

## Article Exchange with the University Of Oregon:

# United Way of Lane County's Promise Neighborhoods and the Benefits of Reading Readiness



Jacob McGrew & Elizabeth Lohrke

### ABSTRACT

*In this paper, we measure statistical relationships between defining characteristics of incoming kindergartners and their initial literacy scores. Our analysis focuses on four elementary schools in Oregon's Springfield School District: two Promise Neighborhood schools and two comparable non-Promise Neighborhood schools. Using scores from the literacy benchmark tests each incoming student takes upon entering kindergarten—controlling for variables such as family income, English language learners, gender, special education, and ethnicity—we find the defining characteristics with the most significant relationships that influence literacy scores. In the absence of a fully randomized experimental design, we give policy suggestions to United Way of Lane County to more effectively increase early literacy in the Lane County, as well as offer advice on the kinds of additional information that would permit a more definitive future study of the Promise Neighborhoods.*

### I. INTRODUCTION

The national United Way Promise Neighborhoods movement was created in 2010 to develop a continuum of “cradle through college and career” (Promise 2010) solutions to improve the educational and developmental outcomes of children living in the United States’ most distressed neighborhoods. Based on the work of Geoffrey Canada in the Harlem Children’s Zone, Promise Neighborhoods could be an efficient solution to releasing thousands of children from the lifelong effects of poverty by developing a full continuum of supports for children, prenatally through emerging adulthood, in families, schools and neighborhoods with the support of a broad range of community partners found in the

sectors of education, business, social service, health, government, faith, and many more (Promise 2010). Children who enter school unprepared to learn tend to face more obstacles throughout their schooling and have a lower degree of long-term success in their adult lives. United Way of Lane County is focused on building a foundation for a successful life for every child by increasing the number of children who enter school ready to learn.

In Lane County, Oregon, thirteen of sixteen school districts use either Dynamic Indicators of Basic Early Literacy Skills (DIBELS) or EasyCBM to measure incoming kindergartners’ early literacy

skills and assess how prepared they are to learn to read, an important sign of school readiness (Promise 2010). Assessed skills include letter recognition, sound fluency and print familiarity. While standardized testing may be an imperfect gauge of student potential, it is currently the best available measure. United Way of Lane County (UWLC) began collecting and aggregating literacy score data from all participating school districts in 2010, only to discover disturbing results. More than half of all children entering kindergarten in Lane County do not have the early literacy skills they are predicted to need for success in school based on the early literacy benchmarks set up the creators of each assessment tool. Two Promise Neighborhoods have been established in the county's lowest scoring communities: the first in the Springfield School District and the other in Eugene's Bethel School District. In these two combined neighborhoods, 82 percent of children entering kindergarten do not meet the early literacy benchmark, as compared to 56 percent across the rest of Lane County. The intent of the Promise Neighborhoods is to concentrate resources on piloting innovative programs to improve incoming kindergartners' school readiness and so as to close the school achievement gap between students in all neighborhoods across Lane County.

- Children enter school with age-appropriate early language and literacy skills.
- Children enter school with age-appropriate social and emotional development.
- Parents have the knowledge and tools to be actively involved in their child's development and education.

UWLC's strategic education investments include parenting education programs, childcare improvement efforts, and early learning programs (Promise 2010).

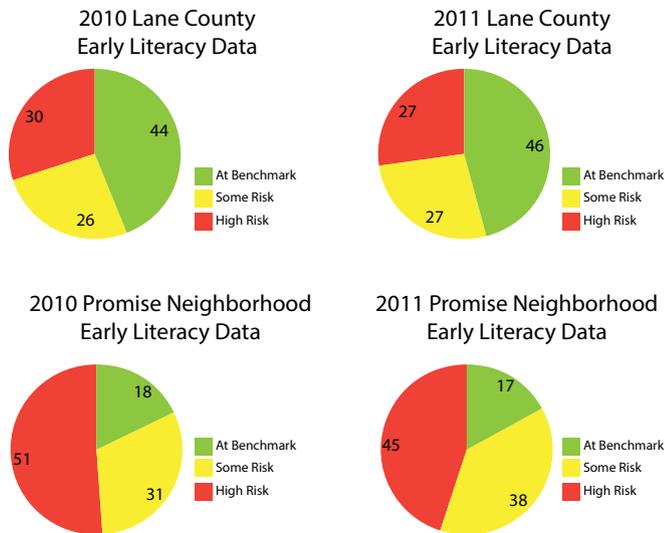


Figure 1: Literacy Data for Lane County

## 2. BACKGROUND

In 2010, United Way of Lane County aligned its community investment process with its established 2020 goals in education, income and health. UWLC's primary education goal is for all children to enter school ready to learn. This goal is broken down into three specific outcomes:

During preliminary discussions with United Way's Associate Director of Education, Holly Mar Conte, our research team received proposed project goals that would give UWLC a compelling case for strategic investment in the Promise Neighborhoods. This project consisted of three distinct projects:

- Prepare a literature review with a strong focus on the short- and long- run indirect costs of children entering school who are unprepared to learn to read, and gather background information on literacy testing.

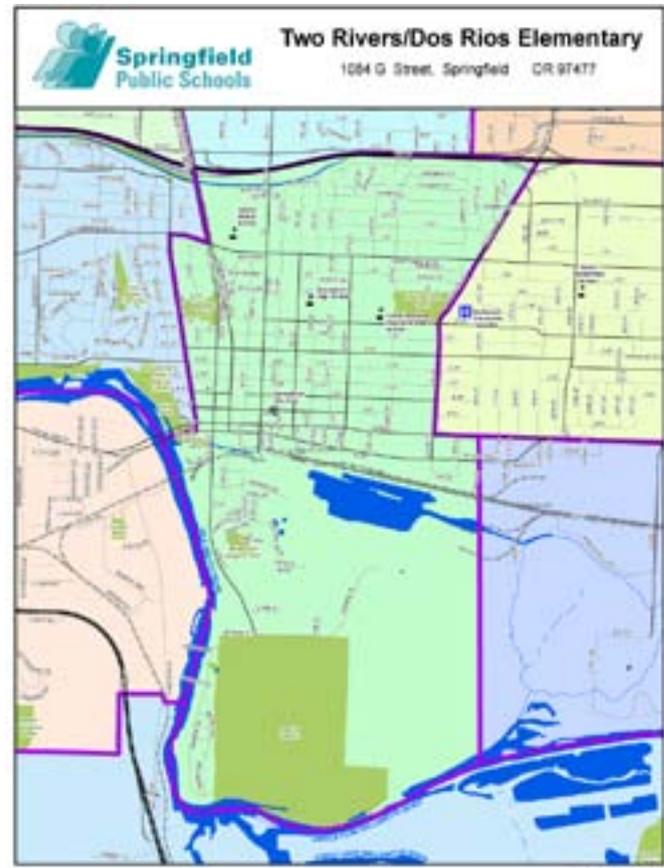


Figure 2: Map of Springfield School District

- Identify the impact of UWLC's Strategic Investments in the Promise Neighborhoods after controlling for factors such as family income, English language learners, gender, special education, and ethnicity.
- Make recommendations for linking data from UWLC-funded programs to school records for data tracking and future assessment. This would include recommending questions for future surveys given out at kindergarten registration.

This analysis focused on two different elementary schools in the Springfield Promise Neighborhoods: Two Rivers-Dos Rios (formerly Brattain) and Maple elementary schools. At 14- and 47-percent, respectively, these elementary schools have some of the highest percentages of students falling short of early literacy benchmarks throughout Lane County (Promise 2010).

### 3. LITERATURE REVIEW

This paper's purpose is to give statistical evidence to the importance of early childhood development (ECD) programs so that policy makers have a bigger incentive to fund similar programs. The Brookings Institution's William Dickens, Isabel Sawhill, and Jeffrey Tebbs (2006) noted that it is difficult for politicians to allocate money towards long-term investments such as ECD because they often face immediate pressures to fund ongoing or immediate aid programs. Though often under funded by both state and local governments, ECD programs have consistently been shown to have a notably higher return for each dollar spent compared to most other programs, both in the short-run and the long run (Rolnick & Grunewald 2003). The economic benefits include a higher likelihood of high school graduation, which leads to a decreased chance of participants committing future crimes or having to rely on welfare benefits (Belfield et al 2005) as well as increased civic involvement and a lower chance of unplanned pregnancies (der Gaag & Tan 1998).

Though arguments are made that extreme poverty and low parental education are the causes of under-performance in school rather than the lack of ECD, 20-year longitudinal data suggests that preschool cognitive and behavioral functioning is highly predictive of literacy in young adulthood, even when the effects of family environmental characteristics, including living arrangements, the quality of the home environment, maternal education, and income are held constant. But it does not stop at just preschool or kindergarten; grade failure in elementary school is also associated with literacy, but this effect disappears after controlling for the measure of preschool abilities (Baydar et al 1994). This suggests that grade failure throughout elementary school and beyond is not precisely correlated with literacy at the time of the test, but instead dependent on literacy abilities learned at the

preschool level.

It is crucial that early childhood development programs are implemented as soon as possible. A key finding of University of Minnesota's Judy Temple and Arthur J. Reynolds (2007) is that the economic returns from high-quality preschool programs are much higher than educational interventions implemented after a child enters school. The University of Cincinnati's Victoria Purcell-Gates and Karin Dahl (1991) found that early literacy plays a crucial role in raising academic achievement, "The children who were the most successful at reading and writing at the end of first grade began kindergarten with more highly and broadly developed schemata about written language as compared to the children who were the least successful."

The Promise Neighborhood program was only recently implemented in Lane County, so long-term effects will need to be interpreted from similar studies. We make some assumptions using a cost-benefit analysis of the High/Scope Perry preschool Program, which collected data on 40-year old individuals who attended the program as children (Belfield et al 2005). In the Perry study, program costs were compared against treatment impacts on educational resources, earnings, criminal activity, and welfare receipts. The treatment group obtained significantly higher earnings than the control group who did not receive the program. For the general public, higher tax revenues, lower criminal justice system expenditures, and lower welfare payments easily outweigh program costs; they re-paid \$12.90 for every \$1 invested. Even though the individual returns through this program were only around 6 percent, the returns to society were more than 12 percent (Heckman & Masterov 2007). The largest program gains came primarily from reduced crime by males. While Lane County jails are being forced to close numerous beds and lay off multiple workers due to budget cuts, the amount of crime in the county is not decreasing quickly enough to deal with these jail space shortages. In the long run, enriched ECD programs are the least-cost, most effective way to reduce crime, far more effective per dollar than increased expenditures on police or incarceration (Heckman & Masterov 2007).

The Harlem Children's Zone, a model for the Promise Neighborhoods, has also been widely cited recently in comparable research studies. Results from the Harlem Children's Zone (HCZ) suggest that high-quality schools are crucial in increasing achievement among low-income students. Harvard University's Will Dobbie and Roland G. Fryer, Jr. (2010) provided the first empirical test of the causal impact of attending Promise Academy charter schools in the HCZ on educational outcomes, with a focus toward seeing whether schools alone can eliminate the achievement gap

or whether the issues that poor children bring to school are too much for educators alone to overcome. The Promise Academy was found to be successful at boosting achievement in both math and English language arts in elementary school. “High-quality schools or community investments coupled with high-quality schools drive these results, but community investments alone cannot” (Dobbie & Fryer 2010). Focusing more funding on ECD programs in the Promise Neighborhoods is an extremely cost effective solution for the long run sustainability of Lane County.

The benefits of cognitive readiness for entering kindergartners do not stop with higher test scores and early literacy skills; research increasingly shows the importance of social-emotional development in a child’s readiness to learn. In a study utilizing a sample of 356 four-year-old children attending Head Start, the behavioral aspects of school readiness, including classroom participation, pro-social behavior, and aggression control were related to cognitive readiness assessments given at the start of the prekindergarten year (Bierman et al 2009). It was found that classroom participation and pro-social behavior each accounted for unique variance in cognitive readiness, while aggressive behavior was associated with low levels of executive function skills. It was concluded that the promotion of competencies associated with classroom participation and pro-social behavior may be particularly critical to cognitive readiness in prekindergarten, which supports the holistic approach used in the Promise Neighborhoods. Social-emotional data was not tracked in this study, but we recommend tracking for this data in the future.

## 4. METHODOLOGY

### 4.1 Basic Structure

To perform a meaningful analysis, we had two main goals:

- Analyze the effect of a variety of incoming kindergarten students’ characteristics, gathered by each school district, on student fall literacy assessment scores.
- Analyze the direct effects of the Promise Neighborhood on fall literacy assessment scores.

A multiple linear regression using Ordinary Least Squares (OLS) would have been the easiest and the most precise way for us to estimate these effects, but after we received the data from the school districts and ran our regressions, we realized this analysis would not be so simple. Besides the data not being uniform in collection or organization, the sample sizes were not large enough and the Promise Neighborhood data was strongly affected by selection bias—which will be discussed later in this paper. This led to very large standard deviations in all regressions, findings that were not statistically significant (having a high p-value), and a

very small coefficient of determination, or R2. The p-value is the probability of obtaining a test statistic at least as extreme as the one that was actually observed, R2 is most often seen as a number between 0 and 1.0, used to describe how well a regression line (created by estimated data) fits a given set of data. An R2 near 1.0 indicates that a regression line fits the data well, while an R2 closer to 0 indicates a regression line does not fit the data very well. R2 provides a measure of how well future outcomes are likely to be predicted by the model. A low R2 was expected since we were dealing with a non-randomized pool of data on a small sample size of children. Because of these problems, we were unable to establish any causal links since we could not accurately estimate coefficients for most of the characteristics. In order to perform a meaningful analysis, we modified our goals to:

- Measure the statistical relationships between the defining characteristics we received from the school districts and fall literacy assessment scores.
- Measure the statistical relationship between a kindergarten student being in a Promise Neighborhood and that student’s fall literacy assessment score, then analyze the difference in relationship after controlling for defining characteristics.

These adjustments would allow us to produce a more meaningful analysis for United Way since our findings would be based off of statistically significant finding. Statistical significance measures whether observations reflect a pattern rather than just chance. Based on previous studies on similar programs such as Harlem Children’s Zone and Perry Preschool, we expected to find a negative correlation between literacy scores and characteristics such as English Language Learners (i.e. language spoken at home may not be English, while literacy tests are in English) and low income household (i.e. low parental education level, or simply a lack of disposable income to purchase at-home reading materials or enroll the child in early childhood development programs) and a positive correlation between literacy scores and living in a Promise Neighborhood (Belfield 2005, Dobbie 2011). In our conclusion we will discuss the importance of a solid experimental design in analyzing educational programs such as the Promise Neighborhoods.

### 4.2 Data Acquisition

Our data was collected from Promise Neighborhood schools and comparable schools in the Springfield School District during each school’s kindergarten registration. The Promise Neighborhoods program was piloted in January of 2010, allowing us to obtain data from the 2010-2011 school year (denoted as 2010) and the 2011-2012 school year (denoted as 2011). Working with United Way’s Associate Director of Education, Holly Mar Conte, and

Springfield School District's Director of Elementary Education, Sara Ticer, we received data on each kindergarten student in the two districts. The comparison schools were also chosen by Sara Ticer.

### 4.3 Scoring Characteristics for Each Neighborhood

Districts throughout Lane County implement different systems to measure reading readiness in kindergarten students. Bethel School District uses DIBELS, while Springfield School District uses EasyCBM. Each assessment implements different tests and grading scales to measure literacy. DIBELS tests on initial sound fluency and letter naming fluency while EasyCBM tests on letter sounds and letter naming. A child is considered "low-risk" in the DIBELS assessment if he or she receives a score of 8 or above on each test (DIBELS n.d.), while EasyCBM is scored on norms so the score corresponding to a student's risk level changes each year depending on the class (Richards n.d.). In the Bethel School District, the minimum score was 0 while the maximum was 97 with a mean of 23.74 and a standard deviation of 20.31. In the Springfield School District, which is the district we observed, the minimum score was 0 and the maximum was 97 with a mean of 18.32 and a standard deviation of 17.53.

### 4.4 Variables

Our variables are listed below with explanations of what was measured and how each was measured. Our reference group was white male kindergarten students who were not on free or reduced lunch, were not registered for special education classes, and were native English speakers. Reference groups, also known as comparison groups, are used in order to evaluate and determine the nature of a given individual or other group's characteristics.

#### 4.4.1 Dependent Variable

$SCORE_i$  = The literacy benchmark score of the  $i^{th}$  student, as tested in the fall of kindergarten year. This score is the sum of Letter Names (LN) and Letter Sounds (LS) using EasyCBM for the Springfield School District.

#### 4.4.2 Independent Variables

$FEM_i$  = A dummy variable that is 1 if the  $i^{th}$  student is female and 0 if the student is male.

$LUNCH_i$  = A dummy variable that is 1 if the  $i^{th}$  student qualified for Free or Reduced Lunch and 0 if the student did not. This was our proxy to identify low-income households. Households with incomes at or below 130% of the poverty level qualify for free lunches. Households at 130-185% of the poverty level qualify for

reduced lunches (Income n.d.).

$SPED_i$  = A dummy variable that is 1 if the  $i^{th}$  student is enrolled in Special Education classes and 0 if the student is not. In Oregon, students are placed in Special Education classes if they are evaluated as having one of the following: intellectual disability; hearing impairment, including difficulty in hearing and deafness; speech or language impairment; visual impairment, including blindness; deaf-blindness; emotional disturbance; orthopedic or other health impairment; autism; traumatic brain injury; or specific learning disabilities (Oregon 2011).

$ESL_i$  = A dummy variable that is 1 if the  $i^{th}$  student is enrolled in an English as a Second Language class and 0 if the student is not. This was our proxy to identify non-native English speakers.

$ETHHISP_i$  = A dummy variable that is 1 if the  $i^{th}$  student is Hispanic or Latino and 0 if the student is not.

$ETHBLACK_i$  = A dummy variable that is 1 if the  $i^{th}$  student is Black or African American and 0 if the student is not.

$ETHASIAN_i$  = A dummy variable that is 1 if the  $i^{th}$  student is Asian or Pacific Islander and 0 if the student is not.

$ETHAMERIND_i$  = A dummy variable that is 1 if the  $i^{th}$  student is American Indian or Native Alaskan and 0 if the student is not.

$ETHMIXED_i$  = A dummy variable that is 1 if the  $i^{th}$  student is mixed ethnicity and 0 if the student is not.

$PN_i$  = A dummy variable that is 1 if the  $i^{th}$  student lived in a Promise Neighborhood and 0 if the student did not.

The Springfield Promise Neighborhood schools were Maple Elementary and Two Rivers-Dos Rios (Brattain) Elementary, while the non-Promise Neighborhood schools were Moffitt Elementary and Riverbend Elementary.

### 4.5 Empirical Modeling

A fitted linear regression model can be used to identify the relationship between a characteristic variable  $Z_i$  and the response variable  $Score_i$  when all the other characteristic variables in the model are "held fixed". Specifically, the interpretation of  $\beta_j$  is the expected change in  $Score_i$  for a one-unit change in  $Z_i$  when the other characteristic variables are held fixed.

Using the variables listed above, we were able to create the following multiple linear regression to measure the statistical relationship between the literacy benchmark score of the  $i^{th}$  student and the unique characteristics of that student in the Springfield School District. We pooled the 2010 and 2011 classes of kinder-

gartners together in order to increase our sample size since both years were tested on the same assessment and would not be much different from each other in terms of either score or characteristics.

#### 4.5.1 Springfield School District (sample size=388)

$$\text{SCORE}_i = \beta_0 + \beta_1\text{FEM}_i + \beta_2\text{LUNCH}_i + \beta_3\text{SPED}_i + \beta_4\text{ESL}_i + \beta_5\text{ETHHISP}_i + \beta_6\text{ETHBLACK}_i + \beta_7\text{ETHASIAN}_i + \beta_8\text{ETHAMERIND}_i + \beta_9\text{ETHMIXED}_i + u_i$$

After correcting for White Standard Error—which assumed that the errors or disturbances in the regression have the same variance (and therefore the same standard deviations) across all observation points—this model allowed us to measure the separate statistical relationship for each characteristic variable we received from the schools for both years (Huber-White n.d.). A statistical relationship is not necessarily causal, so in order to determine causality, a larger, randomized experimental design would be necessary for future analyses.

After analyzing the relationships between each characteristic variable and the pretest score, we wanted to gauge whether the score discrepancies between the Promise Neighborhood schools and non-Promise Neighborhood schools still remained the same when these variables are held constant. We did this by finding the coefficient of PNi in the regression:

$$\text{SCORE}_i = \beta_0 + \beta_1\text{PN}_i + u_i$$

Then comparing this relationship to the coefficient of PNi in the same regression with the characteristic variables controlled for. If the coefficient of PNi was significantly lower after controlling for the other variables, then it can be said that the composition of each neighborhood had more influence on reading readiness than the Promise Neighborhoods—whether it was really the Promise Neighborhoods that were creating a positive change to reading readiness or some other factor such as a higher percentage of native English speakers in the area.

## 5. EMPIRICAL ANALYSIS

### 5.1 Variable Relationships

#### 5.1.1 Springfield School District

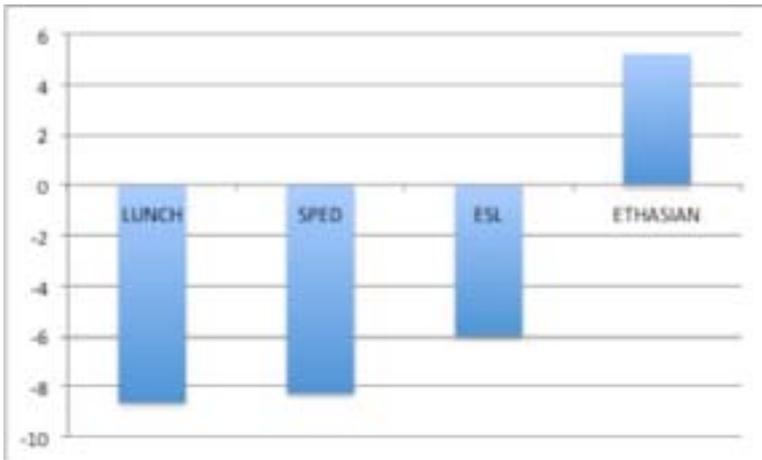
##### Characteristics:

From the standard Springfield characteristic regression, four out

Table 1: Springfield Characteristic Variables

Variable	Coefficient (β)	Std. Error	P-Value
C	28.17026	2.971749	0.0000
FEM	0.255489	1.732722	0.8829
LUNCH	-8.640290	2.888508	0.0030
SPED	-8.278336	2.090280	0.0001
ESL	-5.969369	2.707774	0.0281
ETHHISP	-1.785939	2.555703	0.4851
ETHMIXED	5.964307	4.236837	0.1600
ETHBLACK	-3.192824	6.579323	0.6278
ETHASIAN	5.214545	1.428657	0.0003
ETHAMERIND	-3.704962	5.916947	0.5316
R-squared	0.092656		

of the nine characteristics were statistically significant. The coefficients of LUNCH<sub>i</sub>, SPED<sub>i</sub>, and ETHASIAN<sub>i</sub> were -8.64, -8.28, and +5.21 points on average, respectively, which were all considered significant at the 1 percent statistical significance level. These three coefficients were highly correlated with literacy cores. The coefficient of ESL<sub>i</sub> was -5.97 points on average, which was significant at the 5 percent significance level. Though this coefficient was less correlated to scores than the past three, it was still highly correlated with score outcomes. It should be noted that there was only one Asian kindergartner in the Springfield School District in both years, so the coefficient for ETHASIAN<sub>i</sub> does not necessarily speak for all Asians or Pacific Islanders. The reference group received 28.17 points on average.



**Promise Neighborhood:**

Figure 3: Statistically Significant Characteristic Relationships in Springfield School District (Reference Group Avg. Score: 28.17)

In the regression using only PNi, the coefficient for PNi was not statistically significant, but the 95 percent confidence interval was

Table 2.1: Springfield PNi Effect Not Controlling for Variables

Dependent Variable: SCORE  
 Method: Least Squares  
 Included observations: 388  
 White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient ( $\beta$ )	Std. Error	P-Value
C	18.99187	1.168982	0.0000
PN	-1.836940	1.783228	0.3036
R-squared	0.002554		

between -5.34 and 1.66. Confidence intervals consist of a range of values that act as good estimates of the unknown population parameter. The level of confidence of the confidence interval would indicate the probability that the confidence range captures this true population parameter given a distribution of samples. This value is represented by a percentage, so when we say, “we are 99% confident that the true value of the parameter is in our confidence interval”, we express that 99% of the observed confidence intervals will hold the true value of the parameter. Keep in mind that in infrequent cases, none of these values may cover the value of the parameter. Using the Promise Neighborhood data, we say that there is a 95 percent chance that the Promise Neighborhoods have an effect from -5.34 to 1.66 (Confidence 1999). Unfortunately, not much can be said about PNi since the coefficient was not

statistically significant and the 95 percent confidence interval was so wide with a range of 7 points.

When we added the characteristic variables back in, PNi was still

Table 2.2: Springfield PNi Relationship Controlling for Variables

not close to being statistically significant, but the 95 percent con-

Dependent Variable: SCORE  
 Method: Least Squares  
 Included observations: 388  
 White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient ( $\beta$ )	Std. Error	P-Value
C	28.75297	3.047827	0.0000
FEM	0.237746	1.729673	0.8907
LUNCH	-8.579699	2.894359	0.0032
SPED	-8.359477	2.089369	0.0001
ESL	-5.611835	2.733646	0.0408
ETHHISP	-2.032332	2.570466	0.4296
ETHMIXED	6.181945	4.273041	0.1488
ETHBLACK	-3.819649	6.631214	0.5650
ETHASIAN	4.588984	1.652996	0.0058
ETHAMERIND	-3.769070	5.939931	0.5261
PN	-1.662927	1.756412	0.3444
R-squared	0.094671		

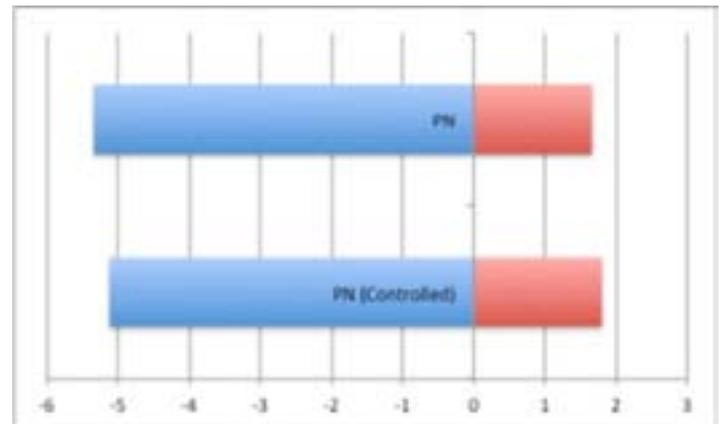


Figure 4: Change in Springfield Promise Neighborhood Confidence Interval, as Variables are Held Constant

confidence interval became slightly smaller—between -5.06 and 1.80 with a range of 6.86 points. This led us to believe there were effects that PNi was picking up from characteristics not controlled

for in our regressions, which will be discussed in the next section of this paper.

## 5.2 Analysis of Estimates

The most significant and perhaps most interesting finding was that in every regression we performed, LUNCHi and SPEDi were always statistically significant at the 1 percent significance level with a negative coefficient ranging from -7 points to -10 points on average. Considering the reference groups in the Springfield School District, a 10-point decrease is a 37 percent decrease in Springfield schools' reading readiness scores. This means that it was highly likely that a student in either a special education class or on free or reduced lunch would receive an early literacy score that was 37 percent lower than his or her peers. Since LUNCHi was our proxy for family income, it is a reasonable inference that a child coming from a lower income family income is at higher risk of entering school being unprepared to begin learning. This may be due to a range of factors such as an absence of necessary parental training or intervention, low parental education level, or simply a household lack of disposable income to purchase at-home reading materials or enroll the child in early childhood development programs—all problems that United Way seeks to address through the Promise Neighborhoods.

ESLi, our proxy for English language learners, was statistically significant at the 5 percent level in almost every regression, each time leading to a negative relationship ranging from -5 to -8 points on average. In the Springfield regression, none of the ethnicity variables were negative and statistically significant; therefore there may be more non-English speaking ethnicities in Springfield that we did not control for in our model, such as Vietnamese or Russian. If this is the case, a stronger focus on English language learners of all backgrounds throughout the city of Springfield could prove to be a huge impact on literacy rates.

## 5.3 Data Limitations

While the Promise Neighborhood regressions showed negative coefficient possibilities in the 95 percent confidence intervals, as more characteristic variables were added, the range of the confidence interval shrank even as it became more positive. If more characteristic variables were added to the regression, the 95 percent confidence interval would likely reach a range between two positive numbers in both districts. This would indicate the Promise Neighborhoods likely have a positive, if minor, relationship to fall literacy scores.

Another important finding from the analysis of each regression was that the variables we used explained very little, meaning

there were many more characteristic variables we did not control for. Our highest R2 was 0.125 and our lowest was 0.093. With the variety of characteristic variables we had available, we were only able to describe between 9.3 percent and 12.5 percent of the characteristics statistically associated with fall literacy scores. We likely observed this outcome due to our small pool of data and the fact that each school district only tracks a few characteristics for incoming students. We address this problem later in the paper by giving United Way of Lane County suggestions on variables to track in the future.

In order for UWLC to conduct more meaningful analyses in the future, either stronger experimental design or better data is required. When dealing with real-world analyses, collecting better data—such as more variables, larger sample sizes, and better-organized lists—is likely the best solution. As more variables are tracked and sample sizes continue to grow each school year, causal links between scores and Promise Neighborhood programs may appear. As stated above, we began to see this slight positive trend in the Promise Neighborhood confidence intervals as we controlled for available variables. More years of data combined with more variables being tracked should allow future analysis of the Promise Neighborhoods to better determine their statistical significance with early childhood literacy.

## 5.4 Policy Implications

One policy we recommend implementing in all Lane County schools is uniform organization and compiling of student data, possibly monitored by the Oregon Department of Education. This will be discussed in further detail shortly.

Using the data available, income and special education had the largest statistical relationship to low fall literacy scores, with non-native English speakers being the next most significant relationship. These characteristics should be taken into account as programs in the Promise Neighborhoods seek to decrease the number of high-risk students in all affected schools.

Observing that income is such a significant factor in a child's ability to be ready to learn by the time they enter school, UWLC could consider focusing a higher percentage of its funding on "Income" projects. Positively affecting income—"moving the needle" as it is often referenced at United Way—would likely affect education by reducing the effects of low-income households on children throughout the county.

UWLC already has efforts underway to help non-native English speakers. They fund parenting education programs and KITS in

Spanish, reaching out to families with young children by providing materials in English and Spanish. As long as these programs are well advertised and provided in English and Spanish, the score discrepancies between native and non-native English speakers who speak Spanish should decline. The next step should be also offering other languages found in Lane County, such as German or French.

## 6. SUGGESTIONS FOR FUTURE TRACKING

As we compiled data from Springfield School District, the most important suggestion we could offer would be to work toward a uniform data collection program. This would make outcomes from different districts in Lane County easier to analyze. The simplest solution would be for all schools in Lane County—and ideally all schools in the state of Oregon—to decide on EasyCBM, DIBELS, or another program for student assessments. Implementing a uniform testing program would allow for easier school comparisons and creation of a student database that could be easily accessed, allowing for much simpler analysis.

When first obtained, the Springfield data contained holes such as missing gender, missing fall literacy scores, and missing special education data. These holes were inconsistent across schools, likely due to the fact that each school organizes student data differently. Not only is a uniform data collection program important, a uniform data storage system is equally necessary. Whether this is a mutually agreed upon template or a master database to which all schools in Lane County contribute, some safeguard for data uniformity is essential for meaningful future analysis at city, county, and state levels.

Another useful characteristic to track would be a universal literacy pre-test given at age 3 or 4. If a majority of Lane County children took a pre-test before enrolling in Promise Neighborhood programs, the effects of those programs and experiences leading up to kindergarten entrance would be easier to analyze (Walstad 1988). Future analysis using pre-test scores would focus on the positive (or negative) change in reading readiness that Promise Neighborhoods offer rather than solely restating the already known fact that Promise Neighborhoods are places in communities with children coming into school unprepared to learn.

In the Promise Neighborhood schools, kindergarten teachers also completed a social-emotional scorecard for each student. The teachers gave each student an “emotional difficulties” rating as well as a “pro-social” score. We subtracted the total difficulties score from the pro-social score to create a basic “emotional score” for each student. If this same evaluation was done throughout Lane County schools, further research could look for a correlation between certain variables and social-emotional scores, including between social-emotional scores and literacy test scores. This analysis would hopefully emphasize the effectiveness of the holistic approach to school readiness that UWLC strives to provide. It could also show the effect of Promise Neighborhoods on a child’s early social abilities.

Another potentially useful characteristic to track would be the number of siblings in each incoming student’s household and whether these siblings are older or younger than the child under study. Negative effects from having too many younger siblings that might distract parental literacy teaching as well as positive effects from having older siblings who can help the kindergartner learn could appear in a future analysis. Asking how many children are in the family along with their ages would provide these useful variables.

## 7. CONCLUSIONS AND FUTURE RESEARCH

Though our analysis led to results we did not predict, our outcome is still of great use to the policy makers of United Way of Lane County. We will continue to work with UWLC to look for ways that help Lane County school districts collect and compile data, allowing for easier economic analysis in the future. If each school district in Lane County were given a uniform way to collect and compile data and advised about which variables to track, programs could be analyzed for efficiency much sooner. This would allow the most affordable and efficient programs to be implemented more quickly.

One of the more significant challenges we had with the data was dealing with selection bias in the Promise Neighborhoods. Selection bias is systematic error due to a non-random sample of a population, causing some members of the population to be less likely to be included than others, resulting in a biased sample. UWLC placed Promise Neighborhoods in the two lowest scoring schools in each district; therefore these schools already had a predisposition for low literacy rates. Conducting a regression on the effects of the Promise Neighborhoods on early reading readiness simply verified that the Promise Neighborhoods were placed in lower performing neighborhoods, which we already knew.

This regression should be run again in the future, when the pool of kindergarten students is much larger and more characteristics are being followed. Following the suggestions for additional characteristics to follow, UWLC will have data on pre-test scores, size of household, and student social and emotional scores. Adding these variables to a regression—along with participation in Early childhood development programs such as KITS and Headstart—should begin to show the true effects of the Promise Neighborhoods and of all other ECD programs on fall literacy scores.

As seen in the literature review, the significant case studies of programs that affect reading readiness were all long-run case studies. Most robust early childhood development analyses contain at minimum twenty- and forty-year follow-ups. The benefits of programs funded by United Way, including those in the Promise Neighborhoods, should be more robustly observed upon following up after the affected children become adults and begins contributing to society. Ideally, a randomly selected group of children from the Promise Neighborhoods would be tracked longitudinally throughout their

lives alongside a randomly selected group of students from the control schools. This would allow policy makers and United Way donors to observe the long-term effects of strategic investment in early child development programs such as those offered in the Promise Neighborhoods.

One last interesting finding was that fall literacy scores were not as highly correlated to future reading scores as anticipated. There were some students in Bethel who received 0 points on their fall assessment but then received 27 points three months later on their winter assessment while a different student who received 30 points on their fall assessment then received 5 points on their winter assessment. This result supports the possibility that improvement and learning may be more important to literacy scores than strict reading readiness at the start of kindergarten, or it could also be a data integrity issue. If future regressions could include winter or spring test scores to look for a correlation between reading readiness in the fall and how each student performs throughout the year, this could open up new conversations about educational policies.

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