level metrics that can be

connected across educational phases and into adulthood, especially among lower-income students who experience persistent educational disparities.

Limitations include restricted tracking beyond survey completion and variation in survey grade levels (7th–9th). Positive grade effects suggest that 7th-grade measures were more robust predictors of later success. While survey-based measures of non-cognitive skills face criticism with respect to their reliability and weaker predictive power compared to metrics like absenteeism (Cleveland & Scherer, 2025), they remain valuable when analyzed alongside broader PreK–12 indicators.

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Table 1 Participants' Sociodemographic Characteristics and Non-Cognitive Skills at Baseline and Educational Outcomes

Baseline Characteristics (N=723)	Proportion (%)
Male	51.9
Black	89.2
Grade	
7th	64.0
8th	18.6
9th	17.4
Living with Parents	28.8
Parents with a Bachelor's Degree or Higher	14.7
SNAP Receipt	69.1
Chronic Absenteeism	6.2
Non-Cognitive Competency Skills	
Anti-drug Knowledge (SD=0.1)	50.0
(Life Skills Knowledge (SD=0.1)	60.0
Self-Control Skills (Mean, 1-5, SD=1.0)	3.6
Baseline Performance	
English II Test Proficient or Above	13.6
Algebra I Test Proficient or Above	14.1
Educational Outcomes	
English II Test Proficient or Above (N=723)	21.6
Algebra I Test Proficient or Above (N=722)	17.6
Postsecondary Enrollment (N=550)	49.0

SNAP: Supplemental Nutrition Assistance Program; SD: Standard deviation

Table 2 Associations between Non-Cognitive Skills and Proficiency in English II and Algebra I and Postsecondary

	Odds Ratio (95% CI)								
	Anti-Drug Knowledge			**Life Skills Knowledge**			**Self-Control Skills**		
	English II (N=723)	Algebra I (N=722)	Post-Secondary Enrollment (N=550)	English II (N=723)	Algebra I (N=722)	Post-Secondary Enrollment (N=550)	English II (N=723)	Algebra I (N=722)	Post-Secondary Enrollment (N=550)
Non-Cognitive Skills	1.48 (1.16, 1.88)**	1.28 (1.02, 1.61)*	1.30 (1.07, 1.58)**	2.50 (1.92, 3.25)***	1.64 (1.24, 2.17)***	1.03 (0.82, 1.28)	1.38 (1.08, 1.76)*	1.15 (0.90, 1.48)	1.20 (0.98, 1.46)!
Male	0.67!	0.71	0.42 ***	0.77	0.77	0.45***	0.67!	0.72	0.43***
Black	0.87	0.99	2.04 !	0.81	0.997	1.94!	0.78	0.95	1.86
Grade 7	2.65**	3.44**	1.92*	3.44**	3.72***	1.99*	2.77**	3.49**	2.01*
Grade 8	0.51*	0.96	0.95	0.55*	0.98	1.01	0.55*	0.98	0.995
Living with Parents	0.91	0.86	1.09	1.02	0.93	1.15	0.96	0.89	1.15
Bachelor's Degree +	1.66!	0.68	2.42**	1.61	0.71	2.50**	1.75*	0.74	2.63***
SNAP Receipt	0.56*	0.42**	0.87	0.69	0.46**	0.91	0.60*	0.43**	0.91
Chronic Absenteeism	1.69	0.55	0.78	1.17	0.45	0.73	1.41	0.48	0.78
ELA Proficiency	9.44***	2.99**	2.10!	5.41***	2.30*	2.19*	8.17***	2.92**	2.12!
Math Proficiency	4.83***	6.09***	1.55	3.50***	5.27***	1.61	4.99***	6.32***	1.62

SNAP: Supplemental Nutrition Assistance Program; ELA: English Language Arts
Significance p-value marked as: !p<0.10, *p<0.05, **p<0.01, ***p<0.001
Reference groups: Female, White, Grade 9, not live with both parents, parents did not have a Bachelor's degree or higher, no SNAP receipt, no chronic absenteeism, ELA below proficient, Math below proficient

Methods: Supporting Online Material

Study Overview and Context

This retrospective cohort study employed regression analyses to explore associations between life skills measured with surveys during adolescence and outcomes in high school, college, and the workplace. The study was made possible through an alliance between the authors, two Mississippi-based Promise Neighborhoods, and the National Strategic Planning and Analysis Research Center (NSPARC) at Mississippi State University, which operates Mississippi's official data clearinghouse linking administrative records from state agencies, such as the Mississippi Department of Education, the National Student Clearinghouse, and the Mississippi Department of Employment Security.

Life Skills Data

Life skills data was accessed through Promise Neighborhood activities conducted in footprint area schools serving 7th through 9th graders. The study used data from the Middle School Health Survey (MSHS, National Health Promotion Associates, 2019) completed by students enrolled in the Botvin LifeSkills Middle School intervention between 2016 and 2020. The Botvin LifeSkills Middle School program, commencing in the 6th or 7th grades, is one of the most widely used and rigorously tested youth substance-use prevention programs worldwide, focused on preventing substance use and risky behaviors by strengthening students' personal self-management skills, social skills, and drug resistance skills.

The MSHS, developed by the creators of the Botvin LifeSkills Middle School program, is administered at the beginning and end of each programming year to assess students' drug awareness and resistance skills, as well as broader life skills, including personal self-management and social-emotional competencies (Botvin & Griffin, 2004; Botvin & Kantor, 2000; Steeger et al., 2023).

To avoid conflating the effects of the intervention, our analytic sample consisted exclusively of baseline survey data. These surveys were most frequently collected in grade 7 (64.0%), with additional responses from grade 8 (18.6%) and grade 9 (17.4%), and were collected from cohorts that participated in the Botvin LifeSkills Middle School program between 2016 and 2020. The survey data was deidentified by our Promise Neighborhood community partners. Each student was assigned a unique identifier, which allowed linkage to student records in the Mississippi Statewide Longitudinal Data System (SLDS) while maintaining confidentiality. The survey components analyzed in this study included three domains.

1. Anti-drug and Life Skills knowledge were assessed using true/false items. Anti-drug knowledge scores were calculated as the mean of 13 items, while Life Skills knowledge scores were calculated as the mean of 19 items.

2. Anti-drug attitudes toward alcohol, tobacco, and other drug use were measured with 8 items on a 5-point Likert scale.

3. Life Skills competencies were measured with 13 items on 5-point Likert scales. Competency areas included drug refusal skills (6 items), assertiveness skills (3 items), relaxation skills (2 items), and self-control skills (2 items).

In the research narrative, we report findings only for survey sections that demonstrated significant associations with educational outcomes, specifically anti-drug knowledge, life-skills knowledge, and self-control skills. Both knowledge variables were treated as continuous measures, with scores ranging from 0 to 1 to represent the proportion of items answered correctly (13 items for anti-drug knowledge and 19 items for life skills knowledge). The self-control skills variable was also continuous, calculated as the average score (out of 5) across two items assessing this construct, with higher values indicating more frequent use of self-control strategies. To improve interpretability of coefficients and ensure numerical stability, all three variables were normalized prior to regression analysis.

Student Outcome Data

Life skills survey data was triangulated with SLDS data by our NSPARC collaborators to explore six long-term outcomes: academic proficiency in high school, high school graduation, post-secondary enrollment, post-secondary degree completion, receipt of SNAP benefits after three years of graduating high school, and workforce earnings after three years of graduating high school. In the

research narrative, we report findings only for outcomes that were significantly associated with life skills, namely high school academic proficiency (English II and Algebra I) and postsecondary enrollment.

The NSPARC-generated educational outcomes documented in the paper were measured by three binary variables: performance level on the English II test, performance level on the Algebra I test, and postsecondary enrollment of high school graduates. Students were coded as "1" if they scored "Proficient" or "Advanced" on either test in their first available test after the survey, and "0" otherwise. Postsecondary enrollment was measured only among high school graduates, who were coded as "1" if they enrolled in a postsecondary institution and "0" otherwise.

Drawing also on NSPARC-generated data, the following control variables were included in the regression models: gender (binary, "1" for female students and "0" otherwise), race (binary, "1" for Black students and "0" otherwise), living with both biological parents (binary, "1" for yes and "0" otherwise), parents with a bachelor's degree or higher (binary, "1" for yes and "0" otherwise), grade at first survey (categorical: 7, 8, or 9), chronic absenteeism prior to survey (binary, "1" for students with 18 or more absences in the academic year preceding the survey, and "0" otherwise), proficient or above on the state English Language Art (ELA) test prior to the survey (binary, "1" for yes and "0" otherwise), proficient or above on the state math test prior to the survey (binary, "1" for yes and "0"

otherwise), and public assistance benefits (SNAP) receipt prior to survey (binary, "1" for yes and "0" otherwise).

Data Analysis

Our NSPARC collaborators ran logistic regression models to assess the associations between life skills indicators and educational outcomes. Robust standard errors were used for all models to address heteroskedasticity. Fixed effects for two variables were included to control for unobserved effects: test school and test year fixed effects for test scores and high school graduation for postsecondary enrollment. SAS (V9.4, Cary, NC) was used for all data analyses. A p-value of less than 0.05 was considered significant on a two-tailed test, although we reported significance at the <0.10, 0.05, 0.01, and 0.001 levels. In the main text, we report findings only for survey sections that demonstrated significant associations with educational outcomes, specifically anti-drug knowledge, life-skills knowledge, and self-control skills. In the paper, for noncognitive skills, we report odds ratios reflecting the impact of a one standard deviation increase in the corresponding independent variable.

Ethical Approval

This retrospective study used only de-identified secondary data and received an exempt review approval from the corresponding author's IRB (PRO-FY2025-81).

Data Accessibility

The life skills dataset generated and analyzed in this study is not publicly available due to confidentiality agreements with participants. The Mississippi Statewide Longitudinal Data System data that support the findings of this study were obtained through the National Strategic Planning and Analysis Research Center (NSPARC) at Mississippi State University. Due to privacy protections under the Family Educational Rights and Privacy Act (FERPA) and state regulations, raw unit-level SLDS data cannot be shared publicly. Researchers interested in accessing similar data must submit a formal request to NSPARC.

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