

Shedding Light on an Elusive Climb: A Longitudinal Study of Indiana English Learner Test Performance

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Abstract

We employed a hazard model to examine Indiana English learner (EL) time to reclassification as fluent English proficient. The data consisted of five years of statewide English language proficiency and state standardized test scores. Findings suggest that language background, socio-economic status, and special education status are negatively associated with the odds to reclassification. In addition, Indiana has a large, rapidly-growing Spanish-speaking EL population, and these students are prevalent in the low socio-economic status group. Based on our findings, we recommend a careful investigation to learn how best to inform educational practices with Spanish-speaking ELs and to address the impact of race, poverty, and English acquisition on their academic performance.

Introduction

The accountability systems mandated by No Child Left Behind (NCLB) require schools to expedite their ELs' English acquisition and academic competency (Wiley, 2007; Menken, 2008; Menken & Solorza, 2014; Ricento & Wright, 2008). These mandates led to a demand for large-scale empirical studies examining the relationship between English acquisition and state test performance and new models to measure English acquisition. Findings from these studies provide substantial evidence to suggest that ELs should not be regarded as homogenous population in summative assessments (Cook & Zhao, 2011; Roberts, Mohammed, & Vaughn, 2010; Stevens, Butler, & Castellon-Wellington, 2000). Yet, current federal policy treats ELs as a homogenous group and prohibits states from adjusting their accountability measures in response to any variables with the exception of time in English language programs (Cook & Zhao, 2011). Furthermore, due to the numerous factors affecting learners, diverse student characteristics, the imprecision of existing instruments and methods, and varying criterion for exit from EL programs, an exact amount of time for English acquisition to occur is difficult to determine.

Theoretical Framework

We employ the theoretical framework articulated by Slama (2014) who argues that longitudinal studies offer superior methods for monitoring EL achievement. These studies should use rigorous methodologies—isolating specific student variables and considering local contexts—to achieve a more comprehensive portrait of language learning.

Methods

Research Question

Which characteristics of English learners are most strongly associated with time to reclassification in Indiana?

Sample

Statewide data from ELs in grades 3 to 7 over a five-year period from 2008/2009 to 2011/2012

Instruments

- Indiana Statewide Testing for Educational Progress Plus® (ISTEP+®)
- LAS Links®

Description of the Data

We used descriptive statistics and discrete-time survival analysis to compare the proportion of ELs reclassified and the odds of reclassification for one group of students to the odds for another group, keeping other factors the same. The descriptive statistics of the student sample used in this study are reported in Table 1.

| Variable | Whole sample | | Proportion reclassified | |
|--------------------------|--------------|-------|-------------------------|-------|
| | Percent | N | Percent | N |
| Female | 48% | 1,907 | 34% | 641 |
| Male | 52% | 2,103 | 32% | 663 |
| Spanish-Speaking | 79% | 3,155 | 29% | 906 |
| SPED eligibility | 10% | 382 | 18% | 67 |
| Free/Reduced Price Lunch | 85% | 3,402 | 30% | 1,013 |
| All EL students | 100% | 4,010 | 33% | 1,304 |

Survival Analysis

We pooled all Indiana district data into one, single analytical file and used survival analysis to examine the following:

- Mean Time to Reclassification
- Likelihood of Reclassification
- Rate of Reclassification
- Cumulative Proportion of Reclassified Students

Specifying the Survival Model

We explored different survival models starting with the most general model (the piece-wise function) (Singer & Willet, 2003) that included dummy variables representing the different periods; however, the general model did not converge appropriately. We then explored polynomial functions and arrived at a final model that converged appropriately. This model was a cubic polynomial function that resembles the final cubic models that Slama (2014) and Umansky and Reardon (2014) reported.

Model Employed for Survival Analysis

The following equation for the survival analysis model shows the level-1 variables.

Logit hazard Reclassification_{ij}

$$= \alpha_0 + \alpha_1 \text{Period}_{ij} + \alpha_2 \text{Period}_{ij}^2 + \alpha_3 \text{Period}_{ij}^3 + \alpha_4 \text{Male}_{ij} + \alpha_5 \text{Spanish}_{ij} + \alpha_6 \text{SES}_{ij} + \alpha_7 \text{SPED}_{ij}$$

Results

The cohort of analysis of grades 3-8 accounts for an individual student count of 4,010 ELLs with 79% identifying as Hispanic, and 21% identifying as non-Hispanic; the survival analysis focused on differences between Spanish-speaking ELs and non-Spanish speaking ELs.

Table 2 provides a summary of the results of fitting discrete-time hazard models to the time to reclassification for the cohorts.

Table 2

| Variable | Parameter | Logit | Odds Ratio |
|-------------------------|------------|------------------|-----------------|
| Male | α_4 | -0.08n.s. (0.06) | 0.93n.s. (0.06) |
| SES | α_6 | -0.43*** (0.08) | 0.65*** (0.05) |
| Spanish | α_5 | -0.52*** (0.08) | 0.60*** (0.05) |
| Sped | α_7 | -0.90*** (0.13) | 0.41*** (0.05) |
| Between-school variance | Estimate | 0.48*** (0.05) | - |

Note. The estimates for the time coefficients were not included, focusing only on the estimates for the question variables.

*** p < 0.0001 n.s. p > 0.05

- Spanish-speaking students were 40% less likely to reclassify than their non-Spanish speaking peers during grades 3 to 7, keeping other factors constant.
- Students eligible for free or reduced priced lunch in third grade had 35% lower odds of being reclassified than their higher SES counterparts.
- Special education students had much lower odds of being reclassified, as much as 59% lower odds.

Figure 1 provides the predicted cumulative proportion of ELs reclassified across demographic groups.

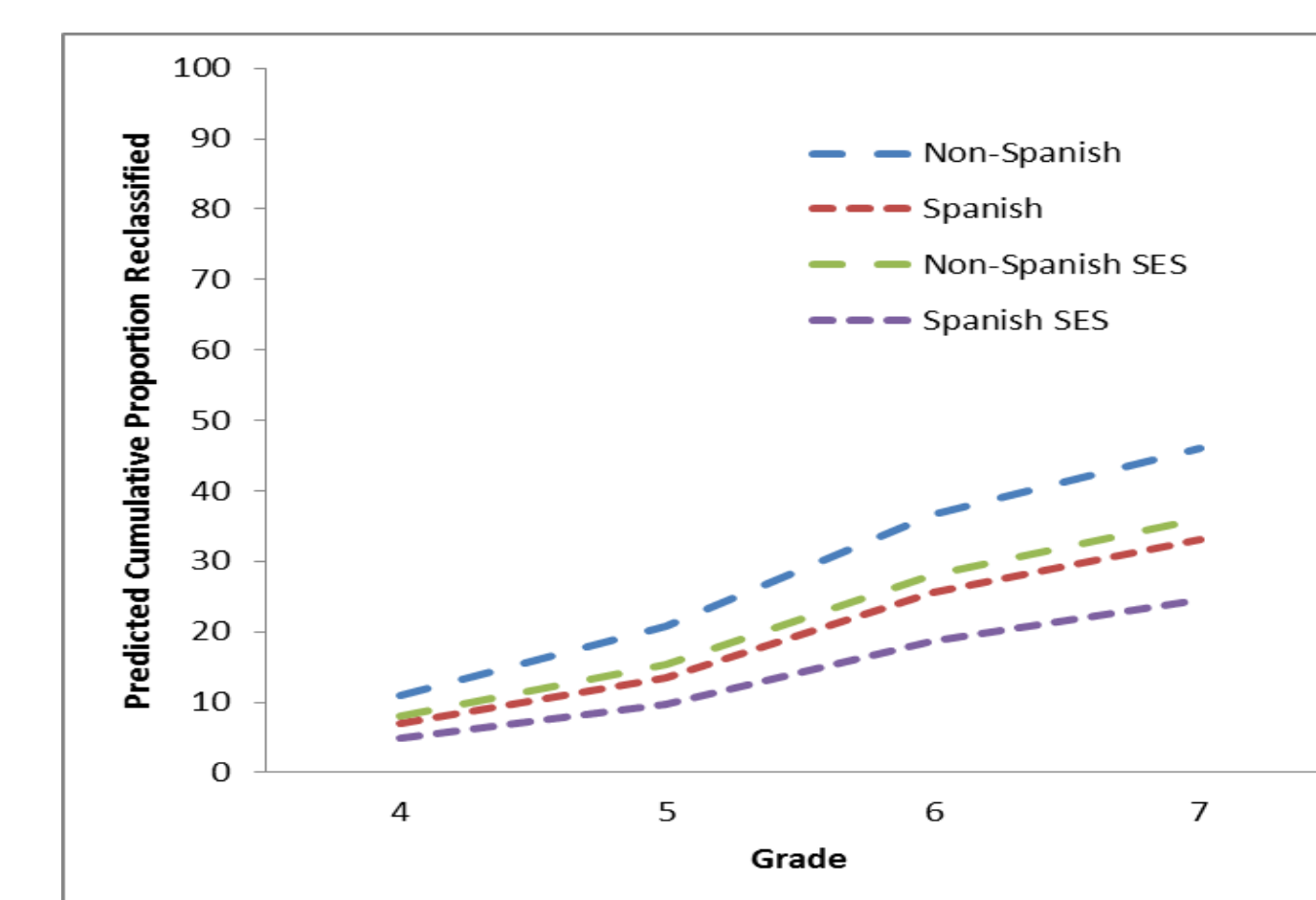


Figure 1. Predicted cumulative proportion of students being reclassified from the third grade to the seventh grade.

- On average, ELs who did not have Spanish as a home language tended to be reclassified sooner. This suggests that ELs from Spanish-speaking home language backgrounds may have an additional disadvantage that is unique, and that is above and beyond the disadvantage of poverty.
- Overall, less than 50% of the ELs were reclassified by the end of 7th grade.
- Most ELs entering middle school will still need EL services, and the majority of these ELs will be Spanish-speaking.

Discussion / Recommendations

Factors Related to Time to Reclassification

Findings from this study indicate the importance of considering home language-related disadvantages when examining the factors influencing the time required by ELs to acquire English proficiency and reach state academic standards.

Estimating home language-related disadvantages is critical because (1) this additional information enables schools to better monitor the achievement gap between Spanish-speaking and non-Spanish EL groups more accurately and (2) this information can also be used by schools to better differentiate their EL programming based on the unique needs of ELs from different home language-backgrounds.

Additional studies that investigate the variation within Indiana's Spanish-speaking EL population need to be conducted as their time to reclassification may be affected by additional background variables that were not included in this study such as country of origin or generational status, e.g. generation 1.5.

Accountability Systems Must Reflect the Heterogeneity of EL Populations

Findings from this study corroborate prior research that indicated that ELs are not a homogenous population and accountability systems should reflect the diversity of this subgroup (Stevens et al., 2000). We recommend the development of accountability systems—based on complexity indices—that are sensitive to the unique characteristics of each district's EL population. These alternative accountability systems would consider the language and background differences within schools' EL populations, as well as additional factors affecting EL time to reclassification and attainment of academic standards, such as SES and race. The accountability system we propose would include complexity indices or weighting formulas similar to those used in the field of educational finance (Ladd, 2008; Michael, Spradlin & Carson, 2009; Toutkoushian & Robert, 2007; Verstegen, & Knoepfel, 2012).

Key References

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