November 2025

The Relationship Between the Trajectory of Non-Cognitive Skills and Public Assistance Receipt

Delta Health Alliance

SLDS
Statewide Longitudinal Data System

Prepared by Mississippi State University's NSPARC

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About Mississippi's SLDS

Mississippi's Statewide Longitudinal Data System (SLDS) is one of the most comprehensive systems in the country and includes administrative records from more than 25 education, workforce, and human service agencies in the state. The SLDS allows for the alignment of multiple sources of de-identified administrative data over time to evaluate educational or workforce strategies in terms of real outcomes, such as entrance into employment, wages, and skill gains.

Prepared by Mississippi State University's NSPARC

The National Strategic Planning & Analysis Research Center (NSPARC) at Mississippi State University is a nationally recognized research center that supports data-driven decision-making across workforce development, education, economic development, and public policy. With over two decades of experience, NSPARC specializes in integrating and analyzing data from multiple sources to address complex challenges faced by state agencies, policymakers, educational institutions, and private-sector partners.

NSPARC's interdisciplinary team—including experts in sociology, economics, computer engineering, and public policy, along with professionals in data analytics and machine learning—produces research that is practical, actionable, and impactful. The center's collaborative approach and cross-domain expertise enable it to generate insights that help stakeholders design and implement solutions with real-world relevance.

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REQUEST

Delta Health Alliance (DHA) requested information on the secondary, postsecondary educational outcomes, and public assistance receipt for students who participated in their Botvin LifeSkills Training (LST) program in both 7th and 9th grade between academic years (AY) 2016 and AY2020.

The LST program provides cognitive-behavioral interventions and has been implemented by DHA for nearly a decade in grades 7-9 in the Indianola Promise Community and the Deer Creek Promise Community in Sunflower and Washington counties.

As part of the evaluation of this program, DHA implemented a survey, the LST Middle School Health Survey, to collect information on the competency level of students participating in the program. DHA has requested the following non-cognitive competencies be examined in this study for students surveyed in both 7th and 9th grade:

- Relationship skills
- Self-management

DHA has requested the application of statistical regression models to estimate the relationship between the changes in non-cognitive competency levels of public school students from 7th grade to 9th grade, and the subsequent performance in the following area:

- For high school students who graduated or dropped out from the high school, SNAP benefit receipt within three years of exiting high school.

This report is a supplementary report to *Delta Health Alliance: The Relationship Between Non-Cognitive Competency and Educational performance,* approved by MDE on March 13, 2025. The study sample is limited to students included in the original report who completed survey items on relationship skills and self-management in both 7th and 9th grades. Based on this subset of MDE data used in the original report, this supplementary report expands the original report by:

- Adding two additional non-cognitive competency indicators collected from DHA's Botvin Lifeskills Survey.

- Examining an additional outcome: SNAP benefit receipt within three years of exiting high school.
- Adding an interaction indicator between 7th and 9th grade non-cognitive measures to identify whether the changes in non-cognitive competencies from middle school to early high school are associated with the later outcomes.

Since the sample size of this study is smaller than in the original report (84 vs. more 500+), a smaller set of explanatory variables were used to reduce multicollinearity and maintain the regression results reliable.

STATED PURPOSE

To fulfill the research and reporting requirements for an Urban Institute Award Project.

METHODOLOGY

DATA

DHA Data

The primary data for this study come from a survey, the LST Middle School Health Survey, which was implemented by DHA to collect information on a set of life skills related competencies of LST program completers in the Sunflower County and Washington County school districts.

The survey was completed by students that were enrolled in grades 7th-9th between AY2016 and AY2020 in the Sunflower County Consolidated School District, and students who enrolled in 7th grade in between AY2018 and AY2020, 8th grade between AY2019 and AY2020, and 9th grade in AY2020 in the school districts of Washington County.

The following fields from the DHA LST survey data were included in the analysis:

RELATIONSHIP SKILL SCORE IN 7TH GRADE – The score of answers for survey questions related to the attitudes against smoking and drinking for cool, fun, and having more friends, calculate for students surveyed in 7th grade.

RELATIONSHIP SKILLS SCORE IN 9TH GRADE – The score of answers for survey questions related to the attitudes against smoking and drinking for cool, fun, and having more friends, calculate for students surveyed in 9th grade.

SELF-MANAGEMENT SCORE IN 7TH GRADE – The score of answers for survey questions related to the frequent use of drug refusal and relaxation skills, calculate for students surveyed in 7th grade.

SELF-MANAGEMENT SCORE IN 9TH GRADE – The score of answers for survey questions related to the frequent use of drug refusal and relaxation skills, calculate for students surveyed in 9th grade.

GENDER – The gender of the surveyed student

SLDS Data

Data for this study also came from Mississippi's State Longitudinal Data System (SLDS), which includes administrative records from more than 25 state agencies. Data from the following SLDS data contributors were used:

Mississippi Department of Education – Data from Mississippi's public schools are contributed to the SLDS by the Mississippi Department of Education (MDE). These data include information on enrollment, school, grade, course, and graduation.

National Student Clearinghouse – Data on postsecondary enrollment nationwide are contributed to the SLDS by MDE. National Student Clearinghouse (NSC) data include information on public high school graduates' enrollment status in all Mississippi public and private postsecondary institutions and out-of-state public and private postsecondary institutions.

Mississippi Community Colleges – Data on community college students are contributed to the SLDS by Mississippi's 15 community colleges and the Mississippi Community College Board (MCCB). These data include information on enrollment, county of residence, academic major, and graduation.

Mississippi Public Universities – Data on 4-year public university students are contributed to the SLDS by Mississippi's eight public universities and the Institutions for Higher Learning (IHL). These data include information on enrollment, county of residence, academic major, and graduation.

Mississippi Public Assistance Data – Supplemental Nutrition Assistance Program (SNAP) benefit records come from the Mississippi Department of Human Services (MDHS). These data provide information on the benefits received by individuals, county of residence, and the period when benefits were received.

INDICATORS

Several indicators were used to measure the dependent variable (Public Assistance Receipt) and principal independent variables (Non-cognitive Competency). Additionally, several student-level demographic and economic characteristics were included as control variables to account for potential confounding effects.

Outcomes:

Public Assistance Receipt – Binary variable where high school graduates or dropouts were coded as "1" if receiving SNAP benefits, within three years of exiting high schools, and "0" otherwise. Individuals who enrolled in postsecondary institutions within three years of high school graduation were excluded in the analysis. Based on data availability (SNAP data through AY2025) and a three-year observation window, high school graduates are sample students who earned a traditional diploma before AY2023. High school dropouts are sample students whose latest dropout were before AY2023, with no subsequent re-enrollment.

DHA Non-cognitive Competency Indicators:

Relationship Skills Score – Continuous variable ranging from 0 to 5, representing the attitudes against smoking and drinking for cool, fun, and having more friends. Higher score indicates stronger anti-use attitudes. These scores were calculated separately for students at 7th and 9th grade and were standardized in the regression analysis to improve coefficient interpretability and ensure numerical stability.

Self-management Score – Continuous variable ranging from 0 to 5, representing the frequent use of drug refusal and relaxation skills. Higher scores indicate more frequent use. These scores were calculated separately for students at 7th and 9th grade and were standardized in the regression analysis to improve coefficient interpretability and ensure numerical stability.

Control Variables:

Several student-level academic, demographic, and economic characteristics were included as control variables to account for factors that may be associated with public assistance receipt.

One control variable was sourced from the DHA data:

Gender – Binary variable where students were coded as "1" for male, and "0" otherwise.

Three control variables were sourced from MDE data:

Chronic Absenteeism Prior to Survey – Binary variable where students were coded as "1" if they had 18 or more absences in the academic year preceding taking the LST Middle School Health Survey, and "0" otherwise.

Proficient or Above on the MAP/PARCC English Language Art (ELA) Test Prior to Survey – Binary variable where students were coded as "1" if scoring "Proficient" or "Advanced" on their first MAP/PARCC ELA test in the grade preceding the one in which they took the LST Middle School Health Survey, and "0" otherwise.

One student-level variable was sourced from data from the Mississippi Department of Human Services (MDHS):

Public Assistance Benefits Receipt Prior to Survey – Binary variable where students were coded as "1" if they received SNAP benefits within one academic year before taking the LST Middle School Health Survey, and "0" otherwise.

ANALYTICAL STRATEGY

For each of the two non-cognitive competencies, a separate logistic regression was fitted. Each regression model includes an interaction between the 7th- and 9th-grade scores, which tests whether the association of 9th-grade non-cognitive competency with SNAP receipt depends on the 7th-grade level (and vice versa). This specification captures whether a student's trajectory (stability, improvement, or decline) of non-cognitive competencies from middle school to early high school relates to the outcome.

For any non-cognitive competency showing a significant association with SNAP receipt, additional models were fitted to estimate whether this association varies by gender across different gender (i.e., separate estimate for male and female samples).

DHA provided 145 students who completed survey items on relationship skills and self-management in both 7th and 9th grade. After matching the DHA survey student list with MDE records, 84 students either graduated or dropped out from high school before AY 2023 had valid and complete DHA, MDE, and MDHS data for the analysis

Because the models stratified gender and prior-SNAP receipt involve small subsamples, the Firth Correction was applied to reduce small-sample bias. The results were reported with unexponentiated coefficients, standard errors, odds ratios, and the number of observations.

DATA SUPPRESSION

In accordance with SLDS Rules and Regulations, numeric values less than 10 are suppressed along with the accompanying percentages. These suppressed values are replaced with the "<10" symbol, and the accompanying percent is replaced with the "---" symbol. Additionally, information calculated using MDE data is suppressed if the percentage is either less than 5% or greater than 95%. Suppressed values are replaced with the "<5.0" and ">95.0" symbols, respectively, and the accompanying numeric values are replaced with the "---" symbol.

RESULTS

TABLE 1. DESCRIPTIVE STATISTICS FOR MULTIVARIATE ANALYSIS

	Mean	Standard Deviation
Outcomes		
% SNAP Receipt within Three Years of Exiting High School (1=yes)	33.3	-
Independent Variables (Non-cognitive Competency Skills)		
Self-management in 7th grade	3.8	0.9
Self-management in 9th grade	4.1	0.6
Relationship Skill in 7th grade	4.5	0.6
Relationship Skill in 9th grade	4.4	0.7
Independent Variables (School Performance Prior to The Survey)		
% Chronic Absenteeism Prior to Survey (1=yes)	<5.0	-
% Proficient or Above on the MAP/PARCC ELA Test Prior to Survey (1=yes)	<5.0	-
Background Characteristics		
% Gender(1=male)	51.2	-
% SNAP Benefits Receipt Prior to Survey (1=yes)	67.9	-

TABLE 2. RELATIONSHIP BETWEEN TRAJECTORY OF RELATIONSHIP SKILL AND SNAP RECEIPT

	Coefficient	Standard Error	Odds Ratio
Relationship Skill in 7th Grade × Relationship Skill in 9th Grade	0.804*	0.394	2.234
Relationship Skill in 7th Grade	-0.048	0.328	0.953
Relationship Skill in 9th Grade	-0.193	0.285	0.824
Gender (1=male)	0.364	0.511	1.439
Chronic Absenteeism Prior to Survey (1=yes)	-0.857	1.354	0.424
Proficient or Above on the MAP/PARCC ELA Test Prior to Survey (1=yes)	0.904	1.336	2.469
SNAP Benefits Receipt Prior to Survey (1=yes)	1.803*	0.701	6.068
Total Observations	***84***		

*Note: !p<.10, *p<.05, **p<.01, ***p<.001* (two-tailed test).

TABLE 3. RELATIONSHIP BETWEEN TRAJECTORY OF SELF-MANAGEMENT AND SNAP RECEIPT

	Coefficient	Standard Error	Odds Ratio
Self-Management in 7th Grade × Self-Management in 9th Grade	0.106	0.294	1.111
Self-Management in 7th Grade	0.048	0.248	1.049
Self-Management in 9th Grade	0.262	0.268	1.300
Gender (1=male)	-0.312	0.505	0.732
Chronic Absenteeism Prior to Survey (1=yes)	-0.267	1.319	0.766
Proficient or Above on the MAP/PARCC ELA Test Prior to Survey (1=yes)	-0.095	1.266	0.909
SNAP Benefits Receipt Prior to Survey (1=yes)	1.344*	0.627	3.834
Total Observations	***84***		

*Note: !p<.10, *p<.05, **p<.01, ***p<.001* (two-tailed test).

TABLE 4. RELATIONSHIP BETWEEN TRAJECTORY OF RELATIONSHIP SKILL AND SNAP RECEIPT BY GENDER

Variables	MALE			FEMALE		
	Coefficient	Standard Error	Odds Ratio	Coefficient	Standard Error	Odds Ratio
Relationship Skill in 7th Grade × Relationship Skill in 9th Grade	1.549!	0.825	4.707	0.383	0.498	1.467
Relationship Skill in 7th Grade	-1.529!	0.878	0.217	-0.087	0.450	0.917
Relationship Skill in 9th Grade	-0.460	0.509	0.631	-0.157	0.385	0.855
Chronic Absenteeism Prior to Survey (1=yes)	-4.682	3.055	0.010	---[1]	---[1]	---[1]
Proficient or Above on the MAP/PARCC ELA Test Prior to Survey (1=yes)	-0.669	2.437	0.512	0.912	1.628	2.489
SNAP Benefits Receipt Prior to Survey (1=yes)	8.935*	4.523	>9.999	0.373	0.837	1.452
Total Observations	***43***			***41***		

*Note: [1] Among the 41 female participants, only one had chronic absenteeism before the survey. Because there's almost no variation for this variable among female samples, the regression software automatically excluded this variable. !p<.10, *p<.05, **p<.01, ***p<.001* (two-tailed test).

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