

Test Score Comparisons Across French Immersion and English Programs

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Purpose of the Study

- Contacted in summer 2014 about conducting a follow-up study to compare MCAS scores for students in the French and English programs
- Conducted two studies in fall 2014:
 1. Examined MCAS and demographic data for MPS students who were in grades 3, 4 and 5 in 2014
 - Cross-sectional analysis (begins on p. 6 of the report)
 2. Examined prior MCAS and demographic data for MPS students who are currently in grade 7
 - Cohort analysis (begins on p. 91 of the report)



Cross-sectional Analysis:

Data from Students in
Grades 3, 4, and 5 in 2014

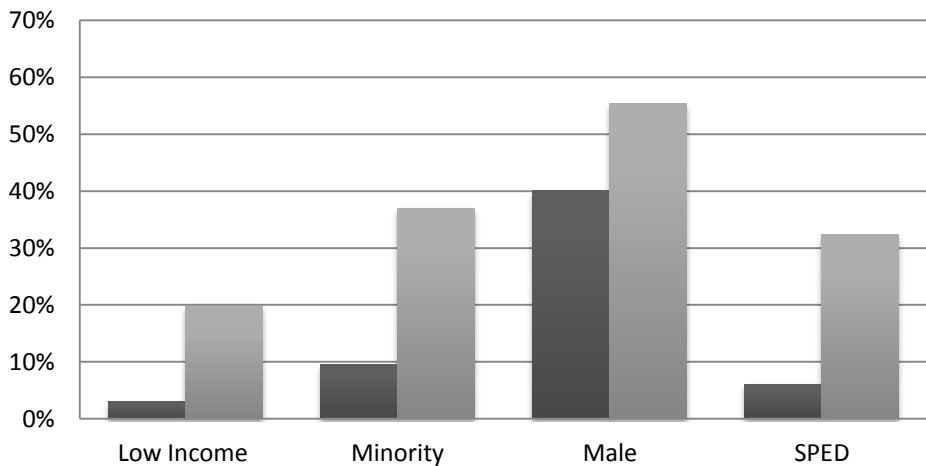


Demographic Comparisons

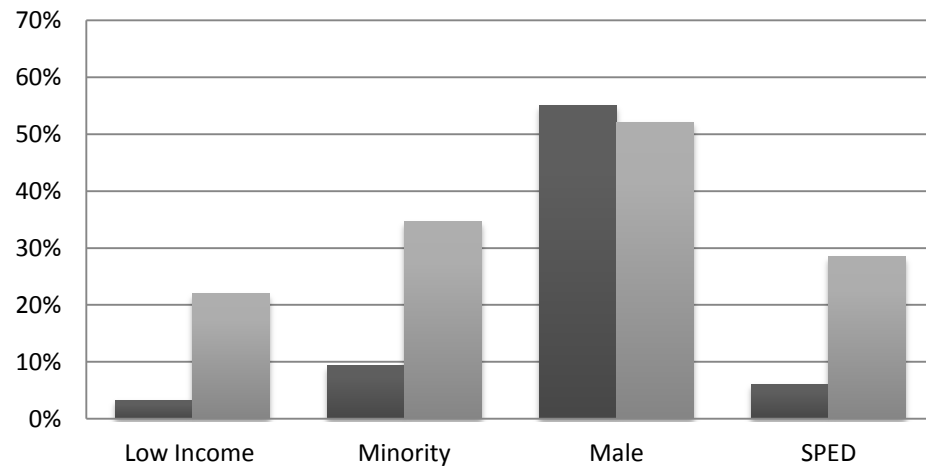
- At grades 3, 4, and 5, the French Immersion program had fewer low income, minority, male, and SPED students than the English program and the differences in percentages were statistically significant
- Also, there were differences in the types of SPED classifications across the French Immersion and English programs
- Note: In some cases, the number of students was small and comparisons are difficult to make (e.g., at grade 3, there were only 10 SPED students in FI)



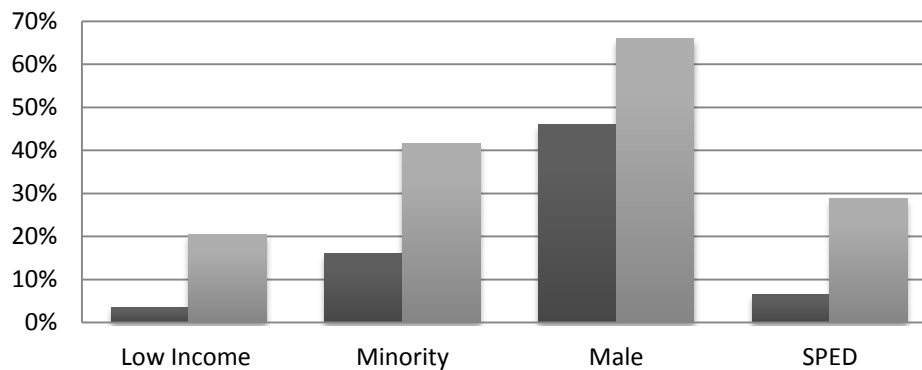
Grade 3



Grade 4



Grade 5



■ French Immersion ■ English Only



Test Score Comparisons

| | | French Immersion | English Only | Difference Score | SD Difference |
|---------|---------------------|-----------------------------|-------------------------|-----------------------------|--------------------------|
| Grade 3 | ELA Scale Score | 247.95 | 242.11 | 5.84* | 0.43 |
| | Math Scale Score | 260.60 | 252.68 | 7.92* | 0.47 |
| Grade 4 | ELA Scale Score | 247.44 | 242.00 | 5.44* | 0.36 |
| | Math Scale Score | 251.26 | 246.54 | 4.72* | 0.31 |
| Grade 5 | ELA Scale Score | 254.34 | 249.19 | 5.15* | 0.36 |
| | Math Scale Score | 257.10 | 249.89 | 7.21* | 0.43 |
| | Science Scale Score | 246.82 | 245.19 | 1.63 | 0.11 |

* Difference is statistically significant



Test Score Comparisons

- ELA and Math
 - At grades 3, 4, and 5, students in the French Immersion program had statistically significantly higher ELA and math scale scores than students in the English program
- Science
 - At grade 5, there was no significant difference between mean science scale scores for French Immersion and English students



Matching Analysis

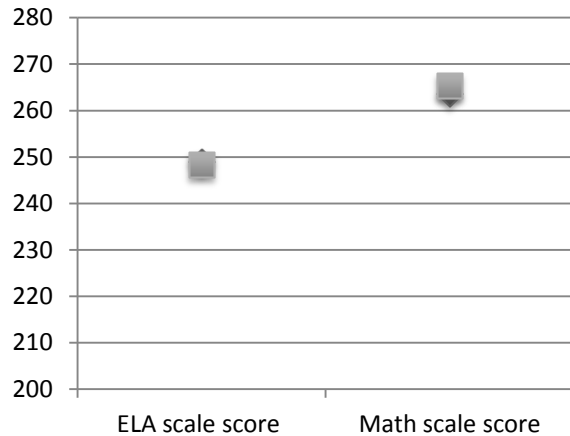
- Compared ELA and math scores for select sub-groups across the French and English programs, isolating minority status
- At all grades, we compared scores in French and English programs for:
 - Non-minority boys who are not SPED and not low income
 - Minority boys who are not SPED and not low income
 - Non-minority girls who are not SPED and not low income
 - Minority girls who are not SPED and not low income

Report: see p. 87

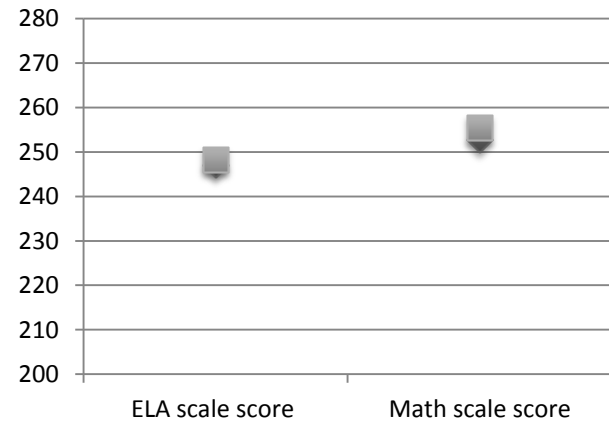


Matching Analysis: Non-minority boys who are not SPED and not low income

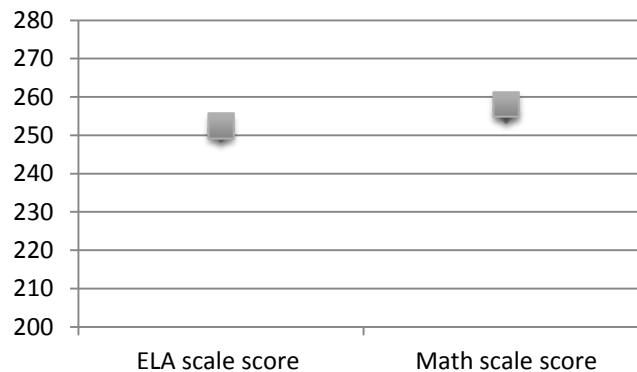
Grade 3



Grade 4



Grade 5

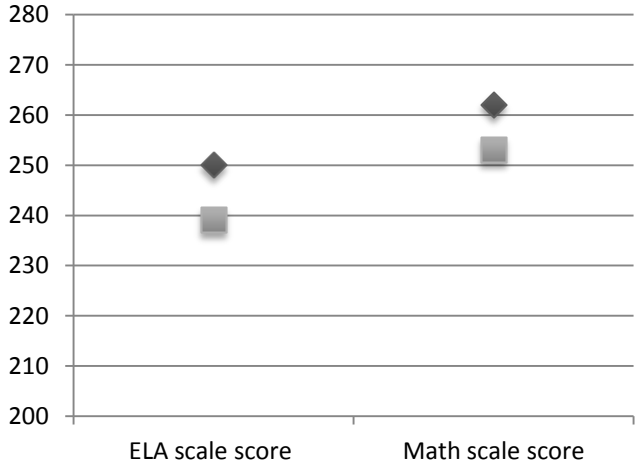


◆ English Only ■ French Immersion

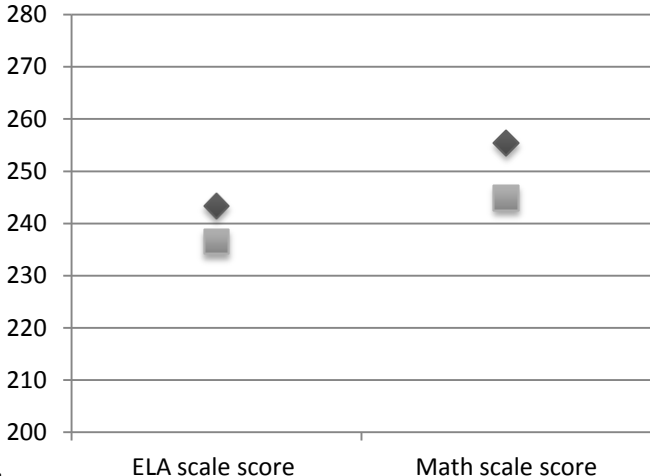


Matching Analysis: Minority boys who are not SPED and not low income

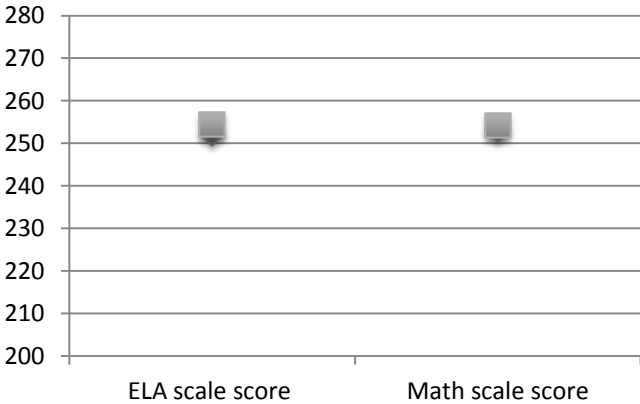
Grade 3



Grade 4



Grade 5



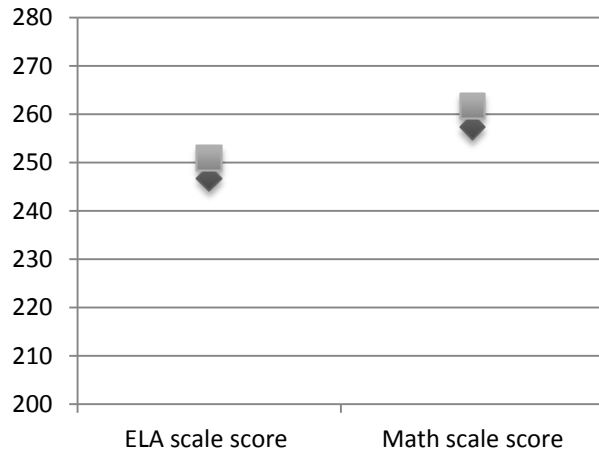
Note there are small numbers of minority males in the FI program – the validity of the comparisons may be compromised

◆ English Only ■ French Immersion

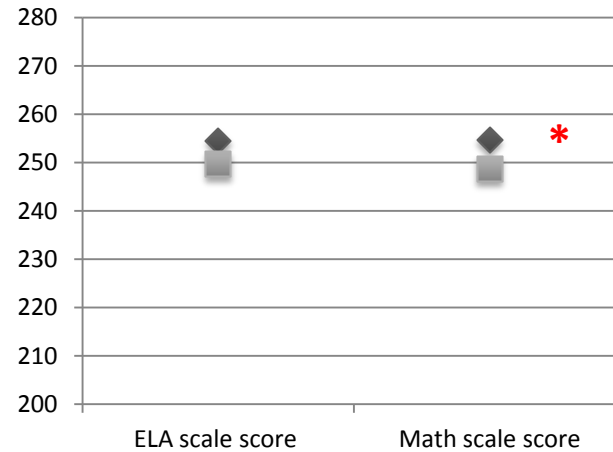


Matching Analysis: Non-minority girls who are not SPED and not low income

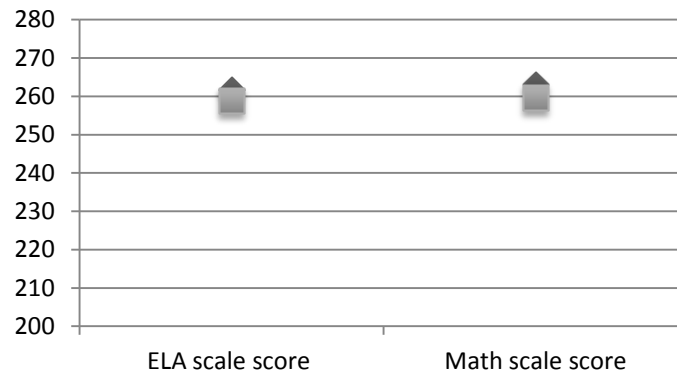
Grade 3



Grade 4



Grade 5



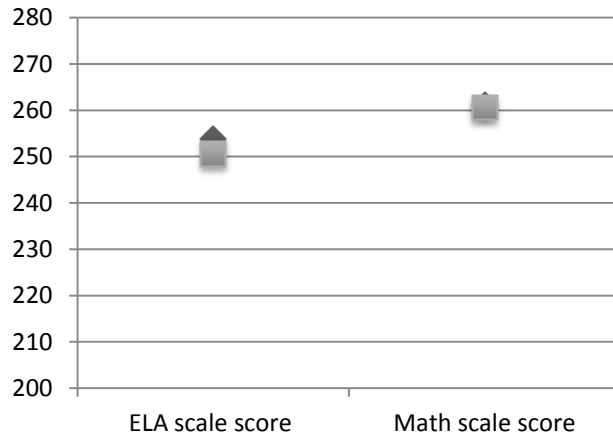
* Difference is statistically significant

◆ English Only ■ French Immersion

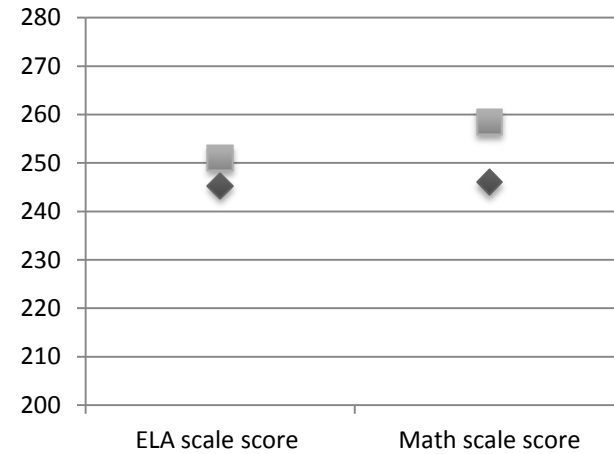


Matching Analysis: Minority girls who are not SPED and not low income

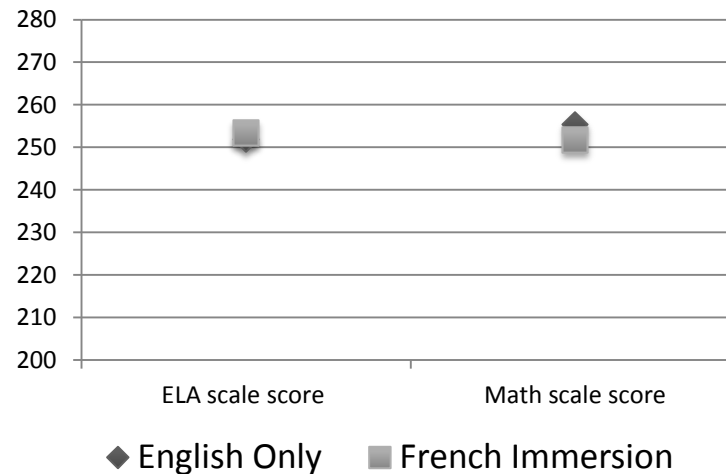
Grade 3



Grade 4



Grade 5



Note there are small numbers of minority females in the FI program – the validity of the comparisons may be compromised



Matching Analysis

- With one exception, there were no differences between scores in the French and English programs for the matched groups
 - However, small numbers of students in some groups make complicated comparisons
- Take away: All else being equal, students with similar characteristics had similar MCAS scores, regardless of program



Test Score Comparisons Controlling for *all* Demographic Characteristics

- Constructed statistical models to look at the predicted difference between MCAS scores in the two programs after controlling for demographic characteristics
 - At grades 3, 4 and 5, there were no significant differences between mean MCAS scores in the French and English programs, after controlling for students' income status, minority status, gender, and SPED status
- Take away:
 - Differences in the demographic make up of the programs explained MCAS score differences between the French and English programs



Student Growth Percentiles

- Compared student growth percentiles (SGPs) in ELA and math across the two programs for grades 4 and 5
 - At grade 4, there was no statistically significant difference between median SGP in ELA when comparing French and English students' performance, but in grade 5, English students demonstrated higher SGPs than French students
 - At grades 4 and 5, there was no statistically significant difference between median SGPs in math when comparing French and English students' performance



Comparisons by Length of Time in MPS

- Students in the French program had been in MPS since 1st grade but students in the English program may have entered after 1st grade
- Separated students in the English program into two groups – those who had been in MPS since 1st grade and those who entered after 1st grade
- Conducted comparisons similar to ones previously described



Comparisons by Length of Time in MPS

- Overall:
 - At all grades, when broken out by length of time in MPS, French Immersion students scored significantly higher than English students who have been in Milton since 1st grade and English students who entered after 1st grade
 - The comparisons (previous slides) between subgroups held when students were split into three groups



Cohort Analysis:

Data from Students who are
Currently in Grade 7



Available Data

- Demographic and MCAS data from students currently in grade 7:
 - 2010 - 2011 Grade 3
 - 2011 - 2012 Grade 4
 - 2012 - 2013 Grade 5
 - 2013 - 2014 Grade 6
- Note that MCAS does not employ a “vertical” scale
 - We are limited to comparing the relationship between French and English students *within* a given year, not *across* the years
 - If the mean score for a cohort is greater in one year than in the previous year, this does not imply increased success on the exam



Demographic Comparisons

- With the exception of gender, there were statistically significant differences between the percentages of students from different subgroups in the French and English programs in all years
 - In all years, the French Immersion program had fewer low income, minority, and SPED students than the English program



Demographic Comparisons

| | | French Immersion | English Only |
|-------------------------------|------------|------------------|--------------|
| 2011 Grade 3 | Low Income | 5 (3.7%) | 45 (26.2%)** |
| | Minority | 17 (12.6%) | 79 (45.9%)** |
| | Male | 65 (48.1%) | 100 (58.1%) |
| | SPED | 12 (8.9%) | 49 (28.5%)** |
| 2012 Grade 4 | Low Income | 6 (4.4%) | 43 (25.1%)** |
| | Minority | 17 (12.6%) | 79 (45.9%)** |
| | Male | 65 (48.1%) | 100 (58.1%) |
| | SPED | 14 (10.4%) | 46 (26.9%)** |
| 2013 Grade 5 | Low Income | 7 (5.2%) | 46 (27.1%)** |
| | Minority | 17 (12.6%) | 79 (45.9%)** |
| | Male | 65 (48.1%) | 100 (58.1%) |
| | SPED | 10 (7.4%) | 34 (20.0%)* |
| 2014 Grade 6 | Low Income | 7 (5.2%) | 48 (27.9%)** |
| | Minority | 17 (12.6%) | 79 (45.9%)** |
| | Male | 65 (48.1%) | 100 (58.1%) |
| | SPED | 6 (4.4%) | 27 (15.7%)* |

* Difference is significant at $p < .01$

** Difference is significant at $p < .001$



Demographic Comparisons

- Students who entered after 1st grade were automatically assigned to the English program. A total of 67 students entered after 1st grade:
 - Entered by school year 2010-2011: 25 students
 - Entered by school year 2011-2012: 5 students
 - Entered by school year 2012-2013: 16 students
 - Entered by school year 2013-2014: 21 students
- Students entering the English program after first grade were more likely to be low income, minority, and male compared to students in the French program or English students who entered before first grade
- The proportion of students designated as needing special education services fluctuated, but was comparable to the Milton English group of students entering before first grade



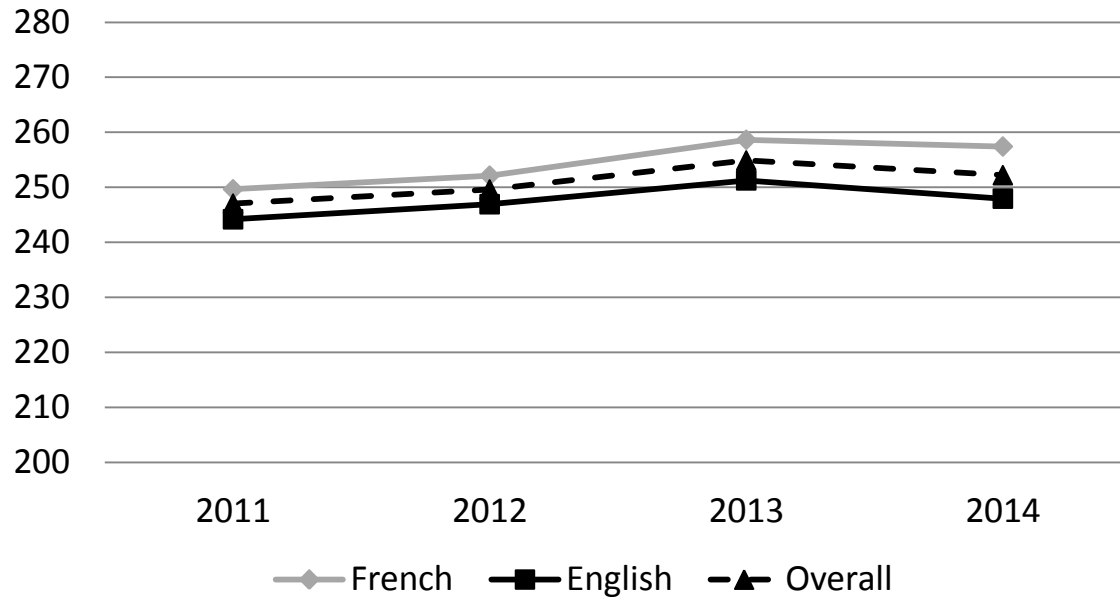
Test Score Comparisons - ELA

| | | Average ELA Scale Scores | Standard Deviation | Difference | SD Difference |
|-----------------|------------------|-----------------------------|-----------------------|------------|------------------|
| 2011 Grade 3 | French Immersion | 249.65 | 10.95 | 5.46* | 0.44 |
| | English | 244.20 | 13.88 | | |
| 2012 Grade 4 | French Immersion | 252.13 | 13.03 | 5.19* | 0.37 |
| | English | 246.94 | 14.91 | | |
| 2013 Grade 5 | French Immersion | 258.65 | 11.44 | 7.38* | 0.57 |
| | English | 251.27 | 14.37 | | |
| 2014 Grade 6 | French Immersion | 257.42 | 11.08 | 9.47* | 0.76 |
| | English | 247.95 | 13.53 | | |

- In each year, mean scores for students in the French program were significantly higher than for students in the English program



Test Score Comparisons – ELA



- This pattern held when broken out by length of time in MPS
- Take away:
 - *For this cohort of students, the gap between mean scores in the French and English programs widened between grade 3 and grade 7 (not possible to conclude that this is the case for all cohorts)*



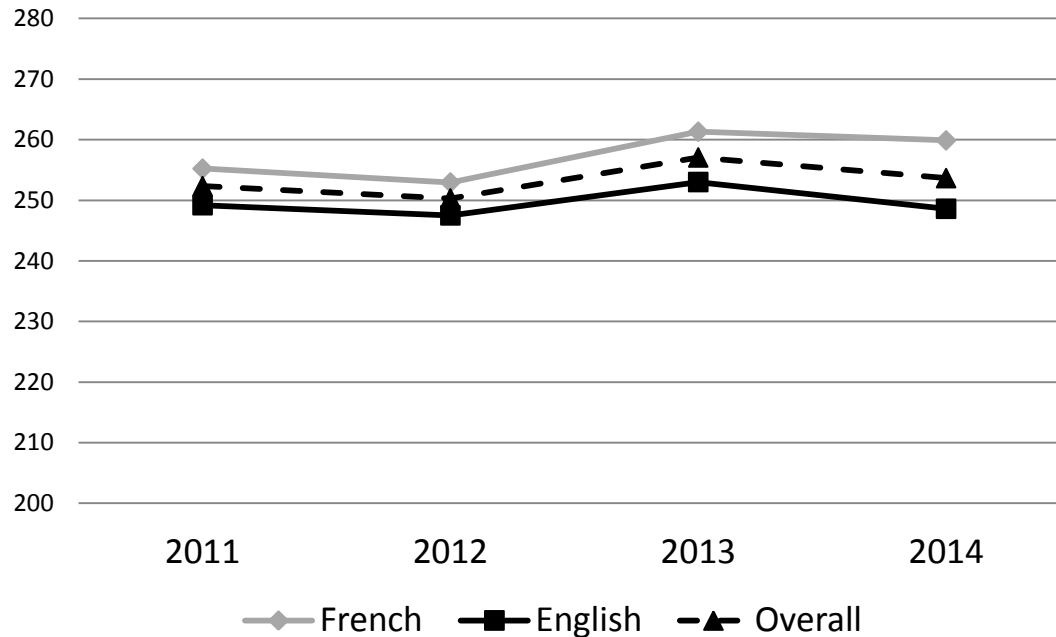
Test Score Comparisons - Math

| | | Average Math Scale Scores | Standard Deviation | Difference | SD Difference |
|-----------------|------------------|------------------------------|-----------------------|------------|------------------|
| 2011 Grade 3 | French Immersion | 255.23 | 11.13 | 6.05* | 0.46 |
| | English | 249.19 | 15.24 | | |
| 2012 Grade 4 | French Immersion | 252.94 | 12.87 | 5.43* | 0.37 |
| | English | 247.51 | 16.03 | | |
| 2013 Grade 5 | French Immersion | 261.32 | 11.90 | 8.31* | 0.57 |
| | English | 253.01 | 16.60 | | |
| 2014 Grade 6 | French Immersion | 259.88 | 13.84 | 11.28* | 0.71 |
| | English | 248.60 | 17.46 | | |

- In each year, mean scores for students in the French program were significantly higher than for students in the English program



Test Score Comparisons - Math



- This pattern held when broken out by length of time in MPS
- Take away:
 - *For this cohort of students, the gap between mean scores in the French and English programs widened between grade 3 and grade 7 (not possible to conclude that this is the case for all cohorts)*



Test Score Comparisons Controlling for *all* Demographic Characteristics

- Constructed statistical models to look at the predicted difference between MCAS scores in the two programs after controlling for demographic characteristics
 - For grades 3 and 4, there was no significant difference between mean ELA and math scores in the French and English programs, after controlling for students' income status, minority status, gender, and SPED status
 - For grades 5 and 6, a significant difference between mean ELA and math scores in the French and English programs remained, after controlling for students' income status, minority status, gender, and SPED status
- **Take away:**
 - While differences in the demographic make up of the programs explained MCAS score differences between the French and English programs at the lower grades, differences remained at the upper grades



Student Growth Percentiles

- With the exception of ELA scores in grade 6, there was no significant difference between median student growth percentiles for ELA and math in the French and English programs. These findings also held when students in the English program were broken out by length of time in MPS
 - In grade 6 ELA, French students demonstrated higher SGPs than English students
 - In grade 6 ELA broken out by length of time in MPS, French students demonstrated higher SGPs than English students who have been in MPS since 1st grade



Comparisons by Length of Time in MPS

- Overall:
 - At all grades, when broken out by length of time in MPS, French Immersion students scored significantly higher than English students who have been in Milton since 1st grade and English students who entered after 1st grade
 - The comparisons (previous slides) between subgroups held when students were split into three groups



Overall Takeaway

- Student demographics differ across English and French Immersion programs
- When matched students were compared, students with similar characteristics had similar MCAS scores, regardless of program
- For grades 3 and 4, when demographic characteristics were considered all together, there was no evidence of a gap between the French and English MCAS scores (supported by two cohorts of students)
- For grade 5, the findings were inconsistent, and for grade 6 a difference remained

