5-2015

A Promise Kept in El Dorado? An Evaluation of the Impact of a Universal, Place-Based College Scholarship on K-12 Achievement and High School Graduation

Jennifer W. Ash
University of Arkansas, Fayetteville

A Promise Kept in El Dorado? An Evaluation of the Impact of a Universal, Place-Based College Scholarship on K-12 Achievement and High School Graduation

A Promise Kept in El Dorado? An Evaluation of the Impact of a Universal, Place-Based College Scholarship on K-12 Achievement and High School Graduation

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Education Policy

by

Jennifer W. Ash
University of North Carolina
Bachelor of Arts in Comparative Literature, 2008

May 2015
University of Arkansas

This dissertation is approved for recommendation to the Graduate Council.

_____
Dr. Gary Ritter
Dissertation Direction

_____
Dr. Patrick Wolf
Committee Member

_____
Dr. Jay Greene
Committee Member

Abstract

The El Dorado Promise is a scholarship program that provides approximately $7,818 per year toward college tuition – for up to five years – to public high school graduates in El Dorado, Arkansas who have attended El Dorado schools since at least the ninth grade. The program was announced in January 2007, and students were able to use the college scholarships in the fall of 2007. School leaders in El Dorado hoped that the enhanced access to college would increase student interest, engagement, and achievement throughout the school district. In this study, I use one-to-one student-level matching to estimate the impacts of the El Dorado Promise on student achievement and high school graduation. I find positive overall achievement effects of the program in both math and literacy, a .12 to .15 standard deviation unit increase over the comparison group over a five-year period. Very few El Dorado students experienced the treatment over the maximum period of five years, with the average student experiencing 1.5 years of the treatment. Annual effects of the Promise ranged from 0.06 to 0.08 standard deviation units, meaning that El Dorado Promise students boasted test scores that were roughly 6 to 8 percent of a standard deviation better than their matched peers each year. Effects are larger for certain subgroups of students, particularly high-achieving students. However, a placebo test indicates that only math impacts can be attributed with high confidence to the introduction of the Promise. For graduation rates, I find mixed results, with some estimates producing largely null effects and others suggesting the Promise had a negative impact on high school graduation.

Acknowledgements

I would like to take this opportunity to thank the many people who were instrumental in helping me complete this dissertation and my doctoral work.

First, I would like to thank the El Dorado Promise team, who were generous in sharing their time, resources, and knowledge that made this work possible. In particular, I would like to thank Alice Mahony and Lila Phillips of the El Dorado Education Foundation, Magen Olive and Katie Sandifer of the Murphy Oil Corporation, and Bob Watson and Jim Tucker, former and current superintendent, respectively, of the El Dorado School District. I would also like to thank all of the teachers, counselors, and administrators who participated in interviews and focus groups. I also would like to acknowledge and thank the Murphy Oil Corporation for their financial support of this research; on a related note, I would like to state that I retained full editorial control of the evaluation. I would be remiss if I did not specifically take the time to acknowledge Sylvia Thompson, the El Dorado Promise Director. Sylvia has consistently gone above and beyond to assist with this research effort, and I have enjoyed getting to know her and witnessing her strong commitment to the important work she is doing.

I would also like to thank everyone who provided their suggestions and feedback on earlier versions of this work, including my University of Arkansas classmates and colleagues and conference discussants and participants at the Association for Education Finance and Policy (AEFP), Association for Public Policy Analysis and Management (APPAM), and PromiseNet conferences.

I am fortunate to have had an excellent committee of talented and accomplished education researchers to guide me through the writing of this dissertation and my doctoral coursework. I am grateful to Dr. Jay Greene, for having the vision to create a department that is

truly unique in the education research world and that has afforded me the opportunity to embark on a meaningful career. Dr. Greene has always pushed me to think more deeply about any subject matter in which I engage with him, and I hope to always retain his "big picture" perspective as I progress through my career.

From his program evaluation course in my first semester as a doctoral student to his guidance through the dissertation writing process, Dr. Patrick Wolf has taught me what excellent, careful scholarship is by example. I deeply appreciate the time and careful attention Dr. Wolf has dedicated to helping me improve this work and his encouragement and assistance in starting a career in program evaluation. I consider Dr. Wolf to be a professional role model, whose integrity and collegiality I sincerely admire, and I hope to continue to learn from his example throughout my career.

Finally, I would like to especially thank Dr. Gary Ritter, who has been invaluable to me as a supervisor, mentor, and friend. I am so grateful for Dr. Ritter for all of the opportunities he has given me and for setting me up to take the professional path that was more difficult for me but also more rewarding. Dr. Ritter's passion for his work is contagious, and I am humbled to have had the opportunity to simultaneously hone my skills and serve others through my work with the Office for Education Policy. It has truly been a pleasure to work with you, and thank you for everything.

Finally, I would like to thank my family, immediate and extended, for their support, encouragement, and insistence on making sure I occasionally got some much-needed rest and relaxation. Thank you, and I love you Mom, Dad, Zach, Mim, Robert, Tenzing, and Elwood.

Jennifer Ash

May 2015

Table of Contents

Chapter 1 – Introduction

In July 2011, representatives from the El Dorado Promise, Murphy Oil Corporation, and the El Dorado School District (EDSD) contacted the Office for Education Policy (OEP) at the University of Arkansas to investigate the impacts of the El Dorado Promise scholarship program. Announced in January 2007, the El Dorado Promise offers a college scholarship to all graduates of the El Dorado School District who have been enrolled in the district since at least the ninth grade. The maximum scholarship amount is equal to the cost of the highest annual resident tuition and mandatory fees at an Arkansas public university ($7,889 in 2014-15), and the El Dorado Promise can be used at any accredited two-year or four-year higher education institution in the country. The El Dorado Promise was modeled after the Kalamazoo Promise, which was announced in 2005 and is widely considered to be the first universal, place-based "Promise" program. Like the Kalamazoo Promise and other Promise programs that were created in its wake, the El Dorado Promise was founded to spur economic development in the region, both directly, by making the city and school district more attractive to families, and indirectly, by increasing the proportion of college graduates in the region. While the Promise is expected to work most directly to improve students' higher education outcomes, it is also intended to lead to improvements in the El Dorado School District. The Promise may produce better K-12 outcomes by motivating students directly to prepare themselves for college and by encouraging the district to make changes, potentially leading to higher standardized test scores and graduation rates.

The Office for Education Policy (OEP) first assisted the El Dorado Promise by producing analyses of enrollment and achievement effects for its 2012 Promise anniversary report. Subsequently, representatives from Murphy Oil and the El Dorado Promise asked the OEP for help identifying a researcher to undertake a comprehensive evaluation of the El Dorado Promise.

Unlike the Kalamazoo Promise, which was set up to be funded in perpetuity, Murphy Oil's $50 million dollar commitment was to fund the Promise for twenty years. Therefore, it is plausible that results from this study and subsequent studies could impact decisions about the program design of the El Dorado Promise and support for future funding.

This study represents the K-12 portion of a comprehensive evaluation of the El Dorado Promise and focuses on student achievement and high school graduation; later studies will examine the higher education effects of the El Dorado Promise.

As more and more Promise programs are founded with very different program designs, the definition of what a Promise program is has changed over time. For the purposes of this dissertation, I use the definition put forth by Michelle Miller-Adams, a leading expert on place-based scholarship programs from the W.E. Upjohn Institute for Employment Research. In her forthcoming book *Promise Nation*, she defines "Promise communities" as

> "those that seek to transform themselves by making a long-term investment in education through place-based scholarships. While these programs vary in their structure, they all seek to expand access to and success in higher education, deepen the college-going culture in K-12 systems, and support local economic development."

In short, Miller-Adams identifies three conditions a scholarship program must meet in order to be considered a "Promise program:"

- place-based scholarships: awards scholarships at least partially based on the place in which a student resides and/or attends school;
- long-term commitment: scholarships must be funded or intended to be funded over a long time period;
- intentions for founding program: scholarship program must have been founded with the aims of improving higher education, K-12, and local economic development outcomes.

To this definition, I add a few clarifications of my own. "Local" means a city, school district, or region; it does not apply to a state, and thus statewide merit-based programs like Georgia HOPE and the Arkansas Academic Challenge Scholarship are not included in this definition.

It is undeniable that the number of Promise programs has grown exponentially since the 2005 announcement of the Kalamazoo Promise. Because of varying definitions of Promise programs, it is not possible to provide a precise estimate of the current number of Promise or Promise-like programs; however, by pulling data from four different sources, I estimate there are between 44 and 72 Promise-style programs currently in place.[1]

Promise programs vary considerably in their design characteristics, differing by funding source, eligibility requirements, the amount and prescribed use of scholarship funding, and the higher education institutions at which Promise funding can be used. Table 1 summarizes the different design characteristics of Promise programs. Early Promise programs, like the Kalamazoo and El Dorado Promise programs, were privately funded through philanthropists, community foundations, or corporations; however, some Promise programs, like the programs in the College Bound Scholarship Program in Hammond, IN, are paid for through public funding sources. For eligibility requirements, Promise programs can be either universal or targeted. Targeted programs award scholarships only to students who meet certain academic, behavioral, or income requirements, whereas universal programs typically award scholarships to all students in the district who have been continuously enrolled in, reside in, and graduate from the district.

[1] I use four sources to obtain estimates of the total number of Promise programs: The Upjohn Institute's database of Promise programs updated in February 2015 (http://www.upjohn.org/sites/default/files/promise/Lumina/Promisescholarshipprograms.pdf), the appendix table from LeGower & Walsh (2014), the list of Promise programs from FinAid.org (http://www.finaid.org/scholarships/promise.phtml), and the Cities of Promise website (http://citiesofpromise.com/promise-programs/).

Targeted program requirements may include having a GPA or SAT/ACT score above a certain threshold, completing a certain number of community service requirements, having incurred no disciplinary infractions during high school, being a first-generation college student, or having a family income below a certain amount. Promise programs also vary in the amount of funding provided, with some giving modest one-time awards of $1,000 while others give generous scholarships, like the Pittsburgh Promise, which awards up to $10,000/year for four years. Different programs vary in the uses for the scholarship; some restrict scholarship usage to tuition and fees, while others allow funding to be used for other expenses that make up the full cost of college attendance (e.g. room, board, and books). In addition, there is the distinction between first dollar and last dollar scholarships. First dollar scholarships guarantee the full amount of a Promise scholarship, regardless of other aid a student receives. Last dollar scholarships typically require that students apply for state and federal financial aid by completing a FAFSA and will pay the difference between the aid a student receives and the cost of tuition/fees or the full cost of attendance. Finally, Promise programs vary in whether they are flexible about the higher education institutions at which scholarships can be used, e.g. allowing scholarships to be used at most in-state public institutions, or inflexible, restricting scholarships to a specific institution or set of institutions.

Table 1

Characteristics of Promise Programs

Funding Source	**Eligibility**	**Scholarship Value**	**Eligible Expenses**	**Eligible Postsecondary Programs**
Private Funding (e.g. philanthropies, corporations) Public Funding	Universal (for all students who meet enrollment and residency requirements) Targeted (only for students who meet certain academic, behavioral, or income requirements)	Modest, one-time awards (e.g. $1,000) Generous, multi-year awards (e.g. $10,000/year for 4 years) First dollar Last dollar	Tuition only Tuition and fees Full cost of college attendance (tuition, fees, room, board, books)	Flexible (e.g. all in-state public institutions) Inflexible (e.g. specific, local institutions only)

The number of Promise programs is growing rapidly, despite the fact that there is little evidence (rigorous or otherwise) on their effectiveness. Considering that Promise programs require considerable resources, and in the case of newer programs, increasingly public resources, it is important to build an evidence base on whether Promise programs are achieving their original goals.

The goal of this work is to evaluate the impact of the El Dorado Promise on student achievement, as measured by standardized test scores, and high school graduation. This study is important because it contributes to the scant evidence base of whether Promise programs are having their intended effects, particularly on the K-12 system. While much of the nascent literature on the efficacy of Promise programs has focused on impacts on district enrollment and,

to a much lesser extent, higher education outcomes (as demonstrated in Chapter 2), this study also addresses whether or not the local K-12 school system has improved in the wake of the Promise. This question is important because students can only take advantage of and benefit from the Promise if they graduate from high school; furthermore, students are more likely to be successful in obtaining a higher education credential if they are academically prepared for college-level work. Thus, this research can start to fill an important gap in the literature on the impact of Promise programs on K-12 outcomes.

Research Questions

The evaluation of the impact of the El Dorado Promise on K-12 outcomes was guided by the following research questions and sub-questions:

1) Achievement Impacts: What impact did the El Dorado Promise have on student achievement in the El Dorado School District?
    a. How did El Dorado students in grades 4-8 perform on the Arkansas Comprehensive Testing, Assessment, and Accountability Program (ACTAAP) assessments as compared to matched comparison groups of students from similar districts over a five-year period?
    b. What are the annual impacts of the El Dorado Promise on student achievement as measured by the ACTAAP?
    c. Is there evidence that the introduction of the El Dorado Promise, and not pre-existing differences, led to any potential differences between El Dorado and comparison students on student achievement (placebo test)?
2) Graduation Impacts: What impact did the El Dorado Promise have on high school graduation?

a. Were the graduating classes of 2011 and 2012 El Dorado students more or less likely to graduate from high school on time than matched comparison groups of students from similar districts?
b. Were El Dorado students more or less likely to graduate at all than comparison students?
c. Were El Dorado students more or less likely to graduate from their ninth grade school district on time than comparison students?
d. Were El Dorado students more or less likely to graduate from their ninth grade school district at all than comparison students?

The first group of research questions addresses how the El Dorado Promise impacted student achievement in the El Dorado School District. The core strategy employed was one-to-one student-level matching, matching El Dorado students to similar students in similar districts and comparing their results. Comparison districts for the El Dorado School District were chosen to have similar pre-Promise achievement, demographic makeup, and economic characteristics to the El Dorado School District. For student matches, I matched each El Dorado student to a student in a comparison district on prior achievement, race/ethnicity, FRL status, and gender. This matching technique created a comparison group that was very similar to El Dorado students on all observable measures. Because of the equivalence (on observables) of the El Dorado and comparison groups, any differences (after the implementation of the program) observed between the two groups can reasonably be attributed to the impact of the Promise. As robustness checks, I calculated two different types of district matches, strict and broad district matches, and two different methods for student matches, exact and modified propensity score, the details of which will be discussed in greater detail in Chapter 4. In addition to estimating overall impacts of the

Promise, in which I examine all data points over a five-year period, I also calculate the annual impact of the Promise. Finally, to address any concerns that any observed effect may not be due to the Promise but instead the differential effectiveness of the El Dorado School District from other districts at any point in time, I conduct a placebo test. For this placebo test, I use the same matching technique as for the primary analyses, except I use data from one year before the previous analyses and examine the effects on achievement outcomes in a pre-Promise year (2005-06). If one-year effects are observed for the primary analyses but no effects are observed for the placebo estimates, I can reasonably conclude that it was the introduction of the Promise, not pre-existing differences (such as practices already occurring in the district that might lead to abnormally high student growth), that led to achievement differences between El Dorado and comparison students.

The second group of research questions and sub-questions addresses whether the Promise had an impact on graduation rates. To answer this question, I employ a very similar methodology to answer the achievement questions, comparing El Dorado students to similar students in similar districts. Slight modifications are made for graduation matches. Comparison districts were selected to have similar pre-Promise graduation rates to El Dorado, and additional indicators considered to be risk factors for not graduating high school were included for graduation matches, including student mobility and being held back a grade prior to the Promise. For graduation estimates, I examined four different outcome variables: graduate on time, graduate at all, graduate from ninth grade school district on time, and graduate from ninth grade school district at all. There are reasons to believe that the El Dorado Promise may have a different effect on these different outcome measures. For example, El Dorado students may not be any more likely to graduate on time, but they may be more likely to graduate at all (later than expected)

because students who previously would have dropped out of high school might be incented to take more time to obtain credits for graduation in order to be able to take advantage of the Promise. Similarly, there may be no effect on students' graduation from any school district on time or at all (graduate on time and graduate at all variables), but El Dorado students who previously would have transferred to and graduated from another Arkansas school district may be more likely to remain and graduate from the El Dorado School District. This effect would be observed in the graduate from ninth grade school district on time and graduate from ninth grade school district at all variables.

For all of the above research questions, I calculate subgroup effects to determine whether the El Dorado Promise had a differential impact on free/reduced lunch-eligible (FRL), African-American, or high-achieving students.

Paper Organization

This dissertation is divided into six chapters. In Chapter 2, I summarize a systematic review of the literature on the impacts of Promise programs on both economic development and education outcomes. Chapter 3 describes the origin and structure of the El Dorado Promise program, including a detailed discussion of initial and ongoing eligibility requirements and the scholarship amount and conditions. Chapter 4 describes the methodology used to answer the aforementioned research questions, and I present the results of these analyses in Chapter 5. I conclude in Chapter 6 by summarizing the findings of this study and discussing their implications for existing and future Promise programs.

Chapter 2 – Literature Review

As more Promise programs are started each year and more communities consider investing considerable financial resources to start their own place-based scholarship programs, there is a growing interest in learning if these programs are having their intended impact on the economic development and quality of education of the regions in which they are located. Considering that Promise programs are a relatively new phenomenon, with the first one started in 2005, it is not surprising that there is relatively little research on the topic. The nature of Promise programs also make them somewhat challenging to study; they are often announced as a surprise, making it difficult to collect pre-program data or consider research design before the intervention has begun. Also, Promise programs, by definition, are implemented at the school district or regional level, often making it difficult to identify a suitable counterfactual. Finally, because of the considerable expense of such programs, it is not feasible to stage a multi-site demonstration of a program for the purposes of research.[2]

A robust literature exists on other financial aid programs, including statewide merit-based scholarship programs, which have some elements that make them analogous to Promise programs. In a 2010 review of the experimental and quasi-experimental research, Deming and Dynarski found that scholarships and other interventions that reduce college costs can lead to higher rates of college enrollment and persistence. In addition, they found that programs that are easy to understand and have simple application processes are most effective. Many of the scholarships included in this review were state-based merit scholarships like the Georgia HOPE

[2] An exception is the 2013 Harris study of The Degree Project, but it must be noted that this is a modified form of a Promise program, since scholarships are available only to certain cohorts within certain schools rather than to all students in a school district. While this study will test the effects of early commitment of aid, The Degree Project is not intended to have the same broad economic development effects as other Promise programs.

scholarship; however, as Dynarski (2004) points out that many "merit-based" programs have very modest GPA and test score requirements and are thus available to a large number of students.

As will be illustrated in the section below, the literature on Promise programs is limited in its scope; the majority of the research on Promise programs focuses on the effects of the Kalamazoo Promise, which, while important, is only one of the many Promise programs now in place.

Despite the growing number of Promise programs, few studies rigorously assess the impacts of Promise programs and even fewer look at their impacts on the K-12 system. Furthermore, the majority of the current research focuses on within district comparisons, comparing students eligible for the scholarships to those who are ineligible. While this research answers important questions about the impact of the scholarship (or the promise of the scholarship) money itself, it does not address the impact of the Promise on the school district as a whole and the systemic changes Promise programs may inspire. This evaluation of the impact of the El Dorado Promise on student achievement and high school graduation, therefore, fills an important gap in the literature and can inform current and future stakeholders who hope Promise programs will serve as an impetus for improvement of their local school systems.

Literature Review Process

Selection Criteria

To better understand what types of achievement and graduation results might be expected from the El Dorado Promise and other potential impacts of the Promise that are not examined in this study, I conducted a systematic review of the literature on the impacts of Promise programs on education and economic development outcomes. In order to ensure that I conducted a

thorough and comprehensive review of the research, I developed criteria to help focus my search based on the frameworks outlined by the Campbell Collaboration, an organization that aims to prepare, maintain, and disseminate systematic reviews in such fields as education, crime and justice, and social welfare.[3] These guidelines employed were intended to methodically uncover all relevant high-quality research on Promise programs.

For these purposes, then, I employed the following search criteria:

- Research on programs that fit the criteria outlined in the definition of Promise programs set forth in Chapter 1;
- Research conducted since the announcement of the Kalamazoo Promise (November 2005);
- Research includes an evaluation component specifically aimed at measuring the impact of the Promise program on education or economic development outcomes
    - Impact must be measured relative to a comparison group or reasonable counterfactual
    - Outcomes examined can be quantitative or qualitative but must be systematically measured

Because Promise programs are new and there is not yet a widely-accepted definition, it is important to define the exact characteristics a program must have in order to qualify as a Promise program, for this review. Once again, for a scholarship program to be considered a Promise program, it must meet the following criteria:

[3] Details about the Campbell Collaboration can found at: http://www.campbellcollaboration.org/.

- place-based: awards scholarships at least partially based on the place in which a student resides and/or attends school;
- long-term commitment: scholarships must be funded or intended to be funded over a long time period (ten years or longer);
- intentions for founding program: scholarship program must have been founded with the aims of improving higher education, K-12, and local economic development outcomes.
    - "Local" means a city, school district, or region and does not apply to a state.

Though it may seem redundant after the Promise definition requirement, the reason for limiting this review to only include research conducted after November 2005 is to exclude any potential predecessors to the Kalamazoo Promise. Though Kalamazoo is widely considered to be the first Promise program, some have identified the Bernard Daly Educational Fund in Lakeview, Oregon as the earliest Promise program[4]; however, this program is not part of the current generation of Promise programs, and any research on it or similar programs should be excluded.

Finally, one of the primary goals of this review was to identify research that estimates the impact of Promise programs. Therefore, this review process limited the search to only include research that systematically measured quantitative or qualitative outcomes (such as student achievement, graduation rates, enrollment, teacher attitudes, etc.) and research that measured these outcomes relative to a comparison group or reasonable counterfactual. This guideline was established to ensure that the research included in this review reported actual impact estimates of

[4] Upon his death in 1920, Bernard Daly, a local doctor, businessman, and politician in Lakeview, Oregon, willed all of his assets to form the Daly Educational Fund, which paid the full tuition costs for all Lake County high school graduates for generations. Information retrieved from: http://citiesofpromise.com/people/bernard-daly/

Promise programs, rather than descriptions of conditions in Promise districts in the post-Promise era. That being said, knowing the nascent state of the literature on Promise programs and wanting to include as many studies as possible, I employed a fairly liberal notion of what a "reasonable counterfactual" is. I accepted studies that used pre-Promise data as comparison, if there was a well-defined time in which the Promise was put in place and could employ or approximate an interrupted time series design. I also included studies that used any comparison group, even if it was not precise (e.g., comparison to national sample).

Application of Selection Criteria

After defining my search criteria, I applied these criteria to a number of different search options to identify as much research on Promise programs as possible. For this review, I used the following search databases and alternative search strategies:

- University of Arkansas Library Resources:
    - EconLit (Ebsco)
- Google Scholar
- Academic conference programs (2005-2015):
    - PromiseNet
    - Association for Public Policy Analysis and Management (APPAM)
    - Association for Education Finance and Policy (AEFP)
- Hand search of W.E. Upjohn Institute website on Promise programs[5]
- Informal network of Promise research community

[5] http://www.upjohn.org/research/education/kalamazoo-promise-place-based-scholarships

The first strategy I employed to identify relevant Promise research was conducting searches of the electronic databases EconLit (powered by Ebsco) and Google Scholar. For both databases, I was either able to access articles directly through the University of Arkansas library or through interlibrary loan. I used the search term "promise scholarship," and this search resulted in the initial identification of 520 journal articles.[6]

Knowing that much of the current literature on Promise programs is "gray," i.e. unpublished, and thus would not necessarily show up in database searches, I also conducted title reviews of all publications listed on the W.E. Upjohn Institute's webpage for Kalamazoo Promise and other place-based scholarships. The Upjohn Institute, located in Kalamazoo, Michigan, has served as a leader in producing research on the Kalamazoo Promise and has explicitly set out to serve as a repository for all Promise-related research. During this hand review process, my goal was to identify any article or publication that may include original analyses of rigorous Promise research or that summarizes such research. Through this process, 104 articles were initially identified for further review.[7]

I also conducted a keyword search, using the search term "scholarship," of conference programs from prominent conferences at which I knew Promise research was presented in the past.[8] Conferences included in this search process were PromiseNet (the annual convening of Promise program practitioners and researchers), the Association for Public Policy Analysis and

[6] Of the initial 520 journal articles, 4 were obtained from the EconLit database, and 516 were obtained from Google Scholar.

[7] Several of the articles identified in this search were also identified through my search of electronic online databases. However, in this initial identification process, I retained all relevant articles; I removed duplicate articles during the study review stage of the systematic review process.

[8] I was familiar with conferences at which Promise research had been previously been presented because I had either presented earlier versions of my El Dorado Promise research or participated in or attended a Promise panel at these conferences.

Management (APPAM), and the Association for Education Finance and Policy (AEFP). The purpose of these searches was to identify research on Promise programs that had not been published in an academic journal and was not necessarily already publicly available, and thus would not have been located in the database reviews or the review of the Upjohn Institute website. Though conference papers have sometimes been uploaded to the conference website, conference papers are not always publicly available. Therefore, I planned to contact authors of the papers I was not able to find. Because I have met many of the researchers studying Promise programs through conferences or my participation in the Lumina Foundation-funded Promise Research Consortium, I expected to have a reasonable response rate from authors.[9] This review of conference programs yielded 88 articles on Promise programs.

The final step in my search process was to exploit information gathered through my informal network of Promise researchers that I have built over the years of conducting El Dorado Promise research. By reviewing past emails and minutes from Lumina Promise Research Consortium meetings, I found a forthcoming Promise panel that will be presented at the April 2015 American Education Research Association (AERA) conference and Western Michigan University's college of working papers from an IES-funded project to investigate the impacts of the Kalamazoo Promise. Once again, because of the early state of the literature on Promise programs, my goal was to try to uncover any unpublished literature or works in progress that I had not found in my other searches. In total, I found 16 articles from information gathered through my informal network.

[9] The Promise Research Consortium is a group of researchers conducting research on the higher education outcomes of Promise programs. The Promise programs represented in the consortium are the Kalamazoo Promise, the El Dorado Promise, the Pittsburgh Promise, the New Haven Promise, and Say Yes to Education in Syracuse and Buffalo.

I initially gathered a large number of potential studies from each of the four search strategies I employed. I then narrowed this list down to my final group of eligible studies through the following review stages: title review, abstract review, and the full study review. Duplicate studies were removed during the full study review stage of the review process. From the initial search process, I retained a total of 724 studies to review (520 articles were gathered through database searches, 104 from the Upjohn website, 88 from conference programs, and 16 from informal networks). The next stage was the title review, during which I retained any article that appeared to discuss Promise programs or review the literature on financial aid programs in general. Through the title review stage, I narrowed down the number of articles considerably ending up with a total of 120 articles. Many studies were removed at this stage because they focused on state merit-based scholarship programs that have the word "promise" in their name (e.g. West Virginia PROMISE or the Michigan Promise Scholarship) but are not "Promise programs" as defined for this review. After the title review, I reviewed the abstracts of all retained articles, further narrowing down the total number of articles that met the selection criteria to 48. Several articles were removed at this stage include literature reviews of financial aid programs that did not include Promise programs. Following the abstract review was the final stage of the review process, the full study review, during which I discarded duplicate articles and reviewed the entire text of the 19 articles that remained. During the full article review, I focused primarily on the study methodology, keeping only the studies with systematic measurement of outcome measures and that compared the Promise zone to a reasonable counterfactual, as stated in the inclusion criteria. Over the course of the final study review stage, six more articles were removed, leaving a final total of 13 articles. Several studies were removed because they did not compare outcomes in the Promise district to a comparison group. One such example was a study

of school climate in the Kalamazoo School District post-Promise conducted by Miron, Jones, and Kelaher-Young (2011). For this study, the authors administered surveys to and conducted interviews with educators and students in Kalamazoo Public Schools to measure their views about changes that had occurred in school climate after the Promise was put in place. While these outcome measures were systematically measured, meeting one of the study inclusion criteria, there was no group against which study participants were compared, making it impossible to ascertain whether observed changes in school climate occurred because of the Promise or would have occurred anyway in the absence of the scholarship. Because the study did not have a counterfactual, this article was not included in the final literature review.

After the application of the selection criteria and the review process, a total of 13 articles met all of the criteria and were thus included in this literature review. Table 2 summarizes the review process, detailing the number of articles retained after each step.

Table 2

Identification of Promise Scholarship Studies for Literature Review

Database/search terms	Studies returned by search	Titles accepted	Abstracts accepted	Unique studies for full review*	Studies accepted for inclusion
EconLit					
"promise scholarship"	4	3	2	2	2
Google Scholar					
"promise scholarship"	516	42	15	10	5
Upjohn Institute (Kalamazoo Promise and Place-Based Scholarships)[10]					
hand search	104	50	17	7	5
Conference Programs					
"scholarship"					
PromiseNet	*7*	*4*	*2*	*1*	*0*
APPAM	*30*	*5*	*4*	*1*	*0*
AEFP	*51*	*3*	*3*	*2*	*0*
Subtotal:	88	12	9	4	0
Informal Network					
Emails/word of mouth from Promise Research Consortium	16	13	6	2	1
Grand Total:	724	120	48	19	13

* Full copies of six studies identified from conference programs were not available. I contacted the authors, but five did not respond, and one said that findings would not be publicly released until spring 2016.
Figures in italics are subtotals for individual conference programs.

[10] Upjohn Institute database of Kalamazoo Promise and Place-Based Scholarships accessed from http://www.upjohn.org/research/education/kalamazoo-promise-place-based-scholarships.

Literature Review Findings

General Findings

The comprehensive search described above yielded a total of 13 evaluations of Promise programs. Though, with 13 studies, it may seem that there is a relatively large literature on Promise programs (considering the fact the intervention is less than ten years old), the Promise literature is limited in a few ways. First of all, the majority of the current literature, nine out of 13 studies, focuses on the impacts of the Kalamazoo Promise. Following the Kalamazoo Promise, the second most studied Promise program is the Pittsburgh Promise, with a total of two studies. The LeGower and Walsh (2014) study is unique in that it examines 20 Promise programs and provides results by Promise program type (eligibility requirements and higher education institutions at which the scholarship can be used) rather than for individual Promise programs.[11] The large proportion of studies focusing on the Kalamazoo Promise is unsurprising, considering it is the oldest Promise program and the Kalamazoo-based Upjohn Institute has placed a priority on studying the Promise; indeed, six of the nine studies on the Kalamazoo Promise were authored by Upjohn Institute researchers.

The Promise studies included in the literature review examine both economic development and education outcomes, reflecting the dual motivations for the founding of Promise programs. In the sections that follow, I summarize the literature on Promise programs in these two areas, and when appropriate, reflect on how the literature may inform the study I am working on and how my study will contribute to the knowledge base about Promise programs.

[11] The El Dorado Promise is one of the Promise programs included in the LeGower and Walsh study.

Economic Development

Seven of the 13 studies measure economic development outcomes. The most common economic development outcome examined (and the most common outcome examined overall) is the enrollment of the local school district in the Promise zone. Six studies examine the impact of the Promise announcement on school enrollment, and four of these studies focus specifically on the impact of the Kalamazoo Promise on enrollment. Enrollment impacts can be calculated using publicly available aggregate data, which may explain the relatively large number of studies for this outcome measure; however, some researchers used student-level data in their studies of enrollment to gain a more nuanced understanding of the entry and exit patterns into the district after the Promise. Other economic development outcomes examined include housing prices (two studies) in Kalamazoo and for Promise programs by design type, and the quantity and nature of media coverage about the school district for the Kalamazoo Promise.

Abbreviated summaries of these articles that includes brief descriptions of the Promise program(s) studied, the counterfactual(s), outcome measure(s), and study results, are presented in Tables 3 and 4. Additionally, a more detailed description of each of the articles, including the evaluation methods used, can be found in Appendix A. Finally, more information about the program characteristics of each of the Promise programs included in this literature review can be found in Appendix B.

Enrollment

Of the six studies that examine local school district enrollment as an outcome of Promise programs, four focus on Kalamazoo, with three of the studies asking whether a change in enrollment took place (Miron & Cullen, 2008; Bartik, Eberts, & Huang, 2010; Miller, Forthcoming) and one focused on describing the nature of enrollment changes (Hershbein,

2013). All three studies found a positive impact of the Kalamazoo Promise on enrollment in the district. The studies also addressed the nature of the enrollment changes in the school district; both Miron and Cullen (2008) and Bartik, Eberts and Huang (2010) found that the racial composition of the district did not change after the Promise. There was also some evidence that more advantaged families were moving in to the district to take advantage of the Promise, with Hershbein (2013) finding that new students were less likely to be FRL-eligible and were more likely to be high-scoring. However, Hershbein (2013) and Miller (Forthcoming) also found that new students were not sorting into the higher-performing schools in the district. Finally, Miller (Forthcoming) and Bartik, Eberts and Huang (2010) found that enrollment increases were greatest in the younger grades, providing further evidence that the Promise was likely driving these enrollment changes since younger students are eligible for a greater percentage of the scholarship value.

In contrast to the Kalamazoo findings, Gonzalez et al. (2011), using a similar methodology to the one used by Bartik, Eberts and Huang (2010) and Miller (Forthcoming), found no impact of the Pittsburgh Promise on enrollment in Pittsburgh Public Schools. The Pittsburgh Promise, unlike the Kalamazoo Promise, is a merit-based scholarship; a more targeted scholarship like the Pittsburgh Promise could be less likely to induce families to move into or stay in the school district, since they would not be sure if their children would qualify. The LeGower and Walsh study (2014) can more definitively answer the question about enrollment effects across different Promise program types. The authors examined enrollment effects for 20 Promise programs and found that universal programs had the largest effects on enrollment, followed by targeted, merit-based programs that had flexible higher education institution arrangements. The authors found no effect on enrollment for targeted, merit-based programs that only allowed scholarships to be

used at a very limited number of institutions. In addition, they found that school districts with merit-based Promise programs experienced increases in white enrollment and decreases in non-white enrollment, while districts with universal flexible HEI Promise programs did not experience differential enrollment by race.

Housing Prices

The second most common economic development outcome examined in the Promise literature is housing prices, with two studies focusing on this measure. Once again, LeGower and Walsh (2014) examined the aggregate impact of several Promise programs on housing prices and found a positive effect, with housing prices experiencing a 6% to 12% ($14,000 to $20,500) increase on average within three years of the Promise announcement. Miller (Forthcoming) examined the impact of the Kalamazoo Promise on housing prices and found no effect.

Perception of District

The final economic development outcome examined is public perception of the school district, as measured by media coverage. Miller-Adams and Fiore (2013) examined the quantity and quality of media coverage about Kalamazoo pre- and post-Promise compared to that for a similar school district. They found that both the amount of media coverage and the amount of positive press for Kalamazoo Public Schools increased after the Promise.

Table 3

Summary of Promise Program Articles Focused on Economic Development Impacts

Study	Promise Program(s)	Promise Program Type: Eligibility, Postsecondary Program(s) Covered	Counterfactual	Outcome Measure	Result
Miron & Cullen (2008)	Kalamazoo Promise	Universal, Flexible	Kalamazoo Public Schools (KPS) before the Promise; similar districts before and after the Promise	Enrollment	Positive; Enrollment in KPS increased after the Promise; Proportion of FRL students in KPS remained steady but increased in comparison districts; Racial composition of KPS remained the same
Bartik, Eberts, & Huang (2010)	Kalamazoo Promise	Universal, Flexible	Kalamazoo Public Schools (KPS) before the Promise	Enrollment	Positive; Enrollment in KPS increased after the Promise; Large enrollment increases in grades 1-9 but not grades 10-12; Decline in exit rates from KPS; Racial composition of KPS remained the same
Gonzalez, Bozick, Tharp-Taylor, & Phillips (2011)	Pittsburgh Promise	Targeted- Merit, Flexible	Pittsburgh Public Schools (PPS) before the Promise	Enrollment; Persistence	Null; Enrollment and persistence rates in PPS did not increase after the Promise

Table 3

Summary of Promise Program Articles Focused on Economic Development Impacts (Cont.)

Study	**Promise Program(s)**	**Promise Program Type: Eligibility, Postsecondary Program(s) Covered**	**Counterfactual**	**Outcome Measure**	**Result**
Hershbein (2013)	Kalamazoo Promise	Universal, Flexible	Kalamazoo Public Schools (KPS) before the Promise	Enrollment	Majority of students who entered KPS came from other Michigan school districts, particularly other districts in Kalamazoo County; KPS retained more students who would have otherwise moved; New students were less likely to be FRL-eligible and more likely to score well on standardized tests; Exiting students were more advantaged than pre-Promise period; Students who entered district not more likely to choose higher-performing schools
Miller-Adams & Fiore (2013)	Kalamazoo Promise	Universal, Flexible	Educational content about Grand Rapids Public Schools (GRPS) before and after the Promise	Media Coverage of District	Positive; Total amount of coverage and amount of positive coverage about KPS increased

Table 3

Summary of Promise Program Articles Focused on Economic Development Impacts (Cont.)

Study	**Promise Program(s)**	**Promise Program Type: Eligibility, Postsecondary Program(s) Covered**	**Counterfactual**	**Outcome Measure**	**Result**
LeGower & Walsh (2014)	Multiple[12]	Universal, Flexible Universal, Inflexible Targeted- Merit, Flexible Targeted-Merit, Inflexible Targeted- Other, Flexible Targeted- Other, Inflexible	Schools in the same county or neighboring counties/areas as Promise zones before and after the Promise	Enrollment; Housing Prices	Positive; Enrollment increased after the Promise; Immediate enrollment increases in K-4; Universal flexible programs had largest effects; Targeted-merit flexible programs had smaller effects; Targeted-merit inflexible programs had no effect; Targeted-merit programs had increases in white enrollment and decreases in non-white enrollment; Universal flexible programs do not experience differential enrollment effects across racial groups; Housing prices in Promise zones increase on average within 3 years of Promise; Increases are primarily observed for houses in the upper half of the housing price distribution.

[12] See Appendix A for the complete list of Promise programs examined in LeGower & Walsh (2014).

Table 3

Summary of Promise Program Articles Focused on Economic Development Impacts (Cont.)

Study	**Promise Program(s)**	**Promise Program Type: Eligibility, Postsecondary Program(s) Covered**	**Counterfactual**	**Outcome Measure**	**Result**
Miller (Forthcoming)	Kalamazoo Promise	Universal, Flexible	Enrollment- Three sets of comparison districts before and after the Promise Housing Prices- Housing prices in the rest of Kalamazoo County before and after the Promise	Enrollment; Housing Prices	Positive (enrollment) and Null (housing prices); Promise increased enrollment by over 1,000 students; Larger enrollment gains in schools in the bottom half of academic achievement distribution; Enrollment increased in every grade except 10^{th} and 11^{th} grade and increases were larger in younger grades; No evidence that Promise changed housing prices

Education

Eight of the 13 studies examined education outcomes; of these eight studies, two looked at K-12 effects, and six looked at higher education effects.[13] The most common education outcomes examined were enrollment in higher education, college choice, and progress through college, each having three studies. One study of the Kalamazoo Promise examined whether students attained a credential four and six years after high school graduation. The dearth of research on K-12 outcomes, in particular, highlights the need for more research in this area, such as the current El Dorado study.

K-12

The two studies on K-12 outcomes both focus on the Kalamazoo Promise and examine the effects of the Promise on students' academic performance and behavior. Bartik, Eberts, and Huang (2010) look at student achievement as measured by standardized tests, comparing test score trends before and after the Promise to trends in similar districts. They find positive impacts of test scores; Kalamazoo students gained 2.5 to 3 more months of learning in reading and math than similar districts over a four-year period. Barik and Lachowka (2013) examine different measures of academic achievement, GPA and number of credits earned. They find that students earned more credits, and, while there were no overall GPA effects, they find large GPA increases for African-American students. Finally, Bartik and Lachowska (2013) examined behavioral measures, such as days of suspension and detention; they found no impact on days of detention but found that students were in out-of-school suspension one to two days less per year.

[13] Some of the studies measured both economic development and education outcomes; thus, the number of study results I describe are greater than 13, which is the total number of studies.

Higher Education

The literature base is stronger for the higher education effects of Promise programs, with studies examining multiple Promise programs on several higher education outcomes, including college enrollment, college choice, progress through college, and credential attainment. For the Pittsburgh Promise and the New Haven Promise, both merit-based programs, authors find no effect of the Promise on enrollment in a higher education institution, suggesting that the scholarship money did not induce more students to attend college (Gonzalez, Bozick, Tharp-Taylor, & Phillips, 2011; Gonzalez et al., 2014). In contrast, when studying the enrollment effects of the universal Kalamazoo Promise program, Bartik, Hershbein, & Lachowska (2015) found the Promise led to a 7 to 8 percentage point increase in college enrollment.

A related question to college enrollment that the literature addresses is the type of institution at which students chose to enroll. All three studies on college choice focus on the Kalamazoo Promise. DesJardins and Ranchhod (2010) examined the colleges to which Kalamazoo students sent ACT scores before and after the Promise and compared this to students in comparison districts. They found that students were more likely to send reports to public universities in Michigan, Michigan's more selective flagship universities (University of Michigan and Michigan State), and public institutions in Kalamazoo. The increase in score reports sent to in-state institutions further reinforces the idea that Kalamazoo led to these changes, since the Promise only allows the scholarship to be used at public Michigan universities. Miller-Adams and Timmeney (2013) looked at college choice for a subset of academically-talented Kalamazoo students, students enrolled in the Kalamazoo Area Math and Science Center. The authors found that these students were also more likely to choose in-state institutions. Finally, Bartik, Hershbein, and Lachowska (2015) found results that were similar to

the previous two studies mentioned, finding a 15 to 20 percentage point increase in enrollment in four-year public institutions in Michigan.

Three studies examined different measures of students' progress through college. Gonzalez et al. (2011) examined college persistence rates for Pittsburgh Promise students and found no overall impact of the Promise; however, they did find some evidence that more advantaged Promise-eligible students, white and non-FRL students, were more likely than Promise-ineligible students to persist in college. Iriti, Bickel and Kaufman (2012) examined Pittsburgh Promise scholars' college retention rates, whether they were more likely to remain in the same institution. They found that Promise students were 10 percentage points more likely to be retained from year one to year two; however, their comparison group was the ACT national sample, and thus this result should be considered with caution. Finally, Bartik, Hershbein, and Lachowska (2015) look at the number of credits/courses attempted and found that Promise-eligible students attempted three more classes than Promise-ineligible students four years after high school graduation.

The last and perhaps most important outcome examined is whether students earned a postsecondary credential. Bartik, Hershbein, and Lachowska (2015) find that, six years after high school graduation, Promise-eligible students were 9 to 11 percentage points more likely to attain any credential than Promise-ineligible students and 7 to 9 percentage points more likely to attain a bachelor's degree than Promise-ineligible students.

Table 4

Summary of Promise Program Articles Focused on Education Impacts

Study	**Promise Program(s)**	**Promise Program Type: Eligibility, Postsecondary Program(s) Covered**	**Counterfactual**	**Outcome Measure**	**Result**
DesJardins & Ranchhod (2010)	Kalamazoo Promise	Universal, Flexible	All other MI high school students; high school students in matched comparison schools before and after the Promise	College choice	Promise students more likely to attend public universities in Michigan, flagship institutions, and public institutions in Kalamazoo; Low-income students more likely to apply to Michigan State than local community college
Bartik, Eberts, & Huang (2010)	Kalamazoo Promise	Universal, Flexible	Kalamazoo Public Schools (KPS) before the Promise; similar districts before and after the Promise	Student achievement (standardized test scores)	Positive; KPS students gained 2.5 more months of learning in reading and 3 months more in math than comparison districts

Table 4

Summary of Promise Program Articles Focused on Education Impacts (Cont.)

Study	**Promise Program(s)**	**Promise Program Type: Eligibility, Postsecondary Program(s) Covered**	**Counterfactual**	**Outcome Measure**	**Result**
Gonzalez, Bozick, Tharp-Taylor, & Phillips (2011)	Pittsburgh Promise	Targeted- Merit, Flexible	Promise-ineligible students before and after the Promise	Enrollment and persistence in higher education institution	Null (enrollment) and Positive (persistence); Promise-eligible students had the same overall likelihood of attending college; White and non-FRL Promise-eligible students were more likely to persist in college
Iriti, Bickel, & Kaufman (2012)	Pittsburgh Promise	Targeted- Merit, Flexible	ACT national sample	College retention rates	Positive; Promise students were retained in college at a higher rate than ACT national sample
Bartik & Lachowska (2013)	Kalamazoo Promise	Universal, Flexible	Promise-ineligible students before and after the Promise	Credits earned; Days of suspension & detention; AP course enrollment; GPA	Positive and Null; Promise-eligible students earned more credits and had fewer days of suspension; African-American Promise-eligible students earned higher GPAs; Null findings for GPA for overall sample and days of detention; Inconclusive AP course enrollment results

Table 4

Summary of Promise Program Articles Focused on Education Impacts (Cont.)

Study	Promise Program(s)	Promise Program Type: Eligibility, Postsecondary Program(s) Covered	Counterfactual	Outcome Measure	Result
Miller-Adams & Timmeney (2013)	Kalamazoo Promise	Universal, Flexible	Non-KPS Kalamazoo Public Schools (KPS) KAMSC students before and after the Promise	College choice	Promise-eligible students were more likely to attend in-state public institutions
Gonzalez, Bozick, Daugherty, Scherer, Singh, Suarez, & Ryan (2014)	New Haven Promise	Targeted- Merit, Flexible	Promise-ineligible[14] students before and after the Promise	Enrollment in higher education institution	Null; Promise-eligible students had the same overall likelihood of attending college

[14] See Appendix A for details on definition of Promise eligibility used for this study.

Table 4

Summary of Promise Program Articles Focused on Education Impacts (Cont.)

Study	**Promise Program(s)**	**Promise Program Type: Eligibility, Postsecondary Program(s) Covered**	**Counterfactual**	**Outcome Measure**	**Result**
Bartik, Hershbein, & Lachowska (2015)	Kalamazoo Promise	Universal, Flexible	Promise-ineligible students before and after the Promise	Enrollment in higher education institution; College choice Credits attempted; Credential attainment	Positive; Promise-eligible students were more likely to enroll in college; Promise-eligible students were more likely to enroll in 4-year public institutions in Michigan; Promise-eligible students attempted 3 more classes; Promise-eligible were more likely to attain a credential after 6 years

Literature Review Summary

In sum, there is research available on many of the important economic development and educational outcomes that Promise programs were founded to impact; however the literature is still limited by its focus on the Kalamazoo Promise. The literature does show some evidence that universal programs are more likely to have an effect or, at least, have a larger effect than targeted programs; this leads me to think that I may observe positive effects for the El Dorado Promise, considering its very similar design to the Kalamazoo Promise. Finally, I found that there is very limited prior evidence on the K-12 outcomes examined in this study, with only one study examining K-12 achievement and no studies looking at high school graduation. This review makes even clearer the need for rigorous research on K-12 impacts of the Promise program, and I hope that this study can help to fill this gap.

Chapter 3 – Overview of the El Dorado Promise

On January 22, 2007, then-President and CEO of Murphy Oil Corporation Claiborne Deming announced the creation of the El Dorado Promise, a universal college scholarship program for El Dorado School District (EDSD) graduates. Unlike traditional forms of financial aid, which typically have merit and/or financial need requirements, the El Dorado Promise scholarship is available to all students, provided they have been continuously enrolled in the district since at least the ninth grade and graduate from El Dorado High School.[15]

Similar to other Promise programs, the El Dorado Promise was established not only to increase the number of college graduates from the area and improve the local education system but also to spur economic development in the area. Like many communities in southern Arkansas, El Dorado, a city of approximately 20,000 located fourteen miles north of the Louisiana border, has suffered from population loss and the closure or relocation of many of its major employers in recent decades (Landrum, 2008). The idea for the El Dorado Promise came from an El Dorado chamber of commerce member, who brought an article about the Kalamazoo Promise to a chamber meeting in the spring of 2006. Chamber members later proposed the idea of starting a similar program in El Dorado to officials from Murphy Oil Corporation, which is headquartered in El Dorado and had a history of funding special programs in the school district. In December 2006, Murphy Oil Corporation's board of directors approved the El Dorado Promise, creating a $50 million endowment to fund the scholarship program for twenty years (Moreno, 2007). Murphy Oil Corporation representatives have stated that they hope the Promise

[15] Originally, the El Dorado Promise was restricted to students who lived within the El Dorado School District boundaries, excluding students who were not residents of the El Dorado School District who attended El Dorado schools through the public school choice program. In February 2013, this restriction was removed, allowing school choice students (estimated to be around 75 students) to be eligible for the Promise (Harten, 2013).

will have a number of economic benefits for both the company and the community, including increasing Murphy Oil's ability to recruit talent, attract business investment, and create better employment opportunities for returning college graduates (Landrum, 2008).

While economic development was a major motivation for the Promise, the Promise is expected to have a more direct impact on the educational system and education level of EDSD graduates, specifically increasing the number of college graduates from the region. In 2007, only fifteen percent of the population of Union County (where El Dorado is located) held a college degree, lower than the state average of 16.7%, which itself was the second-lowest state college attainment rate in the country (Moreno, 2007). El Dorado School District officials estimate that, prior to the Promise, 55% to 65% of students enrolled in college after high school, but a much smaller proportion graduated (Warren, 2014; Moreno, 2007).

While the Promise is primarily intended to improve students' higher education outcomes, it is also expected to lead to improvements in K-12 outcomes. Table 5 shows that the El Dorado School District serves a diverse population; 55% of students are African-American and 58% are eligible for free- or reduced-price lunch. In 2005-06, the school year prior to the announcement of the Promise, the El Dorado School District performed below the state average on all standardized assessments except for Algebra. El Dorado also had a higher averaged freshman graduation rate (AFGR)[16] than the state as a whole for the 2005-06 school year, 86% compared to 80%, though this graduation rate should be interpreted with caution considering its limitations.

[16] The averaged freshman graduation rate (AFGR) is an estimate of the percentage of high school students who graduate on time. It is calculated by dividing the number of high school diplomas awarded by the average of the 8th, 9th, and 10th grade enrollment for the freshman class in question. In recent years, AFGR has been replaced by the four-year adjusted cohort graduation rate, which is widely considered by experts to be a more accurate measure of high school graduation. However, in Arkansas, reliable four-year adjusted cohort graduation rate measures

Table 5

El Dorado School District Demographics, Achievement, and Graduation Rate, 2005-06

	El Dorado	Arkansas
Demographics		
Enrollment	4,577	463,890
% White	42%	68%
% African American	55%	23%
% Hispanic	3%	7%
% Free/Reduced Lunch Eligible	58%	54%
Achievement		
% Prof. or Adv. Benchmarks Math (Grades 3-8)	50%	55%
% Prof. or Adv. Benchmarks Literacy (Grades 3-8)	53%	59%
% Prof. or Adv. End-of-Course Algebra	71%	64%
% Prof. or Adv. End-of-Course Geometry	50%	59%
% Prof. or Adv. 11th Grade Literacy	37%	46%
Graduation Rate		
Avg. Freshman Grad. Rate (AFGR)	86%	80%

The Promise is expected to produce better K-12 outcomes as measured by standardized test scores by motivating students directly or by encouraging the district to make changes. Students themselves may become more motivated to prepare themselves for college; they may enroll in more rigorous coursework or simply become more invested in school and exert more

are only available beginning with the 2011-12 graduating class. While AFGR may not be the most accurate calculation of graduation rate, it is still useful for comparative purposes.

effort. The Promise could also work by impacting the El Dorado School District and its personnel; for example, the district may start new programs to increase students' college-readiness, and teachers may work harder to reach students. Likely, the Promise would work through a combination of both student and school district changes.

The El Dorado Promise is intended to have both economic development and educational benefits in both the short and long term. In the next section, I discuss the specific characteristics of the El Dorado Promise, including eligibility requirements to receive and keep the Promise.

El Dorado Promise

The El Dorado Promise can be applied toward tuition and mandatory fees for up to five years at any accredited two- or four-year college or university in the country, private or public.[17] The maximum amount payable is the highest annual resident tuition and mandatory fees at an Arkansas public university, $7,889 for a student taking 30 credit hours per year in the 2014-15 school year.[18] The El Dorado Promise can be used in combination with other forms of financial aid, including need-based aid, such as the Pell Grant ($5,730/year maximum value for 2014-15), and merit-based scholarships, such as the Arkansas Academic Challenge Scholarship or "Lottery Scholarship" ($2,000 to $5,000/year for 2014-15).[19] The El Dorado Promise is considered to be a "first dollar" scholarship, meaning that, when combined with other forms of financial aid, it may

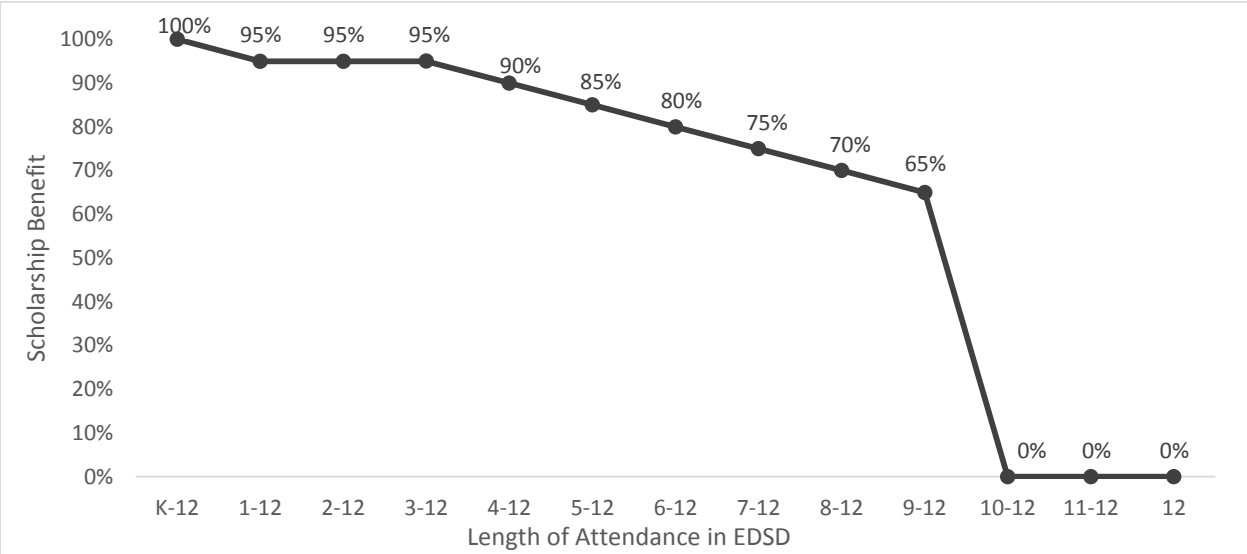
[17] Promise funds cannot be used for summer school or graduate school coursework.
[18] Highest annual resident tuition and mandatory fees is based on University of Central Arkansas' tuition and fees.
[19] To receive the Arkansas Academic Challenge Scholarship, a student must have graduated with a Smart Core diploma and have earned a 2.5 GPA and a 19 ACT score. Beginning in 2013-14, the Arkansas Academic Challenge Scholarship award amount follows a graduated schedule, with $2,000 awarded the first year, $3,000 the second year, $4,000 the third year, and $5,000 the fourth year for four-year in-state colleges and universities. The scholarship amount for two-year institutions is $2,000/year. The Arkansas Academic Challenge Scholarship can be used at participating in-state public or private, two-year or four-year higher education institutions.

be used for other college expenses that appear on a student's college invoice, such as room, board, and textbooks. However, the amount of the Promise scholarship students receive cannot exceed their total cost of attendance; in other words, students whose college costs are completely covered by other forms of aid do not receive the Promise scholarship as a refund. Depending on the institution a student attends and the other forms of aid he or she receives, the combination of the Promise with other forms of financial aid could pay the full cost of college attendance.

To be eligible to receive the Promise, students have to have been continuously enrolled in EDSD since at least the ninth grade and must graduate from El Dorado High School. The amount of the scholarship students receive depends on their length of enrollment in the El Dorado School District. As shown in Figure 1, students who have been continuously enrolled in EDSD since kindergarten are eligible for 100% of the scholarship value; the amount decreases to 95% for students who initially enrolled in first through third grades and then decreases by an additional five percent for initially enrolling in each subsequent grade level until the ninth grade, when students are eligible for 65% of the scholarship value. Students who enrolled in EDSD in the tenth grade or later are not eligible for the Promise. The Promise must be used to obtain an associate's or bachelor's degree; it cannot be used for technical certificates. To use the Promise, students must enroll in an accredited higher education institution in the semester immediately following high school graduation, unless they defer enrollment to join the military.

Figure 1

Percent of El Dorado Promise Scholarship Benefit by Length of Attendance in El Dorado School District



To keep the Promise scholarship, students must be enrolled in at least twelve credit hours per semester, maintain a 2.0 cumulative grade point average, earn at least 24 credits per academic year, and be making progress toward a bachelor's or associate's degree.

Early Results of the El Dorado Promise

Despite being in place since 2007, there is not much prior research or information on the effects of the El Dorado Promise. Exceptions are the impact of the El Dorado Promise on school district enrollment, information from interviews and focus groups about changes that have taken place in the district since the Promise was announced, and Promise eligibility and usage rates from 2007 to 2013.

Ash and Ritter (2014) examined the impact of the El Dorado Promise on district enrollment by comparing El Dorado's enrollment trends before and after the Promise to the enrollment trends of the other districts in Union County and a set of comparison districts. In the

pre-Promise period (1990-91 to 2005-06), all three groups experienced declines in enrollment, with El Dorado losing approximately ten percent of its population. From 2007-08 to 2011-12, however, El Dorado district enrollment experienced a nine percent increase above its expected trend, while comparison district enrollment continued on the same downward trend and Union County district enrollment dropped more than expected. The fact that enrollment in other county districts and similar comparison districts continued to fall but El Dorado School District enrollment increased indicates that the introduction of the El Dorado Promise positively affected district enrollment. Ash and Ritter also examined the difference in free/reduced lunch population in the three groups before and after the Promise; they found that the proportion of low-income students increased significantly in the rest of Union County and comparison districts while the percentage of low-income students held steady in El Dorado around 62-63%, suggesting that the Promise was potentially either inducing more affluent families to move to the district or reducing the number of middle and higher-income families leaving the district.

In addition to enrollment changes, I also know something about how the practices and culture of the El Dorado School District have changed since the Promise announcement in 2007. Interviews and focus groups with district personnel, administrators, and teachers conducted in January 2014 indicated that such a culture change had indeed taken place since the initiation of the Promise. From these interviews, I identified three key factors that had changed:

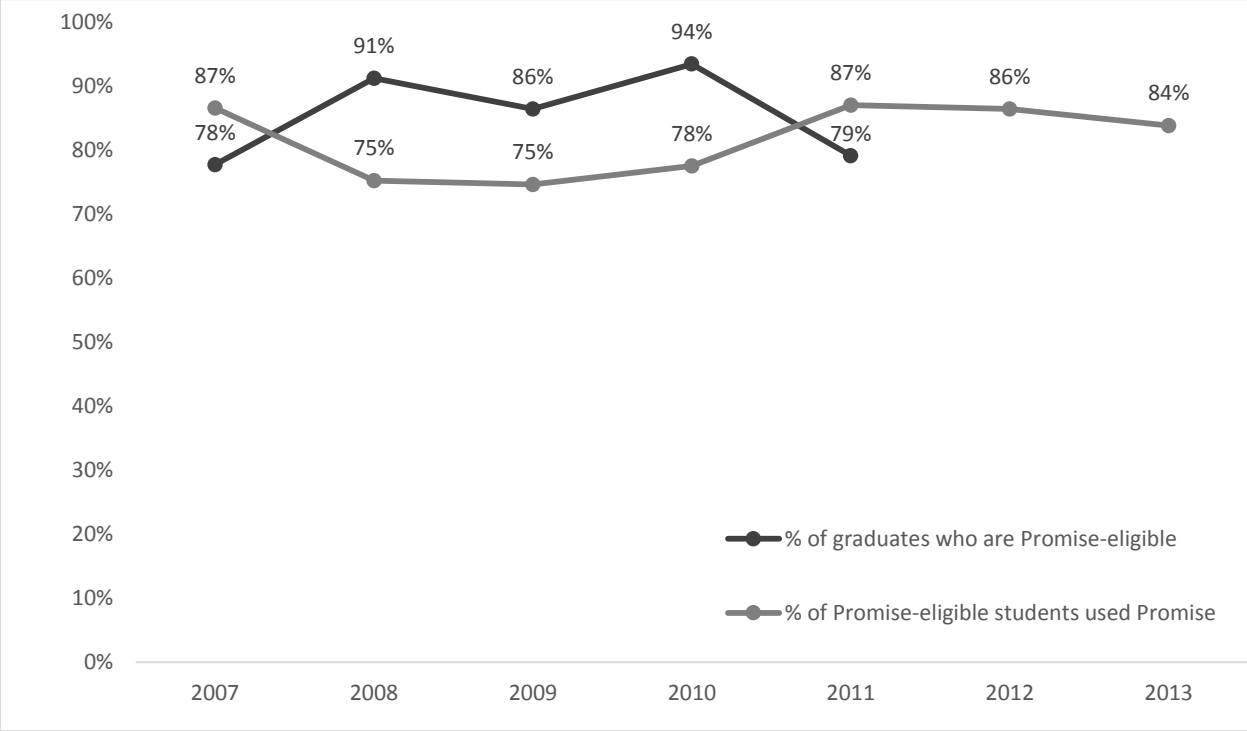
- high expectations for all students;
- increased overall and disadvantaged student enrollment in college preparatory coursework;
- the initiation of efforts to increase college awareness at a young age;

Expectations changed after the Promise because, as teachers and administrators reported, they now felt a weighty responsibility to ensure that all students were prepared for college, since the Promise meant that college was now affordable for all EDSD students. In addition, more students enrolled in Advanced Placement (AP) courses, particularly minority students, who had previously been underrepresented in higher-level courses. Finally, school officials began engaging in a number of practices to expose students to college at a young age, from giving "Promise backpacks" filled with information about college and the Promise scholarship to Kindergarten students to regularly taking students of all ages on college visits. In this paper, I empirically test whether this observed culture change in El Dorado resulted in academic performance gains and higher rates of high school graduation.

Though I have not yet conducted research estimating the impact of the Promise on college enrollment, administrative data from the El Dorado Promise show that the Promise has been used at high rates. From 2007-2011, 78% to 94% of El Dorado High School graduates were eligible for the Promise. As can be seen in Figure 2, a high percentage of Promise-eligible students used the Promise for at least one semester of college, between 75% and 87% from 2007 to 2013. The high eligibility and usage rates indicate that the El Dorado Promise is indeed impacting a high proportion of El Dorado students, lending credibility to the idea that the Promise may have a broader impact on the district and the community.

Figure 2

El Dorado Promise Eligibility and Usage Rates



Summary

The El Dorado Promise was created in the hopes that the program would have a transformative impact on the individual students who are awarded scholarships, the El Dorado School District, and the community as a whole. Indeed, positive enrollment trends and high take-up rates of the Promise are early indicators that the Promise is having an impact on students and the school district. In this study, I analyze the impact the Promise has had on the school district, specifically student achievement, graduation, and the practices and culture of the El Dorado School District. In the next section, I describe the methods used in this evaluation of the K-12 impacts of the El Dorado Promise.

Chapter 4 – Methods

In this chapter, I present the methods used in my evaluation of the effects of the El Dorado Promise on K-12 achievement and high school graduation. For both of the research questions, I describe the research sample, data, and the analytic strategy employed to determine what, if any, impact the El Dorado Promise had on the El Dorado School District.

Research Question #1: K-12 Achievement

Sample

For the achievement analyses, I examine five cohorts of students, described in Table 5. Achievement Cohort 1 is the youngest cohort, comprised of students who were in third grade in 2005-06, and Achievement Cohort 5 is the oldest cohort, comprised of students who were in seventh grade in the pre-Promise year. Achievement analyses will be conducted on unbalanced panel data from 2006-07 to 2010-11, in which students from Achievement Cohort 1 (the youngest students) will be represented five times and students from Achievement Cohort 5 (the oldest students) will be represented once. To be included in the analysis, students must have baseline test scores in math and reading in the El Dorado School District in the pre-Promise year (2005-06) and must be enrolled in EDSD in the 2006-07 school year, the year the Promise was announced.

Table 6

Description of Cohorts for Achievement Analyses, 2005-06 to 2010-11

Promise Period	**Year**	**Achieve.[20] Cohort 1** (youngest)	**Achieve. Cohort 2**	**Achieve. Cohort 3**	**Achieve. Cohort 4**	**Achieve. Cohort 5** (oldest)
Pre-Promise	2005-06	3rd gr	4th gr	5th gr	6th gr	7th gr
Post-Promise	2006-07[21]	4th gr	5th gr	6th gr	7th gr	8th gr
Post-Promise	2007-08	5th gr	6th gr	7th gr	8th gr	
Post-Promise	2008-09	6th gr	7th gr	8th gr		
Post-Promise	2009-10	7th gr	8th gr			
Post-Promise	2010-11	8th gr				

Analytic Strategy

To conduct the analyses for achievement, I employ a two-level matching design:

1) District-level: matching El Dorado to similar districts to create a "population" from which individual student matches are drawn
2) Student-level: matching each El Dorado student to a single matched peer student from the population of students in the comparison districts using exact and propensity score matching techniques

Data

I first define the "population" from which individual student comparison group matches will be drawn. I do so by creating district-level matches for the EDSD with publicly-available data obtained from the Office for Education Policy and the Census websites (Analytic Strategy section below for more detail).[22] District-level variables used include district percent

[20] Achievement
[21] The Promise was announced in January 2007. Because students were tested in March 2007, the 2006-07 school year is treated as a post-Promise year.
[22] Data were retried from http://www.officeforeducationpolicy.org/arkansas-schools-data-benchmark-examinations/ and http://www.census.gov/data.html.

proficient/advanced on the Arkansas Benchmark exams for the 2004-05 and 2005-06 school years, percent free/reduced lunch (2005-06), percent white (2005-06), and district enrollment (2005-06). In addition, I use two Census data variables, percent population change (1990 and 2000 Census) and median income (1999 Census).

For student matches (see Analytic Strategy section), I use a combination of student-level achievement and demographic data. All student-level data used were de-identified and were provided by the Arkansas Department of Education. Achievement data are from the criterion-referenced Arkansas Benchmark examination, administered to all students in public schools in Arkansas in grades three through eight. Questions include open-response items and multiple-choice questions for both the literacy and math exams. Both literacy and math tests are administered in the spring (typically in April), with results generally returned in the summer. In addition to scaled scores, student performance on the Arkansas Benchmark is reported in four categorical levels of performance: Below Basic, Basic, Proficient, and Advanced. Scores are generally reported to the schools and general public as the percent of students scoring at or above the proficient levels on the exam.

For this analysis, I standardize the scaled scores by grade for the population of all Arkansas students, converting them to a z-score with a mean of 0 and a standard deviation of 1. As such, I can report student performance in terms of how distant an individual score is from the mean (0), the average Arkansas student. For example, a student with Benchmark math performance z-score of +0.75 scored three-quarters of a standard deviation above the mean of all students in Arkansas. Likewise, a Benchmark literacy z-score of -0.33 is one third standard deviation below the mean of all students in Arkansas.

Demographic data used include students' free/reduced lunch eligibility, race/ethnicity, gender, and the school and district in which they are enrolled.

District-Level Matching

The district-level matching serves to minimize potential bias occurring from differences in the pool of districts from which the potential individual student matches are drawn. That is, I do not want the findings to be driven by the uniquely positive or negative performance of a small number of "matched" districts.

There are two potential differences that I attempt to control for: differences in the composition of the student population and difference in the districts' performance. Drawing from the literature on peer effects for students, which suggests that students' achievement is affected by the level of advantage of their peers, I match districts on demographic characteristics, such as percent free/reduced lunch-eligible and percent white. I also match on student performance on Benchmark exams (grades 3-8) on math and literacy for two years prior to the Promise. Finally, I match on economic indicators such as median income of the area served by the district, percent population change over the past ten years, and district enrollment.

I make several somewhat arbitrary decisions in the selection of comparison districts. Therefore, I want to check whether or not results would be robust to the selection criteria used. To do that, I employ two different strategies for selecting a set of comparison districts. I create two sets of district matches: strict district matches, which used all of the aforementioned criteria, and broad district matches, which matched on some of the criteria. The matching criteria for both strict and broad district matches are displayed in Table 7. For both strict and broad district matches, districts must be closely matched (+/- 10 percentage points) on two years of prior achievement and the prior year's percent of free/reduced lunch-eligible population. Strict and

broad comparison districts must also have an enrollment between 1,000 and 8,000 students. For the strict district matches, districts are also matched on racial composition, percent population change, and median income. Eight comparison districts are identified using strict district match criteria, and twenty-eight districts are identified using broad district match criteria. Essentially, the larger sample is a check that the first set of districts are not simply idiosyncratically good or bad.

Table 7

Strict and Broad District Matching Criteria- Achievement

Indicator	Strict District Match	Broad District Match
2004-05 % Prof./Adv. Benchmarks (grades 3-8)	+/- 10% (20%)	+/- 10% (20%)
2005-06 % Prof./Adv. Benchmarks (grades 3-8)	+/- 10% (20%)	+/- 10% (20%)
% FRL (05-06)	+/- 10% (20%)	+/- 10% (20%)
% White (05-06)	+/- 25% (50%)	__
% Population Change (1990-2000)	+/- 20% (40%)	__
Median Income (1999)	+/- $5,000 ($10,000)	__
Enrollment (05-06)	Between 1,000 and 8,000	Between 1,000 and 8,000
N of Districts Included	8	28

As would be expected considering the matching criteria, the differences between El Dorado and the comparison district averages on prior achievement and the free/reduced lunch-eligible population are small, between 0 and 3 percentage points (Table 8). Matches between districts on the economic indicators, population change and median income, are also fairly close for strict district matches but larger for broad district matches. Sizeable differences are evident between El Dorado and the comparison districts on racial composition and enrollment. To some extent, El Dorado is unique, and it is difficult to find a sufficient number of districts that match closely on all characteristics.

Table 8

El Dorado and Strict and Broad Comparison District Descriptive Statistics- Achievement

Indicator	El Dorado	Strict Comparison District Average^ (N=8)	Broad Comparison District Average^ (N=28)
2004-05 Math	41%	41%	42%
2004-05 Literacy	47%	48%	49%
2005-06 Math	50%	50%	53%
2005-06 Literacy	53%	52%	55%
% FRL	58%	60%	57%
% White	42%	56%	*71%*
% Pop. Change	-5%	2%	*10%*
Median Income	$29,266	$28,483	*$30,030*
Enrollment	4,577	Total: 18,613 Simple Avg.: 2,327	Total: 52,903 Simple Avg.: 1,889

^Weighted average by enrollment, rounded to nearest integer.
Figures in italics were not matched upon and are displayed for descriptive purposes only.

Student-Level Matching

The strength of the analytic strategy relies on my ability to create individual student-level matches for each student exposed to the post-Promise El Dorado School District. Because I match each El Dorado student with a peer student from a similar district, I ensure that the comparison students are demographically similar to the El Dorado students and, more importantly, have the same "pre-Promise" level of academic achievement. Therefore, the performance of the comparison students represents a very reasonable estimate of what one might expect from the El Dorado students from 2007 onward. If I find that the El Dorado students

outperform their nearly identically matched counterparts, I can view these differences as estimates of the impact of the El Dorado Promise program.

I identify the group of El Dorado Promise-eligible students (or the treatment group) based on their enrollment in the school district in the 2005-06 and 2006-07 school years. Because I can only identify which district a student attends by the district the student is enrolled in when he or she takes standardized tests (which are administered in March), I needed to restrict my sample to students who were in EDSD in both the 2005-06 and 2006-07 school years to ensure that I do not include students who potentially enrolled in EDSD because of the Promise (enrolled after the Promise was announced in January 2007 but before tests were administered in March). Comparison students also must be enrolled in the same school district in the 2005-06 and 2006-07 school years to ensure that comparison students were not more highly mobile than treatment students. While these matching criteria ensure that students are in the same school district in the 2005-06 and 2006-07 school years, students who transferred from their original district to another Arkansas school district after the 2006-07 school year are included in this analysis.

I use two methods to create one-to-one student matches: exact matching and modified propensity score matching. For exact matching, treatment students are matched to comparison students who have the same race/ethnicity, free/reduced lunch eligibility, gender, and test scores that are within a .05 standard deviation (or z-score) range (+/- .025). Separate matches are estimated for the separate math and literacy analyses.

For modified propensity score matching, treatment students are matched exactly on test score and within a range on propensity score, which is based on a combination of important student demographic characteristics. The first step is an exact match on the achievement z-score rounded to the tenth place (e.g. a z-score of -0.13 is rounded to -0.1). The second step is

matching to a student with a propensity score within a .05 standard deviation range. To be specific, the propensity score represents the probability of being in the El Dorado School District based on free/reduced lunch eligibility, race/ethnicity, and gender, and is estimated using a logit model. When there is more than one potential comparison student who has the same rounded z-score and a propensity score within the .05 range, the comparison student is chosen at random.[23] Once again, separate matches are estimated for math and literacy.

With the strict and broad district matches, exact and modified propensity score student matches, and separate matches for math and literacy, there are a total of eight match types for the achievement analyses, shown in Table 9 below.

Table 9

Eight Distinct Achievement Analyses, Varying by Match Types and Subject

	Exact Student Match		**Propensity Score Student Match**	
Strict District Match	*Math*	*Literacy*	*Math*	*Literacy*
Broad District Match	*Math*	*Literacy*	*Math*	*Literacy*

Because each match type covers a different population of treatment and comparison students, I create an overlap sample of the treatment students that are common to all eight match types to be able to compare results. I include several different matching specifications as robustness checks. While the inclusion decisions for both district and student matches are based on theory, these decisions are ultimately somewhat arbitrary. If multiple match types on the same

[23] Stata allows the user to sort the dataset in the same way so that the same random student will be chosen each time the code is run.

population yield a similar effect, I have more confidence that the effects are real and not just a consequence of a particular matching decision that was made.

Pre-treatment equivalence between the treatment and comparison groups is established on all matching variables for each of the eight match types, with the exception of percent Hispanic for the strict district propensity score literacy matches, for which there is a 1 percentage point difference between the treatment and comparison groups. Tables 10 and 11 illustrate the pre-treatment (2005-06) equivalence between El Dorado students and the comparison group of matched students from the strict district exact student matches for math and literacy. This pre-treatment equivalence is, of course, central to the strength of the study design. These tables show that the majority of the El Dorado students and their matched counterparts are from low-income households (57%) and just over half of the students (53%) were African-American. Most importantly, the students in this study perform right around the state average level in both math (z-score = .05, or the 52nd percentile in the state) and literacy (z-score = .02, or the 51st percentile in the state).[24] Pre-treatment equivalence tables for the other matches are displayed in Appendix D.

[24] Table 5 showed that El Dorado students performed below the state average on math and literacy in the 2005-06 school year. Appendix C describes the creation of the analytic sample and shows why El Dorado students in the final analytic sample perform above the state average.

Table 10

Pre-Treatment Equivalence on Strict District Exact Match- Math- Achievement

	El Dorado Promise Students	Comparison Students	Difference	p
Baseline Math z-score (05-06)	0.05	0.05	0.00	0.97
Free/Reduced Lunch-Eligible	57%	57%	0%	1.00
White	46%	46%	0%	1.00
African-American	53%	53%	0%	1.00
Hispanic	1%	1%	0%	1.00
Other Race	0%	0%	0%	1.00
Female	50%	50%	0%	1.00
N	1090	1090		

*** p<0.01, ** p<0.05, * p<0.1

Differences between El Dorado and comparison students for continuous variables (math and literacy z-scores) are estimated using t-tests. Differences between El Dorado and comparison students for categorical variables (FRL, race/ethnicity, gender) are estimated using chi-squared tests.

Table 11

Pre-Treatment Equivalence: Strict District Exact Match- Literacy- Achievement

	El Dorado Promise Students	Comparison Students	Difference	p
Baseline Literacy z-score (05-06)	0.02	0.02	0.00	0.95
Free/Reduced Lunch-Eligible	57%	57%	0%	1.00
White	47%	47%	0%	1.00
African-American	53%	53%	0%	1.00
Hispanic	1%	1%	0%	1.00
Other Race	0%	0%	0%	1.00
Female	51%	51%	0%	1.00
N	1144	1144		

*** p<0.01, ** p<0.05, * p<0.1
Race/ethnicity categories do not add up to 100% because of rounding.

It is important to highlight that the analytic strategy employed is conservative; I followed the academic achievement of all students identified as members of the Promise treatment group in 2006-07, whether or not these students continued on at El Dorado through grade eight. This is commonly known as an intent-to-treat (ITT) analysis and does not bias the results in favor of the treatment group by limiting the sample to the subset of students who remain in the program throughout the entire time period. Thus, the results here might be viewed as a lower-bound estimate of the impacts of attending an El Dorado Promise school.

The data are organized as an unbalanced panel, and the unit of analysis is student-by-year, which means that most students appear in the dataset multiple times. For example, at the most extreme, the youngest students appear in the analysis five times, once for each year from 2007 to 2011. To obtain overall program estimates, I run an ordinary least squares (OLS)

regression on equation (1) for all students in the sample. Standard errors are bootstrapped and clustered at the student level.

$$Y_{it} = \beta_0 + \beta_1 ED + \beta_2 Y_{06} + \beta_3 X_i + \beta_4 \Psi_i + \varepsilon_{it} \quad (1)$$

where Y_{it} is the math or literacy test score for student *i* in year *t*

ED is an indicator for being enrolled in the El Dorado School District in the post-Promise period (for at least the 05-06 and 06-07 school years)

Y_{06} is the baseline (05-06) math or literacy test score for student *i* in year *t*

X_i represents student demographic characteristics, including free/reduced lunch-eligibility, race/ethnicity and gender

Ψ_i is a control for student cohort

ε_{it} is the error term

In equation (1), the indicator of interest is ED, the indicator being enrolled in EDSD or the treatment. In equation (2), I estimate the impact of years of exposure to the Promise in which I substitute the binary variable "ED" with the variable "ED*Yrs," which indicates the number of years a student has been "exposed" to the Promise, i.e. the number of years since the Promise announcement. For this variable, an observation for a treatment student in 2007 is coded as "0.22" for being exposed to the Promise for two months[25], a treatment student in 2008 is coded as "1.22" for one year and two months of exposure, etc. All students in the comparison group are

[25] The Promise was announced in late January 2007, and the Benchmark examinations were administered to students in mid- to late-March 2007; therefore, 2007 test scores reflect approximately two months of exposure to the Promise had only been in place for two months before students were tested. Two divided by nine (for a nine month school year) is 0.22, so students in 2007 had been exposed to the Promise for 0.22 school years.

coded as "0." The coefficient on these estimates will indicate the impact of one additional year of exposure to the Promise, or the annual effect of the Promise.

$$Y_{it} = \beta_0 + \beta_1 ED*Yrs + \beta_2 Y_{06} + \beta_3 X_i + \beta_4 \Psi_i + \varepsilon_{it} \quad (2)$$

I also test to see if effects differ for certain subgroups: free/reduced lunch eligible, African-American, top-scoring students (student who scored in the top half of their class on the 05-06 Benchmark exam), and a super-subgroup of students who are top-scoring and either free/reduced-lunch eligible or African-American.

Equations (3) and (4) are examples of models used to test for subgroup effects for free/reduced lunch-eligible (FRL) students.

$$Y_{it} = \beta_0 + \beta_1 ED*FRL_i + \beta_2 ED*NonFRL_i + \beta_3 Y_{06} + \beta_4 FRL_i + \beta_3 Z_i + \beta_5 \Psi_i + \varepsilon_{it} \quad (3)$$

$$Y_{it} = \beta_0 + \beta_1 ED + \beta_2 ED*FRL_i + \beta_3 Y_{06} + \beta_4 FRL_i + \beta_3 Z_i + \beta_5 \Psi_i + \varepsilon_{it} \quad (4)$$

where $ED*FRL_i$ is an interaction term of the treatment variable (ED) and FRL eligibility

$ED*NonFRL_i$ is an interaction term of the treatment variable (ED) and not being FRL-eligible (NonFRL)

FRL_i is an indicator whether student *i* is free/reduced-lunch eligible or not

Z_i represents other student demographic characteristics, including race/ethnicity and gender

In equation (3), the coefficient β_1 shows the magnitude and significance of the separate effect for both the treated FRL and non-FRL subgroup. In equation (4), β_2 shows the magnitude and significance of the effect for treated FRL students above and beyond all treated students.

Despite the careful matching process and robustness checks, I have some doubts that it was indeed the Promise, not other pre-existing differences between El Dorado and comparison

districts, that led to any positive outcomes I might observe. During focus groups and interviews, EDSD personnel indicated that a number of instructional initiatives had been put into place prior to the Promise to increase student achievement. It is possible that these initiatives, and the fact that EDSD was the type of district that initiated new reforms and initiatives even before the Promise was announced, are the driving factors behind positive results, not the introduction of the Promise. In order to test whether the Promise itself leads to achievement gains, I conduct a placebo test. For the placebo test, my first step is estimating the one-year impacts of the El Dorado Promise, by running equation (1) on a subset of the sample that only includes 05-06 and 06-07 data. I then conduct the placebo test by creating matches using 04-05 data and estimating the one-year impact of being in the El Dorado School District during the 2005-06 school year, a time when the Promise was not in place. If I observe a positive impact for the year in which the Promise was in place but no impact for the placebo analyses, I have stronger evidence that the Promise itself led to improvements in student learning.

Research Question #2: High School Graduation

Sample

For the graduation analyses, I examine two cohorts of students: students expected to graduate in the 2010-11 and the 2011-12 school years. Table 12 below highlights the cohorts included; Graduation Cohorts 1 and 2 include the same students as Achievement Cohorts 4 and 5, respectively. To be included in the analysis, students must have baseline test scores in math and reading in the El Dorado School District in the pre-Promise year (2005-06) and must be enrolled in El Dorado continuously through their ninth grade year because grade nine is the baseline year for graduation rate calculations. Graduation analyses are conducted on pooled data of the two cohorts.

Table 12

Description of Cohorts for Graduation Analyses, 2005-06 to 2011-12

Promise Period	Year	Grad.[26] Cohort 1	Grad. Cohort 2
Pre-Promise	2005-06	6th gr	7th gr
Post-Promise	2006-07	7th gr	8th gr
Post-Promise	2007-08	8th gr	9th gr
Post-Promise	2008-09	9th gr	10th gr
Post-Promise	2009-10	10th gr	11th gr
Post-Promise	2010-11	11th gr	12th gr
Post-Promise	2011-12	12th gr	

Analytic Strategy

To conduct graduation analyses, I use the same two-level matching design, creating district- and student-level matches, as I do for achievement analyses. Unfortunately, I was not able to include a placebo test for graduation results, as the multi-year nature of graduation outcome measures does not allow me to look at yearly differences.

Data

To create district-level matches for graduation analyses, I use many of the same variables used for district-level matches for achievement analyses: 2004-05 and 2005-06 district percent proficient/advanced on the Arkansas Benchmark exams, 2005-06 percent free/reduced lunch, 2005-06 percent white, percent population change from 1990 to 2000, and 1999 median income.

[26] Graduation

I also use the district-level averaged freshman graduation rates (AFGR) for 2005-06, obtained from the U.S. Department of Education's Common Core of Data (CCD).

For student matches, I use the same achievement and demographic data described above for the achievement analyses. For the graduation analyses, I construct two additional student-level variables: pre-Promise mobility (moved school districts between 2003-04 and 2005-06) and whether a student was held back a grade in the pre-Promise time period (whether a student repeated a grade between 2003-04 and 2005-06).

Four graduation outcome measures are created using a combination of graduation and enrollment data for all students in the state of Arkansas:

- graduate on time from any Arkansas school district
- graduate at all from any Arkansas school district
- graduate on time from ninth grade school district
- graduate at all from ninth grade school district

Graduate on time means that a student graduated at the expected time (four years after he or she began ninth grade), and graduate at all means that a student graduated past their expected graduation year, typically in the summer, fall, or spring semester following their expected graduation date. The graduate from ninth grade school district variable allows me to determine if treatment students graduated from El Dorado High School versus another school. The graduation data are restricted to graduates from public schools in the state of Arkansas and thus do not capture students who graduated from schools in another state or private schools.

District-Level Matching

The district matching process for graduation analyses is very similar to the process used for achievement analyses, except districts are matched on averaged freshman graduation rate

(AFGR) rather than enrollment. Also, districts for the graduation analyses are matched within a wider range (30% vs. 20%) on achievement and the percent of students eligible for free/reduced lunch. Table 13 below details the matching criteria for strict and broad district matches for the graduation analyses.

Table 13

Strict and Broad District Matching Criteria- Graduation

Indicator	Strict District Match	Broad District Match
2004-05 % Prof./Adv. Benchmarks (grades 3-8)	+/- 15% (30%)	+/- 15% (30%)
2005-06 % Prof./Adv. Benchmarks (grades 3-8)	+/- 15% (30%)	+/- 15% (30%)
% FRL (05-06)	+/- 15% (30%)	+/- 15% (30%)
% White (05-06)	+/- 25% (50%)	__
% Population Change (1990-2000)	+/- 20% (40%)	__
Median Income (1999)	+/- $5,000 ($10,000)	__
Averaged Freshman Graduation Rate (AFGR) (05-06)	+/- 6% (12%)	+/- 6% (12%)
N of Districts Included	9	43

As can be seen in Table 14, comparison districts are relatively similar to El Dorado for both the strict and broad district matches but comparison districts are slightly more advantaged than El Dorado on most variables. Comparison districts have slightly higher achievement levels than El Dorado, between 2 and 5 percentage points difference, and are more advantaged on their community economic indicators, population change and median income. El Dorado and comparison districts have similar percentages of free/reduced lunch-eligible students, with

differences ranging from 1 to 3 percentage points. Once again, there are large differences between El Dorado and the comparison districts on district racial composition, with comparison districts being having between 14 and 30 percentage points more white students. Finally, the averaged freshman graduation rate (AFGR) is the same for broad comparison districts and 2 percentage points higher than El Dorado for the strict comparison districts. In general, the differences between El Dorado and comparison districts favor the comparison districts, meaning that the comparison group represents a particularly tough test for the hypothesis that the El Dorado Promise improves graduation rates.

Table 14

El Dorado and Strict and Broad Comparison District Descriptive Statistics- Graduation

Indicator	El Dorado	Strict Comparison District Average^ (N=9)	Broad Comparison District Average^ (N=43)
2004-05 Math	41%	43%	44%
2004-05 Literacy	47%	50%	52%
2005-06 Math	50%	52%	54%
2005-06 Literacy	53%	56%	58%
% FRL	58%	59%	55%
% White	42%	56%	*72%*
% Pop. Change	-5%	6%	*19%*
Median Income	$29,266	$30,288	*$31,505*
Averaged Freshman Graduation Rate (AFGR) (05-06)	86%	88%	86%
Enrollment	*4,577*	*Total: 27,701* *Simple Avg.: 3,078*	*Total: 75,303* *Simple Avg.: 1,751*

^Weighted average by enrollment, rounded to nearest integer.
Figures in italics were not matched upon and are displayed for descriptive purposes only.

Student-Level Matching

As with achievement analyses, I use both exact matching and modified propensity score matching techniques to create one-to-one student matches. For graduation student matches, I use three different variables than I did for achievement matches: an average of 05-06 math and literacy scores, a mobility variable that indicates if a student moved districts in the pre-Promise period, and a held back grade variable that indicates if a student was held back a grade in the pre-

Promise period. For exact matching, treatment students are matched to comparison students who had the same race/ethnicity, free/reduced lunch eligibility, gender, mobility status, held back grade status, and an average math and literacy test score within a .05 standard deviation range (+/- .025).

For modified propensity score matching, treatment students are matched exactly on the rounded average math and literacy test score and within a .05 standard deviation range on propensity score. The propensity score, the probability of being in the El Dorado School District based on free/reduced lunch eligibility, race/ethnicity, gender, mobility status, and held back grade status, is estimated using a logit model.

With the strict and broad district matches and exact and modified propensity score student matches, there are a total of four match types for the graduation analyses: strict district exact matches, strict district propensity score matches, broad district exact matches, and broad district propensity score matches. With the four different graduation outcome measures, this comes to a total of 16 unique results for the graduation analyses.

Table 15 shows the pre-treatment equivalence between El Dorado students and the comparison group of matched students from the strict district exact student matches. El Dorado students and comparison student are equivalent on all matching criteria at baseline for the other three match types as well, with the exception of a difference in percent Hispanic for the strict district propensity score match (see Appendix D).

Table 15

Pre-Treatment Equivalence: Strict District Exact Match- Graduation

	El Dorado Promise Students	Comparison Students	Difference	p
Average Math and Literacy z-score (2006)	0.12	0.13	-0.01	0.89
Math z-score (2006)	*0.15*	*0.20*	*-0.05*	*0.41*
Literacy z-score (2006)	*0.10*	*0.07*	*0.03*	*0.59*
Free/Reduced Lunch-Eligible	51%	51%	0%	1.00
African-American	51%	51%	0%	1.00
Hispanic	1%	1%	0%	1.00
Other Race	3%	3%	0%	1.00
Female	48%	48%	0%	1.00
Mobile	6%	6%	0%	1.00
Held Back Grade	1%	1%	0%	1.00
N	409	409		

*** p<0.01, ** p<0.05, * p<0.1
Italics denote a subgroup that was later aggregated.

To obtain overall program estimates, I run logistic regressions on equation (5) for all students in the sample with bootstrapped standard errors. Equation (5) is run four times for each of the four different graduation outcome measures.

$$\Gamma_i = \beta_0 + \beta_1 ED + \beta_2 Y_{06} + \beta_3 X_i + \beta_4 \Psi_i + \varepsilon_{it} \quad (5)$$

where Γ_i is graduation status (graduate on time, graduate at all, graduate from 9th grade district on time, graduate from 9th grade district at all) for student *i*

ED is an indicator for being enrolled in the El Dorado School District in the post-Promise period (for at least the 05-06 and 06-07 school years)

Y_{06} is the baseline (05-06) math or literacy test score for student *i* in year *t*

X_i represents student demographic characteristics, including free/reduced lunch-eligibility, race/ethnicity, gender, mobility status, and held back grade status

Ψ_i is a control for student cohort

ε_{it} is the error term

To obtain subgroup estimates, I run logistic regressions on equations (6) and (7) for graduation variables.[27] I test subgroup results for free/reduced lunch eligible, African-American, and top-scoring students.

$$\Gamma_\imath = \beta_0 + \beta_1 ED*FRL_i + \beta_2 ED*NonFRL_i + \beta_3 Y_{06} + \beta_4 FRL_i + \beta_3 Z_i + \beta_5 \Psi_i + \varepsilon_{it} \quad (6)$$

$$\Gamma_\imath = \beta_0 + \beta_1 ED + \beta_2 ED*FRL_i + \beta_3 Y_{06} + \beta_4 FRL_i + \beta_3 Z_i + \beta_5 \Psi_i + \varepsilon_{it} \quad (7)$$

where $ED*FRL_i$ is an interaction term of the treatment variable (ED) and FRL eligibility

$ED*NonFRL_i$ is an interaction term of the treatment variable (ED) and not being FRL-eligible (NonFRL)

FRL_i is an indicator whether student *i* is free/reduced-lunch eligible or not

Z_i represents other student demographic characteristics, including race/ethnicity, gender, mobility status, and held back grade status

Methods Summary

To estimate the impacts of the El Dorado Promise on K-12 achievement and high school graduation, I employ one-to-one student level matching. Specifically, I match El Dorado to two sets of similar comparison districts to create the "population" from which individual student-

[27] Equations (6) and (7) are examples of models used to test for subgroup effects for free/reduced lunch-eligible (FRL) students.

level matches are drawn. To create student-level matches, I use both exact and modified propensity score matching techniques. To estimate effects, I use an ordinary least squares (OLS) regression for achievement and logistic regression for graduation. In the following chapter, I report overall and subgroup results for achievement and graduation results, as well as robustness checks and a placebo test for the achievement results.

Chapter 5 – Results

One of the findings from my systematic literature review of Promise programs is that there is very little evidence about the impact of Promise programs on K-12 outcomes. Only one study examined the impact of the announcement of a Promise program on academic achievement, and there were no studies that examined the effect on high school graduation. Noting this gap in the literature, for this evaluation, I examine the extent to which the implementation of the El Dorado Promise impacted student achievement and high school graduation in the El Dorado School District.

Research Question #1: K-12 Achievement

Full Sample Results

The first step in my analysis was to determine the impact estimates of the El Dorado Promise program on the sample as a whole for math and literacy. Tables 16 and 17 show that impact estimates were positive and statistically significant for both math and literacy. Treatment impact estimates ranged from 0.123 to 0.147 for math and from 0.104 to 0.145 for literacy, and treatment students were in the sample an average of 1.5 years. In other words, El Dorado Promise students boasted test scores that were roughly 12 to 15 percent of a standard deviation better than their matched peers in math and 10 to 15 percent of a standard deviation better in literacy over an average of 1.5 years. This effect is particularly impressive when you consider the fact that the average boost from the program is slightly greater than the average negative effect of FRL on student achievement. The performance of the control variables validates the soundness of the data and model, as lagged measures of the dependent variables have large coefficients and the coefficients for FRL, African American, and Female are all in the expected

direction and tend to be statistically significant. Finally, the model explains about two-thirds of the total variation in outcome test scores.

Table 16

Overall Achievement Results- Math, 2007-11

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise Students	**0.134*** **	**0.123*** **	**0.147*** **	**0.133*** **
	(0.0229)	(0.0211)	(0.0205)	(0.0206)
Baseline Math z-score (05-06)	0.847***	0.777***	0.842***	0.785***
	(0.0153)	(0.0228)	(0.0134)	(0.0212)
Free/Reduced Lunch-Eligible	-0.113***	-0.0779**	-0.138***	-0.117***
	(0.0334)	(0.0309)	(0.0303)	(0.0289)
African-American	-0.0806**	-0.177***	-0.0320	-0.106***
	(0.0360)	(0.0365)	(0.0300)	(0.0337)
Hispanic	0.119	0.0559	0.134	0.149
	(0.127)	(0.110)	(0.101)	(0.103)
Other Race	0.563	0.245	0.403	0.244
	(0.370)	(0.252)	(0.313)	(0.193)
Female	0.0408*	0.0400*	0.0289	0.0578***
	(0.0234)	(0.0215)	(0.0218)	(0.0224)
Achievement Cohort 2	0.0564*	0.0504	0.0147	-0.00383
	(0.0342)	(0.0317)	(0.0325)	(0.0315)
Achievement Cohort 3	0.0611*	0.0486	0.0257	0.0358
	(0.0335)	(0.0299)	(0.0312)	(0.0301)
Achievement Cohort 4	-0.0708**	0.00172	-0.0486	0.00178
	(0.0332)	(0.0349)	(0.0314)	(0.0336)
Achievement Cohort 5	-0.0469	-0.0434	-0.0234	-0.00635
	(0.0351)	(0.0334)	(0.0345)	(0.0336)
Constant	0.0602*	0.0975***	0.0542*	0.0774**
	(0.0344)	(0.0332)	(0.0321)	(0.0329)
Observations	6,256	7,320	6,968	7,520
(Students)	(2,180)	(2,544)	(2,418)	(2,610)
Avg. Years in Treatment	1.49	1.50	1.51	1.50
R-squared	0.659	0.656	0.681	0.667

*** p<0.01, ** p<0.05, * p<0.1

Bootstrapped standard errors clustered at student level in parentheses

Table 17

Overall Achievement Results- Literacy

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise Students	**0.141*** **	**0.145*** **	**0.104*** **	**0.112*** **
	(0.0214)	(0.0192)	(0.0204)	(0.0190)
Baseline Literacy z-score (05-06)	0.753***	0.774***	0.764***	0.765***
	(0.0143)	(0.0125)	(0.0131)	(0.0116)
Free/Reduced Lunch-Eligible	-0.0431	-0.0750***	-0.0452	-0.0741***
	(0.0284)	(0.0274)	(0.0292)	(0.0264)
African-American	-0.144***	-0.0774***	-0.114***	-0.0818***
	(0.0289)	(0.0286)	(0.0293)	(0.0267)
Hispanic	-0.0807	0.121	-0.105	0.00739
	(0.141)	(0.0818)	(0.0912)	(0.0704)
Other Race	0.165	0.0284	0.0781	0.0543
	(0.234)	(0.151)	(0.176)	(0.128)
Female	0.146***	0.149***	0.120***	0.142***
	(0.0224)	(0.0202)	(0.0207)	(0.0199)
Achievement Cohort 2	-0.00105	0.00826	-0.0264	-0.0354
	(0.0312)	(0.0300)	(0.0298)	(0.0268)
Achievement Cohort 3	-0.0150	-0.00679	-0.00866	-0.0328
	(0.0311)	(0.0278)	(0.0300)	(0.0277)
Achievement Cohort 4	-0.0535*	-0.0290	-0.0532*	-0.0570**
	(0.0311)	(0.0280)	(0.0286)	(0.0271)
Achievement Cohort 5	-0.0411	-0.0287	-0.0438	-0.0467
	(0.0349)	(0.0310)	(0.0332)	(0.0309)
Constant	0.0109	-0.0303	0.0452	0.0311
	(0.0310)	(0.0291)	(0.0298)	(0.0268)
Observations (Students)	6631 (2,288)	7,431 (2,568)	7,118 (2,460)	7,536 (2,614)
Avg. Years in Treatment	1.52	1.51	1.51	1.51
R-squared	0.646	0.667	0.659	0.684

*** p<0.01, ** p<0.05, * p<0.1

Bootstrapped standard errors clustered at student level in parentheses

Table 18 summarizes the annual treatment effect of the Promise for both math and literacy. Annual effects of the Promise ranged from 0.064 to 0.078; in other words, El Dorado Promise students boasted test scores that were roughly 6 to 8 percent of a standard deviation better than their matched peers each year. Moreover, a model with indicator variables for each treatment by year period indicated that these gains compound over time for up to three years. In other words, these gains persist and build upon one another rather than fade away.

Table 18

Annual Effects- Math and Literacy

	Strict Exact	Strict PS	Broad Exact	Broad PS
Annual Effects- Math	**0.0710*** **	**0.0667*** **	**0.0752*** **	**0.0730*** **
	(0.00973)	(0.00869)	(0.00860)	(0.00843)
Annual Effects- Literacy	**0.0756*** **	**0.0781*** **	**0.0643*** **	**0.0664*** **
	(0.00918)	(0.00820)	(0.00876)	(0.00811)

*** p<0.01, ** p<0.05, * p<0.1
Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Subgroup Results

While the overall results are interesting and promising, it is also worth investigating the results for particular subgroups of students. In this section, I investigate whether the impacts differ by student race, wealth, or academic ability. In interviews with teachers and school leaders, I learned that El Dorado educators redoubled their efforts to ensure that they held high expectations for all students, with many EDSD personnel explicitly stating that higher expectations were placed on disadvantaged students, namely free/reduced lunch-eligible and African-American students. In light of the fact that all El Dorado students now had the financial

means to attend college, conversations about college and trips to college campuses became commonplace for all students in the district, regardless of race or class.

Given this background, it is certainly possible that the Promise program might have had a more pronounced effect on economically-disadvantaged students or African-American students. Moreover, because the program focused to such a large extent on college, it is also possible that the program might have gained more traction for students who viewed themselves (or who were viewed by others) as "college material" in terms of academic ability. To investigate these possible differential effects, I disaggregated the data by race, wealth, and pre-Promise academic ability. The results of these analyses are presented in Tables 19-22.

In these tables, the subgroup names (e.g. FRL and Non-FRL) refer to the magnitude and significance of the effect for the overall subgroup, obtained from equation (3), and the italicized "*Treatment Subgroup Name Interaction*" (e.g. *Treatment FRL Interaction*) refers to the effect for the subgroup in question students above and beyond the effect for all treated students, obtained from equation (4). When looking at the descriptive subgroup effects obtained from equation (3), I find that the effects are often larger for the African-American, free/reduced lunch-eligible, highest-scoring half, and highest-scoring half African-American or FRL subgroups. However, only the "highest-scoring half" and "highest-scoring half, African-American or FRL" subgroups consistently had statistically-significant impacts above and beyond those for treated students as a whole. I observed the largest overall and marginal impact for students who were in the highest-scoring half of their class and were either African-American or free/reduced lunch eligible, with overall subgroup effects ranging from 0.165 to 0.261 and annual effects ranging from 0.070 to 0.099.

Table 19

Subgroup Achievement Results- Math

	Strict Exact	**Strict PS**	**Broad Exact**	**Broad PS**
Overall	0.134***	0.123***	0.147***	0.133***
FRL	0.155***	0.130***	0.153***	0.143***
Non-FRL	0.102***	0.113***	0.138***	0.120***
Treatment FRL Interaction	*0.053*	*0.017*	*0.016*	*0.022*
African-American	0.150***	0.098***	0.147***	0.138***
Not African-American	0.115***	0.145***	0.147***	0.127***
Treatment African-American Interaction	*0.036*	*0.047*	*0.000*	*0.011*
Highest-Scoring Half	0.197***	0.239***	0.235***	0.249***
Lowest-Scoring Half	0.072**	0.011	0.063**	0.020
Treatment Highest-Scoring Half Interaction	*0.125****	*0.228****	*0.173****	*0.229****
Highest-Scoring Half, African-American or FRL	0.203***	0.246***	0.252***	0.261***
Non-Highest-Scoring Half, African-American or FRL	0.116***	0.088***	0.119***	0.096***
Treatment Highest-Scoring Half, African-American or FRL Interaction	*0.087**	*0.158****	*0.133****	*0.165****

*** p<0.01, ** p<0.05, * p<0.1

Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Table 20

Subgroup Achievement Results- Literacy

	Strict Exact	**Strict PS**	**Broad Exact**	**Broad PS**
Overall	0.141***	0.145***	0.104***	0.112***
FRL	0.141***	0.152***	0.106***	0.114***
Non-FRL	0.141***	0.136***	0.101***	0.109***
Treatment FRL Interaction	*0.000*	*0.017*	*0.005*	*0.006*
African-American	0.156***	0.155***	0.118***	0.112***
Not African-American	0.124***	0.134***	0.088***	0.112***
Treatment African-American Interaction	*0.032*	*0.021*	*0.029*	*0.000*
Highest-Scoring Half	0.189***	0.166***	0.144***	0.148***
Lowest-Scoring Half	0.094***	0.125***	0.065**	0.076***
Treatment Highest-Scoring Half Interaction	*0.095****	*0.041*	*0.078***	*0.072***
Highest-Scoring Half, African-American or FRL	0.236***	0.184***	0.171***	0.165***
Non-Highest-Scoring Half, African-American or FRL	0.118***	0.134***	0.086***	0.097***
Treatment Highest-Scoring Half, African-American or FRL Interaction	*0.118****	*0.050*	*0.085***	*0.068**

*** p<0.01, ** p<0.05, * p<0.1

Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Table 21

Annual Subgroup Effects- Math

	Strict Exact	**Strict PS**	**Broad Exact**	**Broad PS**
Overall	0.071***	0.067***	0.075***	0.073***
FRL	0.080***	0.068***	0.077***	0.075***
Non-FRL	0.058***	0.064***	0.072***	0.071***
Treatment FRL Interaction	*0.022*	*0.004*	*0.005*	*0.004*
African-American	0.085***	0.082***	0.086***	0.085***
Not African-American	0.056***	0.049***	0.064***	0.060***
Treatment African-American Interaction	*0.029*	*0.033**	*0.022*	*0.025*
Highest-Scoring Half	0.086***	0.095***	0.097***	0.101***
Lowest-Scoring Half	0.056***	0.039***	0.055***	0.046***
Treatment Highest-Scoring Half Interaction	*0.030**	*0.056****	*0.042***	*0.055****
Highest-Scoring Half, African-American or FRL	0.082***	0.089***	0.099***	0.099***
Non-Highest-Scoring Half, African-American or FRL	0.068***	0.060***	0.069***	0.065***
Treatment Highest-Scoring Half, African-American or FRL Interaction	*0.014*	*0.029*	*0.030*	*0.034**

*** p<0.01, ** p<0.05, * p<0.1

Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Table 22

Annual Subgroup Effects- Literacy

	Strict Exact	Strict PS	Broad Exact	Broad PS
Overall	0.076***	0.078***	0.064***	0.066***
FRL	0.089***	0.093***	0.078***	0.080***
Non-FRL	0.056***	0.058***	0.044***	0.048***
Treatment FRL Interaction	*0.033**	*0.034***	*0.035***	*0.031***
African-American	0.094***	0.093***	0.082***	0.079***
Not African-American	0.056***	0.061***	0.045***	0.052***
Treatment African-American Interaction	*0.038***	*0.033***	*0.037***	*0.027**
Highest-Scoring Half	0.078***	0.071***	0.064***	0.064***
Lowest-Scoring Half	0.074***	0.085***	0.064***	0.068***
Treatment Highest-Scoring Half Interaction	*0.004*	*-0.014*	*0.000*	*-0.004*
Highest-Scoring Half, African-American or FRL	0.070***	0.097***	0.094***	0.089***
Non-Highest-Scoring Half, African-American or FRL	0.065***	0.073***	0.056***	0.060***
Treatment Highest-Scoring Half, African-American or FRL Interaction	*0.050****	*0.024*	*0.038***	*0.029**

*** p<0.01, ** p<0.05, * p<0.1
Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Overlap Sample Results

As a robustness check for the achievement analyses, I look at the overlap sample to ensure that different matching strategies yielded similar answers for the same set of students. The overlap sample included the same treatment students for each match type, so the answers are directly comparable. As can be seen in Tables 23 and 24, I find that the four different match types yield relatively similar results (within .02 standard deviation range).

Table 23

Achievement Results for Overlap Sample- Math

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise Students	**0.148*** **	**0.130*** **	**0.152*** **	**0.145*** **
	(0.0241)	(0.0240)	(0.0239)	(0.0244)
Baseline Math z-score (05-06)	0.848***	0.850***	0.862***	0.864***
	(0.0174)	(0.0174)	(0.0168)	(0.0169)
Free/Reduced Lunch-Eligible	-0.158***	-0.123***	-0.155***	-0.111**
	(0.0439)	(0.0414)	(0.0419)	(0.0437)
African-American	-0.0483	-0.0758*	-0.00731	-0.0331
	(0.0423)	(0.0419)	(0.0393)	(0.0403)
Hispanic	0.270	0.237	0.324	0.285
	(0.227)	(0.229)	(0.198)	(0.200)
Female	0.0646***	0.0405	0.0556**	0.0758***
	(0.0246)	(0.0251)	(0.0243)	(0.0249)
Achievement Cohort 2	0.0566	0.0465	0.0241	0.00635
	(0.0375)	(0.0367)	(0.0377)	(0.0379)
Achievement Cohort 3	0.0802**	0.0602*	0.0354	0.0288
	(0.0353)	(0.0348)	(0.0344)	(0.0344)
Achievement Cohort 4	-0.0496	-0.0622*	-0.0354	-0.0361
	(0.0364)	(0.0365)	(0.0355)	(0.0358)
Achievement Cohort 5	-0.00991	-0.0141	0.00346	0.00238
	(0.0390)	(0.0398)	(0.0387)	(0.0397)
Constant	0.0411	0.0740**	0.0318	0.0225
	(0.0374)	(0.0363)	(0.0358)	(0.0378)
Observations	4,981	4,982	4,974	4,978
(Students)	(1,742)	(1,742)	(1,742)	(1,742)
R-squared	0.656	0.657	0.663	0.662

*** p<0.01, ** p<0.05, * p<0.1

Bootstrapped standard errors clustered at student level in parentheses.
Differences in number of observations are due to comparison students appearing in the sample a different numbers of times across match types.

Table 24

Achievement Results for Overlap Sample- Literacy

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise Students	**0.139*** **	**0.138*** **	**0.120*** **	**0.118*** **
	(0.0231)	(0.0237)	(0.0236)	(0.0228)
Baseline Literacy z-score (05-06)	0.722***	0.743***	0.729***	0.731***
	(0.0170)	(0.0179)	(0.0177)	(0.0160)
Free/Reduced Lunch-Eligible	-0.0584	-0.0473	-0.0282	-0.0549
	(0.0356)	(0.0379)	(0.0387)	(0.0349)
African-American	-0.163***	-0.129***	-0.170***	-0.131***
	(0.0361)	(0.0379)	(0.0399)	(0.0361)
Hispanic	-0.176	0.0341	-0.224**	-0.205*
	(0.157)	(0.156)	(0.107)	(0.105)
Female	0.161***	0.175***	0.141***	0.164***
	(0.0241)	(0.0250)	(0.0235)	(0.0224)
Achievement Cohort 2	-0.00870	0.00181	-0.0262	-0.0327
	(0.0341)	(0.0341)	(0.0329)	(0.0327)
Achievement Cohort 3	0.00245	-0.00203	-0.00260	-0.00684
	(0.0345)	(0.0365)	(0.0337)	(0.0346)
Achievement Cohort 4	-0.0483	-0.0340	-0.0470	-0.0494
	(0.0318)	(0.0328)	(0.0338)	(0.0322)
Achievement Cohort 5	-0.0206	-0.0321	-0.0250	-0.0426
	(0.0351)	(0.0391)	(0.0359)	(0.0369)
Constant	0.0209	-0.0141	0.0427	0.0318
	(0.0337)	(0.0377)	(0.0367)	(0.0346)
Observations	5,271	5,269	5,271	5,269
(Students)	(1,836)	(1,836)	(1,836)	(1,836)
R-squared	0.620	0.617	0.620	0.628

*** p<0.01, ** p<0.05, * p<0.1

Bootstrapped standard errors clustered at student level in parentheses

Differences in number of observations are due to comparison students appearing in the sample a different numbers of times across match types.

Placebo Test

While I observe both positive overall and subgroup effects, doubts remain that it was the introduction of the Promise that led to these outcomes. In contrast, it is possible that the El Dorado School District was more effective than other districts at fostering student test score growth prior to the Promise. To test whether it was the Promise that led to achievement gains, I conduct a placebo test, estimating the impact of being in the El Dorado School District in a year that the Promise was not in place. In Tables 25 and 26, the first rows show the one-year impact of the Promise; for both math and literacy, I observe small but statistically significant impacts. The second row in these tables show the one-year impact of being in the El Dorado School District during the 2005-06 school year, a time when the Promise was not in place. If the Promise is indeed leading to improved achievement outcomes, I would expect to see no effect for being in EDSD in the pre-Promise year. Here, I observe a null effect for math but still observe a positive impact for literacy. Importantly, this placebo test provides evidence that the Promise itself may have led to improvements in math achievement but does not allow me to draw the same conclusion about literacy.

Table 25

Placebo Test- Math

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise One-Year Math Effects (05-06 to 06-07)	**0.0516****	**0.0478****	**0.0722*****	**0.0603*****
	(0.0250)	(0.0243)	(0.0223)	(0.0222)
Placebo One-Year Math Effects (04-05 to 05-06)	**0.0234**	**0.00590**	**0.00923**	**0.00614**
	(0.0218)	(0.0203)	(0.0217)	(0.0230)

*** p<0.01, ** p<0.05, * p<0.1
Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Table 26

Placebo Test- Literacy

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise One-Year Effects (05-06 to 06-07)	**0.0846*****	**0.0851*****	**0.0509****	**0.0604*****
	(0.0225)	(0.0210)	(0.0221)	(0.0215)
Placebo One-Year Effects (04-05 to 05-06)	**0.0932*****	**0.0739*****	**0.0580*****	**0.0544*****
	(0.0200)	(0.0195)	(0.0207)	(0.0198)

*** p<0.01, ** p<0.05, * p<0.1
Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

K-12 Achievement Summary

The combination of the primary and the placebo test lead me to conclude that the Promise led to improvements in math achievement scores in the El Dorado School District. In math, while the overall program impact was .134 z-score units, the impact was .155 for economically disadvantaged students, .150 for African American students, .197 for students in the top half of

the class, and a large .203 for the super subgroup of students who were both in the top half of the class and from a disadvantaged background. These estimates reflect only the strict district exact match, but the other match types yielded similar answers and often boasted even larger effects. In literacy, while the overall results are similar to math, the placebo test requires I take caution in interpreting these effects as being a result of the Promise. The annual effects are also sizable and are easier to interpret. Annual math effects range from .067 to .0.075 z-score units, and subgroup effects for students at the top of their class and top half students from a disadvantaged background range from 0.082 to 0.099 z-score units per year.

Research Question #2: High School Graduation

Full Sample Results

To examine potential graduation effects of the Promise, I run logistic regressions on all four match types for each graduation outcome measure separately: graduate on time, graduate at all, graduate from ninth grade district on time, and graduate from ninth grade district at all. Because the interpretation of logistic regression results is not as straightforward as the OLS regression used for achievement results, I first show the mean differences between the treatment and comparison group for strict district exact matches as an example. Table 27 shows that El Dorado students graduate at slightly lower rates on all four measures than comparison students, though these differences are not statistically significant.

Table 27

Percent of Students Who Graduated by Treatment Status: Strict District Exact Match

	N	El Dorado Promise Students	Comparison Students	Difference	p
Graduated on time	816	83%	85%	-2%	0.39
Graduated at all	816	84%	86%	-2%	0.33
Graduated from 9th grade district on time	816	81%	82%	-1%	0.72
Graduated from 9th grade district at all	816	82%	83%	-1%	0.71

Tables 28-31 show the logistic regression results, expressed in odds ratios, on the four graduation outcomes for all four match types. In interpreting odds ratios, a coefficient of 1 on El Dorado Promise students means that El Dorado students graduated as often as comparison students; a coefficient of less than 1 means El Dorado students graduated less often than comparison students, and a coefficient of greater than 1 means they graduated more often than comparison students.

As can be seen across the different graduation outcome measures in Tables 28-31, the exact matching estimates (strict district and broad district) show that El Dorado students either graduated at the same rate as or were slightly less likely to graduate than comparison students, but these differences are not statistically significant at the .05 level. In contrast, the propensity score matching estimates consistently show that El Dorado students were less likely to graduate than comparison students for all four graduation outcome measures. The exact matching methodology yields fewer matches than the propensity score matching methodology; strict and broad district exact matches yield 818 and 880 students, respectively, while strict and broad propensity score matches yielded 934 and 921 students.

The often counter-intuitive performance of the control variables and the low pseudo R-squared indicate that the graduation model was less effective at predicting the outcome than the achievement model. The achievement controls largely perform as expected, as they are positively related to graduation, although often only prior math achievement is statistically significant. Free/reduced lunch status is negatively related to graduation, as is expected, but is often not significant. In addition, the risk factors, being highly mobile and being held back a grade, are negatively related to graduation, although only mobility is consistently significant. These models show that African-American and Hispanic students appear to be more likely to graduate than white students, which is counter to prior research on graduation rates; however, these estimates are most often not statistically significant. Female students are slightly more likely to graduate, but, once again, estimates are not significant. Finally, the pseudo R-squared across the different models is consistently low, ranging from 0.06 to 0.19, indicating that the model does not explain nearly as much of the variation in graduation rates as the achievement models did for achievement. The graduation model is likely less successful than the achievement model because of the much lower sample size, which would explain the lack of statistically-significant controls, and the fact that graduation is more difficult to predict than achievement; nevertheless, it is important to note that the model leads me to have less confidence in the graduation results than I do for the achievement results.

Table 28

Logistic Regression Results (Odds Ratios) on Graduate on Time

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise Students	**0.892**	**0.394*** **	**0.726***	**0.223*** **
	(0.173)	(0.0832)	(0.140)	(0.0543)
Math z-score (2006)	1.599**	1.290	1.725***	1.595***
	(0.297)	(0.209)	(0.314)	(0.275)
Literacy z-score (2006)	1.224	1.645***	1.238	1.428**
	(0.208)	(0.262)	(0.206)	(0.234)
Free/Reduced Lunch-Eligible	0.681	0.624*	0.703	0.823
	(0.180)	(0.160)	(0.187)	(0.228)
Other Race	0.811	0.926	0.558	0.718
	(0.452)	(0.524)	(0.301)	(0.397)
African-American	1.655*	1.434	1.573	1.250
	(0.469)	(0.395)	(0.448)	(0.370)
Hispanic	2.454	0.708	0.903	-
	(2.677)	(0.377)	(0.761)	
Female	1.187	1.092	1.266	0.881
	(0.242)	(0.226)	(0.251)	(0.194)
Mobile	0.543*	0.413***	0.356***	0.395***
	(0.196)	(0.130)	(0.108)	(0.121)
Held Back Grade	0.255	0.227**	0.427	0.200**
	(0.260)	(0.139)	(0.321)	(0.140)
Cohort 2011	0.974	0.975	1.004	0.952
	(0.195)	(0.197)	(0.197)	(0.207)
Constant	5.040***	13.90***	6.302***	25.34***
	(1.185)	(3.735)	(1.499)	(7.781)
Pseudo R2	0.06	0.13	0.09	0.17
Observations	818	934	880	921

*** p<0.01, ** p<0.05, * p<0.1

Table 29

Logistic Regression Results (Odds Ratios) on Graduate at All

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise Students	**0.867**	**0.287*** **	**0.712***	**0.189*** **
	(0.173)	(0.0679)	(0.141)	(0.0499)
Math z-score (2006)	1.563**	1.409**	1.695***	1.657***
	(0.297)	(0.242)	(0.315)	(0.297)
Literacy z-score (2006)	1.212	1.546***	1.264	1.425**
	(0.212)	(0.260)	(0.216)	(0.243)
Free/Reduced Lunch-Eligible	0.729	0.757	0.781	0.868
	(0.198)	(0.206)	(0.212)	(0.251)
Other Race	0.857	0.785	0.610	0.721
	(0.500)	(0.483)	(0.339)	(0.428)
African-American	1.503	1.043	1.489	1.066
	(0.437)	(0.308)	(0.434)	(0.331)
Hispanic	2.183	0.519	0.835	-
	(2.381)	(0.298)	(0.703)	
Female	1.121	0.996	1.155	0.913
	(0.235)	(0.221)	(0.234)	(0.210)
Mobile	0.491**	0.330***	0.355***	0.323***
	(0.178)	(0.107)	(0.109)	(0.102)
Held Back Grade	0.662	0.208**	0.698	0.189**
	(0.776)	(0.130)	(0.585)	(0.135)
Cohort 2011	1.079	1.226	1.107	1.181
	(0.223)	(0.268)	(0.223)	(0.269)
Constant	5.585***	21.87***	6.670***	31.99***
	(1.353)	(6.640)	(1.622)	(10.60)
Pseudo R2	0.05	0.16	0.08	0.19
Observations	818	934	880	921

*** p<0.01, ** p<0.05, * p<0.1

Table 30

Logistic Regression Results (Odds Ratios) on Graduate District on Time

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise Students	**1.051**	**0.470*** **	**0.853**	**0.338*** **
	(0.192)	(0.0917)	(0.155)	(0.0704)
Math z-score (2006)	1.555**	1.224	1.489**	1.432**
	(0.270)	(0.187)	(0.253)	(0.226)
Literacy z-score (2006)	1.222	1.578***	1.335*	1.355**
	(0.197)	(0.239)	(0.212)	(0.206)
Free/Reduced Lunch-Eligible	0.778	0.703	0.760	0.871
	(0.192)	(0.169)	(0.189)	(0.221)
Other Race	0.727	1.106	0.515	0.946
	(0.385)	(0.606)	(0.264)	(0.495)
African-American	1.567*	1.471	1.567*	1.371
	(0.415)	(0.379)	(0.418)	(0.368)
Hispanic	2.738	0.854	1.087	-
	(2.975)	(0.444)	(0.908)	
Female	1.337	1.199	1.398*	0.952
	(0.258)	(0.234)	(0.263)	(0.191)
Mobile	0.451**	0.397***	0.290***	0.375***
	(0.150)	(0.118)	(0.0823)	(0.104)
Held Back Grade	0.290	0.256**	0.453	0.220**
	(0.294)	(0.154)	(0.340)	(0.148)
Cohort 2011	0.981	1.011	1.067	0.954
	(0.185)	(0.193)	(0.198)	(0.189)
Constant	3.476***	8.825***	4.334***	12.72***
	(0.755)	(2.124)	(0.950)	(3.291)
Pseudo R2	0.06	0.10	0.08	0.12
Observations	818	934	880	921

*** p<0.01, ** p<0.05, * p<0.1

Table 31

Logistic Regression Results (Odds Ratios) on Graduate District at All

	Strict Exact	Strict PS	Broad Exact	Broad PS
El Dorado Promise Students	**1.053**	**0.383*** **	**0.862**	**0.321*** **
	(0.197)	(0.0806)	(0.159)	(0.0695)
Math z-score (2006)	1.553**	1.333*	1.483**	1.443**
	(0.275)	(0.212)	(0.256)	(0.234)
Literacy z-score (2006)	1.192	1.461**	1.343*	1.400**
	(0.196)	(0.230)	(0.217)	(0.219)
Free/Reduced Lunch-Eligible	0.825	0.840	0.831	0.946
	(0.207)	(0.211)	(0.210)	(0.247)
Other Race	0.780	1.011	0.570	1.035
	(0.427)	(0.597)	(0.300)	(0.577)
African-American	1.426	1.118	1.482	1.267
	(0.385)	(0.302)	(0.401)	(0.350)
Hispanic	2.453	0.698	1.011	-
	(2.665)	(0.387)	(0.844)	
Female	1.301	1.143	1.315	0.950
	(0.256)	(0.235)	(0.251)	(0.197)
Mobile	0.415***	0.333***	0.292***	0.331***
	(0.138)	(0.101)	(0.0835)	(0.0931)
Held Back Grade	0.784	0.243**	0.762	0.205**
	(0.917)	(0.148)	(0.636)	(0.139)
Cohort 2011	1.059	1.216	1.150	1.104
	(0.204)	(0.246)	(0.218)	(0.226)
Constant	3.726***	11.87***	4.465***	13.83***
	(0.825)	(3.100)	(0.993)	(3.708)
Pseudo R2	0.05	0.12	0.08	0.13
Observations	818	934	880	921

*** p<0.01, ** p<0.05, * p<0.1

When looking at results across different graduation outcome measures, I observe that the differences between El Dorado and comparison students are smaller for the graduate from ninth grade district variables than for the overall graduation variables. For example, in Table 28, which shows the results for graduate on time, the coefficient for the strict district exact match is 0.892, suggesting that Promise students may have graduated on time slightly less often than comparison students. However, for the estimates for graduate on time from the ninth grade school district (Table 30), the coefficient for the strict district exact match goes up to 1.051, indicating that there was essentially no difference between El Dorado and comparison students on the graduate on time variable.

Subgroup Results

Especially considering the different graduation outcomes produced by exact and propensity score matching methodologies, it is important to see if there are different graduation impacts for different types of students. In this section, I investigate whether the graduation impacts differed by student race, wealth, or academic ability. The results of these analyses are presented in Tables 32-35.

As for the achievement analyses, the subgroup names (e.g. FRL and Non-FRL) refer to the magnitude and significance of the effect for the overall subgroup, obtained from equation (6), and the italicized "*Treatment Subgroup Name Interaction*" (e.g. *Treatment FRL Interaction*) refers to the effect for the subgroup in question above and beyond the effect for all treated students, obtained from equation (7). In this section and the discussion that follows in Chapter 6, I focus on the equation (7) or "*Treatment Subgroup Name Interaction*" results.

In general, there are different subgroup effect patterns for exact and propensity score matched groups. For the propensity score estimates, there is not strong evidence of differential effects for FRL and non-FRL students or African-American and not African-American students. For the exact matches, FRL students in El Dorado are generally less likely to graduate than matched comparison students. There is a similar pattern for African-American students, although the differences are most often only marginally statistically significant. The analytic subgroup estimates, *Treatment Highest-Scoring Half Interaction*, indicate that high-achieving students in El Dorado graduate more often than treatment students as a whole; the marginal subgroup effects for high-scoring students range from 1.865 to 3.106 and are most often statistically-significant. The descriptive estimates, however, tend to show positive results for high-scoring students for exact matches and negative results for propensity score matches; furthermore, these estimates are not consistently statistically significant. Given the volatility of the estimates, it is difficult to make any definitive conclusions about graduation subgroup effects.

Table 32

Subgroup Effects- Graduate on Time

	Strict Exact	**Strict PS**	**Broad Exact**	**Broad PS**
Overall	0.892	0.394***	0.726*	0.223***
FRL	0.604*	0.387***	0.504***	0.162***
Non-FRL	1.541	0.407**	1.205	0.344***
Treatment FRL Interaction	*0.392***	*0.952*	*0.418***	*0.473*
African-American	0.653	0.316***	0.539**	0.207***
Not African-American	1.295	0.529**	1.044	0.250***
Treatment African-American Interaction	*0.504**	*0.597*	*0.516**	*0.829*
Highest-Scoring Half	1.659	0.621	1.171	0.379***
Lowest-Scoring Half	0.645*	0.332***	0.573**	0.185**
Treatment Highest-Scoring Half Interaction	*2.571****	*1.871**	*2.045***	*2.044***

*** p<0.01, ** p<0.05, * p<0.1

Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Table 33

Subgroup Effects- Graduate at All

	Strict Exact	**Strict PS**	**Broad Exact**	**Broad PS**
Overall	0.867	0.287***	0.712*	0.189***
FRL	0.625*	0.308***	0.513**	0.167***
Non-FRL	1.358	0.251***	1.103	0.228***
Treatment FRL Interaction	*0.460**	*1.224*	*0.465**	*0.735*
African-American	0.636*	0.275***	0.518**	0.206***
Not African-American	1.258	0.306***	1.045	0.162***
Treatment African-American Interaction	*0.506**	*0.898*	*0.496**	*1.270*
Highest-Scoring Half	1.799*	0.460**	1.238	0.317***
Lowest-Scoring Half	0.596**	0.246***	0.546***	0.161***
Treatment Highest-Scoring Half Interaction	*3.106****	*1.865**	*2.269***	*1.968**

*** p<0.01, ** p<0.05, * p<0.1

Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Table 34

Subgroup Effects- Graduate District on Time

	Strict Exact	**Strict PS**	**Broad Exact**	**Broad PS**
Overall	1.051	0.470***	0.853	0.338***
FRL	0.730	0.423***	0.592**	0.228***
Non-FRL	1.677*	0.545**	1.356	0.534**
Treatment FRL Interaction	*0.435***	*0.776*	*0.437***	*0.426***
African-American	0.771	0.348***	0.597**	0.254***
Not African-American	1.501	0.673	1.285	0.474**
Treatment African-American Interaction	*0.514**	*0.517**	*0.464***	*0.537*
Highest-Scoring Half	1.720**	0.743	1.311	0.615
Lowest-Scoring Half	0.790	0.381***	0.669*	0.254***
Treatment Highest-Scoring Half Interaction	*2.179***	*1.950***	*1.960***	*2.422****

*** p<0.01, ** p<0.05, * p<0.1

Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

Table 35

Subgroup Effects- Graduate District at All

	Strict Exact	**Strict PS**	**Broad Exact**	**Broad PS**
Overall	1.053	0.383***	0.862	0.321***
FRL	0.790	0.367***	0.633*	0.240***
Non-FRL	1.514	0.408**	1.262	0.450**
Treatment FRL Interaction	*0.521**	*0.899*	*0.501**	*0.534*
African-American	0.790	0.328***	0.604**	0.257***
Not African-American	1.475	0.471**	1.296	0.423***
Treatment African-American Interaction	*0.535**	*0.696*	*0.466***	*0.608*
Highest-Scoring Half	1.851**	0.621	1.390	0.578*
Lowest-Scoring Half	0.764	0.313***	0.0662*	0.247***
Treatment Highest-Scoring Half Interaction	*2.423***	*1.986***	*2.100***	*2.343***

*** p<0.01, ** p<0.05, * p<0.1

Regression coefficients for treatment by year variables. Controls included baseline test scores, demographics, and cohort.

High School Graduation Summary

The overall estimates on graduation rate suggest that, at best, the El Dorado Promise had no overall effect and possibly had a negative impact on graduation rates. Exact matching estimates showed a null effect, while propensity score matching estimates showed that El Dorado students graduated less often than comparison students. A greater proportion of the overall sample was matched using the propensity score matching method, suggesting that differences could possibly be due to the inclusion of additional students with unobserved characteristics that make them less likely to graduate. However, given the fact the propensity score method is generally less intuitive than exact matching for this intervention (for which we are not as concerned about unobserved selection effects) and that there is not a strong theoretical reason why the El Dorado Promise would decrease graduation rates, my primary conclusion from these results is that I am unable to reject the null hypothesis of equal graduation rates between treatment and comparison students.

Chapter 6 – Discussion

The El Dorado Promise was established in 2007 with the goal of spurring economic development and improving education in El Dorado. The El Dorado Promise is one of the most generous and flexible Promise programs in the country. The scholarship is universal; the only eligibility requirements for the Promise are that a student be continuously enrolled in the district since at least the ninth grade and graduate from high school from EDSD. The maximum scholarship amount is nearly $8,000 per year, the award amount can be combined with other forms of financial aid to cover college costs beyond tuition and fees, and the scholarship can be used for up to five years. Perhaps most notably, the El Dorado Promise scholarship can be used at any two-year or four-year college or university in the country, setting it apart from many other Promise programs that limit students to in-state public institutions. Considering the generosity of the scholarship and the wide number of potential beneficiaries, it is certainly plausible that such a dramatic gift could have an impact on the school system and the wider community.

In this study, I undertook the task of evaluating whether the Promise has led to school district-wide improvements by estimating the impact of the Promise on student achievement and graduation. To this end, my evaluation of the impact on the El Dorado Promise on K-12 outcomes focused on two central research questions:

1) What impact did the El Dorado Promise have on student achievement in the El Dorado School District?
2) What impact did the El Dorado Promise have on high school graduation?

Taken together, student achievement and high school graduation represent the two most salient K-12 outcomes considered in research on the effectiveness of educational programs. The results from this study should provide insight about how the El Dorado Promise impacted these key

educational outcomes and contribute to the wider literature about the potential impacts of a Promise program with a universal design on the local K-12 system.

K-12 Achievement Summary

For achievement, I found evidence that the El Dorado Promise led to positive impacts in math. While regression results for both math and literacy displayed positive effects, the placebo test indicated that El Dorado students were outscoring comparison students in literacy prior to the Promise in the 05-06 school year, meaning that any subsequent impacts could not be attributed with great confidence to the implementation of the Promise. Overall effects for math ranged from 0.123 to 0.147 z-score units, and the more easily interpretable yearly math effects ranged from .067 to .0.075 z-score units per year. In addition to observing overall math results, it appears that students in the top half of their class experienced especially large gains. Annual subgroup effects for students at the top of their class range from 0.067 to 0.075 z-score units.

Interviews with teachers and school leaders revealed that El Dorado educators redoubled their efforts to ensure that they held high expectations for all students, in light of the fact that all El Dorado students now had the financial means to attend college. As a result of the Promise, conversations about college and trips to college campuses became commonplace for all students in the district, regardless of race or class. Given this background, it is certainly possible that the Promise program might have had a more pronounced effect on economically-disadvantaged students or African-American students. Moreover, because the program focused to such a large extent on college, it is also possible that the program might have gained more traction for students who viewed themselves (or who were viewed by others) as "college material" in terms of academic ability. The subgroup effects allow me to conclude that more academically-talented students were particularly impacted by the implementation of the Promise. Though there was

reason to believe that disadvantaged students may see particularly large effects, the subgroup results do not allow me to conclude that these occurred.

High School Graduation Summary

The results for the impact of the Promise on graduation are mixed, with the answer depending on the matching methodology used. Results from the exact matches show no difference between El Dorado and comparison students on graduation, while propensity score matching estimates showed that the El Dorado Promise may have actually had a negative impact on graduation, with El Dorado students graduating less often than comparison students. However, the theoretical weakness of the propensity score matching method as compared to the exact matching method and the lack of a strong theoretical basis for a college scholarship program leading to negative results lead me to lean more strongly towards the interpretation of graduation results as null.

The fact that the differences between El Dorado and comparison students were smaller for the graduate from ninth grade district variables than for the overall graduation variables may suggest that, while the post-Promise El Dorado School District may be less effective at ensuring that students graduate at all, EDSD may be more effective in retaining students so that they graduate from the school district. It certainly makes sense that the El Dorado Promise may have helped to keep more students who began ninth grade in the district so that they could benefit from the Promise.

There are a few methodological reasons that may explain the mixed results for graduation. For the achievement analyses, the different matching methodologies did not lead to different results; results were relatively similar regardless of the match type use. It is possible

that I observe different results for graduation for a few reasons. The extra students matched through the propensity score method may have consisted of El Dorado students with latent "unlikely to graduate" traits matched to non-El Dorado students without latent "unlikely to graduate" traits.

Another potential explanation for different outcomes is the relative lack of precision in estimating graduation versus test scores. First, it is important to note that the sample sizes for graduation estimates are significantly smaller than that for achievement estimates, which may explain some of the imprecision of the model estimates. In addition, there are some general limitations to graduation measures. For test score matches, prior test score is a strong predictor of future test scores. For graduation, there is no analog "prior graduation rate," making it difficult to find students who would likely have had similar outcomes absent the intervention. A further limitation of the graduation analyses is inherent to the data used. There are also some inherent limitations in the graduation data that may partially explain the results. The data track graduation outcomes for all students in public schools in Arkansas, so school districts will not be penalized for not graduating a student who started in their district in the ninth grade if that student graduates from another public high school in Arkansas. However, El Dorado is a city near the Arkansas-Louisiana border; a student who leaves El Dorado but graduates from a high school in Louisiana would not be counted as graduation, whereas students from comparison districts not on the state border are probably less likely to transfer to a school in another state. It could be possible to partially address this concern by matching El Dorado to other districts on the Arkansas border, but it is fairly difficult to find matches on the other important characteristics in addition to this geographic one. The limitations of the outcome measure, the low explanatory

power, and the often counter-intuitive performance of the control variable estimates lead me to have some doubts about the strength of this model.

Apart from these methodological concerns, there are a number of plausible explanations for null results. Previous educational research has shown that interventions that may have a positive effect on achievement have a null effect on attainment and vice versa; these outcome measures may be capturing different skills and competencies (Wolf et al., 2010). It also is important to note that, prior to the Promise, El Dorado School District's averaged freshman graduation rate was 86%, as compared to 80% for the state as a whole. With a relatively high proportion of students graduating, it may be particularly difficult to impact the student who is on the margin of not graduating high school. It also may not make much theoretical sense that a student who is at-risk of not graduating high school would be motivated to stay in school by the promise of a college scholarship. It is also important to reiterate that achievement results were strongest for students in the top half of their class; these are not the same students as those who are not on track to graduate from high school.

It is not immediately intuitive that the offer of a college scholarship could lead to worse graduation outcomes for students, but there are some scenarios in which this would be possible. For instance, if the school district has truly shifted to become more academically rigorous in order to prepare students for college, students who were already behind may become demotivated when they are not able to meet this higher bar. For struggling students who do not aspire to attend college, a more intense college focus, even just in messaging, could alienate them. In addition, school personnel may shift attention and energy away from low-performing students in order to focus on college-bound students.

Limitations

Whatever the reason for the null or potentially negative graduation effects, the preliminary analyses showing increases in EDSD enrollment and the positive achievement findings from this study suggest that the Promise is having an impact on the school district. However, there are a number of limitations in these analyses that are important to put forward.

The first limitation is the definition of the intervention. For the purposes of this study, the intervention is being enrolled in the post-Promise school district. For some purposes, this makes sense; if you were a student in grade nine or lower the year the Promise was announced, then you were suddenly potentially eligible for a college scholarship, and that could conceivably change your behavior and motivations. In addition, interviews with El Dorado School District personnel showed that certain programmatic and cultural changes did take place in the district because of the Promise. However, as is the case with many school districts, there were a number of initiatives and reforms taking place simultaneously. Many of these were put into place before the Promise or after the Promise was put in place but not for the purposes of supporting Promise goals. Therefore, treating the post-Promise district as the intervention is a clunky definition, since being in the district post-Promise means being exposed to a number of activities that would have potentially occurred in the absence of the Promise.

Another limitation is the identification strategy used. While I used a number of strategies to try to ensure that any observed effects were not the result of arbitrary decisions about the matching parameters, e.g., different matching techniques as robustness checks and the placebo test, I certainly cannot be as confident in the results of matching analyses conveying a causal effect as I would for a randomized control trial. As I discussed in Chapter 2, Promise programs,

as currently implemented, are difficult to study, and methodologies with stronger internal validity often have external validity trade-offs. For example, Harris (2013) is currently conducting a randomized control trial evaluation of a Promise-like program; however, in order to facilitate the use of this research design, the intervention was modified considerably, with the scholarship being offered only to certain cohorts in randomly assigned high schools in Milwaukee. While Harris' study will be an important contribution to the literature in learning about the motivational impact of the scholarship itself, the study cannot inform the literature on the systemic effects of Promise scholarship programs on their local school district and community. Another common strategy employed to evaluate the impacts of Promise programs is a difference-in-differences methodology, comparing the change in outcomes for Promise-eligible students before and after the Promise announcement to the change in outcomes for Promise-ineligible students over the same time period. While this strategy more clearly defines the intervention (eligibility for a scholarship), the within district comparison nets out any positive impacts that may have occurred due to systemic changes the Promise may have caused. At this time, it does not seem like there is a method that can be used to study Promise programs that does not come with significant trade-offs. Therefore, while it is important to acknowledge the limitations of the matching approach used for this study, it is also helpful to remember the fact that this methodology allows me to ask a research question that other methods cannot answer.

Recommendations & Conclusions

The results of this evaluation brought to light several future research questions that could be addressed about the El Dorado Promise. Because the graduation results are mixed and tell a different story from the positive achievement results, it might be worthwhile to examine intermediate outcomes to determine when El Dorado students are getting off track to graduate

while comparison students are not. Using Arkansas' longitudinal student-level testing database, one could examine if El Dorado students are taking Algebra, considered a gateway course for both high school graduation and college enrollment, at a later grade than comparison students or if they are more likely to repeat the class than comparison students. Using high school transcript data, researchers could look more closely at course progression and determine at what point students are failing to gain enough credits for graduation; while this is available for the El Dorado School District, it may be difficult to obtain consent from comparison districts to obtain such data.

The primary future research questions that should be answered about the El Dorado Promise is what the higher education impacts of the Promise are. Following the same difference-in-differences methodology used for the Kalamazoo Promise and, to a lesser extent, the Pittsburgh and New Haven Promise evaluations, one could examine the impact of scholarship eligibility on the ultimate outcomes of interest: college enrollment, persistence, and graduation.

Finally, one of the lingering questions for the Promise community is what the long-term effects of the Promise are. While the difference-in-differences strategy is a strong design to capture the immediate impact of Promise programs, Promise programs change over time, and arguably, many school districts may become better at supporting the Promise through targeted college-preparation initiatives over time. For questions of long-term impact of Promise programs, a matching methodology similar to the one used in this study could be employed.

Overall, this study provided evidence about the impact of a Promise program on academic achievement and high school graduation, outcomes that are understudied in the current Promise literature. Considering that improving the local school system is an explicit goal of

many Promise programs, it will be important for future studies to examine these outcomes and further contribute to the literature on Promise programs.

References

Andrews, R. J., DesJardins, S., & Ranchhod, V. (2010). The effects of the Kalamazoo Promise on college choice. *Economics of Education Review, 29*(5), 722-737.

Ash, J. W., & Ritter, G. W. (2014, April 25). Early Impacts of the El Dorado Promise on Enrollment and Achievement. Retrieved January 1, 2015, from http://www.officeforeducationpolicy.org/wp-content/uploads/El-Dorado-Promise-AER.pdf

Bartik, T. J., Eberts, R., & Huang, W. (2010) The Kalamazoo Promise, and enrollment and achievement trends in Kalamazoo Public Schools. Presented at the PromiseNet 2010 Conference, June 16-18, Kalamazoo, MI.

Bartik, T. J., & Lachowska, M. (2013). The short-term effects of the Kalamazoo Promise Scholarship on student outcomes. *New analysis of worker well-being research in labor economics*, *Research in Labor Economics, 38*, 37-76.

Bartik, T. J., Hershbein, B., & Lachowska, M. (2015). Longer-term effects of the Kalamazoo Promise scholarship on college enrollment, persistence, and completion. Presented at the Association for Education Finance and Policy 2015 Conference, February 26-28, Washington, D.C.

Deming, D., & Dynarski, S. (2010). College aid. In *Targeting investments in children: Fighting poverty when resources are limited.* Chicago, IL: University of Chicago Press, 282-302.

Dynarski, S. (2004). The New Merit Aid. In *College Choices: The Economics of Where to Go, When to Go, and How to Pay for It*, Caroline Hoxby, ed. Chicago: University of Chicago Press, 63–100.

Gonzalez, G. C., Bozick, R., Tharp-Taylor, S., & Phillips, A. (2011). *Fulfilling the Pittsburgh Promise: Early Progress of Pittsburgh's Postsecondary Scholarship Program*. RAND Corporation.

Gonzalez, G. C., Bozick, R., Daugherty, L., Scherer, E., Singh, R., Suarez, M., & Ryan, S. (2014). Transforming an Urban School System: Progress of New Haven School Change and New Haven Promise Education Reforms (2010-2013). RAND Corporation.

Harris, D. N. (2013). Is traditional financial aid too little, too late to help youth succeed in college? *An introduction to The Degree Project promise scholarship experiment. New directions for youth development, 2013*(140), 99-116.

Harten, D. (2013, February 28). El Dorado Promise Inc. expands scholarship eligibility requirements. *Arkansas Democrat-Gazette*. Retrieved January 10, 2015, from http://www.arkansasonline.com/news/2013/feb/28/el-dorado-promise-scholarship-eligibility-requirem/

Hershbein, B. J. (2013). A second look at enrollment changes after the Kalamazoo Promise. Upjohn Institute Working Paper 13-200. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Iriti, J., Bickel, W., & Kaufman, J. (2012). Realizing "the Promise:" Scholar retention and persistence in post-secondary education. Pittsburgh, PA: Evaluation for Learning Group, Learning Research and Development Center, University of Pittsburgh.

Landrum, N. E. (2008). Murphy Oil and the El Dorado Promise: A case of strategic philanthropy. *Journal of Business Inquiry*, *7*(1), 79-85.

LeGower, M., & Walsh, R. (2014). Promise scholarship programs as place-making policy: Evidence from school enrollment and housing prices (No. w20056). National Bureau of Economic Research.

Miller, A. (Forthcoming). College scholarships as a tool for economic development? Evidence from the Kalamazoo Promise. *Journal of Public Economics, 88*, 1747-1769.

Miller-Adams, M., & Timmeney, B. (2013). The impact of the Kalamazoo Promise on college choice: An analysis of Kalamazoo Area Math and Science Center graduates. Upjohn Institute Policy Paper No. 2013-014. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Miller-Adams, M. & Fiore, J. (2013). The Kalamazoo Promise and changing perceptions of the Kalamazoo Public Schools. Policy Paper No. 2013-016. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Miller-Adams, M. (Forthcoming). What is a Promise Scholarship Program? In *Promise Nation: Transforming Communities through Place-Based College Scholarships.* Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

Miron, G. & Cullen, A. (2008). Trends and patterns in student enrollment for Kalamazoo Public Schools. Evaluation of the Kalamazoo Promise Working Paper #4. Kalamazoo, MI: Western Michigan University.

Miron, G., Jones, J. N., & Kelaher-Young, A. J. (2011). The Kalamazoo Promise and Perceived Changes in School Climate. *Education Policy Analysis Archives*, *19*(17).

Moreno, S. (2007, January 31.) College scholarships for all no myth in El Dorado. *The The Washington Post.* Retrieved January 10, 2015, from http://www.washingtonpost.com /wp-dyn/content/article/2007/01/30/AR2007013001497_pf.html

W.E. Upjohn Institute for Employment Research. (2015, February). Institute's database of Promise programs. Retrieved March 29, 2015, from http://www.upjohn.org/sites/default/files/promise/Lumina/Promisescholarshipprograms.pdf

Warren, C. (2014, February 1). The Promised Land. *American Way*, 44-47.

Wolf, P., Gutmann, B., Puma, M., Kisida, B., Rizzo, L., Eissa, N., & Carr, M. (2010). Evaluation of the DC Opportunity Scholarship Program: Final Report. NCEE 2010-4018. National Center for Education Evaluation and Regional Assistance.

Appendix A – Literature Review Summary Tables

Trends and Patterns in Student Enrollment for Kalamazoo Public Schools (2008) – Miron, G. & Cullen, A.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • overall enrollment in Kalamazoo Public Schools (KPS) • enrollment in KPS by socioeconomic status and race/ethnicity • enrollment changes at the school-level (elementary, middle, high school) and grade-level This analysis uses grade-, school- and district-level data.	Kalamazoo Promise	• The authors estimated the impact of the Kalamazoo Promise on KPS enrollment using an interrupted time-series design, comparing enrollment trends before and after the Promise. • The authors also compare enrollment trends in KPS to enrollment trends in 5 demographically similar urban districts in MI.	• In the 2 years after the Promise, enrollment increased 12.1% or by 1,211 students. • In the post-Promise years, enrollment in KPS increased by 12.2% while enrollment in comparison districts decreased by 8.7%. • The proportion of students qualifying for FRL leveled off after the Promise, while the proportion of FRL students continued to grow in the comparison districts. ○ The proportion of students who qualified for FRL at the high school level increased by 3.1 percentage points while the FRL proportion decreased by 2 percentage points at the elementary and middle school levels. • For the district as a whole, the racial composition did not change after the Promise. ○ The number of white students increased at the elementary and middle school levels, and the number of African-American students increased at the high school level.

Trends and Patterns in Student Enrollment for Kalamazoo Public Schools (2008) – Miron, G. & Cullen, A. (Cont.)

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
			• Taken together, the FRL and racial composition findings suggest that the Promise is inducing more advantaged families into the district at the lower school levels, and preventing less advantaged students from leaving at the high school level. • Limitation: The authors could have produced more precise estimates by conducting regression estimates and controlling for student characteristics.

The Effects of the Kalamazoo Promise on College Choice (2010) – Andrews, R. J., DesJardins, S., & Ranchhod, V.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were college choice (as expressed by ACT score report sent to college). College choice types included: • Individual colleges • Public universities in Michigan • Flagships (University of Michigan and Michigan State University)	Kalamazoo Promise	• The authors estimated the impact of the Kalamazoo Promise using difference-in-differences regressions, comparing outcomes for Kalamazoo Promise students to (1) students in all other public high schools in Michigan and (2) students in matched comparison schools who were not eligible in pre- and post-Promise time periods. • The authors used a difference-in-differences-in-differences approach to estimate college choice for low-income families (<$50,000/yr) • Regressions controlled for students' ACT scores, race, high school GPA, and family income category, high school characteristics	In the post Promise period, students are more likely to send score reports to: • public universities in Michigan after the Promise • flagship universities (University of Michigan and Michigan state) • public institutions located in Kalamazoo (Western Michigan University and Kalamazoo Valley Community College) Students from low-income families are less likely to send score reports to Kalamazoo Valley Community College and more likely to send reports to Michigan State (more likely to show interest in more expensive institutions)

The Kalamazoo Promise, and Enrollment and Achievement Trends in Kalamazoo Public Schools (2010) – Bartik, T. J., Eberts, R. W., & Huang, W.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • enrollment in Kalamazoo Public Schools (KPS) • relative enrollment in KPS by ethnic group • achievement on Michigan Educational Assessment Program (MEAP) test This analysis uses student-level data.	Kalamazoo Promise	• The authors use an interrupted time-series design to estimate the impact of the Kalamazoo Promise on enrollment and achievement, comparing trends before and after the Promise. • The authors further examine enrollment trends by looking at student entry into the school district (by grade level) and exit from the district. • The authors also compare test score trends in KPS to state as a whole and similar comparison districts.	The authors found that the Kalamazoo Promise led to: • a 25% increase in overall enrollment in KPS ○ large increase in enrollment among students in grades 1-9 (53.8% increase), but not in grades 10-12 (15.2% increase). This is consistent with Promise eligibility requirements. ○ a steep decline in exit rates from KPS ○ a reversal in decline of KPS' white enrollment and stabilization of KPS' racial makeup • KPS students gained 2.5 more months of learning than similar districts, and 3 months more in math than similar districts. Limitations: • The authors do not have an enrollment comparison group for Kalamazoo Public Schools. The authors cannot definitively say that changes in trends were caused by the Promise rather than other changes.

Fulfilling the Pittsburgh Promise: Early Progress of Pittsburgh's Postsecondary Scholarship Program (2011) – Gonzalez, G. C., Bozick, R., Tharp-Taylor, S., & Phillips, A.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • enrollment and persistence in Pittsburgh Public Schools (PPS) in grades 5-12 • enrollment in a higher education institution (by race and socioeconomic status) • persistence in a higher education institution (by race and socioeconomic status)	Pittsburgh Promise	• The authors estimated the impact of the Pittsburgh Promise on PPS enrollment using an interrupted time-series design, comparing trends before and after the Promise. The authors estimated the impact of the Pittsburgh Promise on postsecondary enrollment and persistence using a difference-in-differences methodology, comparing outcomes of PPS graduates who met the Promise eligibility requirements (GPA, attendance, length of time in district) to those who did not meet the requirements in pre- and post-Promise time periods.	The authors found: • Enrollment and persistence rates in PPS did not increase after the Promise • Promise students had the same overall likelihood of attending college ○ Positive effects on persistence only for white and non-FRL students • Limitation: One limitation of this study is that the within-district comparison of students leads to an inherently conservative estimate of the impact of the Promise. Students who do are not eligible for the Promise scholarship may still be affected by it through peer effects or changes in the school culture.

Realizing “The Promise”: Scholar Retention and Persistence in Post-Secondary Education (2012) – Iriti, J., Bickel, W., & Kaufman, J.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • year 1 to year 2 college retention rate (staying in same institution from one year to another) • college retention rates by institution type	Pittsburgh Promise	• The authors compare Pittsburgh Promise scholar retention rates to ACT national sample rate.	The authors found that: • 76% of Promise students were retained between 2008 and 2009 compared to 66% of ACT national sample students (10 percentage point advantage) • Promise Scholar retention rates were equal to or higher than ACT national sample students for all institution types Limitation: Differences between the retention rates for Promise scholars and the ACT national sample could be due to pre-existing differences between student samples (e.g. Pittsburgh Promise students must have had a 2.5 high school GPA, so they could be better prepared than some students included in ACT sample)

The Short-Term Effects of the Kalamazoo Promise Scholarship on Student Outcomes (2013) – Bartik, T. J. & Lachowska, M

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • credits earned (number of credits earned and indicator variable for whether more credits than normal (8) were earned) • out-of-school suspension (days of suspension and indicator variable for whether a student was suspended) • detention (days of detention and indicator variable for whether a student was in detention) • AP course enrollment (number of attempted AP credits and indicator variable for enrolled in one or more AP courses) Annual high school GPA	Kalamazoo Promise	• The authors estimated the impact of the Kalamazoo Promise using a difference-in-differences methodology, comparing outcomes for students who were eligible for the Promise to those who were not eligible in pre- and post-Promise time periods. • A secondary regression analysis controlled for student fixed effects.	• The authors found a nine percent increase in the probability of earning any credits. • The Promise decreased the number of days spent in out-of-school suspension by one to two days per school year. • There is not strong evidence that the Promise had an effect on days in detention or GPA for the overall sample. • Large differences between the AP course enrollment outcomes of the Promise-eligible and Promise-ineligible students in the two pre-Promise years led the authors to doubt the validity of AP course enrollment results. ○ In student fixed effects estimations, authors found large increases in GPA among African-American students, ranging from 0.17 to 0.63 standard deviations. • Authors found evidence that increases in GPA may be working through fewer suspension days. One limitation of this study is that the within-district comparison of students leads to an inherently conservative estimate of the impact of the Promise. Students who do are not eligible for the Promise scholarship may still be affected by it through peer effects or changes in the school culture.

A Second Look at Enrollment Changes after the Kalamazoo Promise (2013) – Hershbein, B. J.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • enrollment trends (entry and exit) in Kalamazoo Public Schools (KPS) by student characteristics (geographic origin of students who enter the district and destination of student who leave, socioeconomic status, performance of school in which students enroll) This analysis uses student-level data.	Kalamazoo Promise	• The author uses an interrupted time-series design to estimate the impact of the Kalamazoo Promise on enrollment, comparing trends before and after the Promise.	The author found that: • Of new students entering KPS, between 50% and 60% came from other Michigan school districts (90% of these students came from other districts in Kalamazoo County) • KPS retained more students who would have otherwise moved somewhere in Michigan outside of Kalamazoo County • New students who entered KPS were 7 percentage points less likely to be FRL-eligible and scored higher on the MEAP exam than previous years' new entrants • Exiting students were more economically advantaged than in pre-Promise years • Students who entered KPS in post-Promise period were not more likely to choose higher-performing schools Limitations: • The author does not have an enrollment comparison group for Kalamazoo Public Schools. The author cannot definitively say that changes in trends were caused by the Promise rather than other changes.

The Kalamazoo Promise and Changing Perceptions of the Kalamazoo Public Schools (2013) – Miller-Adams, M. & Fiore, J.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • local perceptions of the Kalamazoo Public School (KPS) district as measured by media coverage	Kalamazoo Promise	• The authors review educational content about KPS in Kalamazoo's local newspaper pre- and post-Promise and compare it to the educational content about Grand Rapids Public Schools (GRPS) in Grand Rapids' local newspaper. • Articles were coded as positive, negative, or neutral.	The authors found that: • the amount of coverage of KPS increased post-Promise while there was no change in the amount of coverage of GRPS the percentage of positive coverage increased post-Promise while there was no change in the percentage of positive coverage of GRPS

The Impact of the Kalamazoo Promise on College Choice: An Analysis of Kalamazoo Area Math and Science Center Graduates (2013) – Miller-Adams, M. & Timmeney, B.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • College choice (in-state private, out-of-state private, in-state public, out-of-state public) among Kalamazoo Area Math and Science Center (KAMSC) graduates Data used were provided by KAMSC.	Kalamazoo Promise	• The authors compared college choice of KPS KAMSC* student to non-KPS KAMSC students. • The authors make 2 comparisons: (1) compare KPS students to non-KPS students and (2) compare KPS students' college choices before and after the introduction of the Promise. • The authors compare means and three-year averages. *The Kalamazoo Area Math and Science Center (KAMSC) is a selective program that provides accelerated courses in math, science, and technology in grades 9-12. It is open to students in the Kalamazoo Public schools and districts in the surrounding area.	• The authors found evidence that the introduction of the Kalamazoo Promise led to an increase in the percentage of Kalamazoo Promise students attending in-state public institutions. ○ The percentage of KPS KAMSC students attending in-state institutions increased 28.7 percentage points after the introduction of the Promise while the percentage of non- KPS KAMSC students attending in-state institutions only increased 7.4 percentage points after the Promise. Limitations: • The authors could have produced more precise estimates by conducting regression estimates and controlling for student characteristics. • Another limitation of this study is that it does not identify whether KPS students are eligible for the Promise. This study can be an interpreted as an estimate of the Kalamazoo Promise on all KPS KAMSC students rather than eligibility for the scholarship on Promise-eligible KAMSC students. Because of the sample studied, this work may have limited generalizability to other Promise programs, which may not have a similar magnet program for high-achieving students.

Transforming an Urban Public School System: Progress of New Haven School Change and New Haven Promise Education Reforms (2010-2013) (2014) – Gonzalez, G. C., Bozick, R., Daugherty, L., Scherer, E., Singh, R., Suarez, M. J., & Ryan, S.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • enrollment in a higher education institution Data used were a combination of New Haven Public Schools (NHPS) administrative data and National Student Clearinghouse (NSC) data.	New Haven Promise	• The authors estimated the impact of the New Haven Promise using a difference-in-differences methodology, comparing outcomes of NHPS graduates who met 3 of the 5 Promise eligibility requirements (GPA, attendance, length of time in district) to those who did not meet these 3 requirements in pre- and post-Promise time periods. • Regressions controlled for race/ethnicity, gender, FRL-eligibility, ELL status, and whether or not a student was enrolled in special education.	The authors found that the New Haven Promise led to: • no difference in college enrollment between students who meet 3 out of 5 Promise eligibility requirements and those who did not Limitations: • Researchers did not have data on 2 of the 5 eligibility requirements (New Haven residency and number of community service hours), which means that some students could be falsely classified as Promise-eligible. One limitation of this study is that the within-district comparison of students leads to an inherently conservative estimate of the impact of the Promise. Students who do are not eligible for the Promise scholarship may still be affected by it through peer effects or changes in the school culture.

Promise Scholarship Programs as Place-Making Policy: Evidence from School Enrollment and Housing Prices (2014) – LeGower, M. & Walsh, R.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • K-12 public school enrollment • Housing prices	Arkadelphia Promise*; Baldwin Promise; Bay Commitment; College Bound Scholarship Program[+;] Denver Scholarship Foundation[+;] El Dorado Promise; Great River Promise*; Hopkinsville Rotary Scholars; Kalamazoo Promise[+]; Legacy Scholars; Leopard Challenge; New Haven Promise*[+]; Northport Promise; Peoria Promise[+]; Pittsburgh Promise[+]; Promise for the Future[+]; Say Yes Buffalo*; Say Yes Syracuse[+]; Sparkman Promise*; Ventura College Promise *pre-data only for enrollment estimates [+]Programs included in housing estimates	• The authors estimated the impact of multiple Promise programs on school enrollment and housing prices using a difference-in-difference approach, comparing schools in Promise zones to schools in the same county or neighboring counties/areas before and after the Promise announcement. This study examines the heterogeneous impact of Promise programs on three dimensions: eligibility requirements (universal vs. merit) and eligible higher education institutions (HEI) (flexible vs. inflexible).	• The enrollment of school districts with Promise programs increases relative to surrounding areas. ○ Promise announcement leads to immediate increases in K-4 enrollment. ○ Universal promise programs that allow scholarship to be used at a large range of postsecondary institutions (flexible HEI) have immediate enrollment increases of 8%, flexible HEI merit-based programs have enrollment increases of 4%, and inflexible HEI merit-based programs have no effect on enrollment. ○ School districts with merit-based Promise programs experience increases in white enrollment and decreases in non-white enrollment. ○ School districts with universal flexible HEI Promise programs do not experience differential enrollment effects across racial groups. • Housing prices in Promise zones experience a 6% to 12% ($14,000 to $20,500) increase on average within 3 years of the Promise announcement. ○ Housing price increases are primarily observed for houses in the upper half of the housing price distribution. In Pittsburgh and Denver, housing price increases are observed only in neighborhoods that feed into schools with higher test scores.

Longer-Term Effects of the Kalamazoo Promise on College Enrollment, Persistence, and Completion (2015) – Bartik, T. J., Hershbein, B., & Lachowska, M.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • enrollment in a higher education institution • college choice • number of college credits /class attempted • credential earned (associate's or bachelor's, 4 years after high school and 6 years after high school) Data used were a combination of Kalamazoo Public Schools (KPS) administrative data and National Student Clearinghouse (NSC) data.	Kalamazoo Promise	• The authors estimated the impact of the Kalamazoo Promise using difference-in-differences regressions, comparing outcomes for Kalamazoo graduates who were eligible for the Promise to those who were not eligible in pre- and post-Promise time periods. • The authors used 2 regression specifications to estimate effects. • Model (1) controlled for race/ethnicity, gender, FRL-eligibility, and high school attended. Model (2) controlled for all variables in model (1) plus high school GPA, highest math course taken, and enrollment in AP courses.	The authors found that the Kalamazoo Promise led to a: • 7 to 8 percentage point increase in college enrollment (11 to 13 percent) ○ 9 to 12 percentage point increase in enrollment in 4-year colleges (20 to 25 percent increase) ○ 15 to 20 percentage point increase in enrollment in 4-year public institutions in Michigan • 1.5 more classes attempted 2 years after high school graduation • 3 more classes attempted 4 years after high school graduation • No effect on credential attainment 4 years after high school graduation • 9 to 11 percentage point increase in attainment of any credential 6 years after high school graduation (25 percent increase) 7 to 9 percentage point increase in attainment of bachelor's degree 6 years after high school graduation (25 to 30 percent increase)

College Scholarships as a Tool for Community Development? Evidence from the Kalamazoo Promise (Forthcoming) – Miller, A.

Outcome Measure(s)	Promise Program(s)	Analytic Strategy	Findings/Limitations
The outcomes examined in this study were: • enrollment (by school performance, school poverty level • housing prices The enrollment analysis uses school- and district-level data.	Kalamazoo Promise	• The author estimated the impact of the Kalamazoo Promise on enrollment using a difference-in-differences methodology, comparing enrollment in KPS to enrollment in 3 different groups of comparison districts in pre- and post-Promise time periods. • The 3 sets of comparison districts for enrollment estimates are 1) other Kalamazoo County public school districts, 2) district with similar 2002 enrollment, and 3) all other Michigan Public School districts • The author uses a similar methodology for housing prices, comparing housing prices in Kalamazoo to housing prices in the rest of Kalamazoo County in pre- and post-Promise time periods.	The authors found: • Promise increased enrollment by over 1,000 students (estimates range from gains of 1,195 to 2,020 students) ○ Larger enrollment increases in schools in the bottom half of academic achievement distribution ○ Enrollment increased in every grade except 10th and 11th grade, and increases were generally larger in younger grades • No evidence that the Promise changed housing prices Limitation: Comparing home prices in Kalamazoo to home prices in the rest of the county could be problematic because, prior to the Promise, county was different from Kalamazoo, and this comparison assumes there were no spillover effects from Kalamazoo into the rest of the county.

Appendix B – Description of Promise Programs Included in the Literature Review

Promise Program[28]	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs[29] Covered	More Information
Arkadelphia Promise	November 2010	Arkadelphia, AR	Southern Bancorp; Ross Foundation	Class of 2011	Targeted-Merit: Continuously enrolled in district since 9th grade; Graduate from district; 2.5 GPA or 19 ACT; Complete FAFSA; Apply for 2 scholarships	Average cost of tuition and fees at the four southern Arkansas public universities for 4 years of tuition and mandatory fees; Amount prorated by length of enrollment in district	Flexible: Any accredited public or private 2-year or 4-year institution in the U.S.	Pays difference between the Arkansas Academic Challenge (Lottery) Scholarship and the average cost of tuition and mandatory fees at the four southern Arkansas public universities

[28] Adapted from the The Upjohn Institute's database of Promise programs (http://www.upjohn.org/sites/default/files/promise/Lumina/Promisescholarshipprograms.pdf), LeGower and Walsh (2014), and Promise program websites. If there were discrepancies between these sources, I defer to information from the Promise program website. If information for date announced is not available on the Promise program website, I use the date from LeGower and Walsh (2014) since they conducted an extensive search for this information.

[29] Higher education institutions (HEIs)

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Baldwin Promise (MI Promise Zone)	September 2009	Baldwin, MI	Community foundation; Local community	Class of 2010	Universal: Attend Baldwin High School or a non-public school within the promise zone for 1 or more years; Graduate from district or complete GED; Reside in district; Complete FAFSA	$5,000/yr. for 4 years of tuition and mandatory fees; Amount prorated by length of enrollment in district and diploma type (regular or GED)	Flexible: Any accredited public or private 2-year or 4-year institution in Michigan	Pays difference between federal/state grants and the cost of tuition and mandatory fees up to $5,000

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Bay Commitment	2006	Bay, MI	Bay Area Community Foundation	Class of 2008	Targeted-Other: Continuously enrolled in district since 9th grade; Graduate from district; Reside in district for 6 years; Be a first-generation college student; Submit a scholarship application and essay	$2,000 one-time scholarship	Inflexible: Local college/ university: Delta College (2-year) or Saginaw Valley State University (4-year)	In 2013 and 2014, the number of awards was capped at 100. Media reports indicate that more than 100 students apply and a committee decides which eligible students will receive the scholarship.

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
College Bound Scholarship Program	February 2006	Hammond, IN	Mayor of Hammond; Municipal casino revenue	Class of 2006	Targeted-Merit: Continuous residency within Hammond City for 3 years; Parent/ guardian must be home-owner in Hammond City; Graduate from any HS (public or private) in Hammond City; 3.0 cumulative GPA OR 2.5 cumulative GPA with 1000 SAT (math and verbal) OR 2.5 cumulative GPA with 1400 SAT; Complete FAFSA	$10,500/yr[30] for 4 years of tuition and mandatory fees; Amount prorated by length of enrollment in district	Flexible: Any accredited public or private 2-year or 4-year institution in Indiana	Pays difference between all other financial aid (except for loans) and the cost of tuition and mandatory fees up to $10,500[2]

[30] Cost of tuition and fees for 30 credit hours at Purdue University Calumet, Hammond

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Denver Scholarship Foundation	October 2006	Denver, CO	Private donors; Foundations	Class of 2007	Targeted-Merit: Continuously enrolled in district since 9th grade; Graduate from district; 2.0 GPA; Complete FAFSA and demonstrate financial need (expected family contribution (EFC) < 2x Pell Grant limit)	$250 to $3,400/yr. for 5 years; Amount depends on institution attended at expected family contribution (EFC)	Flexible: 40 accredited public or private 2-year or 4-year institutions in Colorado	Institution a student can attend is restricted by GPA. Students with 2.0 to 2.749 GPAs can only initially enroll in certificate programs.

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
El Dorado Promise	January 2007	El Dorado, AR	Murphy Oil Corporation	Class of 2007	Universal: Continuously enrolled in district since 9th grade; Graduate from district; Reside in district[31]	$7,889/yr.[32] (2014-15) for 5 years of tuition and mandatory fees; Amount prorated by length of enrollment in district	Flexible: Any accredited public or private 2-year or 4-year institution in the U.S.	"First dollar" scholarship, meaning the scholarship amount is guaranteed even if students receive other forms of aid. El Dorado Promise can be combined with other forms of aid to pay up to the total cost of attendance (including room, board, and books).

[31] Residency restriction removed beginning with class of 2013

[32] Average tuition and fees for University of Central Arkansas: http://admissions.umich.edu/costs-aid/costs

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Great River Promise	2010 (Phillips and Arkansas counties)	Phillips and Arkansas counties, AR	Southern Bancorp; Phillips Community College Foundation; Delta Bridge Project;	Class of 2010	Targeted-Other: Continuously enrolled in district since 9th grade; Graduate from district; 95% attendance and punctuality record; Good behavior (no drug or DUI offenses)	Average cost of tuition and fees at Phillips Community College (PCC) for 2 years	Inflexible: Phillips Community College (PCC)	Pays difference between all other financial aid (except for loans) and the cost of tuition and mandatory fees at PCC

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Hopkinsville Rotary Scholars	2005	Hopkinsville, KY	Hopkinsville Rotary Club	Class of 2012	Targeted-Merit: Graduate from public or private high school in district; 2.5 GPA; 95% attendance; Good behavior (never been expelled); Complete FAFSA; Enroll in and complete free Orientation to College course	Average cost of tuition and fees at Hopkinsville Community College (HCC) for 2 years	Inflexible: HCC	Pays difference between other financial aid and the cost of tuition and mandatory fees at HCC

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Jackson Legacy	September 2006	Jackson, MI	Jackson Community Foundation; Local funders	Class of 2008	Targeted-Merit: Continuously enrolled in district since 8th grade; Graduate from district; Reside in district; 2.5 GPA; Complete 20 hours of community service; Complete FAFSA	$1,000 one-time scholarship; Amount prorated by length of enrollment in district	Inflexible: Jackson Community College; Spring Arbor University; Baker College of Jackson	Number of scholarships awarded depends on available funding; eligible recipients will be selected by lottery

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Kalamazoo Promise	November 2005	Kalamazoo, MI	Anonymous donors	Class of 2006	Universal: Continuously enrolled in district since 9th grade; Graduate from district; Reside in district	$13,486/yr[33] (2014-15) for 4 years of tuition and mandatory fees; Amount prorated by length of enrollment in district	Flexible: In-state; Public and private*; 2-year and 4-year *starting with class of 2015	"First dollar" scholarship; Scholarship available for up to 10 years following graduation from KPS

[33] Average tuition and fees for the College of Literature, Science, and Arts, University of Michigan, Ann Arbor: http://admissions.umich.edu/costs-aid/costs.

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Legacy Scholars	2005	Battle Creek, MI	W.K. Kellogg Foundation; Battle Creek Community Foundation	Class of 2012	Universal: Continuously enrolled in Battle Creek or Lakeview school district since 10th grade; Graduate from district	Average cost of tuition and fees at Kellogg Community College for 2 years (62 credits); Amount prorated by length of enrollment in district	Inflexible: Kellogg Community College	Students are required to take a minimum of 6 credit hrs/ semester. Funds can be used to purchase books.

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Leopard Challenge	2007	Norphlet, AR	Local funders	__	Targeted-Merit: Continuously enrolled in district since 9th grade; Graduate from district; Reside in district; 2.25 GPA	$4,000/yr; Amount prorated by length of enrollment in district	Flexible: Any accredited public or private vocational / technical, 2-year, or 4-year institution in the U.S.	__

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
New Haven Promise	2010	New Haven, CT	Yale University Community Foundation of New Haven; Yale-New Haven Hospital; Wells Fargo	Class of 2011	Targeted-Merit: Continuously enrolled in district since 9th grade; Graduate from district; Reside in district; 3.0 GPA; 90% attendance; Complete 40 hours of community service; Positive disciplinary record	100% of unmet need for full cost of attendance at public institutions; $2,500 for in-state private colleges/ universities; Amount prorated by length of enrollment in district	Flexible: Any accredited public or private vocational / technical, 2-year, or 4-year institution in Connecticut	Students with a GPA between 2.5 and 2.99 can apply for "Passport to Promise," which awards 20 one-time scholarships of $1,000. Passport recipients who maintain a 2.0 GPA or higher during their freshman year are eligible for a full Promise scholarship in subsequent years.

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Northport Promise	August 2007	Northport, MI	The Northport Promise Steering Committee	Class of 2008	Universal: Continuously enrolled in district since 9th grade; Graduate from district; Reside in district; Participate in fundraising activities	Amount depends on available funding (in past has been $1,000-$2,000/yr); Amount prorated by length of enrollment in district	Flexible: Any accredited public vocational / technical, 2-year, or 4-year institution in Michigan	

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Peoria Promise	2007	Peoria, IL	Mayor of Peoria; Local funders	Class of 2008	Universal: Continuously enrolled in district since 10th grade; Graduate from district; Reside in district	Average cost of tuition and fees at Illinois Central College for 2 years (64 credits); Amount determined by residency/ length of attendance in district, attendance record/course completion, GPA, ACT, participation in extracurricular activities, community service, and work/ internships	Inflexible: Illinois Central College (local, 2-year)	Peoria Promise is awarded through tuition reimbursement rather than direct payment to institution; reimbursement is only available for classes in which students earned a grade of A, B, C or better.

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Pittsburgh Promise	December 2006	Pittsburgh, PA	Mayor and school superintendent; UPMC Challenge Grant	Class of 2008	Targeted-Merit: Continuously enrolled in district since 9th grade; Graduate from district; Reside in district; 2.5 GPA; 90% attendance; Complete FAFSA	$10,000/yr for 4 years of tuition, fees, books, and room/board; Amount prorated by length of enrollment in district	Flexible: Any accredited public or private 2-year or 4-year institution in Pennsylvania	"Last dollar" scholarship-pays for tuition, fees, books, room, and board after other federal/state/ Institutional aid have been deducted

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Promise for the Future	2001	Pinal County, AZ	Central Arizona College Foundation	__	Targeted-Merit: Continuously enrolled in district since 8th grade; Graduate from Pinal County HS; 2.75 GPA	Average cost of tuition and fees at Central Arizona College for 2 years	Inflexible: Central Arizona College (local, 2-year)	LeGower and Walsh (2014) found evidence that this program was announced as early as 2001, prior to the Kalamazoo Promise.

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Say Yes Buffalo	December 2011	Buffalo, NY	Say Yes to Education; Buffalo; Buffalo Public Schools; Other community partners	Class of 2013	Universal: Continuously enrolled in district since 9th grade; Graduate from district; Reside in district; Complete FAFSA	100% of unmet need for tuition at public institutions for 4 years; Amount prorated by length of enrollment in district; $5,000/yr for in-state private colleges/ universities for student with family income greater than $75,000[34]	Flexible: Any State University of New York or City University of New York campus (2-year and 4-year); Private partner colleges	"Last dollar" scholarship- pays for tuition after other federal/state/ institutional aid has been deducted

[34] Most Say Yes Higher Education Compact private college guarantee full tuition to students with incomes of less than $75,000

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Say Yes Syracuse	September 2009	Syracuse, NY	Say Yes to Education; Syracuse City School District; Other community partners	Class of 2009	Universal: Continuously enrolled in district since 10th grade; Graduate from district; Reside in district	100% of unmet need for tuition at public institutions for 4 years; $5,000/yr for in-state private colleges/ universities for student with family income greater than $75,000[35]; Additional $2,000/yr for books, fees, room/board is available for students enrolled at SUNY/CUNY schools who have received maximum Pell grant, reside on campus, and have high remaining need	Flexible: Any State University of New York or City University of New York campus (2-year and 4-year); Private partner colleges	"Last dollar" scholarship- pays for tuition after other federal/state/ institutional aid has been deducted

[35] Most Say Yes Higher Education Compact private college guarantee full tuition to students with incomes of less than $75,000

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Sparkman Promise	March 2011	Sparkman, AR	Sparkman Scholarship Foundation	Class of 2011	Targeted-Merit: Continuously enrolled in district since 9th grade; Graduate from district; 2.5 GPA or 19 ACT; Receive AR lottery scholarship; Complete FAFSA; Apply for 2 scholarships	Maximum tuition at AR public universities for 4 years; Amount prorated by length of enrollment in district	Flexible: Any accredited public or private 2-year or 4-year institution in the U.S.	Pays difference between the Arkansas Academic Challenge (Lottery) Scholarship and the maximum cost of tuition at AR public universities

Promise Program	Date Announced	Location	Proposed by/ Funded by	First Eligible Class	Criteria to Receive Scholarship	Maximum Scholarship Value	HEIs Covered	More Information
Ventura College Promise	March 2006	Ventura County, CA	Ventura College Foundation	Class of 2006	Universal: Complete FAFSA	Average cost of tuition and fees at Ventura College for 1 year	Inflexible: Ventura College (local, 2-year)	

Appendix C – Sample Description

To create the sample for the achievement and graduation analyses, I remove students who did not have all demographic or outcome measures available for all years and/or did not have the expected grade pattern in the post-Promise years. Students who are coded as being in the "wrong grades" are students who skipped a grade, failed a grade, or were missing grade information for any of the analysis years. This step is taken to ensure that treatment students are matched to comparison students who are taking a test in the same grade. This is not to be confused with the pre-Promise "held back" variable used in the graduation analyses, which is calculated using students' grade information from pre-Promise years.

Table 36 shows the differences between students who are included in the sample and students who are excluded for the sample for one of the reasons described above for the strict district analytic sample. In general, students who are excluded from the sample are less advantaged than students included in the sample. They have much lower test scores and a higher percentage are FRL-eligible. A smaller percentage are white and a greater percentage are African-American. Also, a smaller percentage of the students not in the sample are females.

Table 36

Differences between Students in the Sample and Not in the Sample- Strict District

	Total	Students In Sample	Student Not In Sample	Difference	p
Math z-score (2006)	-0.02	0.03	-0.41	0.44***	0.00
Literacy z-score (2006)	-0.09	-0.04	-0.49	0.45***	0.00
Free/Reduced Lunch-Eligible	61%	59%	77%	-18%***	0.00
Female	50%	51%	44%	7%***	0.00
White	53%	54%	46%	8%***	0.00
African-American	42%	42%	47%	-5%***	0.00
Hispanic	4%	4%	5%	-1%	0.46
Other	1%	0%	2%	-2%***	0.00

*** p<0.01, ** p<0.05, * p<0.1

Differences between El Dorado and comparison students for continuous variables (math and literacy z-scores) are estimated using t-tests. Differences between El Dorado and comparison students for categorical variables (FRL, race/ethnicity, gender) are estimated using chi-squared tests.

N varies by characteristic, and thus are not reported here for formatting purposes.

In addition, it is not possible to find matched comparison students for all treatment students, so some treatment students included in the original analytic sample are not included in the final analytic sample. Tables 37 and 38 show the differences between treatment students who are matched and students are not matched for the strict district exact matches for math and literacy. Students who were not matched had higher math test scores than students who were matched, but the difference was not statistically significant. In contrast, students who were matched had higher literacy test scores than students who were not matched. A larger percentage of matched students were FRL-eligible and white. A greater percentage of not matched students were African-American, Hispanic, or Other race, though not all of these differences are statistically significant at the .05 level. Also, a greater percentage of the students not matched were females, though this difference was not statistically significant.

Table 37

Differences between Treatment Students Matched and Not Matched- Strict District Exact, Math

	Total	Students Matched	Students Not Matched	Difference	p
Math z-score (2006)	0.07	0.05	0.15	-0.10	0.19
Free/Reduced Lunch-Eligible	55%	57%	47%	10%***	0.00
Female	50%	50%	45%	5%	0.15
White	43%	46%	30%	16%***	0.00
African-American	55%	53%	60%	-7%*	0.05
Hispanic	2%	1%	7%	-6%***	0.00
Other	1%	0%	3%	-3%***	0.00
N	1,324	1,090	234		

*** p<0.01, ** p<0.05, * p<0.1
Race does not add up to 100% because of rounding.

Table 38

Differences between Treatment Students Matched and Not Matched- Strict District Exact, Literacy

	Total	Students Matched	Students Not Matched	Difference	p
Literacy z-score (2006)	-0.04	0.02	-0.36	-0.38***	0.00
Free/Reduced Lunch-Eligible	55%	57%	48%	9%**	0.03
Female	50%	51%	43%	7%*	0.07
White	43%	47%	21%	26%***	0.00
African-American	55%	53%	67%	-14%***	0.00
Hispanic	2%	1%	9%	-8%***	0.00
Other	1%	0%	3%	-3%***	0.00
N	1,324	1,144	180		

*** p<0.01, ** p<0.05, * p<0.1

Appendix D – Pre-Treatment Equivalence Tables

Table 39

Pre-Treatment Equivalence on Strict District Propensity Score Match- Math- Achievement

	El Dorado Promise Students	Comparison Students	Difference	p
Baseline Math z-score (05-06)	0.05	0.05	0.00	0.97
Free/Reduced Lunch-Eligible	57%	57%	0%	0.90
White	44%	46%	-2%	0.36
African-American	54%	53%	1%	0.75
Hispanic	2%	1%	1%	0.10
Other Race	1%	0%	1%	0.13
Female	50%	49%	1%	0.58
N	1272	1272		

*** p<0.01, ** p<0.05, * p<0.1

Table 40

Pre-Treatment Equivalence: Strict District Propensity Score Match- Literacy- Achievement

	El Dorado Promise Students	Comparison Students	Difference	p
Baseline Literacy z-score (05-06)	-0.01	-0.01	0.00	0.99
Free/Reduced Lunch-Eligible	56%	56%	0%	0.87
White	44%	46%	-2%	0.32
African-American	53%	53%	0%	0.75
Hispanic	2%	1%	1%**	0.03
Other Race	1%	0%	1%	0.21
Female	50%	51%	-1%	0.78
N	1284	1284		

*** p<0.01, ** p<0.05, * p<0.1

Table 41

Pre-Treatment Equivalence on Broad District Exact Match- Math- Achievement

	El Dorado Promise Students	Comparison Students	Difference	p
Baseline Math z-score (05-06)	0.08	0.08	0.00	0.99
Free/Reduced Lunch-Eligible	57%	57%	0%	1.00
White	46%	46%	0%	1.00
African-American	53%	53%	0%	1.00
Hispanic	1%	1%	0%	1.00
Other Race	0%	0%	0%	1.00
Female	49%	49%	0%	1.00
N	1209	1209		

*** p<0.01, ** p<0.05, * p<0.1

Table 42

Pre-Treatment Equivalence: Strict District Exact Match- Literacy- Achievement

	El Dorado Promise Students	Comparison Students	Difference	p
Baseline Literacy z-score (05-06)	0.01	0.01	0.00	0.99
Free/Reduced Lunch-Eligible	56%	56%	0%	1.00
White	46%	46%	0%	1.00
African-American	53%	53%	0%	1.00
Hispanic	1%	1%	0%	1.00
Other Race	0%	0%	0%	1.00
Female	50%	50%	0%	1.00
N	1230	1230		

*** p<0.01, ** p<0.05, * p<0.1

Table 43

Pre-Treatment Equivalence on Broad District Propensity Score Match- Math- Achievement

	El Dorado Promise Students	Comparison Students	Difference	p
Baseline Math z-score (05-06)	0.06	0.06	0.00	0.99
Free/Reduced Lunch-Eligible	56%	56%	0%	0.97
White	43%	45%	-2%	0.55
African-American	54%	54%	0%	0.81
Hispanic	1%	1%	0%	0.35
Other Race	0%	0%	0%	0.40
Female	49%	49%	0%	0.73
N	1305	1305		

*** p<0.01, ** p<0.05, * p<0.1

Table 44

Pre-Treatment Equivalence: Strict District Propensity Score Match- Literacy- Achievement

	El Dorado Promise Students	Comparison Students	Difference	p
Baseline Literacy z-score (05-06)	-0.02	-0.02	0.00	0.99
Free/Reduced Lunch-Eligible	55%	56%	-1%	0.69
White	44%	45%	-1%	0.48
African-American	54%	53%	1%	0.78
Hispanic	2%	1%	1%	0.20
Other Race	1%	0%	1%	0.40
Female	50%	49%	1%	0.78
N	1307	1307		

*** p<0.01, ** p<0.05, * p<0.1

Table 45

Pre-Treatment Equivalence: Strict District Propensity Score Match- Graduation

	El Dorado Promise Students	**Comparison Students**	**Difference**	**p**
Average Math and Literacy z-score (2006)	0.06	0.06	0.00	0.97
Math z-score (2006)	*0.08*	*0.13*	*-0.05*	*0.40*
Literacy z-score (2006)	*0.05*	*0.00*	*0.05*	*0.44*
Free/Reduced Lunch-Eligible	51%	52%	-1%	0.74
African-American	53%	49%	4%	0.27
Hispanic	1%	5%	-4%***	0.01
Other Race	3%	3%	0%	0.57
Female	48%	48%	0%	0.90
Mobile	10%	5%	5%**	0.01
Held Back Grade	2%	1%	1%	0.40
N	467	467		

*** p<0.01, ** p<0.05, * p<0.1

Table 46

Pre-Treatment Equivalence: Broad District Exact Match- Graduation

	El Dorado Promise Students	**Comparison Students**	**Difference**	**p**
Average Math and Literacy z-score (2006)	0.12	0.12	0.00	0.96
Math z-score (2006)	*0.14*	*0.16*	*-0.02*	*0.72*
Literacy z-score (2006)	*0.09*	*0.08*	*0.01*	*0.81*
Free/Reduced Lunch-Eligible	51%	51%	0%	1.00
African-American	52%	52%	0%	1.00
Hispanic	1%	1%	0%	1.00
Other Race	3%	3%	0%	1.00
Female	49%	49%	0%	1.00
Mobile	8%	8%	0%	1.00
Held Back Grade	1%	1%	0%	1.00
N	440	440		

*** p<0.01, ** p<0.05, * p<0.1

Table 47

Pre-Treatment Equivalence: Broad District Propensity Score Match- Graduation

	El Dorado Promise Students	Comparison Students	Difference	p
Average Math and Literacy z-score (2006)	0.06	0.06	0.00	1.00
Math z-score (2006)	*0.08*	*0.09*	*-0.01*	*0.88*
Literacy z-score (2006)	*0.04*	*0.03*	*0.01*	*0.89*
Free/Reduced Lunch-Eligible	51%	51%	0%	0.85
African-American	53%	51%	2%	0.51
Hispanic	1%	2%	-1%	0.46
Other Race	3%	4%	-1%	0.86
Female	48%	48%	0%	1.00
Mobile	10%	9%	1%	0.74
Held Back Grade	2%	1%	1%	0.13
N	469	469		

*** p<0.01, ** p<0.05, * p<0.1

Appendix E – Descriptive Statistics

Table 48

Description of Overall Math Sample- Achievement, 2007-11

	Strict Exact	Strict PS	Broad Exact	Broad PS
Baseline Math z-score (05-06)	0.12	0.08	0.10	0.09
Free/Reduced Lunch-Eligible	58%	57%	58%	57%
White	46%	45%	46%	44%
African-American	53%	53%	53%	54%
Hispanic	1%	2%	1%	2%
Other Race	0%	0%	0%	0%
Female	51%	50%	50%	50%
Observations (Students)	6,256 (2,180)	7,320 (2,544)	6,968 (2,418)	7,520 (2,610)

Table 49

Description of Overall Literacy Sample- Achievement, 2007-11

	Strict Exact	Strict PS	Broad Exact	Broad PS
Baseline Literacy z-score (05-06)	0.01	-0.01	0.00	-0.02
Free/Reduced Lunch-Eligible	58%	57%	57%	57%
White	46%	45%	46%	44%
African-American	53%	53%	53%	54%
Hispanic	1%	1%	1%	2%
Other Race	0%	0%	0%	0%
Female	51%	51%	50%	50%
Observations (Students)	6,631 (2,288)	7,431 (2,568)	7,118 (2,460)	7,536 (2,614)

Race/ethnicity categories do not add up to 100% because of rounding.

Table 50

Description of Overall Sample- Graduation

	Strict Exact	Strict PS	Broad Exact	Broad PS
Average Math and Literacy z-score (05-06)	0.13	0.06	0.12	0.06
Baseline Math z-score (05-06)	0.17	0.11	0.15	0.08
Baseline Literacy z-score (05-06)	0.08	0.02	0.09	0.04
Free/Reduced Lunch-Eligible	51%	51%	51%	51%
White	45%	43%	44%	43%
African-American	51%	51%	52%	52%
Hispanic	1%	3%	1%	2%
Other Race	0%	3%	3%	4%
Female	48%	48%	49%	48%
Mobile	6%	8%	8%	10%
Held Back Grade	0%	1%	1%	1%
Observations	818	934	880	938