

# Effects of Early Literacy on Reading Comprehension: A Longitudinal Analysis on the Differential Impact on LEP students

**Camila Munante, Dr. Sean McCarron, Dr. Sara Hart & Dr. Callie Little**  
 Department of Psychology, College of Arts and Sciences, Florida State University

## INTRODUCTION

### Past Research:

- Phonological Awareness (PA) has been a reliable indicator of later reading comprehension skills. This emphasizes the need for a strong foundational understanding of how early literacy may differ in various learners. (Erbeli et al., 2018)
- Phonics-based instruction is especially helpful to students with Limited English Proficiency or L2 learners because it improves decoding skills and reading abilities in foreign languages. (Murphy Odo, 2021)
- Both ELLs and non-ELLs have shown increased reliance on vocabulary and spelling at higher grade levels (6-10). Reading comprehension improves not only through vocabulary expansion but through stronger spelling skills. (Reed et al., 2016)
- ELLs and non-ELLs are shown to have varying early literacy profiles within their English proficiency identity. Understanding the differences reveals the need for more instruction time and that conversational English proficiency alone does not equate to academic language proficiency. (Vargas et al., 2024)

### Present Study:

- We examined how early literacy indicators, specifically phonological awareness (measured by Phoneme Segmentation Fluency, or PSF), in Kindergarten would later predict reading comprehension (SAT10) & vocabulary (PPVT) skills in second grade.
- We then aimed to understand if English proficiency and socioeconomic status impacted the strength of the indicators.

### Hypotheses:

- Limited English Proficiency (LEP) students will demonstrate lower reading comprehension and vocabulary knowledge compared to Non-LEP students after controlling for PA.
- When controlling for socioeconomic status, the relationship between early literacy measures and reading comprehension results will weaken, implying that socioeconomic status is a vital demographic determinant of literacy outcomes rather than early phonological awareness measure alone.

## PARTICIPANTS

- The children's data are from the Florida Progress Monitoring and Reporting Network datasets from school years 2004/2005 and 2006/2007
- N = 39,899 children.
- 52.6% male and 47.4% female.
- 35% White, 34.8% Black, 23.8% Hispanic, 4.4% Multiracial, 1.4% Asian, and 0.3% Native American.

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## METHODS

- Kindergarten (Grade 0): 2004-2005
- Second-grade (Grade 2): 2006-2007.
- Aged approximately 5-6 years in Kindergarten and 7-8 years in second grade.

### Specific Measures

- Phonological Awareness (PSF): Measured in Kindergarten (2004-2005)
- Stanford Achievement Test (SAT10): The standardized reading assessment in second grade (2006-2007)
- Peabody Picture Vocabulary Test (PPVT): standardized test that measures receptive vocabulary in second grade (2006-2007)

### Covariates:

- Socioeconomic Status (SES): Measured by free lunch status
- English Proficiency: Coded as Limited English Proficient (LEP) or Proficient.

### Procedure:

- Data was filtered to include only students with matching "student\_IDs" at both time points (Kindergarten and Second grade).
- Data was analyzed in RStudio using multiple regression models with LEP status as a moderating variable to understand if the relationship between Phonological Awareness (PA) and reading comprehension differs between LEP and Non-LEP students. Covariates were controlled for in the analysis to isolate the effects of PA and the moderating role of language group.

## TABLES

Table 1: Regression Coefficients for Predicting Vocabulary Knowledge Scores: Effects of Phonological Awareness, LEP, Gender, and SES on Vocabulary Knowledge (PPVT)

Predictor	Estimate	Std. Error	t-value	p-value
Intercept	95.78	0.26	370.51	<.001***
Phonological Awareness (PSF)	0.218	0.005	46.40	<.001***
LEP (Limited English Proficiency)	-7.76	0.31	-25.15	<.001***
Gender (Male)	1.08	0.19	5.63	<.001***
Low SES (Free Lunch)	-6.77	0.20	-34.57	<.001***
LEP x Gender (Male)	1.11	0.43	2.58	<.01**

Table 2: Regression Coefficients for Predicting Reading Comprehension Scores: Effects of Phonological Awareness, LEP, Gender, and SES on Reading Comprehension (SAT10)

Predictor	Estimate	Std. Error	t-value	p-value
Intercept	595.44	0.70	849.31	<.001***
Phonological Awareness (PSF)	0.67	0.01	51.91	<.001***
LEP (Limited English Proficiency)	-6.88	0.61	-11.33	<.001***
Gender (Male)	-8.20	0.47	-17.28	<.001***
Low SES (Free Lunch)	-15.29	0.54	-28.31	<.001***

Financial disadvantage seems to impact deeper reading skills more than word recognition.

The lack of interaction effect in Table 2 implies that LEP affects boys and girls similarly in reading comprehension but differently in vocabulary knowledge.

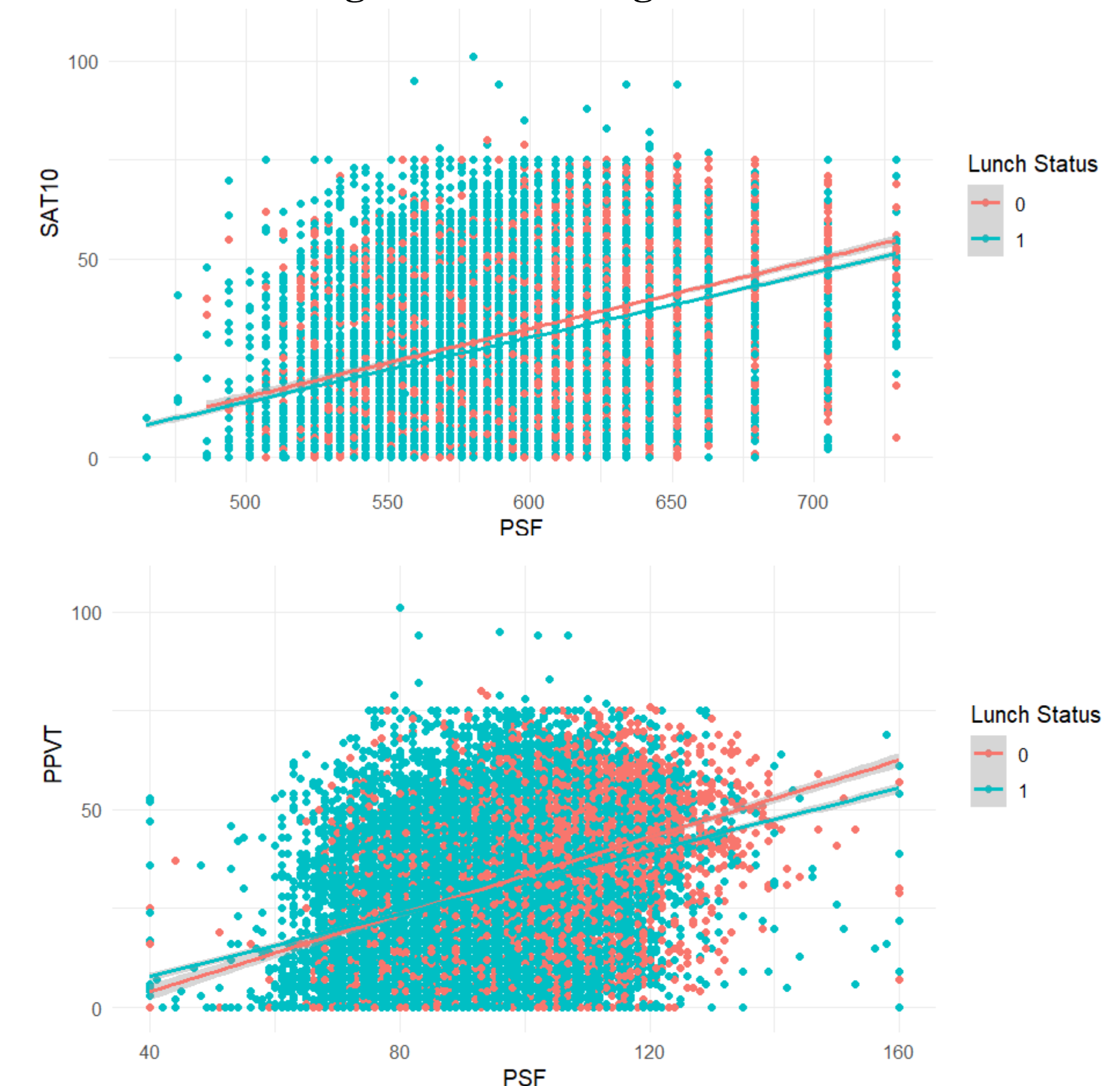
## RESULTS

### Effect of Early Phonological Awareness (PSF) on Later Reading Comprehension and Vocabulary Knowledge: Controlling for English proficiency through LEP Status



Students who had Limited English Proficiency (1) performed worse than their peers who did not (0) in both reading comprehension (SAT10) and vocabulary measures (PPVT).

### Effect of Early Phonological Awareness (PSF) on Later Reading Comprehension and Vocabulary Knowledge: Controlling for SES through Lunch Status



Students who received free lunch (1) performed worse than their peers who didn't qualify for free lunch (0) in both reading comprehension (SAT10) and vocabulary measures (PPVT).

## CONCLUSIONS

- LEP students demonstrate lower reading comprehension (SAT10) and vocabulary knowledge (PPVT) compared to their non-LEP peers.
- When SES (measured via free/reduced lunch eligibility) is controlled for, the relationship between early phonological awareness (PA) and later reading comprehension (SAT10) weakens
- Even with strong early phonological awareness (PA), LEP students and Low-SES students still scored lower on both SAT10 and PPVT.

### Additional Exploratory Results:

- These findings also brought up unexpected gender differences. Males underperformed in reading comprehension but slightly outperformed in vocabulary.
- LEP students struggle across both literacy domains, but the effect is stronger in Vocabulary for female LEP students.
- Males and LEPs perform worse on SAT10 in G2, even when controlling for PA at Kindergarten.

### Future Implications:

This study highlights that LEP students face significant challenges in reading comprehension and vocabulary, which are further exacerbated by low SES.

Future interventions should focus on **early support for LEP students, especially those from low-SES backgrounds**, while considering gender-specific needs to improve literacy outcomes. Tailored approaches can better address these compounded challenges and enhance literacy development for all students.

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