*Original Paper*

# Understanding the Gap of Reading Performance between ELL and EOL Children from Low-Income Families in Elementary School Years

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*Abstract*

*This study explored reading development in low income children of English Language learners (ELLs) from kindergarten to the fourth grade. Data used in this study came from the Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K: 2011). A sample size was 3,451 students below the poverty threshold. The independent variables were the indicators of home language and gender. The six dependent variables were students' reading item response theory (IRT) scale scores in the fall and spring semester of the kindergarten year and all the spring semesters from the first to the fourth grade. Six full 2-way analysis of variance (ANOVA) models were used for the statistical analyses. The results found there is a gender difference in children's reading performance, with female doing slightly better than male students. The low-income children's performance in reading IRT scores has shown differences among the three groups. The English Only Learners (EOL) had the highest mean scores throughout the five years. The group of Multilingual Learners (ML) and English Language Learner (ELL) group had mixed results of the second or lowest scores among these three groups. Among the six subgroups the EOL female had the highest mean scores throughout the five years.*

*Keywords*

*academic performance, child development, English language learners (ELL), English only learners (EOL), kindergarten, literacy, multilingual learners (ML), reading*

## 1. Introduction

All children learn to talk due to the Language Acquisition Device (LAD) that they are born with according to Chomsky (1965). First language acquisition starts at birth and keeps developing through 12 years of age, with continuous acquisition of new vocabularies throughout a lifetime (de Villiers & de Villiers, 1979; Krashen, 2004). Even before they can read, children develop basic literacy concepts, for example, speech sounds can be represented by letters and letter sequences (Peregoy & Boyle, 2017). They also use language to talk about things that are not present (Harris, Aycicegi, & Gleason, 2003). If children develop a large vocabulary, the path to reading will be greatly facilitated as vocabulary directly relates to reading comprehension, academic literacy, and general communication in and out of school. Children who begin elementary school with a small vocabulary are more likely to struggle when it comes to learning to read (Cunningham & Allington, 2011). Low-income students showed lower academic achievement in reading, math, and science subjects (Reardon, 2011). To gain a better understanding of less-advantaged students' reading development, this study focuses on students from low-income families. Beside family incomes, two factors—gender and home language—are often found to make a difference in children's language and literacy development (Genesee, 2017; Simonsen, Kristoffersen, Bleses, Wehberg, & Jørgensen, 2014).

*1.1 Low-income Families*

Compared to middle-income and high-income families, children from low-income families performed less well on most measures of academics success (Orozco, 2019). Similar results were found in measurements such as standardized test scores, school grades, high school completion rates, college enrollment, and college completion rates (Reardon, 2013).

Several reasons lead to this disparity between the children from low and middle income. First, low-income families have less access to the resources to raise children, compared to high-income families (Wadsworth, Evans, Grant, Carter, & Duffy, 2016). A study found that early poverty and persistent economic hardship results in lower cognitive function in young children (Schoon, Jones, Cheng, & Maughan, 2012). Second, research showed that the type of talk parents use in the household and family's socioeconomic status have an influence on children's language development (Pan & Uccelli, 2009). Studies from the NICHD Early Child Care Research Network (2005) showed that poverty and early speech input affect a child's language development. Parents from professional families than those from welfare programs spent more time talking with the young children. The difference in spending time resulted in children whose parents were professionals developed twice the amount of vocabulary than those from welfare families. When it is time to go to preschool, the gap of vocabulary volume is due to the impact of socioeconomic status on language inputs in the homes that had been widened (Hart & Risley, 1995).

*1.2 Gender*

Whether gender is a meaningful source of variation in language abilities has remained a matter of debate across the decades (Barbu et al., 2015). Although in general intelligence, there is not a marked

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gender difference discovered by research (Furnham & Rawles, 1995), studies have found some differences in learning reading and math between the genders: male students than females tend to have better math performance outcomes (Cimpian, Lubienski, Timmer, Makowski, & Miller, 2016); females have slightly better verbal skills than males (Galambos, Berenbaum, & McHale, 2009). Two national report cards in 2005 and 2007 have shown that in the fourth and eighth grades males had higher average math scores than females, but females did better than males in reading and writing (Lee, Grigg, & Dion, 2007; Perie, Grigg, & Donahue, 2005). A recent study using K-8 national longitudinal data also found the similar trend that females did better than males in reading (Robinson & Lubienski, 2011).

*1.3 Home Language*

English Only Learners (EOLs) often refers to those students who have learned and used English from early childhood. In contrast to students whose first languages are not English and speak English only as a second language are English Language Learners (ELLs). There are also students who have used more than one language at home and use these languages equally. They are multilingual learners (MLs). Challenges exists when an individual acquires a second language. While the belief that learning a new language is easy for young children is still debatable (Peregoy & Boyle, 2017), researchers who study second language acquisition propose that second language development is a very complex process and lasts a long period of time (Cummins, 2008; Krashen, 2003; McLaughlin, 1984). The ELL students with the limited English proficiency might not be able to communicate fluently or learn effectively in English. They constantly have challenges to become fluent in English and keeping up with the academic achievement of peers. Results from a recent study show that there were differences between the EOLs and ELLs groups in children's learning outcomes in reading performance and proficiencies (Lin, Wei, & Wang, 2017). During the kindergarten year, the EOL children did better than ELL children in the development of reading proficiencies such as "letter recognition", "beginning sounds", "ending sounds", and "sight words". In the first grade, the EOL children performed better on "work in context" and "literal inference". The reading gap seemed to widen between the groups as the children finished the first grade (Lin, Wei, & Wang, 2017).

The ELL students fall behind non-ELL students on academic performance remains stable. Using students' records from the 2002 to 2017 the National Assessment of Educational Progress (NAEP) to analyze students' academic learning outcomes, the results found that ELL students had lower reading scores than non-ELL students (Aud et al., 2013). The achievement gap in 2017 between non-ELL and ELL students was 37 points at 4th-grade and 43 points at the 8th-grade level (McFarland et al., 2018). Three levels were used by NEAP to categorize students' reading skills: (1) basic level indicating partial mastery of fundamental skills, (2) proficient level indicating demonstrated competency over challenging subject matter, and (3) advanced level indicating superior performance beyond proficient. The report from NAEP 2005 study showed that nearly 73% of ELL students in the 4th grade scored below basic requirements in reading while the white counterparts who had 47% of the students fell

behind in reading (Fry, 2007).

The earliest time in which the National Report Card tracks students' academic performance starts in 4th grade. With the United States federal "No Child Left Behind Act", each state is required by the U.S. Department of Education to set a standard for accountability and determine the methods and procedures for measuring students' adequate yearly progress (AYP). Third grade is the earliest grade level on the state test with two main content areas in reading and math.

How much progress low-income ELL students had made in reading development in the elementary school years is not clear. In order to better understand how the impact of contextual factors are on ELL children, it is important to investigate reading development from kindergarten to the fourth grade.

*1.4 Research Questions*

Two main issues will be investigated and discussed: what is the low-income children's overall reading development from kindergarten to the fourth grade in comparison to the whole student population? What are the differences of low-income students' reading development between the genders, as well as among English Language Learners (ELL), English Only Learners (EOL), and Multilingual Learners (ML) from kindergarten to the fourth grade?

## 2. Method

*2.1 Data file and Samples*

The K-fourth grade data file of Early Childhood Longitudinal Study, Kindergarten Class of 2010-2011 (ECLS-K: 2011) was used for this study. Sponsored by the U.S. Department of Education and National Center for Education Statistics (NCES), in the fall of 2010, the ECLS-K: 2011 study selected a nationally representative sample of kindergartners and has followed them through the 2015-2016 school year. By then most of these children were at the end of the fifth grade (Tourangeau et al., 2015). The sample size of ECLS-K: 2011 was 18,135 students with 10,076 were at or above and 3,451 below the poverty threshold. This study focused on those 3,451 low-income students.

Using a multistage probability sample design, a nationally representative sample of children attending kindergarten in 2010-2011 was selected to participate in the ECLS-K 2011 study. In order to attain an adequate sample size for analysis of some minority groups (Asian, Alaskan, and Pacific Islanders) these were oversampled (Tourangeau et al., 2015). Because of the oversampling method, the subpopulation representatives became disproportionate to the whole population. To avoid bias and error, sampling weight was used to balance subpopulation representativeness. Based on the recommendation made by the NCES, the weight variable of W8CF8P_80 was applied to the analyses for this study.

*2.2 Independent Variables*

The independent variables of this study were the indicators of gender and home language. The gender indicator separated students into male or female groups. The indicator of home language included three groups of students: (1) the English Language Learners (ELL) group was the students who used non-English language at home; (2) the English Only Learners (EOL) group was students who had

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English language at home; (3) the Multilingual Learners (ML) group was students who can't choose a primary or used two languages equally at home.

*2.3 Dependent Variables*

Item response theory (IRT) scale scores were used for measuring students' reading performance. The six dependent variables of the reading data came from the fall and the spring semesters in kindergarten and all the spring semesters from the first to the fourth grade. Composed of different sets of test items with varying degrees of difficulty, the IRT scale scores are used for the assessments of students' academic performance in reading. The item response theory is able to equate the different tests to a common vertical scale. With this unique function, researchers can make comparisons of achievements across the semesters from using IRT scale scores.

*2.4 Analysis*

Descriptive analyses were conducted for data quality checking and for providing references for further analyses. Six full 2-way analysis of variance (ANOVA) model were designed to test each of the two main effects and one 2-way interaction effect. The two main effects were gender and home language. The 2-way interaction term was gender-home language. With two subgroups for gender and three subgroups for home language, the 2-way ANOVA had a total of 6 (2x3) breakdown groups.

## 3. Results

The descriptive analyses in Table 1 showed 1,782 (51.6%) male students and 1,669 (48.4%) female students. Among these students, there were 2,172 (63.1%) students who had a home language of the English (EOL), 1,222 (35.5%) students whose home language was not English (ELL), and 47 (1.4%) students who used two languages equally at home (ML).

**Table 1. Demographic Information of the Students**

| Categories | N | % |
|---|---|---|
| Gender | | |
| Male | 1782 | 51.6 |
| Female | 1669 | 48.4 |
| Home Language | | |
| ELL | 1222 | 35.5 |
| EOL | 2172 | 63.1 |
| ML | 47 | 1.4 |

*3.1 Kindergarten—Fall Semester*

The average kindergarteners' reading IRT scale score for all the students was 53.79 with a standard deviation of 11.42 and a range from 31.43 to 125.03 (see Table 2). Table 2 also showed for the

low-income students, the mean reading IRT scale score was 48.60 with a standard deviation of 9.01 and a range from 32.78 to 97.96. The mean scores of the subgroups of students from low-income families were male = 47.96, female = 49.33, ELL = 47.13, EOL = 49.60, and ML = 48.09 (see Table 3). Among the six subgroups in table 4, the group that got the highest average score was EOL female (M = 50.23) and the group with the lowest mean score was ELL male (M = 46.20) (see Table 4).

**Table 2. Descriptive Statistics of Students' Reading IRT Scores from the Kindergarten to the Fourth Grade**

| Grade & Semester | SES | M | SD | Min | Max |
|---|---|---|---|---|---|
| K-Fall | All | 53.79 | 11.42 | 31.43 | 125.03 |
| | Low-Income | 48.60 | 9.01 | 32.78 | 97.96 |
| K-Spring | All | 67.81 | 13.50 | 32.66 | 125.03 |
| | Low-Income | 61.12 | 12.54 | 32.66 | 114.88 |
| First-Spring | All | 93.59 | 17.55 | 39.04 | 138.96 |
| | Low-Income | 84.47 | 17.46 | 39.04 | 136.38 |
| Second-Spring | All | 107.62 | 14.96 | 57.31 | 139.49 |
| | Low-Income | 99.59 | 15.38 | 58.01 | 135.49 |
| Third | All | 116.48 | 13.79 | 65.69 | 146.69 |
| | Low-Income | 108.77 | 14.37 | 65.69 | 142.20 |
| Fourth | All | 122.63 | 12.43 | 61.42 | 143.92 |
| | Low-Income | 116.04 | 13.88 | 61.65 | 143.29 |

**Table 3. Descriptive Statistics of Low-Income Students' Reading IRT Scores by Family Income, Gender, and Home Language**

| | K-Fall | K-Spring | 1st Grade-Spring | 2nd Grade-Spring | 3rd Grade | 4th Grade |
|---|---|---|---|---|---|---|
| All | 53.79 | 67.81 | 93.59 | 107.62 | 116.48 | 122.63 |
| Low-income | 48.60 | 61.12 | 84.47 | 99.59 | 108.77 | 115.79 |
| **Gender** | | | | | | |
| Male | 47.96 | 60.16 | 83.39 | 98.76 | 106.61 | 115.12 |
| Female | 49.33 | 62.20 | 85.74 | 100.57 | 110.99 | 116.97 |
| **Home Language** | | | | | | |
| ELL | 47.13 | 59.75 | 80.13 | 96.46 | 107.71 | 114.60 |
| EOL | 49.60 | 62.20 | 86.73 | 101.58 | 109.42 | 116.81 |
| ML | 48.09 | 58.47 | 86.09 | 99.43 | 106.10 | 115.95 |

**Table 4. Descript Analyses of Bi-variables of Low-Income Students' Reading IRT Scores**

| Home Language | Gender | K-Fall | K-Spring | 1st Grade-Spring | 2nd Grade-Spring | 3rd Grade | 4th Grade |
|---|---|---|---|---|---|---|---|
| ELL | Male | 46.20 | 58.54 | 78.17 | 94.52 | 105.15 | 112.94 |
| | Female | 48.13 | 61.04 | 82.24 | 98.55 | 110.43 | 116.18 |
| EOL | Male | 49.05 | 61.30 | 85.91 | 101.30 | 107.44 | 116.22 |
| | Female | 50.23 | 63.25 | 87.74 | 101.93 | 111.42 | 117.44 |
| ML | Male | 48.08 | 58.66 | 84.97 | 96.81 | 101.97 | 114.94 |
| | Female | 48.10 | 58.21 | 87.03 | 101.82 | 108.81 | 117.09 |

Both main effects and the 2-way interaction (home language X gender) on the ANOVA test showed statistical significances at p*** < .001 level. The statistical significances from these effects listed as follows: home language, [F (2, 792165) = 7233.52, p < .001], gender, [F (1, 792165) = 5193.05, p < .001], the interaction, [F (2, 792165) = 218.16, p < .001] (see Table 5).

**Table 5. Two-way ANOVA Test the Effects of Home Language and Gender on Students' Reading Performance in the Fall of Kindergarten**

| Source | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Language | 1145094 | 2 | 572547 | 7233.52 | 0.000 |
| Gender | 411040 | 1 | 411040 | 5193.05 | 0.000 |
| Language X Gender | 34536 | 2 | 17268 | 218.16 | 0.000 |
| Error | 62700947 | 792159 | 79 | | |
| Total | 1937804641 | 792165 | | | |
| Corrected Total | 64272699 | 792164 | | | |

a. R Squared = .024 (Adjusted R Squared = .024)

b. Computed using alpha = .05

*3.2 Kindergarten—Spring Semester*

The average kindergarteners' reading IRT scale score for all the students was 67.81 with a standard deviation of 13.50 and a range from 32.66 to 125.03. For the low-income students, the mean reading IRT scale score was 61.12 with a standard deviation of 12.54 and a range from 32.66 to 114.88 (see Table 2). The mean scores of the subgroups of students from low-income families were male = 60.16, female = 62.20, ELL = 59.75, EOL = 62.20, and ML = 58.47 (see Table 3). Among the six subgroups, the group that got the highest average score was EOL female (M = 63.25) and the group with the lowest mean score was ML female (M = 58.21) (see Table 4).

Both main effects and the 2-way interaction (home language X gender) on the ANOVA test showed statistical significances at p*** < .001 level. The statistical significances from these effects are listed as follows: home language [F (2, 795470) = 4133.24, p < .001], gender [F (1, 795470) = 5716.11, p < .001], the interaction [F (2, 795470) = 138.51, p < .001] (see Table 6).

**Table 6. Two-way ANOVA Test the Effects of Home Language and Gender on Students' Reading Performance in the Spring of Kindergarten**

| Source | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Language | 1272061 | 2 | 636031 | 4133.24 | 0.000 |
| Gender | 879604 | 1 | 879604 | 5716.11 | 0.000 |
| Language X Gender | 42629 | 2 | 21314 | 138.51 | 0.000 |
| Error | 122407327 | 795464 | 154 | | |
| Total | 3102850520 | 795470 | | | |
| Corrected Total | 124575945 | 795469 | | | |

a. R Squared = .017 (Adjusted R Squared = .017)

b. Computed using alpha = .05

*3.3 First Grade*

The average first graders' reading IRT scale score for all the students was 93.59 with a standard deviation of 17.55 and a range from 39.04 to 138.96. For the low-income students, the mean reading IRT scale score was 84.47 with a standard deviation of 17.46 and a range from 39.04 to 136.38 (see Table 2). The mean scores of the subgroups of students from low-income families were male = 83.39, female = 85.74, ELL = 80.13, EOL = 86.73, and ML= 86.09 (see Table 3). Among the six subgroups, the group that got the highest average score was EOL female (M = 87.74) and the group with the lowest mean score was ELL male (M = 78.17) (see Table 4).

Both main effects and the 2-way interaction (home language X gender) on the ANOVA test showed statistical significances at p*** < .001 level. The statistical significances from these effects are listed as follows: home language [F (2, 972842) = 16404.23, p < .001], gender [F (1, 972842) = 5539.00, p < .001], the interaction [F (2, 972842) = 462.73, p < .001] (see Table 7).

**Table 7. Two-way ANOVA Test the Effects of Home Language and Gender on Students' Reading Performance in the Spring of First Grade**

| Source | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Language | 9648464 | 2 | 4824232 | 16404.23 | 0.000 |
| Gender | 1628934 | 1 | 1628934 | 5539.00 | 0.000 |
| Language X Gender | 272162 | 2 | 136081 | 462.73 | 0.000 |
| Error | 286096189 | 972836 | 294 | | |
| Total | 7241037904 | 972842 | | | |
| Corrected Total | 297409276 | 972841 | | | |

a. R Squared = .038 (Adjusted R Squared = .038)

b. Computed using alpha = .05

*3.4 Second Grade*

The average second graders' reading IRT scale score for all the students was 107.62 with a standard deviation of 14.96 and a range from 57.31 to 139.49. For the low-income students, the mean reading IRT scale score was 99.59 with a standard deviation of 15.38 and a range from 58.01 to 135.49 (see Table 2). The mean scores of the subgroups of students from low-income families were male = 98.76, female = 100.57, ELL = 96.46, EOL = 101.58, and ML = 99.43 (see Table 3). Among the six subgroups, the group that got the highest average score was EOL female (M = 101.93) and the group with the lowest mean score was ELL male (M = 94.52) (see Table 4).

Both main effects and the 2-way interaction (home language X gender) on the ANOVA test showed statistical significances at p*** < .001 level. The statistical significances from these effects are listed as follows: home language [F (2, 869683) = 11852.84, p < .001], gender [F (1, 869683) = 3987.12, p < .001], the interaction [F (2, 869683) = 1380.36, p < .001] (see Table 8).

**Table 8. Two-way ANOVA Test the Effects of Home Language and Gender on Students' Reading Performance in the Spring of Second Grade**

| Source | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Language | 5444910 | 2 | 2722455 | 11852.84 | 0.000 |
| Gender | 915795 | 1 | 915795 | 3987.12 | 0.000 |
| Language X Gender | 634105 | 2 | 317052 | 1380.36 | 0.000 |
| Error | 199754430 | 869677 | 230 | | |
| Total | 8826610132 | 869683 | | | |
| Corrected Total | 206627400 | 869682 | | | |

a. R Squared = .033 (Adjusted R Squared = .033)

b. Computed using alpha = .05

*3.5 Third Grade*

The average third graders' reading IRT scale score for all the students was 116.48 with a standard deviation of 13.79 and a range from 65.69 to 146.69. For the low-income students, the mean reading IRT scale score was 108.77 with a standard deviation of 14.37 and a range from 65.69 to 142.20 (see Table 2). The mean scores of the subgroups of students from low-income families were male = 106.61, female = 110.99, ELL = 107.71, EOL = 109.42, and ML = 106.10 (see Table 3). Among the six subgroups, the group that got the highest average score was EOL female (M = 111.42) and the group with the lowest mean score was ML male (M = 101.97) (see Table 4).

Both main effects and the 2-way interaction (home language X gender) on the ANOVA test showed statistical significances at p*** < .001 level. The statistical significances from these effects are listed as follows: home language [F (2, 850938) = 1977.67, p < .001], gender [F (1, 850938) = 21648.92, p < .001], the interaction [F (2, 850938) = 293.46, p < .001] (see Table 9).

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**Table 9. Two-way ANOVA Test the Effects of Home Language and Gender on Students' Reading Performance in the Third Grade**

| Source | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Language | 794597 | 2 | 397298 | 1977.67 | 0.000 |
| Gender | 4349094 | 1 | 4349094 | 21648.92 | 0.000 |
| Language X Gender | 117906 | 2 | 58953 | 293.46 | 0.000 |
| Error | 170945389 | 850932 | 201 | | |
| Total | 10232543779 | 850938 | | | |
| Corrected Total | 176160580 | 850937 | | | |

a. R Squared = .030 (Adjusted R Squared = .030)

b. Computed using alpha = .05

*3.6 Fourth Grade*

The average fourth graders' reading IRT scale score for all the students was 122.63 with a standard deviation of 12.43 and a range from 61.42 to 143.92. For the low-income students, the mean reading IRT scale score was 116.04 with a standard deviation of 13.88 and a range from 61.65 to 143.29 (see Table 2). The mean scores of the subgroups of students from low-income families were male = 115.12, female = 116.97, ELL = 114.60, EOL = 116.81, and ML = 115.95 (see Table 3). Among the six subgroups, the group that got the highest average score was EOL female (M = 117.44) and the group with the lowest mean score was ELL male (M = 112.94) (see Table 4).

Both main effects and the 2-way interaction (home language X gender) on the ANOVA test showed statistical significances at p*** < .001 level. The statistical significances from these effects are listed as follows: home language [F (2, 814912) = 2503.00, p < .001], gender [F (1, 814912) = 4219.06, p < .001], the interaction [F (2, 814912) = 500.00, p < .001] (see Table 10).

**Table 10. Two-way ANOVA Test the Effects of Home Language and Gender on Students' Reading Performance in the Fourth Grade**

| Source | SS | df | MS | F | P |
|---|---|---|---|---|---|
| Language | 957220 | 2 | 478610 | 2503.00 | 0.000 |
| Gender | 806745 | 1 | 806745 | 4219.06 | 0.000 |
| Language X Gender | 191215 | 2 | 95608 | 500.00 | 0.000 |
| Error | 155821677 | 814906 | 191 | | |
| Total | 11118531415 | 814912 | | | |
| Corrected Total | 157732670 | 814911 | | | |

a. R Squared = .012 (Adjusted R Squared = .012)

b. Computed using alpha = .05

## 4. Discussion

The ECLS-K4 kindergarten data file provides a unique opportunity to study children's reading development from kindergarten to the fourth grade. In 2010, more than 18,000 students started kindergarten that year. Among those students, more than 18% of them were ELLs. Through the five years of schooling, children showed growth in reading development with various paces.

The mean scores of IRT reading scale score between the overall population and low-income students were 5.19 in the fall and 6.69 in the spring of the kindergarten year. It was 9.12 in spring of first, 8.02 in second, 7.70 in third, and 6.60 in fourth grade. The biggest gap was in the spring of the first grade.

There is a gender difference in children's reading performance, with female students doing slightly better than male students. In the fall of the kindergarten year, the females' average was one point higher than the males. The gender gap remained around two points until the third grade when the gap was enlarged to four points. However, it returned to two points at the end of the fourth grade (see Figure 1).
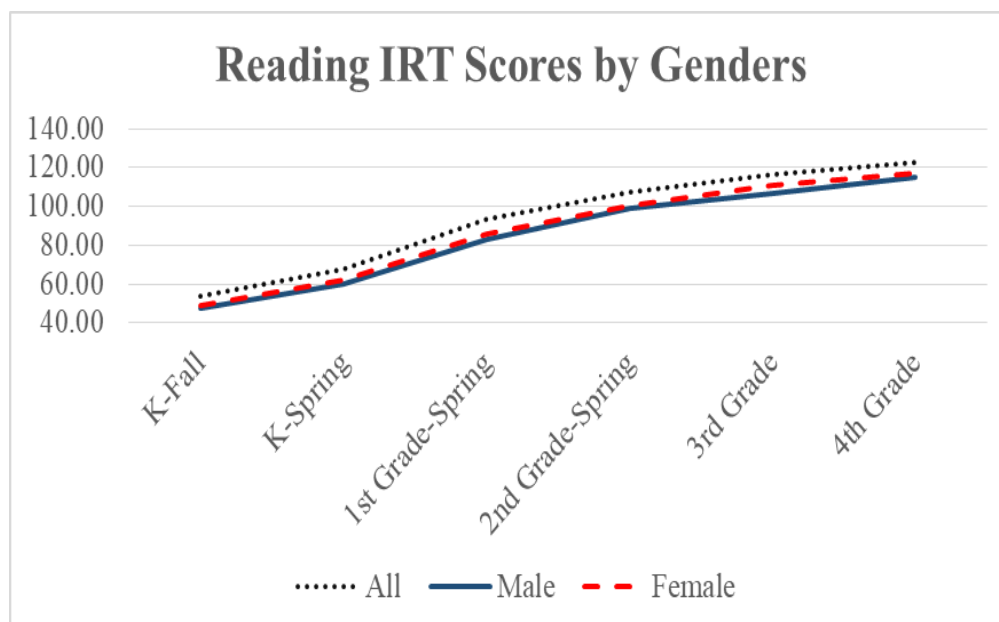


**Figure 1. Low-income Students' Reading IRT Scores Changed between Kindergarten and Fourth Grade by Gender**

The low-income children's performance in reading IRT scores has shown differences among the three groups. The English Only Learners (EOL) had the highest mean scores throughout the five years. The group of Multilingual Learners (ML) and English Language Learners (ELL) group had mixed results of the second or lowest scores among these three groups. In these five years of assessment, the biggest gap among these three groups occurred in the first and second-grade years with seven points in the first grade and five points in the second grade. The overall trend started with a gap of two points, which widened in the first and second grade, and closed again in the third grade (three-points) and the fourth grade (two-points) (see Figure 2).
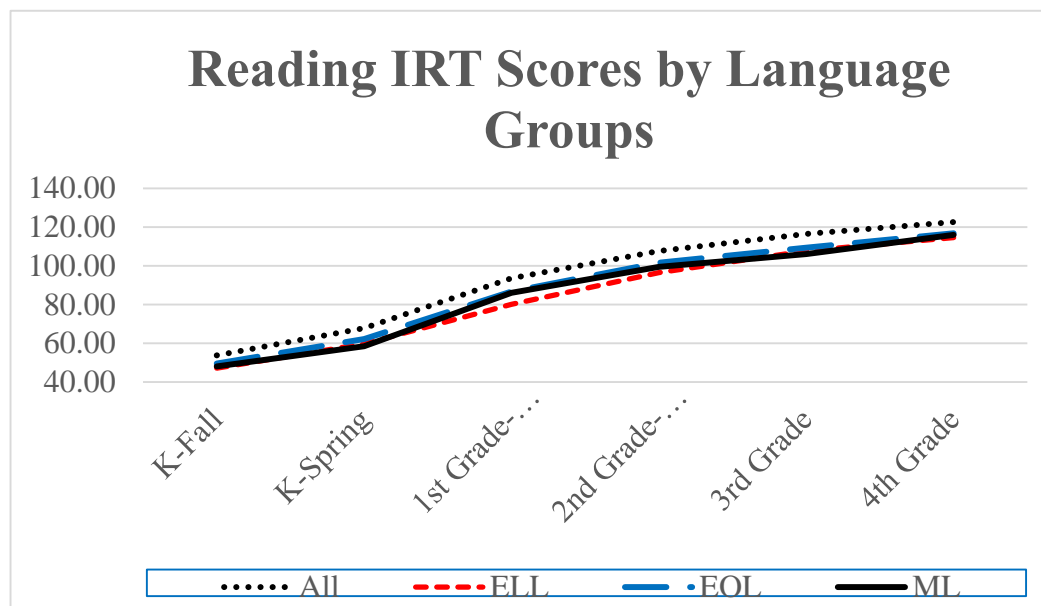
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**Figure 2. Low-income Students' Reading IRT Scores Changed between Kindergarten and Fourth Grade by Language Groups**

Among the six subgroups (2 genders X 3 home languages), the EOL female had the highest mean scores throughout the five years, while ELL male had the lowest scores for most of the times. When we only tested the gender difference, there was only a one or two-point difference. After taking the bivariate factor, the gap between the highest to the lowest group become even larger. For example, the gap between the EOL female and ELL male was 9.58 points in the spring of the first grade; the gap between EOL female and ML male was 9.45 in the third grade.

Low-income students' average reading scores are lower than the mean scores of the whole population. This means that the low-income students started with less preparation at the beginning of kindergarten and the reading development was lagging behind. In terms of gender difference, male students scoring slightly lower than female students indicates the necessity of improving male students' reading development through more parent and educator effort. The most important discovery from this study is that low-income ELL students are most likely to struggle with reading and need more interventions in the early school years.

## 5. Implications

The finding that the gap between low-income and overall students in IRT reading score was increased from kindergarten to the fourth grade rather than narrowed carries important implications for educators. With the challenges ELL students face in learning the English language and academic content, the issues related to socioeconomic status pose special problems for ELLs, and place an extra burden on teachers and schools to meet mandated test score requirements. "Socioeconomic status has proven to be the strongest predictor of standardized test scores" (Peregoy & Boyle, 2017, p. 27). "Students in

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low-income neighborhoods consistently score lower than those in more affluent circumstances" (p. 27). There are so many factors that affect ELLs' performance on the test, e.g., prior schooling, proficiency and literacy in native language, parents' educational background, etc. Among them, the amount of exposure to print at home is critical in a child's literacy development and directly relates to a family's socioeconomic status. Emergent literacy perspective believes that children begin to develop literacy from the moment they are first exposed to reading and writing at home during preschool years and earlier. Whether a family can provide a rich literacy resource to encourage early literacy development makes a great difference in a child's literacy development. When children are immersed in social environments where reading and writing for a variety of purposes abound, they take note of how language is used around them, and naturally and gradually construct knowledge of functions and forms of print.

Therefore, how much exposure children have to language in their surroundings since they were born is essential in early literacy development. High SES families are more likely to have lots of stories to read aloud to the children and lots of opportunity to engage children in literacy activities at home. All these opportunities help children build knowledge of the world, and develop early literacy concepts, such as how print works in form and function. Comparing children from high SES, the lack of exposure to meaningful print at home makes it especially hard for low SES children to develop toward conventional reading and writing.

Additionally, students living in poverty are the ones who most likely lack access to computer and internet for online reading comprehension and learning (Rideout & Katz, 2016). They may also have fewer well-qualified teachers (Clotfelter, Ladd, & Vigdo, 2006) and library resources to draw on (Pribesh, Gavigan, & Dickinson, 2011) than those middle-income children. Questions inevitably arise about whether equal educational opportunities are truly provided to every student, or whether some students are privileged while others are not. Educational practitioners and researchers have also questioned the high-stakes testing for its "potential to create larger divisions between rich and poor and between those with power and those without" (Peregoy & Boyle, 2017, p. 28).

Despite the many problems with standardized tests, it is worth pointing out that standardized tests provide benchmarks that allow educators to compare the learning outcomes of ELLs to those of EOLs and MLs. Though children from low SES started out kindergarten below par in reading, with high-quality instruction, children can still catch up and succeed. Balanced comprehensive literacy perspective believes that immersion in language-rich environment alone is not sufficient to promote early literacy development for children. Rather, effective explicit literacy instruction is equally important, including phonemic awareness, phonics, and vocabulary development, reading fluency and reading comprehension. To help ELL and ML students from low-income families develop literacy skills, it is critical that an early intervention program is needed that combines a rich literacy environment with direct instruction on specific aspects of literacy using a variety of effective teaching strategies.

It is highly recommended that teachers work with parents to provide children with a rich literacy

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environment during the elementary school years. Family can offer an important foundation for children's literacy development. Children benefit most when they are actively participating and immersed in a wide range of literacy activities at home, such as listening, talking, writing, and reading experiences. Built on the literacy activities already present in the home, school literacy instruction can most likely enhance ELL students' reading performance. Moreover, as aforementioned, it is also necessary for low SES schools to be equipped with more digital tools with more financial support so students can be prepared to effectively use technological skills for literacy learning. Having well-trained teachers to help ELLs develop literacy skills is also essential. This study demonstrates the importance of designing and delivering more effective professional development on literacy instruction targeting teachers primarily working with ELLs in low SES schools.

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