[ERA-8] The Effect of School-Based Diversity on Long-Term Economic Opportunity: Evidence from Education and Workforce Data in Maryland

Created: 10/24/2018
Updated: 11/15/2018

Status:	Under Review
Project Title:	The Effect of School-Based Diversity on Long-Term Economic Opportunity: Evidence from Education and Workforce Data in Maryland
Abstract or Brief Description:	Over the last several decades, there has been a large shift in demographics of the U.S., particularly in urban communities, raising questions about the effects of increased diversity on both short-term schooling outcomes -- where debates regarding inclusion and integration largely have played out -- and long-term economic opportunity. This project will examine how school-based diversity -- defined by the racial, ethnic, and language composition within schools -- predicts college enrollment and persistence, and wages. To do so, we will use K-12 education data from MSDE, higher education data from MHEC, and wage data from DLLR. We also will leverage several identification strategies, including exploiting within-school variation over time, to limit sources of bias due to non-random sorting of students to schools.
Research Project Question:	What is the effect of diversity based on race, ethnicity, native language, and country of origin on longer-term economic opportunity, as measured by college going, college graduation, and wages?
Research Agenda Questions:	2. Are Maryland students academically prepared to enter postsecondary institutions and complete their programs in a timely manner?
Benefit to the State of Maryland:	The findings of this study will help to disentangle the roles of student, school, and neighborhood demographic characteristics to help policy makers determine the best areas in which to intervene.
Explanation of Cross-Sector Qualities:	This project focuses on data from K-12, higher education, and labor.
Proposed Center Output:	This project is expected to result in the following MLDS Center products: (1) Research series presentation(s) (2) Research report(s).
Estimated Timeline for the Proposed Project:	Roughly two years
Plans for Further Development:	We plan to submit results to academic conferences (e.g., American Educational Research Association, Association for Education Finance and Policy, Association for Public Policy and Management) and academic journals (e.g., Education Evaluation and Policy Analysis, Education Finance and Policy).
Researcher Applicant Name:	Dr. David Blazar

Researcher Email Address:	dblazar@umd.edu
Researcher Organization:	University of Maryland College Park
Researcher Phone Number:	6175498909
Research Applicant Background and Qualifications:	Dr. Blazar is a member of the MLDS research team. He is an Assistant Professor of Education Policy and Economics at the University of Maryland College Park. He received his doctorate in Quantitative Policy Analysis in Education (focus in economics) at the Harvard Graduate School of Education.
Grant Funds:	Yes, I plan to apply for grant funds for this project.
Description of Grant Program:	The Russell Sage Foundation is the principal American foundation devoted exclusively to research in the social sciences. The foundation serves as a research center for academics and journalists, a funding source for studies by scholars at other academic and research institutions, and an active member of the nation's social science community. The foundation also publishes books and a journal that derive from the work of its grantees and visiting scholars. RSF funds research projects in four principal programs—Behavioral Economics; the Future of Work; Race, Ethnicity, and Immigration; and Social Inequality—and in a number of special initiatives. RSF also hosts working groups that develop and cultivate original social science research in new or understudied fields.
Name of Grantor:	Russell Sage Foundation
RFP or Grant Program Information:	http://www.russellsage.org/research/funding/race-ethnicity-immigration
Amount of Grant Funds Sought / Awarded:	Roughly $175,000
Grant Application Date:	11/30/2018
Letter of Support:	Yes
Intent to Proceed Without Grant:	Yes

High School Determinants of STEM College and Career Outcomes

National Science Foundation (NSF)
EHR Core Research (ECR)
Level II ($1,500,000 for 3 years)
Due date: January 24, 2019

https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504924

Principal Investigator: Dr. Jane Lincove, Investigator, MLDS Center
Co-Principal Investigators: Dr. Angela K. Henneberger, Research Director, MLDS Center
David Blazar (UMCP)
Researchers: Kalena Cortes (Texas A&M), Rachel Durham (BERC), Tracy Sweet (UMCP),
Meagan Garvin (UMBC)

November 26, 2018

Abstract

Nationally, there is focus on preparing students to enter middle and high skilled jobs, which offer higher wages and better benefits than low skilled jobs. The advancements in science, technology, engineering, and math (STEM) industries, research, and development, and subsequently the need for middle and high skilled STEM workers are a major driver in preparing students for college and career. Maryland is a strong performer in STEM secondary, postsecondary, and workforce production; however, competing states significantly outproduce Maryland in terms of STEM graduates, STEM workforce development, and STEM-based economic development. Furthermore, there is an under-representation of minority and low income students in STEM fields. Examining the high school determinants of STEM college and career outcomes is critical for determining the best policies to implement to increase Maryland's STEM production. This proposed study will provide insight into how to improve pathways to STEM careers for all students by examining how high school resources influence these pathways.

Significance and Background

Introduction

STEM workforce development is a vital issue for the US and Maryland. A 2006 study reported that Maryland ranks second in the nation in professional and technical workers as a percentage of the workforce and has over 220,000 workers employed in professional, scientific, and technical service industries (Towson University/Maryland Department of Business and Economic Development, 2006). The state's STEM-related industries account for millions of dollars in economic investment. But, with an aging workforce, significant shortfall in qualified K-12 STEM teachers, and a rapidly changing economic and social environment, Maryland cannot assume that it can maintain this advantage unless and until it attends to the emerging challenges facing the state in STEM education and workforce development. Indeed, while national assessments of education quality, education level of workforce, and R&D volume place Maryland among the nation's leaders, Maryland already suffers from a shortage of highly qualified STEM workforce. We have approximately 6,000 STEM openings a year and we produce approximately 4,000 STEM graduates, one of the largest STEM workforce deficits among Maryland's competitor states (Pathmore, 2008).

Maryland is a strong performer in STEM secondary, postsecondary, and workforce production; however, competing states significantly outproduce Maryland in terms of STEM graduates, STEM workforce development, and STEM-based economic development (STEM Taskforce, 2009). However, strengthening Maryland's STEM secondary, postsecondary, and workforce production is critical for maintaining and enhancing Maryland's status as a leader and strengthening the State's education and workforce development. Furthermore, there is an under-representation of minority and low income students in STEM fields. Because STEM jobs require post-secondary training, examining the high school determinants of STEM college and career outcomes is critical for determining the best policies to implement to increase Maryland's STEM production.

STEM Shortage

Maryland's STEM taskforce report outlines a problematic shortfall in STEM workforce development:

"For the approximately 6,000 STEM job openings each year, Maryland's institutions of higher education are graduating about 4,000 STEM graduates. The higher education pipeline begins in the P-12 schools with strong elementary and middle school teachers who have experienced high quality, integrated STEM teacher preparation programs. To build the pipeline will require an investment at every stage of that pipeline. States that are successfully inducing growth in STEM industries have more STEM graduates per year than STEM job openings. Maryland lags behind

its identified competitor states, ranking eighth out of 11 states in the ratio of STEM graduates to STEM jobs. To meet its STEM workforce needs, Maryland is forced to rely upon imported STEM talent, a source that is becoming less reliable as more states seek to grow their knowledge-based economy."

While Maryland has excellent 2- and 4-year degree program to fill high-tech workforce needs, not all high school students have the secondary training to qualify for these programs, and access to STEM fields in college is inequitably limited for low-income students and students of color. The Governor and General Assembly have taken steps to make college more affordable, but the STEM Task Force Reports that, "We need to do more to enlarge the pool of STEM undergraduates and to bolster the production of STEM graduates." Making new investments at the secondary level (innovative curricula, hands-on experience, etc.) requires an understanding of existing resources and resource gaps and how these factors help or hinder workforce development.

Underrepresentation of Minority and Low Income Students in STEM

"As the Maryland high school demographics change over the next two decades, Maryland will need to draw more heavily on its population of minority and economically disadvantaged students to meet its demand for STEM- ready workers. Historically, these students have been underrepresented in the STEM education pipeline. The state must expand its efforts to reach across the entire state to seek potential STEM students, especially in traditionally underserved and underrepresented communities. And, it must provide higher education institutions with the financial resources they need to increase their capacity to successfully guide students through a STEM major, ensuring that they have the knowledge and skills to enter and succeed in a Maryland STEM career." (STEM Task Force Report).

The Importance of High School Determinants

Central to increasing Maryland's STEM postsecondary and workforce production is examining the high school determinants of STEM college and career outcomes. As stated in the STEM Task Force Report: "The keystone effort to create the competitive workforce of the 21st century, from the middle-skills jobs to the Ph.D. scientists and engineers, is the preparation students receive in elementary, middle, and high school. This preparation will ensure that those students seeking a two- or four-year degree will successfully transition to college and that those students who wish to immediately enter the workforce will be qualified to do so and will be equally qualified to pursue any level of higher education they desire. Second, this commitment must be coupled with a pledge to secure the resources and support necessary to ensure that all students meet the high expectations and requirements set for them." (STEM Task Force Report).

A number of recent Maryland policy initiatives focus on expanding STEM access at the secondary into postsecondary levels, including expansion of Maryland pathways in technology

early college high school (P-TECH), where students graduate with a high school diploma and a no-cost, two year associate degree in a STEM field in six years or less and receive "first in line" consideration for STEM jobs. Furthermore, Maryland is a national leader in advanced placement (AP) course taking and test scores, and the Maryland State Department of Education (MSDE) has funded curricular alignment between secondary and postsecondary, with a specific focus on engineering, biomedical sciences, and environmental science fields. For example, USM institutions now include three years of science and three years of mathematics, with a minimum requirement of Algebra II.

The Current Study

The purpose of this study is to examine the high school determinants of STEM postsecondary and workforce production in Maryland. This study will identify issues that may be hampering state progress in producing STEM workers including racial, ethnic, and income inequality in access to STEM education in HS. Two related major issues will be the focus of this study: 1) The underrepresentation of minority and low-income students in high school STEM courses that feed into STEM majors, and 2) the lack of qualified teachers in STEM fields. The findings of this study will help State policymakers identify the most appropriate policy and practice recommendations to improve the production of STEM workers in Maryland, including the development of a pipelines of effective teachers in STEM fields.

Research Questions

This proposal will focus on STEM pathways from high school to STEM majors in 2-year and 4-year colleges and into STEM careers. Specifically, this proposal will examine:

1. To what degree do high school STEM resources influence the pathways of students from high school to STEM careers?
2. Do inequities in the distribution of high school STEM resources contribute to underrepresentation of female students, black students, Hispanic students, low-income students, and other groups in STEM majors and careers?
3. Is the pipeline of STEM teachers meeting the needs of Maryland high schools in a way that support workforce development?

Research Design and Methods

The Maryland Longitudinal Data System (MLDS) is Maryland's statewide repository for individual-level education and workforce data that are longitudinally linked across three state agencies: (1) the Maryland State Department of Education (MSDE); (2) the Maryland Higher Education Commission (MHEC); and (3) the Department of Labor, Licensing and Regulation (DLLR). Data are linked using students' social security number (SSN), state assigned student

identification (SASID) number (for education data), name, date of birth, and demographics. Greater than 95% of student high school records can be linked to either a higher education or a workforce record. The MLDS currently houses data from academic years 2007-08 through 2017-18, and there are close to 7 million distinct student and employee records.

Measures

STEM skills will be measured using administrative records of state standardized tests, including annual assessment of math performance in middle school and high school exams in algebra and biology, SAT and other exam scores, and course completion.
HS STEM resources will be measured by aggregating data in MSDE records on teachers, STEM courses offered, AP courses, and aggregate student performance on state exams and SATs.
High school graduation will be measured using administrative records from MSDE to determine attainment of a regular high school diploma from a Maryland public high school.
College enrollment and degree attainment will be measured using administrative records from MHEC for Maryland 2-year and 4-year public and private colleges and the National Student Clearinghouse (NSC) for out-of-state colleges. STEM major and STEM degree attainment will be examined and aggregated to the high school level.
Workforce wages and industry will be measured using administrative records from DLLR. A quarterly wage is provided for each quarter in which an individual worked for a company in Maryland that is eligible for unemployment insurance (UI). Wages will be summed across quarters within a year to create yearly earnings. STEM industries will be identified using industry NAICS code.

Analytic Plan

High School to STEM pathways

The relationship between high school resources and STEM college and career pathways will be estimated through econometric modeling of student outcomes as a function of both individual characteristics and school aggregate characteristics.

We will begin with a descriptive analysis of the distribution of STEM resources across public high schools in Maryland, focusing on the intersection of human capital, courses, magnet programs, and peer groups. We will identify differences in resources across districts and high schools, as well as across gender, race/ethnicity, and income groups within districts and schools.

Next, we will attempt to identify association and causal relationship between high school resources and post-secondary outcomes. The first strategy estimates student outcomes as function of individual and high school characteristics. In this study, we will estimate persistence

on STEM careers pathways (hs graduation, entering a STEM degree program, completing a STEM degree program, and entering the STEM workforce) as a function of student performance on STEM standardized tests and high school resources in STEM. Because student's sort non-randomly into high schools, basic regression estimates cannot isolate the effect of high school resources on students. Following Black, Lincove, Cullinane, and Veron (2015), we get a better estimate of the causal effect of school characteristics by using a longitudinal sample of high school students and including both time-varying high school resources and high school fixed effects. In this way, we exploit changing high school resources (e.g. expanded AP courses or more highly-qualified STEM teachers) to estimate the effect of increased resources on student outcomes. As long as resource changes are exogenous to student demographics (a testable assumption), the fixed effects model will provide insight into whether investments (or disinvestments) in STEM are associated with college and workforce outcomes for students.

The second strategy will use advanced matching techniques to compare STEM outcomes for students with similar observable ability through middle school but who attend high schools with different levels of resources for STEM. Through state assessment scores, we can identify students with strong STEM skills through middle school. Advanced matching techniques allow us to compare similar student populations (by demographics and middle school performance) who were and were not exposed to "treatment" of different types of STEM resources (such as AP courses offered in high school, highly qualified STEM teachers, etc). We can then estimate a causal effect of these "treatments" on entry into post-secondary training and employment in STEM.

STEM Teacher Pipeline

The role of the STEM teacher pipeline will be examined by describing the STEM teacher workforce in the state in terms of education, training, certification, and demographics. We will then measure the distribution of STEM teachers across high school relative to student demographics. We also will examine "leaks" in the STEM teacher pipeline at each of several stages, focusing in particular on recruitment, placement, and retention. All three of these analyses are descriptive in nature and will rely on basic descriptive statistics.

Finally, we will use regression analysis to estimate the effect of STEM teachers and their qualifications on student entry into post-secondary STEM training and careers. The key threat to validity for drawing causal conclusions is the non-random sorting of students to teachers. However, several experimental studies indicate that bias due to these processes can be eliminated by controlling for students' prior performance (Blazar, 2018; Kane & Staiger, 2011; Kane et al., 2013). Our regression analysis will look both at predictors of teacher placement in different types of high schools, and at the relationship between teacher qualifications and post-secondary outcomes for students.

MLDS Research Agenda

This proposal is responsive to the following questions on the MLDS Center research agenda:

- *Are Maryland students academically prepared to enter postsecondary institutions and complete their programs in a timely manner?*
- *Are exiters of Maryland colleges successful in the workforce?*
- *Assess STEM post-graduate student state and regional job acceptance and retention.*
- *What are the workforce outcomes for Maryland students who earn a high school diploma (via high school graduation or GED®) but do not transition to postsecondary education or training?*
- *What are the workforce outcomes for Maryland high school students who complete Career Technical Education coursework, who either enter the workforce directly or also obtain postsecondary education or training?*

Evaluation of a state or federal education program

This work evaluates Maryland public high schools and postsecondary institutions (e.g., their ability to educate students to prepare for STEM, with a specific focus on minority and low income students).

Cross-sector

This research is cross-sector by incorporating data from Maryland high school students, data on college enrollments and degree, and workforce industry and wages.

Benefit to the State of Maryland

Development of the STEM workforce requires investment in students before they reach college. This study will identify issues that may be hampering state progress in producing STEM workers in Maryland by identifying high school factors that facilitate or hinder STEM career pathways, with attention to the most vulnerable high school populations. The findings of this study will help State policymakers identify the most appropriate policy and practice recommendations to improve the production of STEM workers in Maryland including strategies to improve the pipeline STEM teachers in a way that support workforce development.

Available Resources

As a team, we have substantial capacity to complete this work, including strong pre-existing relationships with agency partners. The investigators on this project have ample experience with developmental science, education policy, and advanced statistical analyses. We have access to doctoral students and sufficient work space to complete the work at the University of Maryland Baltimore County, the University of Maryland School of Social Work, and the College of

Education. Funding from NSF will provide effort support for the faculty and graduate students working on the project. In addition, this project will include 1-2 senior researchers as advisors and mentors for our empirical work.

Center Product and Further Development

- **MLDS Center products.** This project is expected to result in the following MLDS Center products:
  (1) Research series presentation(s)
  (2) Research report(s).

- **Further development.** We plan to submit results to academic conferences (e.g., Association for Public Policy Analysis and Management; American Educational Research Association) and academic journals (e.g., *Journal of Research on Educational Effectiveness; Education Evaluation and Policy Analysis*).

Timeline

Grant application due: January 24, 2019

Earliest funding date: August 24, 2019

Grant duration 3 years from funding date

We will resubmit in October 2019 if proposal is rejected with recommendations.

References

STEM Task Force. (2009). Investing in STEM to Secure Maryland's Future. Retrieved from https://mbrt.org/wp-content/uploads/2009/stem-task-force-report.pdf, November 2018.

CURRICULUM VITAE

JANE ARNOLD LINCOVE

EDUCATION

Ph.D	2005	University of Southern California, Public Policy
MPP	2001	UCLA, Public Policy
BS	1995	Northwestern University, Speech

Experience in Higher Education

2016-present	UMBC, Associate Professor, Public Policy
2016-present	Research Fellow, Tulane University, Economics
2017-present	Research Staff, Maryland Longitudinal Data System Center
2014-2016	Tulane University, Associate Center Director, Economics
2014-2016	Tulane University, Research Assistant Professor, Economics
2006-2014	University of Texas at Austin, Assistant Professor, Public Policy
2005-2006	University of Texas at Austin, Postdoctoral Fellow, Public Policy

PUBLICATIONS, PRESENTATIONS, AND CREATIVE WORKS

Publications

Peer-reviewed works

Cortes, Kalena and **Lincove, Jane Arnold**. Match or Mismatch? Automatic Admissions and College Preferences of Low- and High-Income Students. *Educational Evaluation and Policy Analysis* (accepted for publication).

Lincove, Jane Arnold, Valant, Jon, and Cowen Joshua M. You Can't Always Get What You Want: Capacity Constraints in a Choice-Based School System. *Economics of Education Review* (available online).

Black, Sandra, Cortes, Kalena, and **Lincove, Jane Arnold**. Apply Yourself: Racial Differences in College Application Behavior. *Education Finance and Policy* (accepted for publication).

Lincove, Jane Arnold, Barrett, Nathan, and Strunk, Katharine O. (2018) Lessons from Hurricane Katrina: The Employment Effects of the Mass Dismissal of New Orleans Teachers. *Educational Researcher*, 47(3), 191-203.

Lincove, Jane Arnold, Cowen, Joshua, and Imbrogno, Jason (2018). What's in Your Portfolio? How Parents Rank Traditional Public, Private, and Charter Schools in Post-Katrina New Orleans' Citywide System of School Choice. *Education Finance and Policy*, 13(2), 194-226.

Walsh, Julie A., Bush-Mecenas, Susan, Strunk, Katharine O., **Lincove, Jane Arnold**, and Huguet, Alice (2017). Evaluating Teachers in the Big Easy: How Organizational Context

Shapes Policy Responses in New Orleans. *Educational Evaluation and Policy Analysis*, 39(4), 539-570.

Von Hippel, Paul, Osborne Cynthia, **Lincove, Jane Arnold**, Mills, Nicholas, and Bellows, Laura (2016). Teacher Quality Difference between Teacher Preparation Programs: How Big? How Reliable? Which Programs are Different? *Economics of Education Review,* 53(1), 31-45.

Black, Sandra, Cortes, Kalena, and **Lincove, Jane Arnold** (alphabetic authorship) (2016). Efficacy vs. Equity: What Happens when States Tinker with College Admissions in a Race-Blind Era? *Educational Evaluation and Policy Analysis*, 38(2), 336-363.

Lincove, Jane Arnold & Parker, Adam (2016). The Influence of Conditional Cash Transfers on Eligible Children and Their Siblings. *Education Economics,* 24(4), 352-373.

Lincove, Jane Arnold, Osborne, Cynthia, Mills, Nick, and Bellows, Laura (2015). Teacher Preparation for Profit or Prestige: Analysis of a Diverse Market for Teacher Preparation Programs. *Journal of Teacher Education*, 66(5), 415-434.

Black, Sandra, **Lincove, Jane Arnold**, Cullinane, Jenna, & Veron, Rachel (2015). Can You Leave High School Behind? *Economics of Education Review,* 46(2), 52-63.

Lincove, Jane Arnold (2015). Improving Identification of Demand-side Obstacles to Schooling: Findings from Revealed and Stated Preference Models in Two SSA Countries, *World Development,* 66(1), 69-83.

Lincove, Jane Arnold, Osborne, Cynthia, Mills, Nick, & Dillon, Amanda (2014). The Politics and Statistics of Value-Added Modeling for Accountability of Teacher Preparation Programs, *Journal of Teacher Education,* 65(1), 24-38.

Lincove, Jane Arnold (2012). The Influence of Price on School Enrollment under Uganda's Policy of Free Primary Education, *Economics of Education Review,* 31(5), 799-811.

Barczyk, Amanda N. & **Lincove, Jane Arnold** (alphabetical authorship) (2010). Cash and Counseling: A Model for Self-directed Care Programs to Empower Individuals with Serious Mental Illnesses. *Social Work in Mental Health,* 8(3), 209-224.

Lincove, Jane Arnold (2009). Determinants of Schooling for Boys and Girls in Nigeria under a Policy of Free Primary Education. *Economics Education Review,* 28(40), 474-484.

Lincove, Jane Arnold (2009). Are Markets Good for Girls? The World Bank and Neoliberal Education Reforms in Developing Countries. *Whitehead Journal of Diplomacy*, 10(1), 59-76.

Lincove, Jane Arnold (2008). Growth, Girls' Education, and Female Labor: A Longitudinal Analysis, *Journal of Developing Areas*, 41(2), 45-68.

Lincove, Jane Arnold (2006). Efficiency, Equity and Girls' Education, *Public Administration and Development*, 26, 339-357.

Lincove, Jane Arnold & Painter, Gary (alphabetical authorship). (2006) Does the Age that Children Start Kindergarten Matter? Evidence of Long-Term Educational and Social Outcomes. *Educational Evaluation and Policy Analysis*, 28(2), 153-179.

Non-peer-reviewed works

Cortes, Kalena and Lincove, Jane Arnold (alphabetical authorship) (2016). Can Admissions Percent Plans Lead to Better Collegiate Fit for Minority Students? *American Economic Review: Papers & Proceedings*, 106(5): 348–354

Lincove, Jane Arnold and Cortes, Kalena (2016). Match or Mismatch? Automatic Admissions and College Preferences of Low- and High-Income Students. NBER Working Paper #22559. National Bureau of Economic Research.

Black, Sandra, Cortes, Kalena, and **Lincove, Jane Arnold** (alphabetical authorship) (2015). Academic Undermatching of High-Achieving Minority Students: Evidence from "Race-Neutral" and Holistic Admissions Policies. *American Economic Review: Papers & Proceedings*, 105(5), 604-610.

Arce-Trigatti, Paula, Harris, Doug, Jabbar, Huriya, and **Lincove, Jane Arnold** (2015). Many Options in New Orleans Choice System. *Education Next*, 15(4).

Black, Sandra E., Cortes, Kalena, and **Lincove, Jane Arnold** (alphabetical authorship) (2015). Apply Yourself: Racial Differences in College Application Behavior. NBER Working Paper #21368. National Bureau of Economic Research.

Lincove, Jane Arnold (2014). Access to Education. In *Encyclopedia of Education Economics and Finance.* Dominic Brewer and Lawrence Picus (Eds.) Thousand Oaks, California: SAGE Publications.

Lincove, Jane Arnold (2014). Demand for Education. In *Encyclopedia of Education Economics and Finance.* Dominic Brewer and Lawrence Picus (Eds.) Thousand Oaks, California: SAGE Publications.

Black, Sandra E., Cortes, Kalena, and **Lincove, Jane Arnold** (alphabetical authorship) (2014). Efficacy vs. Equity: What Happens When States Tinker with College Admissions in a Race-Blind Era? NBER Working Paper #20804. National Bureau of Economic Research.

Black, Sandra E., **Lincove, Jane Arnold**, Cullinane, Jenna, and Veron, Rachel (2014). Can You Leave High School Behind? NBER Working Paper #1982. National Bureau of Economic Research.

Cullinane, Jenna (primary author) & Lincove, Jane Arnold (2014). The Effect of Institutional Inputs on Time to Degree for Traditional and Non-traditional College Students.

Texas Workforce Data Quality Initiative Working Paper. Ray Marshall Center, University of Texas at Austin.

Osborne, Cynthia, **Lincove, Jane Arnold**., et.al. (2012). Technical Report: Educator Preparation Programs' Influence on Student Achievement in Texas. PEEQ Working Paper. Project on Educator Effectiveness and Quality, University of Texas at Austin.

Osborne, Cynthia, **Lincove, Jane Arnold**., et.al. (2012). The Texas Report: Educator Preparation Programs' Influence on Student Achievement in Texas. PEEQ Working Paper. Project on Educator Effectiveness and Quality, University of Texas at Austin.

Lincove, Jane Arnold (2012). Can Teacher Incentive Pay Improve Student Performance? Evidence from a Diverse Implementation. PEEQ Working Paper. Project on Educator Effectiveness and Quality, University of Texas at Austin.

Lincove, Jane Arnold (2011). Risk Aversion and the Design of Teacher Incentive Pay. PEEQ Working Paper. Project on Educator Effectiveness and Quality, University of Texas at Austin.

Lincove, Jane Arnold (2007). Do Private Markets improve the quality or quantity of primary schooling in Sub-Saharan Africa? Occasional Paper No. 136. National Center for the Study of Privatization in Education. New York, NY.

Lincove, Jane Arnold (2007). Do Private Markets improve the quality or quantity of primary schooling in Sub-Saharan Africa? USAID EdData Working Paper.

Lincove, Jane Arnold (2006). The Effect of Costs on Primary Schooling for Boys and Girls in Nigeria. USAID EdData Working Paper.

Works submitted or in preparation

Weixler, Lindsay, Lincove, Jane Arnold, and Gerry, Alica. The Provision of Pre-K in the Absence of Centralized School Management (submitted).

Arce-Trigatti, Paula, Lincove, Jane, Harris, Doug, and Jabbar, Huriya. Is There Choice in School Choice? (submitted)

Strunk, Katharine, Barrett, Nathan, and Lincove, Jane Arnold. When Tenure Ends: The Short-run Effects of the Elimination of Louisiana's Teacher Employment Protections on Teach Exit and Retirement (submitted)

Lincove, Jane Arnold, Barrett, Nathan, and Strunk, Katharine. Revisiting the Hedonic Wage Function for Teachers: Evidence from Non-Unionized Charter Schools (in preparation)

Lincove, Jane Arnold, Barrett, Nathan, and Strunk, Katharine. Overworked or Underpaid: Principal Compensation in Charter Schools (in preparation)

Lincove, Jane Arnold, Carlson, Deven, and Barrett, Nathan. System-Wide Effects of Decentralization on School Staffing: Evidence from New Orleans (in preparation)

Presentations

Conference/Poster Presentations (juried)

"System-Wide Effects of Decentralization on School Staffing: Evidence from New Orleans," APPAM, Chicago, Illinois, November 2017.

"Transportation in School Choice Cities" AEFP, Washington, D.C., March 2017.

"Overworked or Underpaid: Principal Pay in Charter Schools" AEFP, Washington, D.C., March 2017.

"Overworked or Underpaid: A Longitudinal Analysis of Principal Compensation in a Context of Increasing School Autonomy" APPAM, Washington, DC., November 2016.

"When Tenure Ends: The Short-run Effects of the Elimination of Louisiana's Teacher Employment Protections on Teacher Exit and Retirement" APPAM, Washington, DC., November 2016.

"Revisiting a Hedonic Wage Function for Teachers: Charter Schools and Compensating Differentials." AEFP, Denver, Colorado, March 2016.

"Match or Mismatch: The Role of College Readiness, High School Peers, and Admissions Uncertainty in College Application and Enrollment Behavior." APPAM, Miami, Florida, November 2015.

"Revisiting a Hedonic Wage Function for Teachers: Charter Schools and Compensating Differentials." APPAM, Miami, Florida, November 2015.

"Revisiting a Hedonic Wage Function for Teachers: Charter Schools and Compensating Differentials." SEA, New Orleans, Louisiana, November 2015.

"You Have to Apply Yourself: Racial and Ethnic Differences in College Application." AEFP, Washington, DC, February 2015.

"Is There Choice in School Choice? Differences and Similarities in New Orleans Charter Schools." International Conference on School Choice Research, Ft. Lauderdale, Florida, January 2015.

"You Have to Apply Yourself: Racial and Ethnic Differences in College Application" SEA, Atlanta, Georgia, 2014

"You Have to Apply Yourself: Racial and Ethnic Differences in College Application." APPAM, Albuquerque, New Mexico, November 2014

"Tests, Courses, or High Schools: Predicting College Success with College Readiness Measures." AEFP, San Antonio, Texas, March 2014

"Training Teachers for Profit or Prestige." AEFP, San Antonio, Texas, March 2014.

"The Bumpy Path to College Graduation." APPAM, Washington, DC, November 2013.

"Can You Leave High School Behind?" AERA, San Francisco, California, April 2013.

"The Politics and Statistics of Value-added Modeling for Accountability." AEFP, New Orleans, Louisiana, March 2013.

"District Choices for Teacher Incentive Pay and the Implications for Equity and Achievement." APPAM, Baltimore, MD, November 2012

"Can Teacher Incentive Pay Improve Student Performance on Standardized Tests?" AEFP, Boston, MA, March 2012.

"Can Teacher Incentive Pay Improve Student Performance on Standardized Tests?" APPAM, Washington, DC, November 2011.

"Designing Teacher Incentive Pay Contracts: Evidence from the Texas DATE Program." AERA, New Orleans, Louisiana, April 2011.

"Risk Aversion and the Design of Teacher Incentive Pay." AERA, Denver, Colorado, April 2010.

"School District Preferences and Teacher Incentive Pay." APPAM, Washington, DC, November 2009.

"Why are Children out of School Under Free Primary Education Policies: A Comparison of Two SSA Countries." CIES, Charleston, South Carolina, October 2009.

"The Distributional Effects of Free Primary Education in Uganda." APPAM, Washington, DC, November 2007.

"Private Education Markets and Universal Primary Education Policy in Four SSA Countries." APPAM, Madison, Wisconsin, November 2006.

Conference/Poster Presentations (invited, not juried)

"Explaining Racial Gaps in College Application Choices." Federal Reserve Bank, Washington, DC, October 2015.

"Competition Between Public, Private, and Charter Schools." The Urban Education Future: Lessons from New Orleans 10 Years after Hurricane Katrina, New Orleans, Louisiana, June 2015.

"Can Teacher Incentive Pay Improve Student Performance on Standardized Tests?" National Academy of Education, Washington, D.C., November 2010

"Lessons from Teacher Incentive Pay in Texas." SEDL, Austin, Texas, August 2010

Other Professional Presentations

Invited Seminars and Colloquia

"School Closure and Teacher Employment and Earnings," Tulane University Department of Economics: External Stakeholder Brown Bag.

"The Teaching Profession in the Era of School Reform," Tulane University. Invited panelist. June 2017.

"Match or Mismatch?" UMBC School of Psychology Doctoral Seminar, Baltimore, MD, April 2017.

"Overworked or Underpaid: How Charter Schools Compensate Principals." UMBC Economics and Policy Seminar Series, Baltimore, MD, December 2016.

"Revisiting a Hedonic Wage Function for Teachers: Charter Schools and Compensating Differentials." Murphy Institute Policy Working Group Seminar, December 2015.

"A 10-year Follow-up on Pre-Katrina Teachers' Employment Outcomes." Education Research Alliance for New Orleans, Policy Brown Bag, December 2015.

"Training Teachers for Profit or Prestige." University of Houston, Education Policy Seminar, Houston, Texas, March 2015.

"Is There Choice in School Choice? Differences and Similarities in New Orleans Charter Schools." Education Research Alliance for New Orleans, Policy Brown Bag, January 2015.

"Demand-side Obstacles to Education in Developing Countries." IDEC – Hiroshima University, Hiroshima, Japan, January 2009

"LBJ's Legacy in Contemporary Social Welfare Policy: Have We Come Full Circle?" LBJ Centennial Conference, Austin, Texas, October 2008.

"Women's Education and Child Health in India." Fulbright-Hays Seminar, Austin, Texas, June 2008.

"Is Free Equal? The Effect of Free Primary Education on Gender Parity in Nigeria and Uganda." Women and Gender Studies New Faculty Seminar, Austin, Texas, February 2008.

Experience in Other than Higher Education

2003-2005	Los Angeles Child Care Alliance, Policy Advisor
2001-2002	Public Works Inc., Program Coordinator
1996-1998	Development Coordinator, Para Los Niños

Honors Received

2015	Newcomb Research Fellow, Tulane University
2014	Most Helpful Professor Award
2009	Most Useful Class Award
2007	LBJ School Best New Faculty
2005	New Scholars Seminar, American Political Science Association

Research Support and/or Fellowships

2018-present	$200,000 IES National School Choice Center, PI
2016-present	$1,000,000, Lyle Spencer Award, Researcher
2014-present	$3,000,000, Laura and John Arnold Foundation, Co-PI
2014-2015	$10,000, Educate Texas, PI
2013-2105	$800,000, US Department of Labor, Researcher
2012-2015	$225,000, US Dept. of Education Investing in Innovation(i3) Fund, PI
2013-2014	$50,000, Texas Higher Education Coordinating Board, PI
2010-2012	$2,500,000, Texas Education Agency, PI
2010-2014	$16,000, Stephen H. Spurr Centennial Fellow, PI
2010-2012	$45,000, Spencer Foundation/Nat'l Academy of Education, Postdoc Fellow
2007-2009	$15,000, Univ. of Texas Policy Research Institute, PI
2007-2008	$1,000, New Faculty Fellowship, PI
2005-2008	$25,000, Texas Health and Human Services Commission, Co-PI
2005-2008	$750,000, Texas Health and Human Services Commission, Co-PI
2005-2006	$5,000, UT Policy Research Institute, PI

PhD Students

Beth Arman (in progress), PhD Public Policy, chair
Tyrone McCoy, (in progress), PhD Public Policy, member
Delana Gregg (in progress), PhD LLC, co-chair
Anne Kellogg (in progress), PhD Public Policy, chair
Amanda Koch (committee forming), PhD Public Policy, chair
David Sears (committee forming), PhD Public Policy, member
Erin Stauder, 2018, PhD Public Policy, member
Whitney Ruble, 2016, PhD economics, member, Tulane University
Matt Farber, 2016, PhD economics, member, UT-Austin
Greg Cumpton, 2016, PhD public policy, chair, UT-Austin
Jenna Cullinane, 2016, PhD public policy, chair, UT-Austin
Kelty Garbee, 2016, PhD educational administration, member, UT-Austin
Elizabeth Barkowski, 2012, PhD education policy, member, UT-Austin
Gloria Lenoir, 2011, PhD education policy, member, UT-Austin

Shannon Stackhouse, 2009, PhD education policy, chair, UT-Austin
John Gasko, 2008, PhD education policy, member, UT-Austin

Masters Students

Shelby Carvalho, 2015, MPP, chair, UT-Austin
William Atkins, 2014, MPP, chair, UT-Austin
Michael Franco, 2013, MPP, chair, UT-Austin
Katherine Dochen, 2012, MPP, chair, UT-Austin
Greg Pardo, 2012, MPP, chair, UT-Austin
Bonnie Doty, 2012, MPP, chair, UT-Austin
Martha Bloem, 2011, MPP, chair, UT-Austin
Katherine Rodriguez, 2010, MPP, UT-Austin
Rachel Veron, 2010, MPP, chair, UT-Austin
Jenna Cullinane, 2010, MPP, chair, UT-Austin
Abbey Goldstein, 2009, MPP, chair, UT-Austin
Susannah Hansen, 2009, MPP, chair UT-Austin
Lindsay Perlmutter, 2009, MPP, chair, UT-Austin
Priscilla Aquino-Garza, 2008, MPP, chair, UT-Austin
John Dooley, 2007, MPP, chair, UT-Austin

Undergraduate Students

Shelby Carvalho, departmental honors thesis, 2010-2011, chair, UT Austin
Daniel Tesfay, departmental honors thesis, 2008-2009, chair, UT Austin

SERVICE

Service at UMBC

Department

2017-18, member, Faculty Search Committee (health policy)
2016-present, member, PhD Examination Committee
2016-present, member, Ad Hoc Committee on Student Exam Policy
2016-present, member, Education Policy Track
2016-present, member, Evaluation Policy Track
2017-present, UMD School of Medicine Dual Degree Advisory Board

Service at Tulane University

University

2014-2016, trained faculty, Title IX Hearing Board
2014-2016, student mentor, Newcomb Faculty Fellows Program

Service at UT Austin

University

2008-2014, member, Student Fulbright Selection Committee
2008-2013, member, Faculty Grievance Committee
2011-2013, advisor, Top 10% Policy Implementation Group
2012-2014, member, Bridging Disciplines Program Curriculum Committee – Public Policy

Department

2013-2014, chair, IT Governance Committee Chair
2005-2015, member, Center for Health and Social Policy Executive Committee
2009-2014, chair, Specialization in Social and Economic Policy
2008, 2009, 2010, 2012, 2013, member, Graduate Admissions Committee
2010-2014, member, PhD Exam Committee
2006, 2008, member, Faculty Search Committee

Professional Service

2017-present, co-chair Human Capital and School Finance Section, *AERA*
2017-present, editorial board, *AERA Open*
2016-present, editorial board, *Educational Evaluation and Policy Analysis*
2016-2018, APPAM Policy Relevance Committee
2017-present, member, Maryland Longitudinal Data System User Group
Multiple years, proposal reviewer, American Education Research Association, Division L
Multiple years, journal reviewer, Journal Review for *Journal of Labor Economics, Educational Evaluation and Policy Analysis, Sociology of Education, World Development, Economics of Education Review, Social Science Quarterly, Journal of Developing Areas, Public Administration and Development, Science,* and others

Community Service

2018-present, BERC Institutional Board, Johns Hopkins University
2017-present, Research and Policy Board Member, MLDS Center
2017-present, Parent Teacher Organizations, Mount Washington School (BCPS)
2015-present, steering committee, New Orleans Educational Equity Index
2012-2014, advisory board, Maplewood Elementary School
2012-2015, advisor, Texas Higher Education Coordinating Board
2010-2014, advisor, Texas Education Agency