Student Composition in United Way of Lane County's Promise Neighborhoods and the Benefits of Reading Readiness

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Abstract:

In this paper, we measure statistical relationships between characteristics of incoming kindergartners and initial literacy scores. Our analysis includes eight elementary schools, four of which are Promise Neighborhood schools in Lane County: Two Rivers-Dos Rios Elementary (formerly Brattain) and Maple Elementary in the Springfield School District plus Fairfield Elementary and Malabon Elementary from the Bethel School District. Our control group includes comparable schools that are not part of the Promise Neighborhoods in each district. Using scores from the literacy benchmark tests each incoming student takes upon entering kindergarten–controlling for certain variables–we find characteristics with the largest coefficients, making them most likely to have a relationship that influences literacy scores. This provides useful information for program planning and spending in the Promise Neighborhoods. Using the statistical relationships discovered in our analysis, and some we felt would be useful for study if available, we suggest variables on which to collect data for future assessments. This data will be collected through a questionnaire given out with kindergarten registration packets. We also include a literature review that focuses on the importance of children entering school prepared to learn. The emphasis in these studies is on both literacy skills and social-emotional development prior to kindergarten, as well as the benefits associated with early childhood development program investment.

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1. Introduction

The national Promise Neighborhoods movement was created to develop a continuum of “cradle through college and career” 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. 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, thirteen of sixteen school districts use either DIBELS (Dynamic Indicators of Basic Early Literacy Skills) 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. Assessed skills include letter recognition, sound fluency and print familiarity. While standardized testing may be an imperfect way to gage 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, realizing 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. Two Promise Neighborhoods have been established in the county’s lowest scoring communities. One is in the Springfield School District and the other is 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 in the Promise Neighborhoods is to concentrate resources on piloting innovative programs to improve incoming kindergartners' school readiness and identify effective programs for scale-up to other neighborhoods across Lane County.

2. Background

In 2010, UWLC 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:

- 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.

During preliminary discussions with United Way's Associate Director of Education, Holly Mar Conte, we received proposed project goals that would give UWLC a compelling case for strategic investment in the Promise Neighborhoods. We were able to narrow the goals of this project down to 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.
- 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 surveys given out at kindergarten registration.

This analysis focuses on four different elementary schools in Promise Neighborhoods: Two Rivers-Dos Rios (formerly Brattain) and Maple elementary schools in the Springfield School District, and Fairfield and Malabon elementary schools in the Bethel School District. These elementary schools have the highest percentages of students falling short of early literacy benchmarks throughout Lane County.

3. Literature Review

3.1 Related Research

Early childhood development (ECD) programs have consistently been shown to be good economic investments for public dollars (Rolnick and Grunewald 2003). There is a very high return for each dollar spent, both in the short-run and the long run. Most state and local governments under-fund ECD programs, yet well-focused investments could yield high returns (Rolnick and Grunewald 2003). The monetary benefits are

based on a lifetime of improved productivity that includes a decreased likelihood of participants committing crimes or having to rely on welfare benefits (Belfield 2004).

Investments by organizations such as UWLC are valuable for the community. Dickens and Sawhill (2006) observed that it could be difficult for politicians to allocate money when it is going to a long-term investment because they face such immediate pressures to fund ongoing or immediate aid programs. Even so, ECD programs provide an excellent opportunity for states to invest in human capital. When examined in comparison to other government spending, ECD programs are typically found to be an excellent investment (Rolnick and Grunewald 2003).

It is important to invest in children even before the school-age years. A key finding of Temple and Reynolds (2007) is that the economic returns from high-quality preschool programs exceed most other educational interventions; especially those implemented after children enter school. And the benefits tend to extend beyond the classroom. Children enrolled in ECD programs benefit from the direct exposure to good nutrition, as well as the indirect result of increased civic involvement and lower numbers of unplanned pregnancies (Gaag and Tan 1999).

Though arguments can be made that extreme poverty and low parental education are the causes of under-performance in school and not 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 controlled. 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 1993). 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.

3.2 Relevant Case Studies

There are several key studies that can be used to inform and support our analysis. Perry Preschool and Head Start are two well-known, large-scale interventions that are studied nationally. The Harlem Children's Zone, a model for the Promise Neighborhoods, has also being cited recently in research studies.

Results from the Harlem Children's Zone (HCZ) suggest that high-quality schools are enough to increase achievement among the poor (Dobbie and Fryer 2010). Researchers have found that early literacy plays a crucial role. Children entering first grade knowing their letters, possessing good phonological awareness, being familiar with print, able to identify certain sight words with speed and accuracy, and with larger vocabularies are more likely to learn to read without difficulty (Purcell-Gates and Dahl 1991).

School is a crucial learning space, but numerous studies cite the home environment as the most powerful contributor to development of early literacy skills. The concentrated, coordinated programs and services offered in the Promise Neighborhoods, such as parenting education, child care improvement efforts, and other programs designed to directly impact child development, are its greatest strength. If a child has a parent or parents with the skills to offer positive support, their chances of performing well in school, academically and socially, are much higher (Mettling 2008).

Even before preschool, children will have more success in learning to read if there are books in the home and parents who support their child's desire to learn. The parent education programs supported by UWLC do exactly that. If parents know how to help their child learn, the child will receive academic support not just during school hours, but also around the clock.

Early environments play a large role in shaping later outcomes. Skill begets skill and learning begets more learning. Early advantages accumulate, as do early disadvantages (Heckman 2004). Understanding the importance of "family literacy", the intervention program Project EASE (Early Access to Success in Education) was implemented in Minnesota. It involved a total of 248 kindergarten students, 177 of who participated in the one-year intervention project. The experimental program included parent education and parent/child activities performed at school and at home (Jordan et al 2000). The goal was to both inform and engage parents in helping develop literacy abilities in their children. Strong home literacy support led to the greatest gains in language skills.

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 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. These findings support the comprehensive approach used in the Promise Neighborhoods. Improving students' analytical and social skills will have a positive impact on not only each student, but also each classroom they join. If a student enters school unprepared to learn, students will show outward behavioral problems that may lead to bullying in the short-run and crime in the long run. A lack of classroom participation will cause the student to fall behind in the short run and may lead to the student dropping out of school in the long run.

The Promise Neighborhood program was only recently implemented in Lane County, so long-term effects will need to be assumed from studies of similar programs. 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 2004). 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 2004). 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. Enriched early childhood development programs have been shown to reduce future crime. In the long run they are the least-cost, most effective way to reduce crime, far more effective per dollar than increased expenditures on police or incarceration (Heckman 2004). Focusing more funding on early childhood development programs in the Promise Neighborhoods is one cost effective solution for the long run sustainability of Lane County.

4. Methodology

4.1 Basic Structure

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

- Analyze the effect of characteristic variables, received from each school district, on incoming kindergarten students' fall literacy assessment scores.
- Analyze the direct effects of the Promise Neighborhood on fall literacy assessment scores.
- Controlling for the school year, analyze whether the Promise Neighborhoods had more or less effect as compared to the previous school year.

A multiple linear regression would have been the easiest way for us to look for 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. This led to very

large standard deviations in all regressions and findings that were not statistically significant. A low R^2 was expected since we were dealing with a non-randomized pool of data on a small sample size of children. We were unable to make any causal links because of these problems. In order to still perform a meaningful analysis, we modified our goals:

- Measure the statistical relationships between the characteristic variables we received from the school districts with 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 characteristic variables.
- Examine the differences in Promise Neighborhood kindergartner composition from the 2010 school year to the 2011 school year as compared to the control schools in each district and try to determine whether this change in composition is the reason for changing rates of "high-risk students".

This would allow us to produce a useful analysis for United Way. 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 each district. 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, Springfield School District's Director of Elementary Education, Sara Ticer, and Bethel's Director of Instruction, Drew Braun, we received data on each kindergarten student in the two districts. The comparison schools for each district were selected by Sara Ticer and Drew Braun.

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. In our sample of 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 our sample of Springfield School District, 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, along with explanations of what is being measured and how each is 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.

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 and Initial Sounds (ONRF) and Letter Naming Fluency (LNF) using DIBELS for the Bethel 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 not.

$LUNCH_i$ = 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.

$SPED_i$ = A dummy variable that is 1 if the i^{th} student is enrolled in Special Education classes and 0 if the student is not.

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 Promise Neighborhood schools were Fairfield Elementary

and Malabon Elementary in the Bethel School District and Maple Elementary and Two Rivers-Dos Rios (Brattain) Elementary in the Springfield School District. The non-Promise Neighborhood schools were Danebo Elementary and Prairie Mountain Elementary in the Bethel School District and Moffitt Elementary and Riverbend Elementary in the Springfield School District.

4.5 Empirical Modeling

A multiple linear regression was the most efficient way to measure the statistical relationships between kindergarten student characteristics and fall literacy scores. Using the variables listed above, we were able to create the following models to measure the statistical relationships in each school district. Since the Springfield and Bethel school districts use different scoring systems for their literacy tests, we were unable to pool the districts together. We did pool the 2010 and 2011 classes of kindergartners together in order to increase our sample size.

4.5.1 Bethel School District (n=461, df=451)

$$SCORE_i = \beta_0 + \beta_1 FEM_i + \beta_2 LUNCH_i + \beta_3 SPED_i + \beta_4 ESL_i + \beta_5 ETHHISP_i + \beta_6 ETHBLACK_i + \beta_7 ETHASIAN_i + \beta_8 ETHAMERIND_i + \beta_9 ETHMIXED_i + u_i$$

4.5.2 Springfield School District (n=388, df=378)

$$SCORE_i = \beta_0 + \beta_1 FEM_i + \beta_2 LUNCH_i + \beta_3 SPED_i + \beta_4 ESL_i + \beta_5 ETHHISP_i + \beta_6 ETHBLACK_i + \beta_7 ETHASIAN_i + \beta_8 ETHAMERIND_i + \beta_9 ETHMIXED_i + u_i$$

These models, while correcting for White Standard Error, allowed us to measure the separate statistical relationship for each characteristic variable we received from the schools for both years. A statistical relationship is not necessarily causal, so in order to

determine the latter, a more formal (and preferably randomized) experimental design is necessary.

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 PN_i in the regression

$$SCORE_i = \beta_0 + \beta_1 PN_i + u_i$$

then comparing this relationship to the coefficient of PN_i in the same regression after controlling for the characteristic variables. If the coefficient of PN_i was significantly lower after controlling for the other variables, then it can be said that the composition of each neighborhood has more influence on reading readiness than the Promise Neighborhoods. We used this data to see whether it was 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.

It is possible that the programs were not solely responsible, but also a change in neighborhood composition led to the 8 percent decrease in high-risk children in the Promise Neighborhoods. We measured the change in percentages of the statistically significant characteristics as compared to the control schools in the same district during each school year.

5. Empirical Analysis

5.1 Variable Relationships

5.1.1 Bethel School District

Characteristics:

From the standard Bethel characteristic regression, five of the nine characteristics were statistically significant. The coefficients of $LUNCH_i$, $SPED_i$, and ESL_i, were -7.61, -9.28, and -7.35 points on average, respectively, which were all significant at the 1 percent significance level. The coefficients of $ETHHISP_i$ and $ETHASIAN_i$ were -6.40 and 12.02 points on average, respectively, which were both significant at the 5 percent significance level. The reference group received 32.06 points on average.

Promise Neighborhood:

In the regression using only PN_i, the coefficient for PN_i was not statistically significant, but the 95 percent confidence interval was between -1.85 and 5.61. Not much can be said about PN_i since the coefficient was not statistically significant and the 95 percent confidence interval was so wide.

When we added the characteristic variables back in, PN_i was still not close to being statistically significant, but the 95 percent confidence interval became smaller—between -1.78 and 5.46. There are statistical relationships that PN_i is picking up from characteristics not controlled for in our regressions. This will be discussed later in the paper.

From 2010 to 2011, the Bethel Promise Neighborhood schools received a smaller percentage of special education, ESL, Hispanic and Asian/ Pacific Islander

kindergarten students, but the percentage on Free or Reduced Lunch stayed about the same at 48 percent. Compared to the two control schools in the district, the percentage of special education kindergartners decreased from 53.6 percent to 33.3 percent, ESL kindergartners decreased from 50 percent to 18.4 percent, Hispanic kindergartners decreased from 51.2 percent to 37.7 percent, and Asian/ Pacific Islander kindergartners decreased from 42.9 percent to 25 percent. Some of these decreases could have been by chance, but we believe certain decreases reflect that Promise Neighborhood programs are helping students learn literacy skills before they enter school. This implies some students who enroll in special education or ESL classes are catching up to their classmates even before school starts.

5.1.2 Springfield School District

Characteristics:

From the standard Springfield characteristic regression, four out of the nine characteristics were statistically significant. The coefficients of $LUNCH_i$, $SPED_i$, and $ETHASIAN_i$ were -8.64, -8.28, and +5.21 points on average, respectively, which were all significant at the 1 percent significance level. The coefficient of ESL_i was -5.97 points on average, which was significant at the 5 percent significance level. There was only one Asian kindergartner in the Springfield School District in both years, so the coefficient for $ETHASIAN_i$ does not necessarily speak for all Asians or Pacific Islanders. The reference group received 28.17 points on average.

Promise Neighborhood:

In the regression using only PN_i, the coefficient for PN_i was not statistically significant, but the 95 percent confidence interval was between -5.34 and 1.66. Not

much can be said about PN_i since the coefficient is not statistically significant and the 95 percent confidence interval was so wide.

When we added the characteristic variables back in, PN_i was still not close to being statistically significant, but the 95 percent confidence interval became slightly smaller—between -5.06 and 1.80. Again, there are effects that PN_i was picking up from characteristics not controlled for in our regressions. This will be discussed in the next section of this paper.

From 2010 to 2011, the Springfield Promise Neighborhood schools received a smaller percentage of special education kindergarten students and a slightly smaller percentage of students who were ESL or on Free or Reduced Lunch. Compared to the two control schools in the district, the percentage of special education kindergarten students decreased from 40.6 percent to 28.6 percent, ESL students decreased from 48.1 percent to 46.3 percent, and students on Free or Reduced Lunch decreased from 37.4 percent to 36.8 percent. Some of these decreases could have been by chance, but we believe some decreases are likely a reflection of Promise Neighborhood programs helping students learn basic school readiness skills before they enter kindergarten.

5.2 Analysis of Estimates

The most significant and perhaps most interesting finding was that in every regression we performed, $LUNCH_i$ and $SPED_i$ were always statistically significant at the 1 percent significance level with a negative coefficient ranging from -7 points to -10 points on average in both districts. Considering the reference groups in both districts, a 10 point decrease is a 31 percent decrease in Bethel schools and a 37 percent decrease in Springfield schools for the reading readiness scores. Since $LUNCH_i$ was

our proxy for family income, it is a reasonable inference that lower family income implies a child entering kindergarten is at higher risk of being less prepared to read. This may be due to a range of factors such as an absence of needed parental training or intervention, low parental education level, or simply that the household lacks the disposable income to enroll the child in early childhood development programs or even buy books.

The ESL_i characteristic 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 Bethel school district, ESL_i and $ETHHISP_i$ were highly correlated, possibly because of the high percentage of Mexican-born immigrants and second generation Mexican-Americans in the neighborhood. In the Springfield regression, $ETHHISP_i$ was not statistically significant; therefor there may be more non-English speaking ethnicities in Springfield that we did not control for in our model.

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 and 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, though small, relationship to fall literacy scores.

Another important finding from the analysis of each regression was that our variables explained very little. Our highest R^2 was 0.125 and our lowest was 0.093. With

the variety of characteristic variables we had available, we were actually only able to describe between 9.3 percent and 12.5 percent 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.

In order for United Way of Lane County (UWLC) to receive more meaningful analysis in the future, either stronger experimental design or better data are required. When dealing with school districts and families, getting better data 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 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.

5.4 Policy Implications

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

Using the data available, income and special education had the largest statistical relation to low fall literacy scores, with non-native English speakers being the next most significant relationship. These variables 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 number of high risk children living in low income households 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.

6. Suggestions for Future Tracking

As we compiled data from both school districts, the most important suggestion we can offer would be to work toward a uniform data collection program. This would make outcomes from different districts in the area 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 either EasyCBM or DIBELS for student assessments. Implementing a uniform testing program would allow for easier school comparisons and create a student database that could be easily accessed, allowing for simple analysis.

Both the Springfield and Bethel data contained holes such as missing gender, missing fall literacy scores, and missing special education data. These holes were inconsistent across districts, likely due to the fact that each district 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 type of data uniformity is essential for meaningful future analysis at city, county, and state levels.

Another useful variable 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.

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. The total difficulties score was subtracted 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.

UWLC has just distributed a new questionnaire to parents as part of their kindergarten registration packets for data collection and analysis. After working with data from past questionnaires, we have suggestions on additions and changes for the current questionnaire that could help analysis in the future.

On the original questionnaire a space was provided to write in other parent education classes taken before the start of kindergarten, but there is no way to indicate whether a family participated in the KITS program. KITS has been shown to be effective, making it one of the most statistically powerful programs available in the Promise Neighborhoods. It would be beneficial to know which families participated in KITS and how the program affected fall literacy scores for those students.

Another potentially useful variable to track on the questionnaire would be the number of siblings in each incoming student's household and whether these siblings are older or younger than the child. Negative effects from having too many younger siblings 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 variables.

One change to the questionnaire that could increase accuracy and simplify analysis would be to replace "sliding-scale" questions with "yes/no" questions. For example, instead of the question "How often do you read to your child?" with three different answer choices, the questions could be "Do you read to your child more than twice a week?" with the option to choose "Yes" or "No". This should reduce the likelihood of parents stretching the truth. Again, this should result in cleaner, more accurate data.

6.1 Randomization of KITS

Data from programs offered in the Promise Neighborhoods are highly susceptible to self-selection bias. It is likely that parents who enroll their children in the programs offered are already making greater investments in their future, including preparing these

children for school. They would be more likely to already dedicate their own time to teaching their children reading and writing skills. United Way has begun efforts to address selection bias in the programs piloted in the Promise Neighborhoods.

The KITS program, for example, uses random selection and employs a control group. To recruit participants, KITS fliers are distributed by volunteers who go door-to-door in the Promise Neighborhoods. Fliers are also sent to Head Start programs. In the first year of the KITS pilot, canvassing was only done in the catchment area for two intervention schools and then not in the areas of two other schools, all of which are in the Promise Neighborhoods. In year two of KITS, canvassing was done in all four elementary catchment zones. Fliers regarding only kindergarten registration were distributed at all of the schools. KITS representatives then attended the registration events at all four schools and took contact information for interested families. Ultimately a total of 39 children and their families were involved in the KITS study.

Children and their parents were assessed prior to the KITS intervention and again just prior to beginning kindergarten (after the first eight weeks of intervention). The second benchmark allowed researchers to measure school readiness skills without the influence of formal elementary school instruction. Fidelity of instructors to the program in both playgroups and parent workshops was carefully monitored. Every session was videotaped and rated, with the absence or presence of key elements noted. A very high average score was recorded for both years, indicating the same strategies were being employed across all sessions. These randomization efforts should be implemented in all of the Promise Neighborhood programs in order to conduct more significant analysis on entire neighborhood effects in the future.

7. Conclusions and Further Research

Though our analysis turned into something we had not planned to conduct, we are pleased with the results. We are working 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 shown 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. UWLC placed Promise Neighborhoods in the two lowest scoring schools in each district; therefore these schools already had a predisposition for low literacy rates. Scoring reading readiness is difficult in these neighborhoods because new classes of kindergarten students coming in every year are usually less prepared to begin learning to read compared to students from more affluent parts of each district. Conducting a regression on the effects of the Promise Neighborhoods on early reading readiness simply verified the Promise Neighborhoods were placed in lower performing neighborhoods. This is a fact we already knew.

This regression should be run again in the future, when the pool of kindergarten students is much larger and more variables are being tracked. If UWLC takes our suggestions for additional variables to track, they will have data on participation in Headstart, EC Cares, other preschool programs, parent education programs, KITS, and student social and emotional scores. Adding these variables to a regression should

begin to show the true effects of the Promise Neighborhoods as well as the effects of each program 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. The Perry Preschool analysis cited in this paper contained 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 after the affected child becomes an adult and begins contributing to society. Ideally, a randomized group of children from the Promise Neighborhoods would be tracked throughout their lives alongside a randomized group 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. 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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Table 1: Bethel Characteristic Variables

Dependent Variable: SCORE
Method: Least Squares
Date: 05/24/12 Time: 23:37
Sample: 1 461
Included observations: 461
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	32.05588	2.121420	15.11057	0.0000
FEM	0.146059	1.820214	0.080243	0.9361
LUNCH	-7.613724	2.123258	-3.585869	0.0004
SPED	-9.276194	2.553409	-3.632867	0.0003
ESL	-7.348876	3.007732	-2.443328	0.0149
ETHHISP	-6.403810	2.791620	-2.293940	0.0223
ETHMIXED	-2.434538	3.136901	-0.776096	0.4381
ETHBLACK	2.411022	3.240948	0.743925	0.4573
ETHASIAN	12.01626	5.180490	2.319521	0.0208
ETHAMERIND	1.602703	11.65032	0.137567	0.8906

R-squared	0.122923	Mean dependent var	23.74187
Adjusted R-squared	0.105420	S.D. dependent var	20.31011
S.E. of regression	19.20976	Akaike info criterion	8.770167
Sum squared resid	166425.7	Schwarz criterion	8.859829
Log likelihood	-2011.524	Hannan-Quinn criter.	8.805471
F-statistic	7.023078	Durbin-Watson stat	0.684376
Prob(F-statistic)	0.000000		

Table 2: Springfield Characteristic Variables

Dependent Variable: SCORE
Method: Least Squares
Date: 05/24/12 Time: 23:43
Sample: 1 388
Included observations: 388
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	28.17026	2.971749	9.479352	0.0000
FEM	0.255489	1.732722	0.147450	0.8829
LUNCH	-8.640290	2.888508	-2.991264	0.0030
SPED	-8.278336	2.090280	-3.960395	0.0001
ESL	-5.969369	2.707774	-2.204530	0.0281
ETHHISP	-1.785939	2.555703	-0.698806	0.4851
ETHMIXED	5.964307	4.236837	1.407726	0.1600
ETHBLACK	-3.192824	6.579323	-0.485282	0.6278
ETHASIAN	5.214545	1.428657	3.649964	0.0003
ETHAMERIND	-3.704962	5.916947	-0.626161	0.5316

R-squared	0.092656	Mean dependent var	18.31959
Adjusted R-squared	0.071052	S.D. dependent var	17.53184
S.E. of regression	16.89752	Akaike info criterion	8.517646
Sum squared resid	107928.9	Schwarz criterion	8.619734
Log likelihood	-1642.423	Hannan-Quinn criter.	8.558123
F-statistic	4.288938	Durbin-Watson stat	1.868326
Prob(F-statistic)	0.000025		

Table 3: Bethel PN_i Relationship Not Controlling for Variables

Dependent Variable: SCORE
Method: Least Squares
Date: 05/24/12 Time: 23:39
Sample: 1 461
Included observations: 461
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.89328	1.283946	17.83041	0.0000
PN	1.880758	1.898722	0.990539	0.3224

R-squared	0.002128	Mean dependent var	23.74187
Adjusted R-squared	-0.000046	S.D. dependent var	20.31011
S.E. of regression	20.31058	Akaike info criterion	8.864490
Sum squared resid	189346.5	Schwarz criterion	8.882422
Log likelihood	-2041.265	Hannan-Quinn criter.	8.871550
F-statistic	0.978823	Durbin-Watson stat	0.484950
Prob(F-statistic)	0.323011		

Table 4: Bethel PN_i Relationship Controlling for Variables

Dependent Variable: SCORE
Method: Least Squares
Date: 05/24/12 Time: 23:38
Sample: 1 461
Included observations: 461
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	31.32793	2.274798	13.77174	0.0000
FEM	0.097269	1.817884	0.053507	0.9574
LUNCH	-7.825135	2.133519	-3.667714	0.0003
SPED	-9.212627	2.540766	-3.625925	0.0003
ESL	-6.815111	3.037069	-2.243977	0.0253
ETHHISP	-6.576018	2.777282	-2.367789	0.0183
ETHMIXED	-2.025821	3.153490	-0.642406	0.5209
ETHBLACK	2.566761	3.188666	0.804964	0.4213
ETHASIAN	12.09244	5.256818	2.300335	0.0219
ETHAMERIND	1.042514	11.62305	0.089694	0.9286
PN	1.842288	1.836150	1.003343	0.3162

R-squared	0.124860	Mean dependent var	23.74187
Adjusted R-squared	0.105413	S.D. dependent var	20.31011
S.E. of regression	19.20983	Akaike info criterion	8.772294
Sum squared resid	166058.0	Schwarz criterion	8.870921
Log likelihood	-2011.014	Hannan-Quinn criter.	8.811128
F-statistic	6.420371	Durbin-Watson stat	0.685146
Prob(F-statistic)	0.000000		

Table 5: Springfield PN_i Effect Not Controlling for Variables

Dependent Variable: SCORE
Method: Least Squares
Date: 05/24/12 Time: 23:44
Sample: 1 388
Included observations: 388
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.99187	1.168982	16.24650	0.0000
PN	-1.836940	1.783228	-1.030121	0.3036

R-squared	0.002554	Mean dependent var	18.31959
Adjusted R-squared	-0.000030	S.D. dependent var	17.53184
S.E. of regression	17.53210	Akaike info criterion	8.571085
Sum squared resid	118646.6	Schwarz criterion	8.591503
Log likelihood	-1660.791	Hannan-Quinn criter.	8.579181
F-statistic	0.988357	Durbin-Watson stat	1.915531
Prob(F-statistic)	0.320767		

Table 6: Springfield PN_i Relationship Controlling for Variables

Dependent Variable: SCORE
Method: Least Squares
Date: 05/24/12 Time: 23:43
Sample: 1 388
Included observations: 388
White Heteroskedasticity-Consistent Standard Errors & Covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	28.75297	3.047827	9.433923	0.0000
FEM	0.237746	1.729673	0.137451	0.8907
LUNCH	-8.579699	2.894359	-2.964283	0.0032
SPED	-8.359477	2.089369	-4.000958	0.0001
ESL	-5.611835	2.733646	-2.052876	0.0408
ETHHISP	-2.032332	2.570466	-0.790647	0.4296
ETHMIXED	6.181945	4.273041	1.446732	0.1488
ETHBLACK	-3.819649	6.631214	-0.576011	0.5650
ETHASIAN	4.588984	1.652996	2.776162	0.0058
ETHAMERIND	-3.769070	5.939931	-0.634531	0.5261
PN	-1.662927	1.756412	-0.946775	0.3444

R-squared	0.094671	Mean dependent var	18.31959
Adjusted R-squared	0.070657	S.D. dependent var	17.53184
S.E. of regression	16.90112	Akaike info criterion	8.520578
Sum squared resid	107689.3	Schwarz criterion	8.632875
Log likelihood	-1641.992	Hannan-Quinn criter.	8.565102
F-statistic	3.942300	Durbin-Watson stat	1.872928
Prob(F-statistic)	0.000040		

Figure 1.1: Map of Promise Neighborhoods

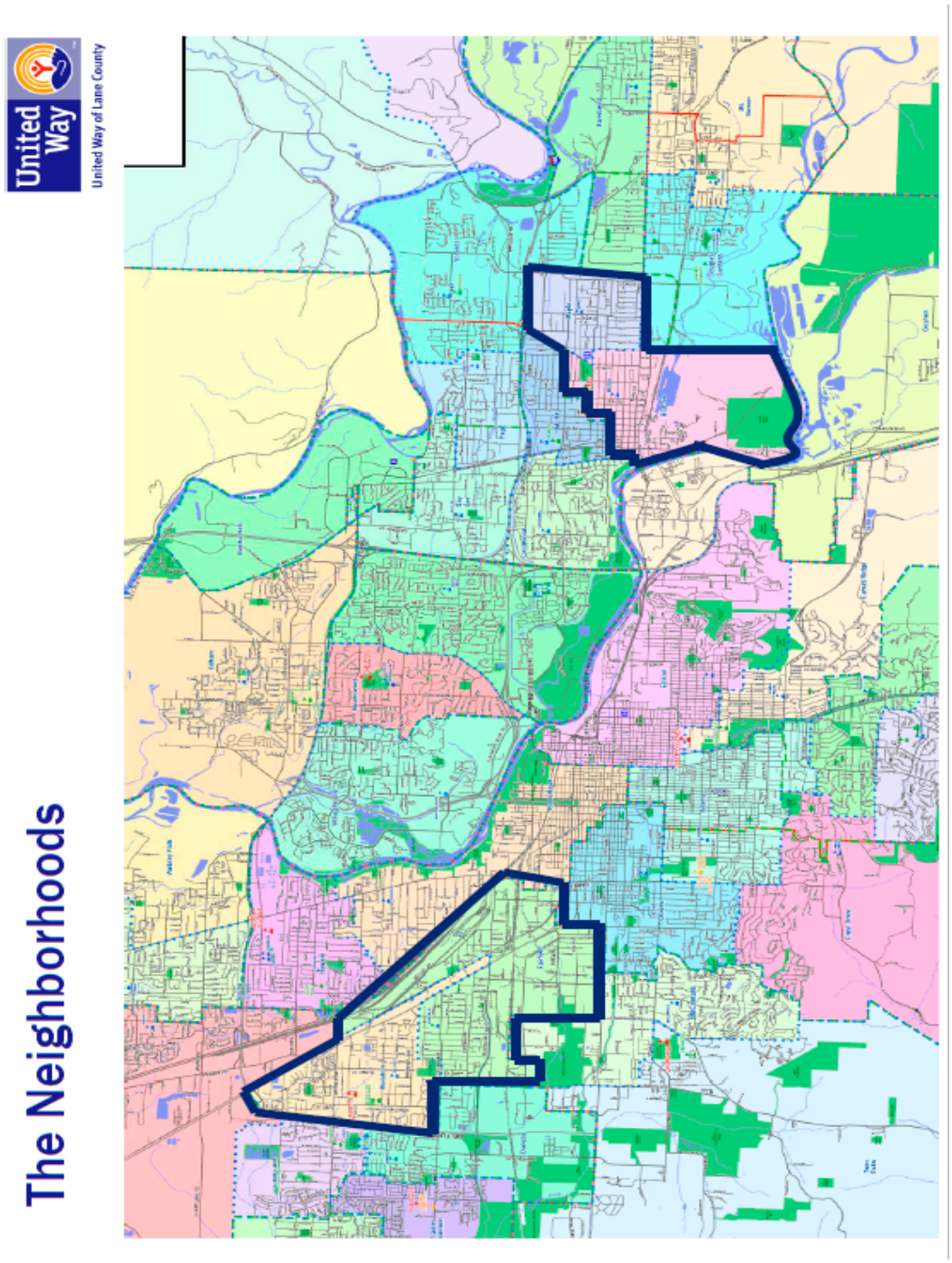

Figure 1.2: Map of Bethel School District Promise Neighborhood

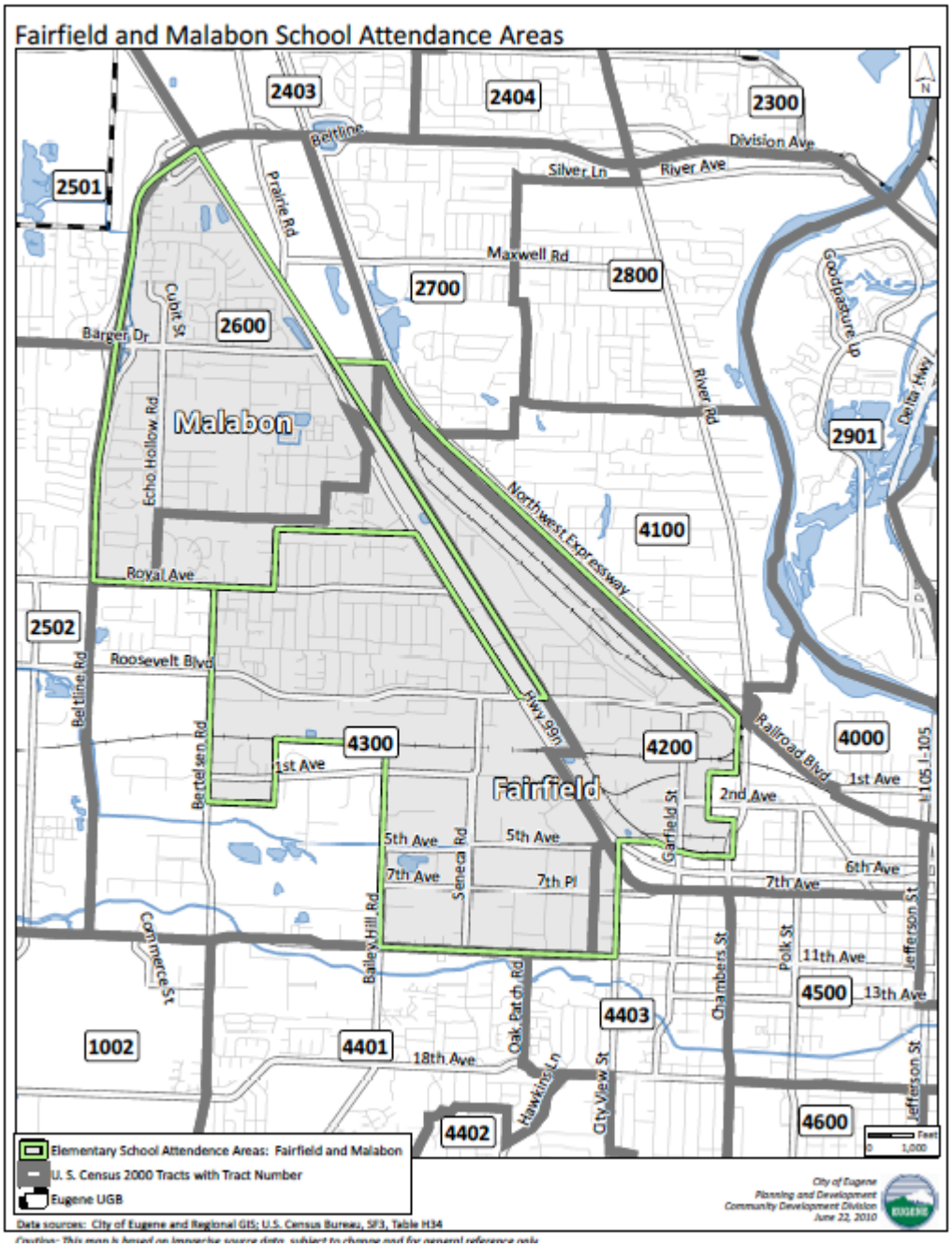

Figure 1.3: Map of Springfield School District Promise Neighborhood

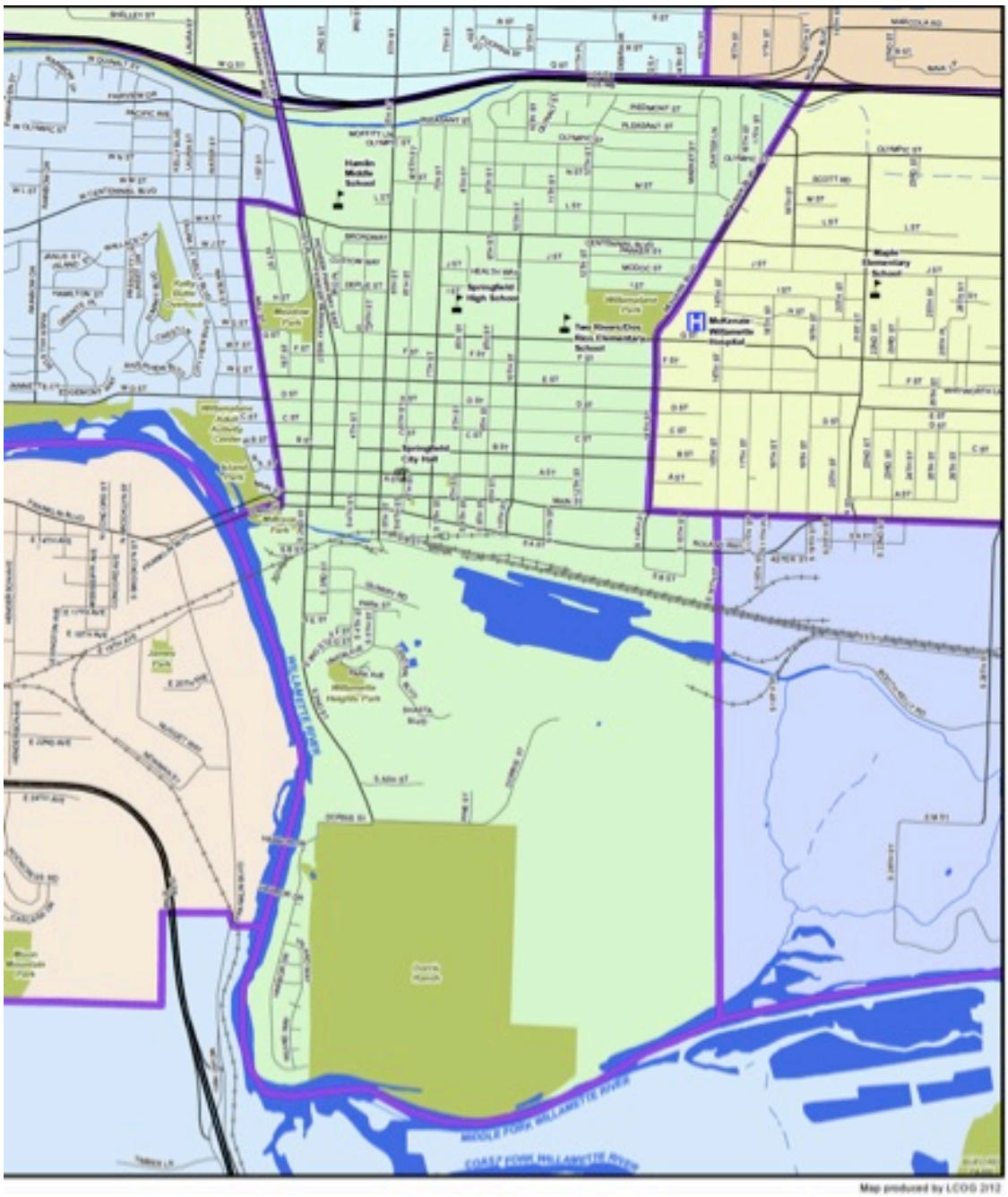

Figure 2: Literacy Data for Lane County and the Promise Neighborhoods

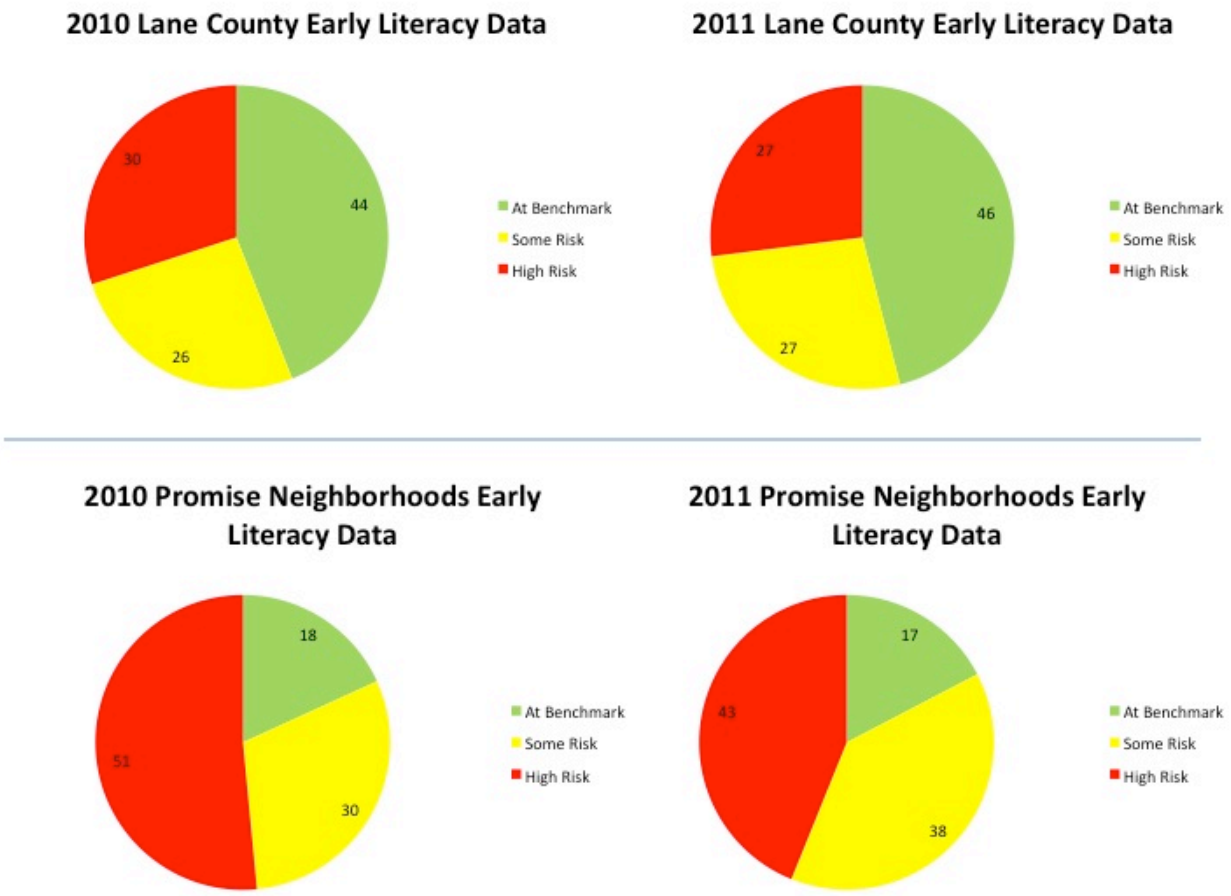

Figure 3.1: Statistically Significant Characteristic Relationships in Bethel School District
(Reference group average score: 32.05)

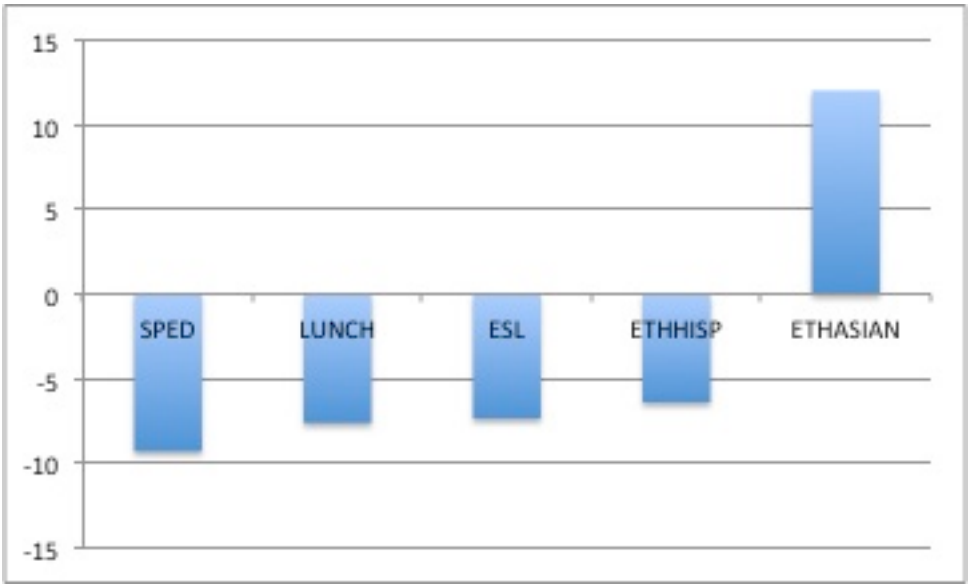

Figure 3.2: 95 percent Confidence Interval Characteristic relationships in Bethel School District
(Reference group average score: 32.05)

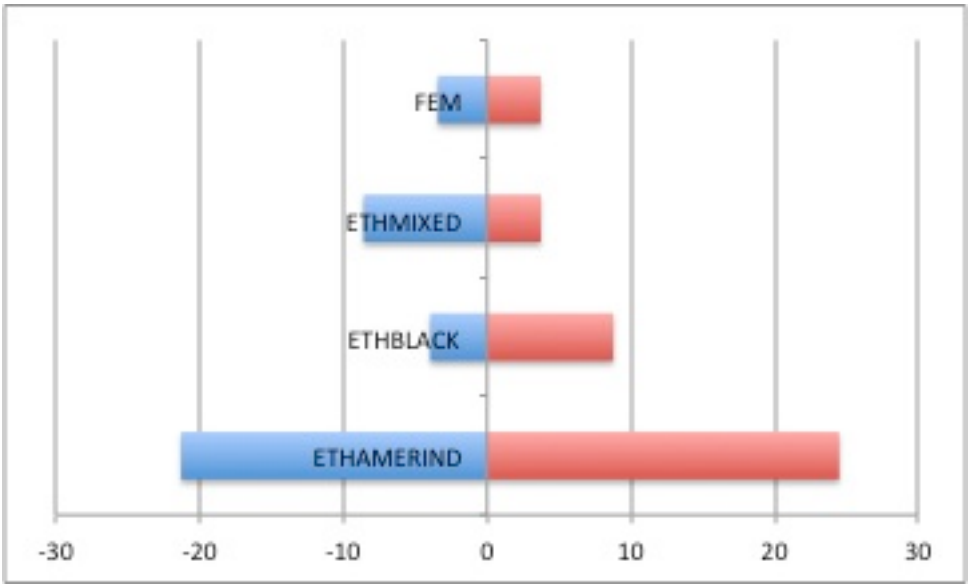

Figure 4.1: Statistically Significant Characteristic relationships in Springfield School District (Reference group average score: 28.17)

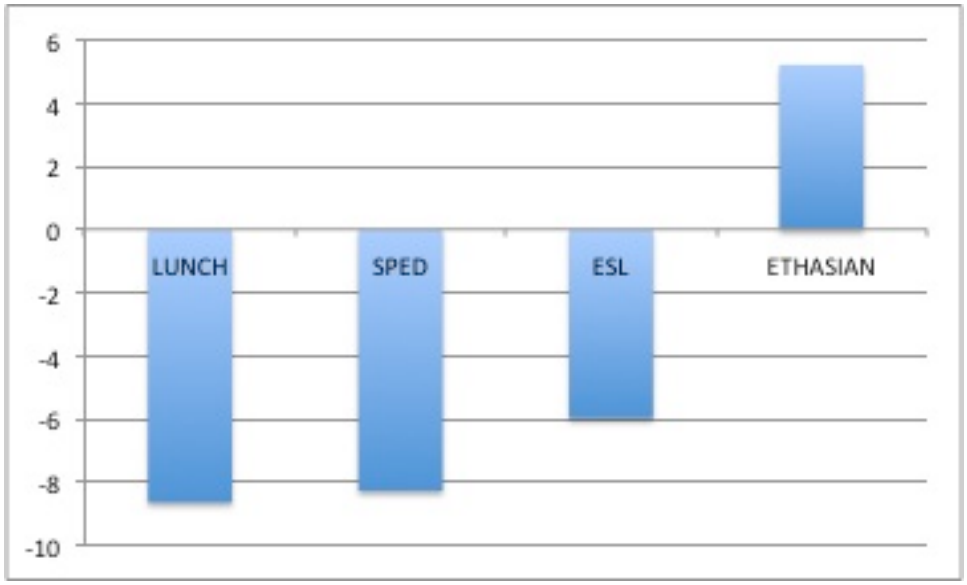

Figure 4.2: 95 percent Confidence Interval Characteristic relationships in Springfield School District (Reference group average score: 28.17)

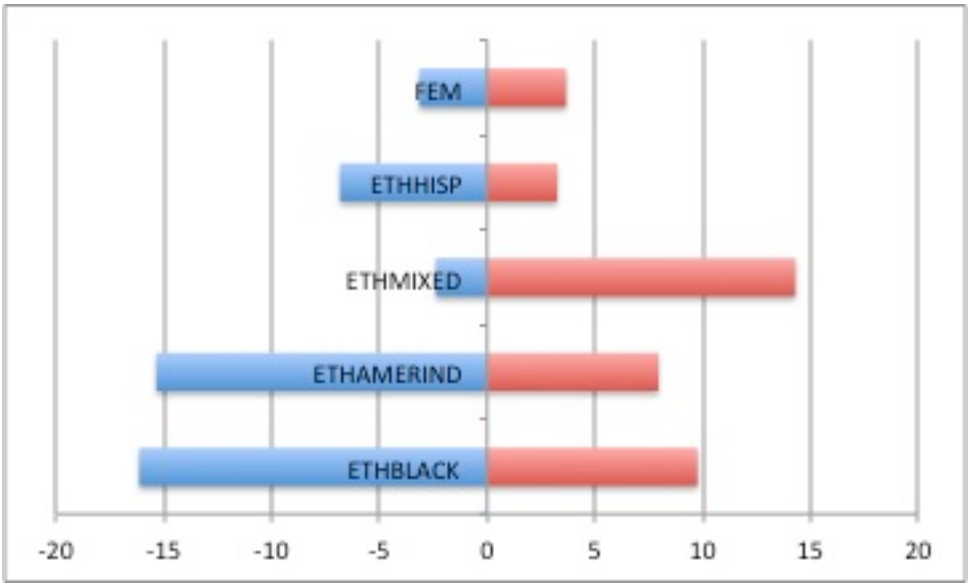

Figure 5: Change in Bethel Promise Neighborhood Confidence Interval, as Variables are Held Constant

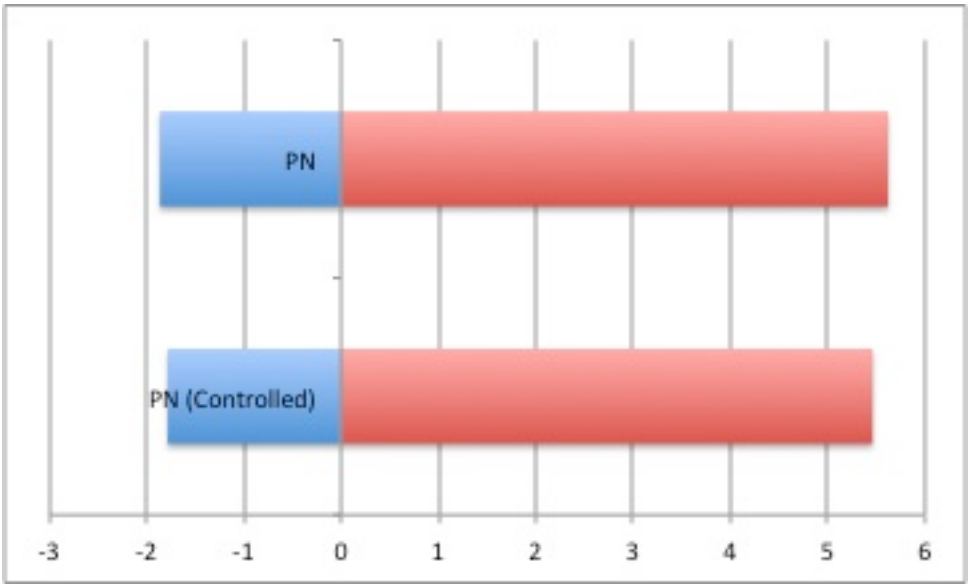

Figure 6: Change in Springfield Promise Neighborhood Confidence Interval, as Variables are Held Constant

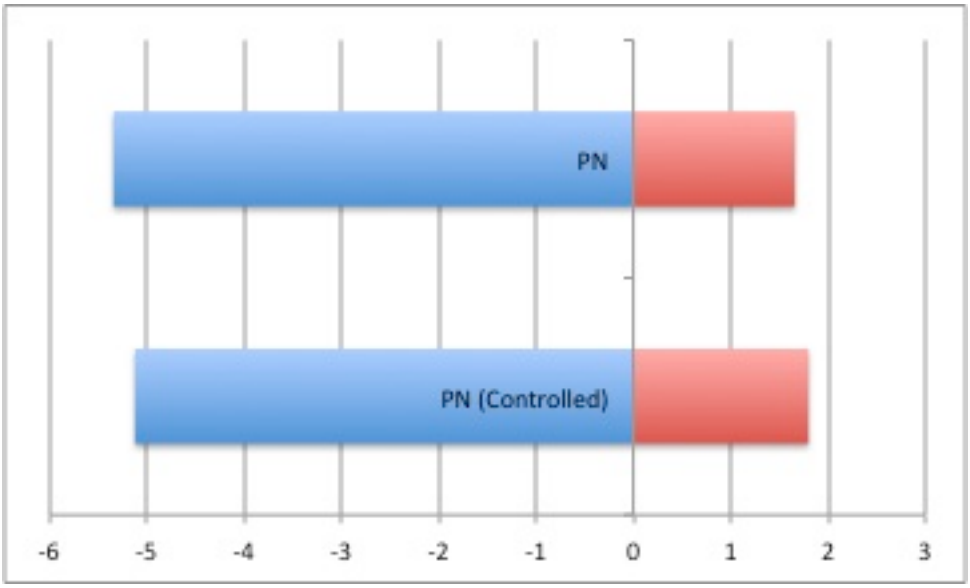

Figure 7: Change in Composition of Bethel Promise Neighborhoods Compared to Bethel Control Schools

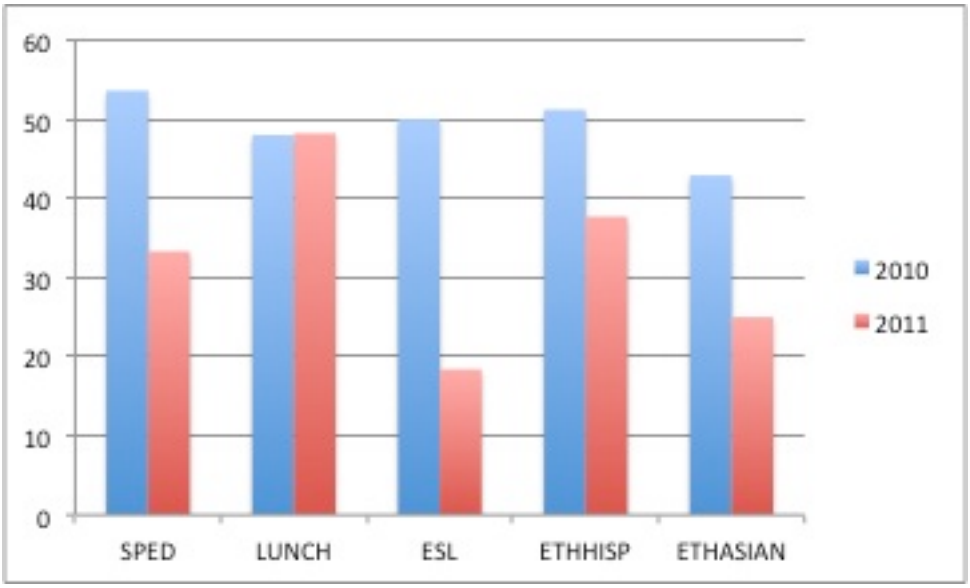

Figure 8: Change in Composition of Springfield Promise Neighborhoods Compared to Springfield Control Schools