



The Rigor Gap: Comparing Course Grades and End-of-Course Exam Results of Algebra I and
10th Grade English Students in Florida

Eric Andrew Frey
Steven Birnholz

Working Paper 2020–01

September 2020

The Florida Council of 100
400 North Tampa Street
Suite 1010
Tampa, FL 33602

Author Note

Eric Andrew Frey, Economist, The Florida Council of 100; Steven Birnholz, Executive Vice President and Director of Policy, The Florida Council of 100.

We thank the Florida Department of Education for providing access to the data used in this research. Any opinions and conclusions expressed herein are those of the authors and do not necessarily reflect the views of the Florida Department of Education. All results have been reviewed to ensure that no confidential information is disclosed.

Correspondence concerning this paper should be addressed to Eric Frey, Florida Council of 100, 400 North Tampa Street, Suite 1010, Tampa, FL 33602

Email: efrey@fc100.org

© 2020 by Eric Andrew Frey and Steven Birnholz. All rights reserved.

Abstract

Utilizing administrative data from three consecutive school years (2015–16 through 2017–18) provided by the Florida Department of Education, this paper examines the course grades earned in Algebra I and 10th Grade English by students who earned a non–passing score on the corresponding end–of–course (EOC) exam. We found what we have come to refer to as a “rigor gap”: many students possess course grades unlikely to be predicted by their non–passing end–of–course exam score. Among our findings, 72% of English 2 students and 55% of Algebra I students who did not pass the corresponding EOC received a course grade of C or higher. Moreover, 37% of 10th Grade English students and 12% of Algebra I students who did not pass the corresponding EOC received a course grade of B or higher. While our research does not include student data from the COVID–19 pandemic, we hypothesize that the pandemic has increased the identified rigor gap due to, among other things, more lenient grading practices and issues related to delivering high quality distance learning. With the U.S. Department of Education having waived requirements for EOCs such as these during the recently completed 2019–20 school year as a result of the pandemic, our findings provide information relevant to the policy discussion on whether or not statewide, standardized assessment requirements should resume in 2020–21.

Table of Contents

Abstract.....	2
Introduction.....	5
Background	8
Florida Standards Assessments (FSA).....	8
Literature Review	10
Methodology	12
Results	15
English 2 and the ELA Grade 10 FSA.....	15
Algebra I and the Algebra I End of Course (EOC) Exam	20
Discussion.....	24
Findings and Implications.....	24
Limitations	29
Conclusion	33
References	34
Appendix A	39

List of Figures

Figure 1: Course Grade Distribution of Non–Passing ELA FSA Grade 10 Students 15

Figure 2: Relationship Between English 2 Grades and Non–Passing ELA FSA Grade 10 Scores
..... 16

Figure 3: Course Grade Distribution of ELA FSA Grade 10 Level 1 Students 17

Figure 4: Course Grade Distribution of ELA FSA Grade 10 Level 2 Students 18

Figure 5: English 2 Average Grade by Year and Score on Grade 10 ELA FSA 19

Figure 6: Course Grade Distribution of Non–Passing Algebra I EOC Students 20

Figure 7: Relationship Between Algebra I Course Grades and Non–Passing EOC Scores 21

Figure 8: Course Grade Distribution of Algebra I EOC Level 1 Students 22

Figure 9: Course Grade Distribution of Algebra I EOC Level 2 Students 23

Figure 10: Algebra I Average Grade by Year and Score on Algebra I EOC..... 24

Figure 11: Retention Rates by Grade and Year 28

Figure 12: Course Grade Distribution of Non–Passing ELA FSA Grade 10 Students – Annual
Records Only 39

Figure 13: English 2 Average Grade by Year and Score on Grade 10 ELA FSA – Annual
Records Only 40

Figure 14: Course Grade Distribution of Non–Passing Algebra I EOC Students – Annual
Records Only 41

Figure 15: Algebra I Average Grade by Year and Score on Algebra I EOC – Annual Records
Only..... 42

List of Tables

Table 1: Numeric Grade Conversion 14

Introduction

Despite the clear message that exists today of the near necessity of a postsecondary credential to achieve economic self-sufficiency, many still fail to attain it. The most recent data show that only 39% and 65% of students who started at two-year and four-year public institutions, respectively, in 2012 completed a degree within six years of starting (Shapiro et al, 2019). While a great effort is being made by higher education institutions to improve these outcomes, portions of the problem likely lie in factors affecting students before they ever step foot on a college campus.

One factor could be that many college-going students simply are not prepared for the academic rigors of a postsecondary education. While 84% of high school students report that they want to pursue postsecondary education (YouthTruth, 2017) and 79% of parents believe their child will earn a 2- or 4-year degree (Learning Heroes, 2019), a 2017 nationwide survey found only half of 12th grade students felt that their school had helped them develop the skills and knowledge they needed for college-level classes (YouthTruth). Indicative of this perspective in Florida, 100% and 54% of 2019 Florida high school graduates took the SAT and ACT, respectively, and failed to demonstrate college readiness at the following rates: SAT English/Reading/Writing (39% of students aren't college ready), SAT Math (66%), ACT English (44%), ACT Math (67%), and ACT Reading (55%) (ACT, 2019; CollegeBoard, 2019a). The 2019 SAT results also showed that only 33% of Florida high school graduates earned "college ready" scores in both English/Reading/Writing and Math, compared to 45% nationally (CollegeBoard, 2019b), and 2019 ACT Results showed that only 22% of Florida high school graduates met ACT's college readiness benchmarks in all four tested subject areas, compared to the national average of 26%. Moreover, data from the 2013 National Assessment of Educational

THE RIGOR GAP

Progress (NAEP), the last administration of the high school test in Florida, indicated that 28% of Florida 12th grade students scored below what the NAEP defines as “Basic” in reading, and 40% of 12th grade students scored below Basic in mathematics, both results being worse than the national average.

This lack of college readiness can also be seen in the number of students taking remediation courses upon entering college. In the 2011–12 academic year, the last for which such remediation data was collected, 70% of all First Time in College students at Florida public postsecondary institutions needed remediation in at least one area, including 91% in math, 49% in reading, and 44% in writing (Florida Legislature’s Office of Program Policy Analysis and Government Accountability, 2013).

In an effort to enforce rigor and better ensure students are learning the requisite course content, Florida possesses a robust set of statewide, standardized end-of-course (EOC) exams that are directly tied to content teachers are expected to teach in the classroom. With these, parents and students have an additional data point outside of the traditional course grade for evaluating a student’s content knowledge in a given subject. If teachers are holding students accountable throughout the school year for the standards that students will be assessed on via EOCs, there should be considerable alignment between course grades and EOC scores. However, if many students earn course grades that are higher than their performance on the corresponding EOC would predict, it could be evidence that a portion of teachers and administrative leaders are not holding students accountable to the standards, making them less prepared for success at the postsecondary level or in the workplace. Additionally, this practice could create considerable cognitive dissonance for students and their parents as they are not sure

THE RIGOR GAP

whether their high course grade or low EOC score is a more accurate indicator of their true content knowledge.

To learn more about this potential “rigor gap,” we analyzed administrative data provided by the Florida Department of Education (FLDOE) on students’ transcripts and EOC scores on the two “must pass” exams for graduation, Algebra I and English Language Arts (ELA) Grade 10, from the 2015–16 school year through the 2017–18 school year for students who did not pass one or both of the aforementioned EOCs on their first attempt. Our research found many students possess course grades unlikely to be predicted by their non–proficient EOC score. As a preview of our findings, 72% of non–passing ELA Grade 10 EOC students and 55% of non–passing Algebra I EOC students received a course grade of C or higher. Moreover, 37% of English 2 students and 12% of Algebra I students who did not pass the corresponding EOC received a course grade of B or higher.

Before moving forward, it is worth noting that, while this research was conducted with student data prior to the COVID–19 pandemic, we hypothesize that the drastic impact it had on students’ learning experiences during the 2019–20 spring semester has likely exacerbated the rigor gap presented in the cohorts which comprise our research through, among other things, more lenient grading practices and issues related to delivering high quality distance learning. With the U.S. Department of Education having waived requirements for EOCs such as these during the recently completed 2019–20 school year as a result of the pandemic, our findings provide information relevant to the policy discussion on whether or not statewide, standardized assessment requirements should resume in 2020–21.

Background

Florida Standards Assessments (FSA)

As stated in the Florida Department of Education’s (FLDOE) (2019c) Statewide Assessment Program Information Guide, “the primary purpose of Florida’s K–12 statewide assessment program is to measure students’ achievement of Florida’s education standards.” The two assessments that our research focuses on measure students’ achievement of Florida’s education standards in English 2, which is first attempted almost exclusively by grade 10 students, and Algebra I, which is first attempted by students in a variety of middle and high school grades (predominantly grade 9). The assessment for English 2 is commonly referred to as the “ELA Grade 10 FSA,” and the assessment for Algebra I is commonly referred to as the “Algebra I EOC.” We refer to them as such throughout the remainder of this paper.

While students of public high schools in Florida take a variety of EOCs in English, math, science, and social sciences on their way to graduation, the only two that affect a student’s ability to earn a high school diploma are the Algebra I EOC and the ELA Grade 10 FSA. Each of these exams provides students with a scaled score which falls into one of five achievement levels. If a student’s scaled score on the Algebra I EOC or ELA Grade 10 FSA falls below the range of a Level 3 score, the student must either retake the exam until achieving at least a Level 3 or earn what is referred to as a “concordant score” on an alternative assessment to receive a standard diploma. Using results published by the Florida Department of Education (2019b), we calculated that over the three academic years to which our research pertains, approximately 51% of students passed the ELA Grade 10 FSA. Additionally, the passing rate for first-time test takers of the Algebra I EOC over the same period was 59%, but the passing rates were significantly different for this exam based on whether a student first took the exam in middle school or in high school. Students who took the Algebra I EOC for the first time in middle

THE RIGOR GAP

school had an 89% passing rate, while those who took it for the first time in high school had a 40% passing rate.

There are a variety of options by which students who do not pass the EOCs can earn a concordant score necessary for receiving a standard high school diploma. For most of the students in our sample, these options included earning a particular minimum score on assessments such as relevant sections of the SAT, ACT, or the Postsecondary Education Readiness Test (PERT), a Florida test purposed for placing college students in the appropriate courses (FLDOE, 2020b). In 2018, a revision of state rule added the PSAT Math as an option for use as a concordant score (Statewide, Standardized Assessment Program Requirements, 2018). However, due to the timing of rule implementation, very few of the students in our data would have been affected by this change (FLDOE, 2019a).

Literature Review

There has been scarce theoretical (Betts, 1997; Costrell, 1994) and empirical literature published on the effects of teacher grading standards on student outcomes. Betts (1997) found, theoretically, that schools with higher grading standards induce greater student effort and gains in performance. In using data following a national sample of high school sophomores from 1980 – 1992, Betts and Grogger (2003) found that tougher school grading standards in math increase 12th grade math scores for students in all performance quartiles. They further found that the increase in math grading standards did not have a significant effect on a student’s probability of graduating high school or attending college, but there was a small negative effect on graduation rates for Blacks and Hispanics. However, while their work contained a rich set of student–level controls, there were school–level characteristics not included in their analysis that might be the true driving force of the decrease in the graduation rate among these minority groups. Bonesrønning (2004) also found that lower secondary school students in Norway (13–16 years old) exposed to harder grading practices in mathematics perform significantly better than other students. Additionally, he found that easy grading is more likely to take place in classes with high average performance.

Figlio and Lucas (2004) provide the only empirical study on this issue using Florida data, to our knowledge. Using Alachua county student–level data on 3rd, 4th, and 5th grade students, including Florida Comprehensive Assessment Test (FCAT) scores (a predecessor of Florida’s current FSAs), from school years 1995–1996 through 1998–1999, they found that “on average, teachers tend to grade less stringently than the state standards (as reflected in the FCAT scores) indicate they should.” For example, 61% of “B students” and 17% of “A students” were not proficient on the FCAT. However, teachers with high grading standards were found to have a

THE RIGOR GAP

positive significant effect on the change in students' math and reading test scores. More recently, in examining students' Algebra I course grades and EOC results in North Carolina, Gershenson (2018) found that 36% of Algebra I students who scored a "B" in the classroom did not pass the state's corresponding EOC.

Figlio and Lucas (2004) and Gershenson (2018) both provide examples of large numbers of students receiving course grades that are higher than what their corresponding EOC scores would predict. This could have adverse consequences on the amount of content a student learns in a given year, as they might believe they know the content better than they actually do. As a result of possessing course grades that are higher than they should be, students might spend less time studying to actively acquire the content knowledge. While we are unaware of any such research looking at K–12 students, Babcock (2010) analyzed data on university students and found that the average time a student spent studying was 50% lower in a class in which the average expected grade of the students in the class was an "A" than in the same course taught by the same instructor in which students expected a "C."

Gershenson (2020) also provides the first research, to our knowledge, to look at the effects of teacher grading standards on the learning gains of middle and high school students in the United States. Using data on Algebra I students in North Carolina from 2006–2016, he found that teachers with higher grading standards increase student learning – regardless of the student's gender, race, or ethnicity. He also found that teacher grading standards tend to be higher at more affluent schools, thus "provid[ing] more evidence of the 'soft bigotry of low expectations' for relatively disadvantaged students."

Our research adds to the current literature by providing the course grade distribution of Algebra I and Grade 10 English students who did not pass the corresponding EOC in Florida.

THE RIGOR GAP

Also, while others have looked at the relationship between course grades and end-of-course exam scores in Algebra I (Gershenson, 2018, 2020), our research is the first, to our knowledge, to look at the relationship between course grades and EOC results in a high school English course.

Methodology

The data utilized in this project consists of student transcript data, English Language Arts (ELA) Grade 10 FSA score data, and Algebra I EOC score data provided by the Florida Department of Education (FLDOE) for students who attempted an Algebra I course, English 2 (10th Grade) course, or both, during the school years 2015–16 through 2017–18. This provided English 2 course grades and ELA Grade 10 FSA scores for 498,164 students, as well as Algebra I course grades and EOC scores for 511,225 students. As privacy laws mandate, the data provided by FLDOE is void of personally identifiable information (e.g., first and last name, social security number, etc.).

In an effort to prevent having to account for the effect additional time and instruction on the material may have on a student's EOC/FSA score (Gershenson, 2018), the observations in our sample were limited to a student's first attempt at the relevant Algebra I course or English 2 course, and its affiliated end-of-course exam. From here, we restricted our sample to include only students who took the same course (e.g., students who did not switch from regular to honors, or vice versa) at the same school, for the full one credit, without pausing their attempt to complete the course. Limiting the sample to students who fit these parameters enabled us to better ensure that the course grade of a student in our sample is based on the judgment and assessment practices of only one teacher. A student who has attempted the full credit course without pause is one where the course is attempted in one school term or contiguous school

THE RIGOR GAP

terms (e.g., semesters 1 and 2). Removing observations that did not fit these parameters yielded 456,912 students with English 2 and ELA Grade 10 FSA scores, and 477,896 students with Algebra I course grades and EOC scores.

While this data included students with FSA and EOC scores at every level (1–5), we were advised by FLDOE to only consider the cases of students who did not pass the respective end of course exam, that is, students with a score of Level 1 or Level 2 on either the Algebra I EOC or ELA Grade 10 FSA. Ultimately, this provided 230,458 students with English 2 course grades and ELA Grade 10 FSA scores, and 202,308 students with Algebra I course grades and EOC scores.

Table 1*Numeric Grade**Conversion*

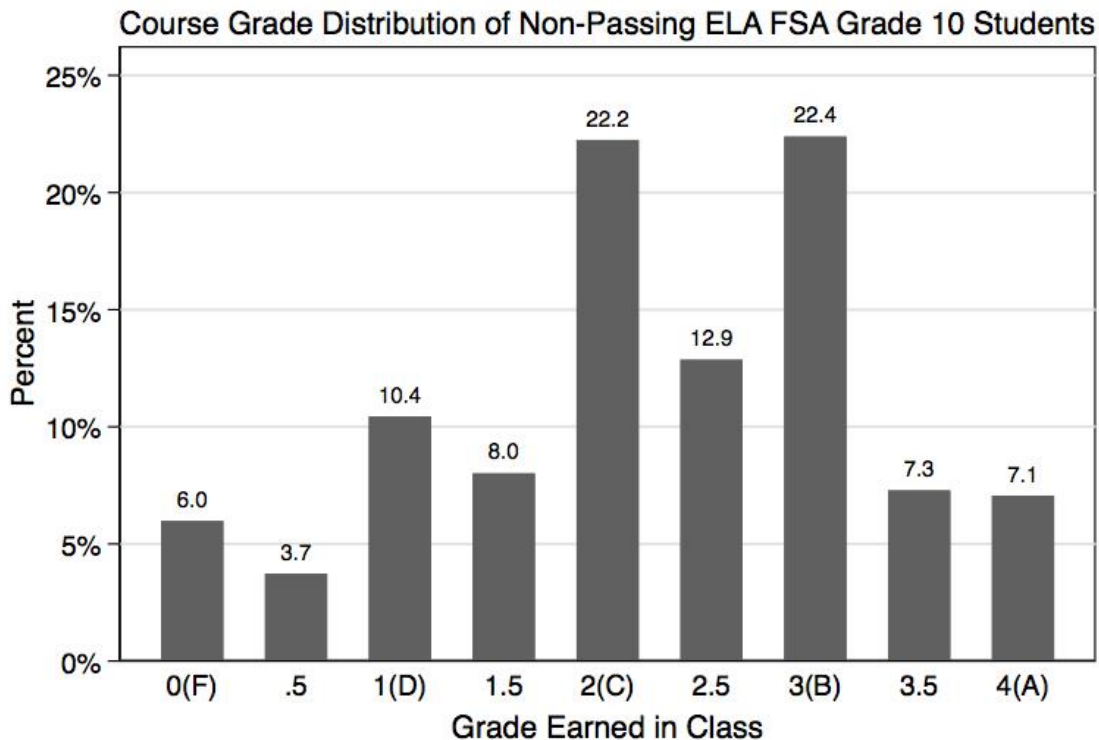
Grade	Number
A	4
B	3
C	2
D	1
F	0

The grade value provided in the transcript data was in the form of a letter grade (A–F). For the purposes of our work, we converted the letter grade to its typical numeric value (see Table 1). With the transcript data being organized by unique student identifier, year, course, and term, there was not an annual course grade provided for all students. For some, an annual course grade was provided, and this was noted as such through the value of the term variable in the transcript data, but, oftentimes, the course grade provided was the grade earned in the course during a specific term, rather than the entire year. To generate an annual course grade for these students that did not have one provided in the data, we took the average of their course grades over each of the terms the student was enrolled in during their first attempt of the course. For example, a typical student’s transcript had a grade earned during semester 1 and a grade earned during semester 2 for a given course. If a student earned a 3(B) in semester 1 and a 2(C) in semester 2, their annual course grade for our analysis would be a 2.5. As a check on the robustness of our descriptive results, we also conducted our analyses using only observations in the data that did provide us with the final grade a student earned – needing no averaging to be done on our part. There were no significant differences (see Appendix A).

Results

English 2 and the ELA Grade 10 FSA

Many students received grades in their English 2 course that were higher than their non-passing ELA Grade 10 FSA exam scores would likely predict. Figure 1 provides the English 2 course grade distribution of the students who did not pass the ELA Grade 10 FSA over the three academic school years in our study. From this, we can see that the most common grade earned by students who did not pass the exam is a 3(B) (22.4% of all non-passing students), with 2(C) following closely behind (22.2%). In addition, approximately 10% of students who did not pass the Grade 10 ELA FSA earned below a 1(D) in English 2, while 72% earned a 2(C) or above (Figure 2).

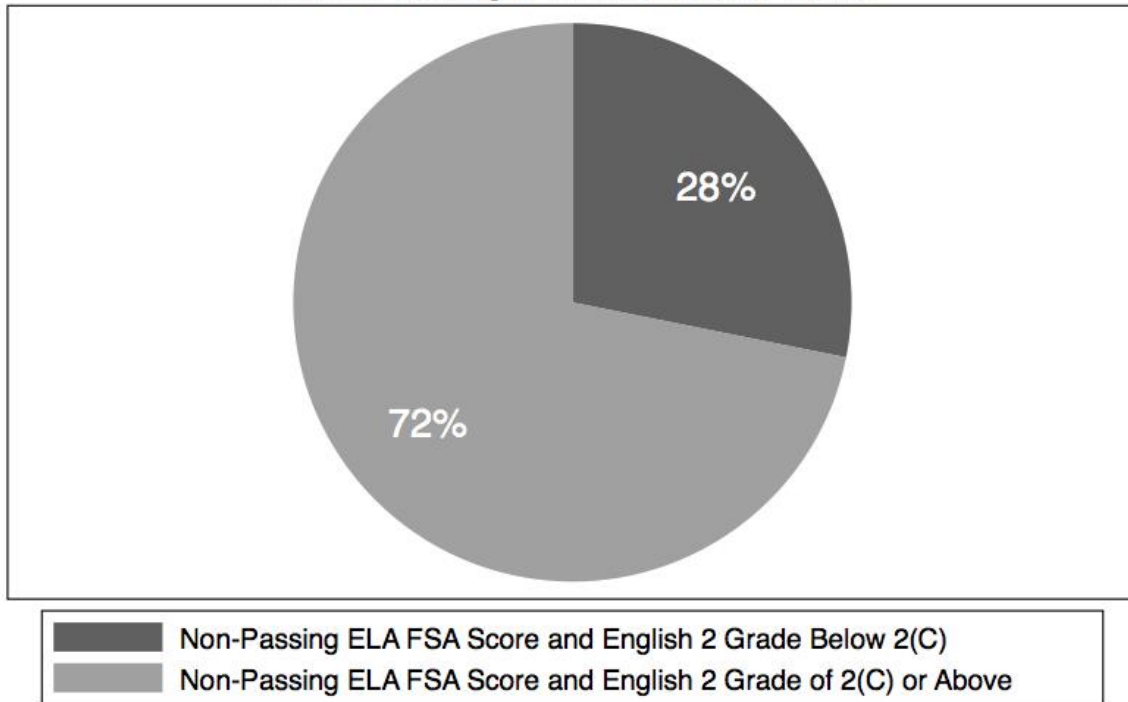


Note: Data from 2015-16 school year through 2017-18 school year (230,458 students)

Figure 1

THE RIGOR GAP

Relationship Between English 2 Grades
and Non-Passing ELA FSA Grade 10 Scores



Note: Data from 2015-16 school year through 2017-18 school year (230,458 students)

Figure 2

THE RIGOR GAP

While Figure 1 combines Grade 10 ELA FSA non-passing students together, Figures 3 and 4 present separate course grade distributions for Level 1 and Level 2 students, respectively.

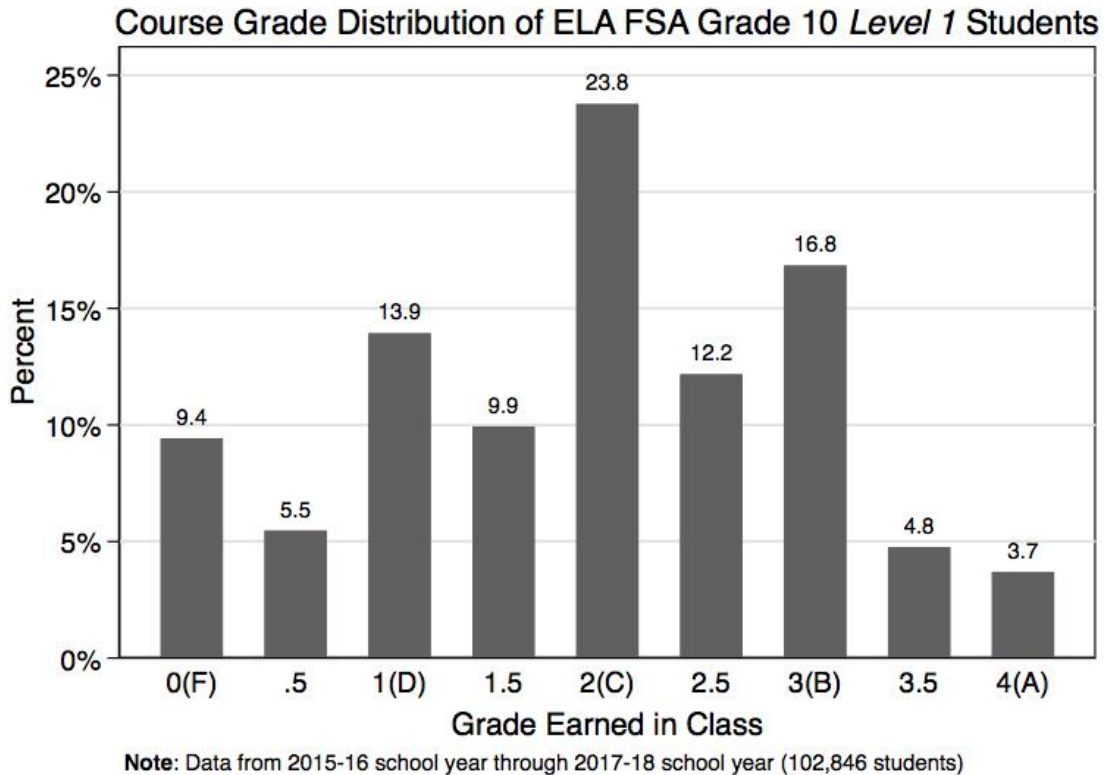


Figure 3

The most common grade earned in the classroom by Level 1 students was a 2(C) (23.8% of Level 1 students). Just over a quarter of Level 1 students earned a 3(B) or higher in the classroom, and approximately 15% earned below a 1(D).

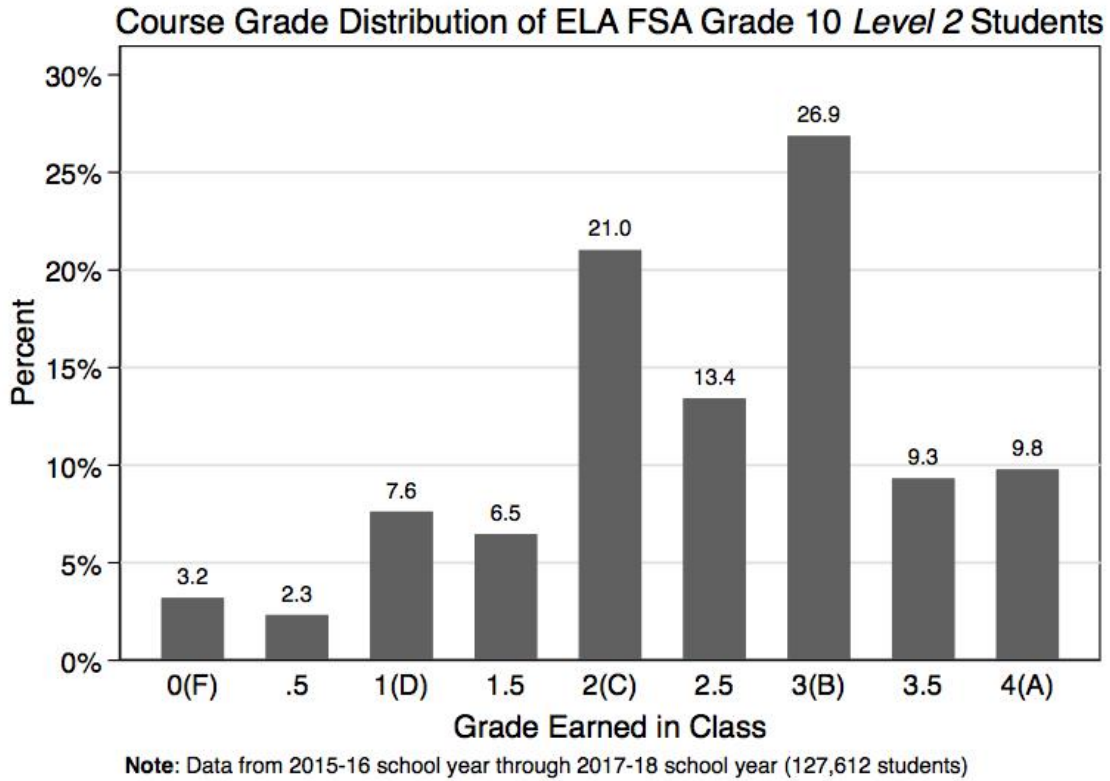


Figure 4

Among Level 2 students, the most common grade was a 3(B) (26.9% of Level 2 students). In fact, nearly half of all Level 2 students (46%) earned a 3(B) or higher in the classroom. Conversely, about 13% of these students earned a 1(D) or below.

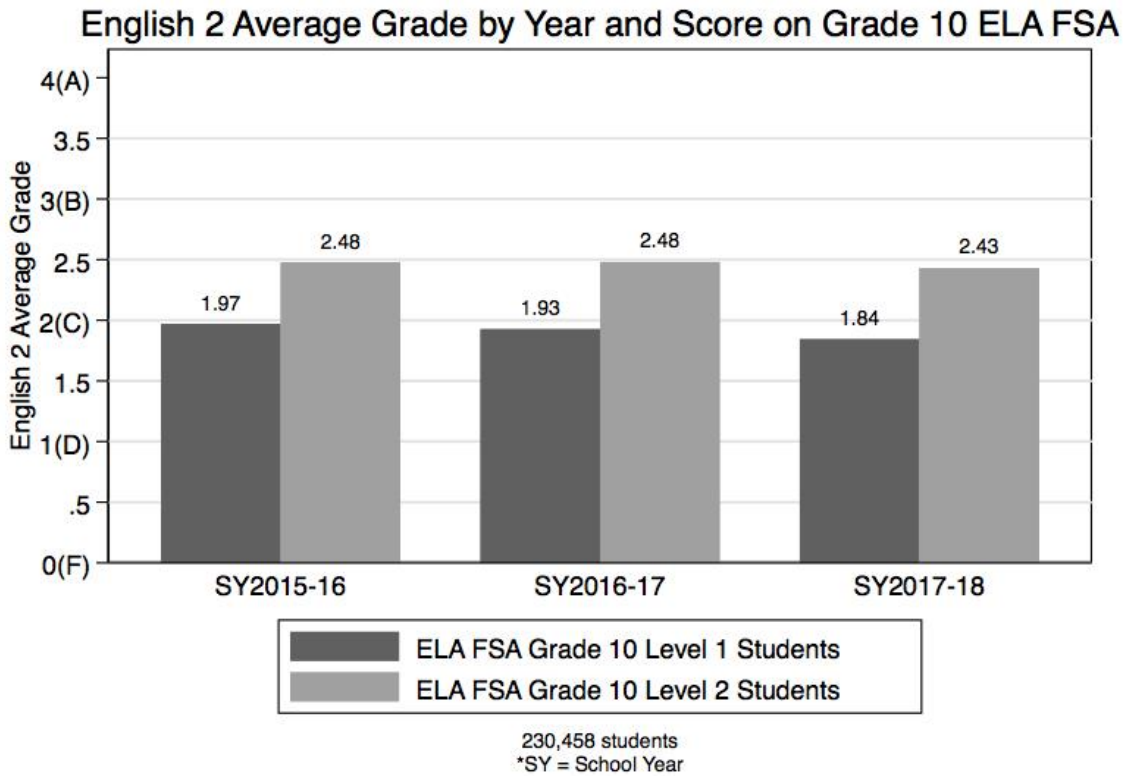


Figure 5

Figure 5 illustrates that our findings on course grades and end-of-course exam scores are not driven by a change in grading practices in any particular school year. The average English 2 course grade for a given EOC score remained very consistent over the three academic years in our sample.

THE RIGOR GAP

Algebra I and the Algebra I End of Course (EOC) Exam

Examining the course grade distribution of non-passing Algebra I EOC students (Figure 6), the most common grade was a 2(C) (40.6%), and roughly 84% of Algebra I EOC non-passing students earned a 1(D) or higher in the class. More than half (55%) earned a 2(C) or higher as a course grade (Figure 7).

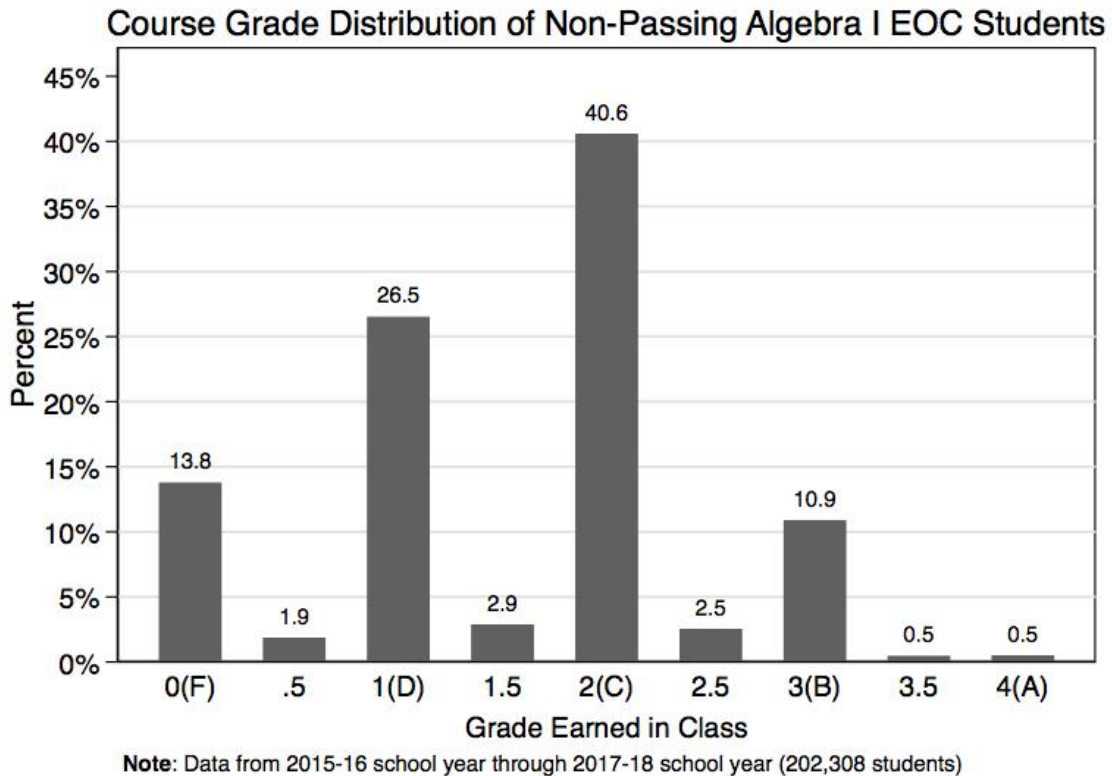
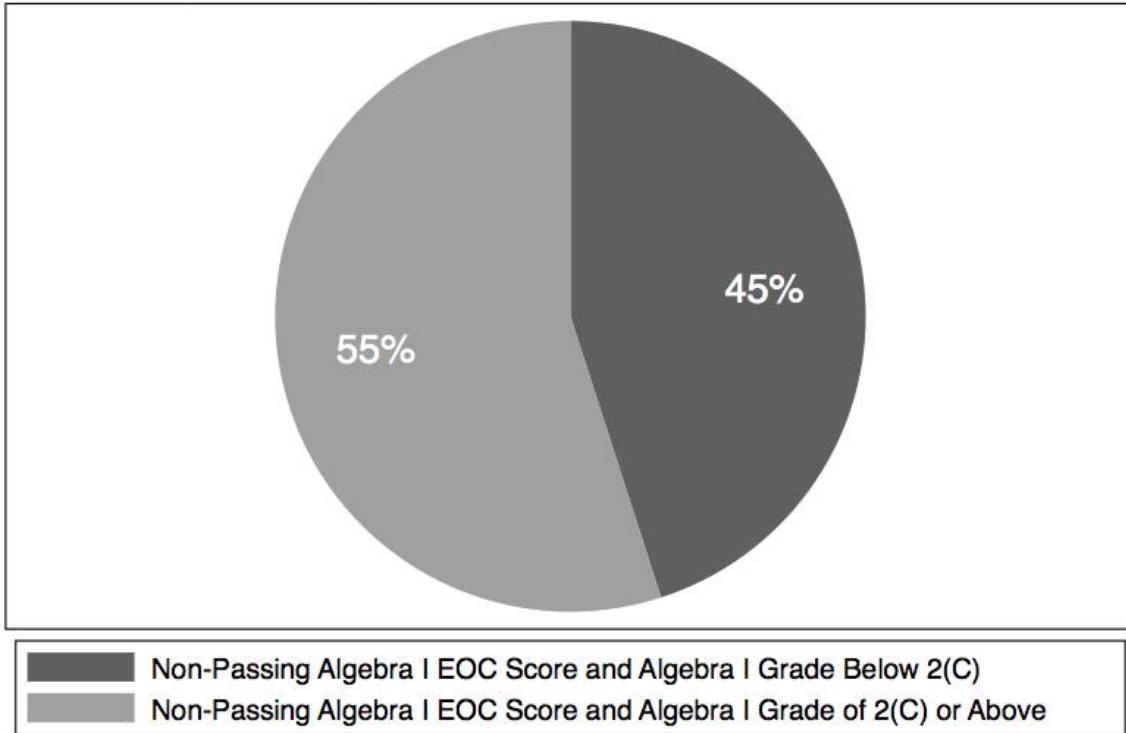


Figure 6

THE RIGOR GAP

Relationship Between Algebra I Course Grades and Non-Passing EOC Scores



Note: Data from 2015-16 school year through 2017-18 school year (202,308 students)

Figure 7

THE RIGOR GAP

Just as was done with the English 2 data, we present the course grade distributions of Level 1 and Level 2 Algebra I EOC students separately in Figures 8 and 9.

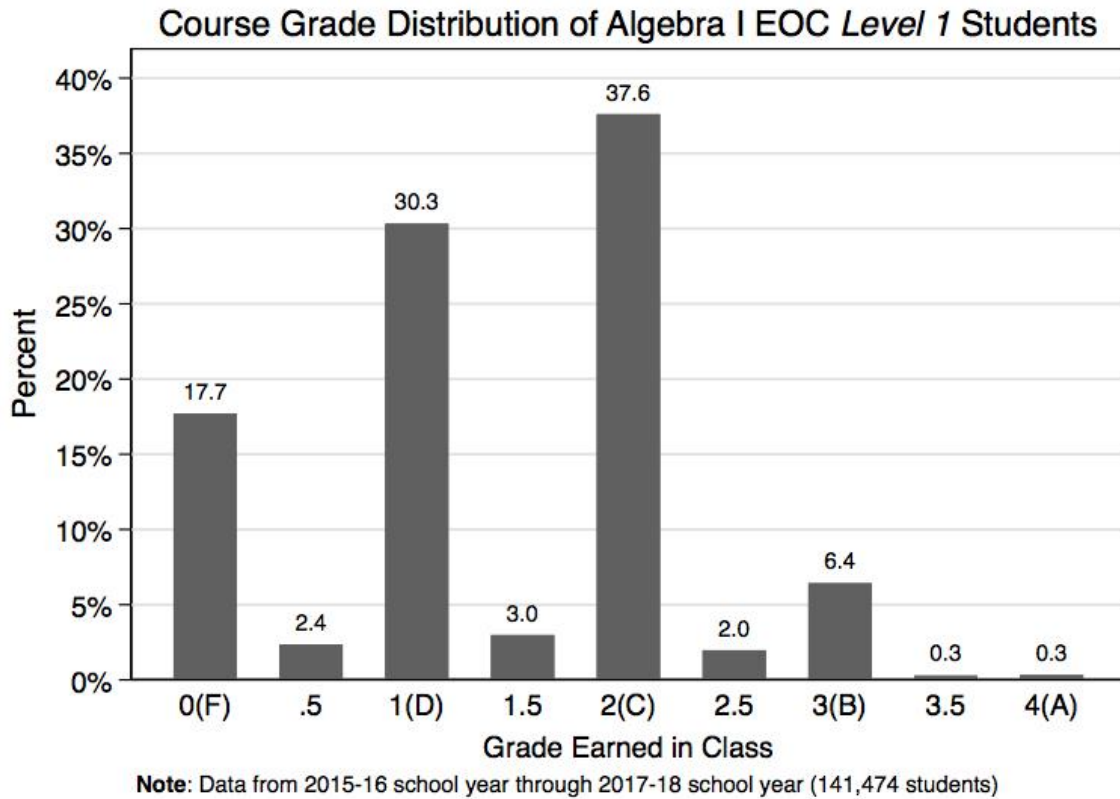


Figure 8

THE RIGOR GAP

In both cases, the most common grade earned was a 2(C) (37.6% of Level 1 students and 47.5% of Level 2 students). Moreover, greater than 20% of students who scored a Level 2 on the EOC received a 3(B) in the classroom.

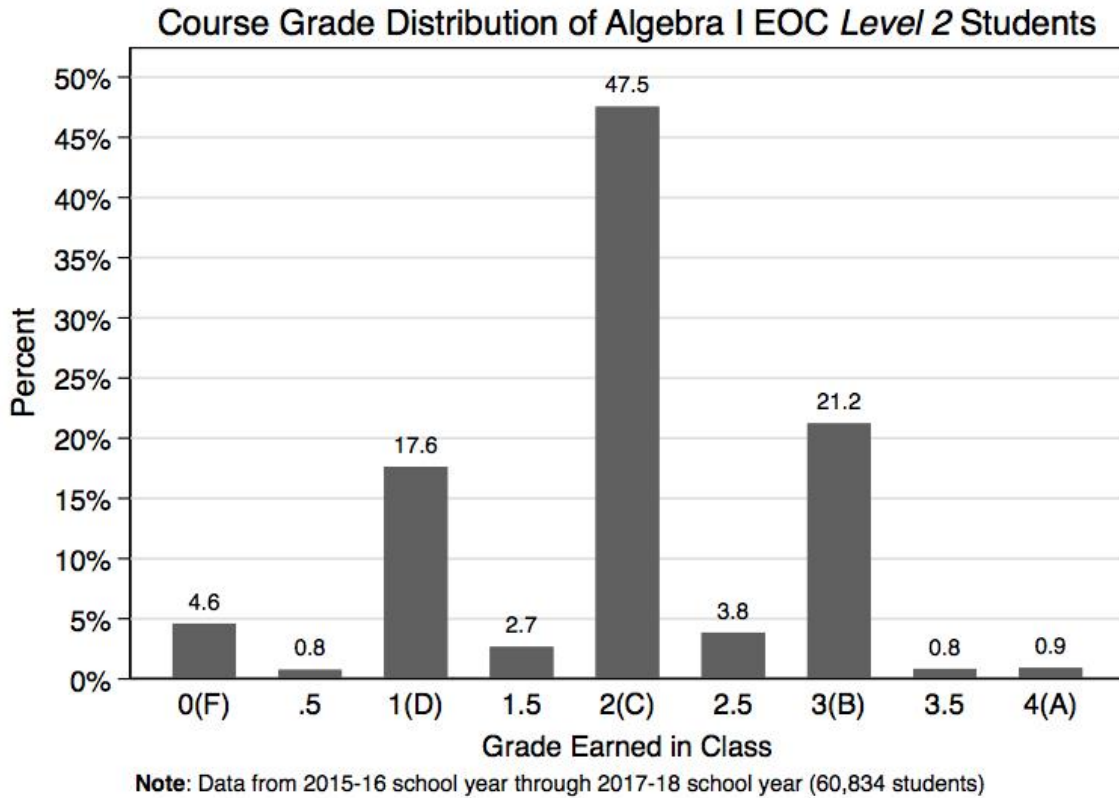


Figure 9

THE RIGOR GAP

As was found in the English 2 data, the average course grade earned by Algebra I students who did not pass the EOC varied little over the three academic years in our study (Figure 10). Thus, our findings were not affected by a change in grading practices in any one particular academic year.

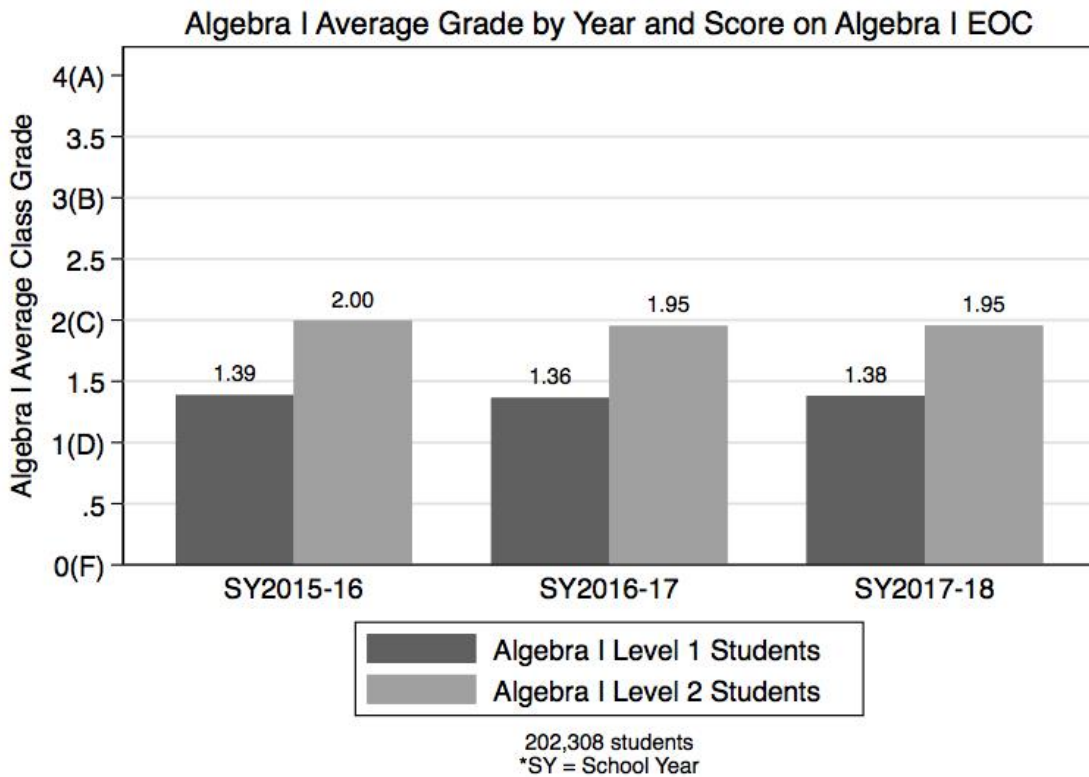


Figure 10

Discussion

Findings and Implications

Our research indicates an apparent disconnect between the rigor of the expectations of student content knowledge in the classroom and the rigor of Florida’s EOCs. With the most common grade earned by non-proficient Grade 10 ELA FSA students being a B and 55% of non-proficient Algebra I students earning a course grade of C or higher, a number of teachers appear to have a lower definition of proficiency than that of the state assessments which were

THE RIGOR GAP

designed to provide a safety net for ensuring that graduates have the foundational skills necessary to succeed after high school. Figlio (2004) also found this to be the case in his research on Alachua county elementary students, as did Gershenson (2018) in his research on Algebra I students in North Carolina. With the U.S. Department of Education having waived requirements for EOCs such as these during the recently completed 2019–20 school year as a result of the COVID–19 pandemic, our findings provide information relevant to the policy discussion on whether or not statewide, standardized assessment requirements should resume in 2020–21.

When the course is easier than it should be in terms of how a student is assessed, less human capital is likely to be accumulated during the school year. Students will likely study less than they would if their teacher held them to a higher standard (Babcock, 2010), and by the time the student has received their EOC score which raises the question of which measurement of knowledge should be given more credence, it is time to enjoy summer recess or focus on the next class in the subject’s succession. The student is likely less able to devote the time and energy to the subject matter they have just learned they are not proficient in.

To our knowledge, there is no data currently available to explicitly quantify the effect of the COVID–19 pandemic on the rigor gap our research observes in prior school years. That said, we hypothesize the rigor gap has increased as a result of, among other factors, relaxed grading policies and issues related to delivering high quality distance learning. Education Week found that during the 2019–20 spring semester affected by the pandemic, at least 16 states suggested or mandated a “do no harm” method of grading so as to avoid damaging a student’s academic standing, and 9 states adopted a pass/fail system (Schwartz, 2020). Similarly, Malkus et al (2020) found that only 67% of schools were in districts whose websites mentioned that student

THE RIGOR GAP

assignments were being graded and at least 28% of schools were under district policies that grades “can only go up” from the time school buildings closed. Moreover, 12% of schools were in districts whose websites made clear that work would not be graded (as of May 29th). Multiple Florida school districts adopted these policies that grades could only increase, or that work would not be graded, during the distance learning period (e.g., Clay County District Schools, 2020; Davidson-Hiers, 2020). In related work, Gross & Opalka (2020) found that just 42% of school districts expect teachers to collect student work, grade it, and include it in final course grades for at least some students. This lack of incentive to work to raise a “C” to a “B” – or to receive any grade at all – likely decreased many students’ mastery of standards typically covered in the latter half of the school year.

As for the quality of the impromptu distance learning experienced by students during the pandemic, Malkus et al (2020) found that only 20% of schools were in districts offering “rigorous” remote instruction defined by, among other characteristics: relying primarily on online platforms; expecting all students to participate by either explicit statements or formally taking attendance; and requiring that teachers grade students’ work based on either completion or performance. Additionally, the quality of instruction varied regionally, as Gross & Opalka (2020) noted that only 27% of rural districts in their research expected teachers to provide instruction, compared with just over half of urban school districts. Economic differences were also present, as the most affluent quartile of districts in their sample were twice as likely to expect live video instruction from teachers than the least affluent quartile. These issues related to delivering quality remote learning experienced by many during the pandemic likely increased the rigor gap.

THE RIGOR GAP

Given the findings in our research showing a significant number of students earning high grades in Algebra I and English 2 while failing the corresponding EOC, one may question if the EOCs are more difficult than necessary. However, Florida’s performance on nationally recognized standardized tests (e.g. SAT, ACT, and NAEP results presented in the Introduction section of this paper) would appear to suggest this is not the case. Further, if the Algebra I EOC and ELA Grade 10 FSA were not “must pass” assessments, teacher grading standards would be the primary accountability mechanism ensuring student academic fitness for graduation. In that event, it is worth noting that from 2005–2018, student retention in Florida public schools declined significantly – especially at the high school level (see Figure 11) (FLDOE, 2020a, 2020c, 2020d; personal communication, January 9, 2020). For example, the number of 8th and 9th grade students being retained declined by 49% and 83%, respectively, between 2005 and 2018.

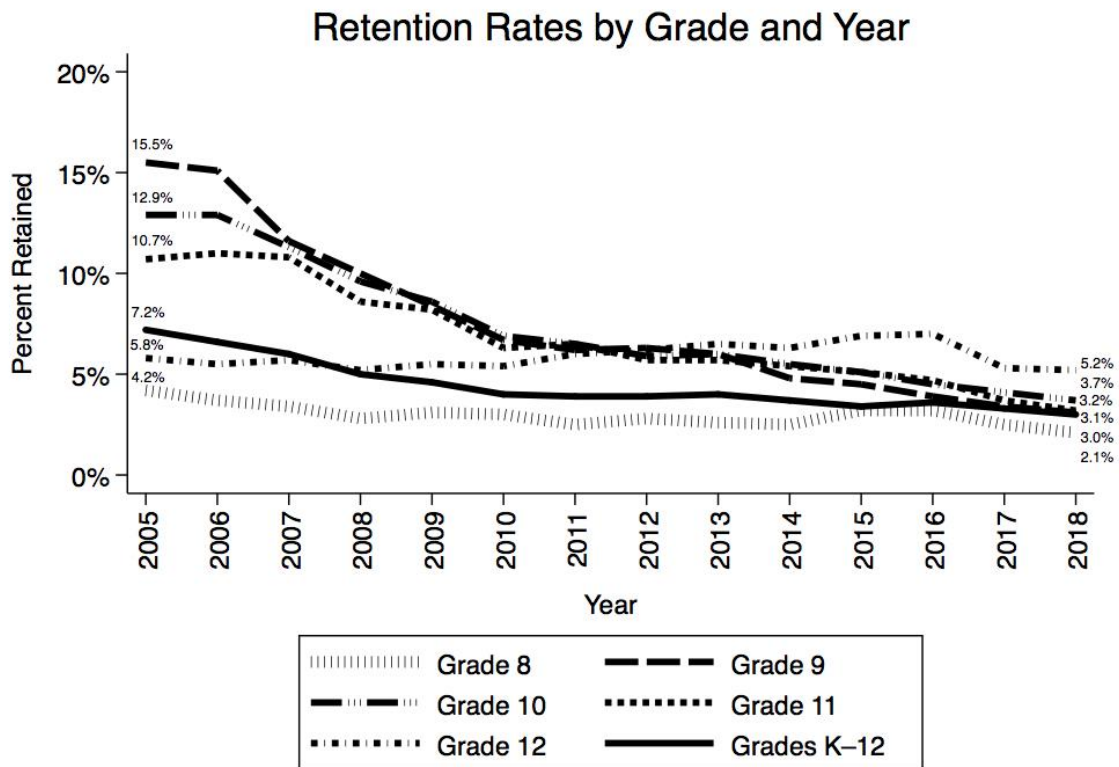


Figure 11

A large decrease in retention is justified if students’ academic abilities are significantly improving over time, but 8th grade NAEP scores in Florida show the number of students performing below the Basic level in Reading and Mathematics only decreased by six and one percentage point, respectively, over this same time period (National Assessment of Educational Progress [NAEP], 2020). To look into student learning gains further, we can see what has occurred on the Grade 12 NAEP scores in Florida. The test was administered for the first time in 2009 and again in 2013. Between these two administrations, the percentage of students performing below Basic in Reading and Mathematics decreased by two and one percentage point, respectively (NAEP, 2013a, 2013b). If the drop in retention was due to students possessing greater knowledge over time, we would expect to find gains on these nationally–

THE RIGOR GAP

recognized measures of student learning which better correlate with the significant drop in retention.

As mentioned in the Background section of the paper, students who do not pass either of the EOCs in our research must retake the exam until they earn a passing score, or earn a concordant score on an alternative assessment (e.g., SAT, ACT, PERT). That said, while earning a concordant score enables a student to pursue college, it does not necessarily mean they have demonstrated college readiness. For example, an Algebra I EOC concordant score could be achieved for many of the students in our data by scoring a 97 or higher (scale range: 50–150) on the PERT Mathematics exam (FLDOE, 2019a). However, the college-ready score is a minimum of 114 (FLDOE, 2020b), and state education officials have stated the PERT is not as rigorous as the current math standards (News Service of Florida, 2018). The SAT Math subsection is another option where the concordant score of 420 is below the SAT's stated college-readiness score of 530. For English, students in our dataset could earn a concordant score by, among other options, scoring at least a 430 on SAT Evidence-Based Reading and Writing (EBRW) – 50 points below what the SAT defines as a college-ready score on that particular subtest (480). However, it is worth noting that current Florida rule raises the SAT EBRW concordant score up to the SAT-defined college ready score of 480 for students who enter Grade 9 in the 2018–19 school year and beyond, but the ACT-related concordant score for the Grade 10 ELA FSA remains below the ACT's college ready benchmark (Statewide, Standardized Assessment Program Requirements, 2018).

Limitations

It is important to note the descriptive analyses presented in our research cannot illuminate the specific mechanism(s) by which some students arrive at a higher course grade than their EOC score would merit. One of the potential avenues by which this rigor gap may operate is in the

THE RIGOR GAP

weighting teachers assign to the broad categories their graded assignments and assessments fall into. While a student's EOC grade is a summative assessment of their knowledge of the content, a student's course grade is oftentimes a function of much more than their personal knowledge of the content. For example, a student's grade might be heavily based on their performance on collaborative exercises, homework graded solely on completion, and activities that reflect effort rather than mastery, which might not necessarily demonstrate a specific student's knowledge of the content. If there are enough assignments such as this of a significant weight throughout the year, it might obfuscate the student's overall performance on tests and quizzes – assignments that generally require the student to independently and explicitly demonstrate content knowledge – and, ultimately, lead to a course grade that does not accurately reflect the student's knowledge of the content. In fact, a 2018 national survey showed 48% of elementary and middle school teachers say report card grades reflect effort more than achievement (Learning Heroes, 2019). This contrasts with parents' perceptions of the meaning of class grades, as 84% of K–12 parents believe report card grades reflect grade-level achievement (Learning Heroes, 2019). Also, Gershenson (2020) found anecdotally that another mechanism potentially enabling the rigor gap is teachers "often report[ing] pressure from others to confer high grades or to pass students."

While we believe much is to be gained from the various descriptive statistics and graphs presented in this paper, it leaves much to be learned as to any causal relationship existing between teacher grading standards and performance on the corresponding end-of-course exam in Florida. Building a statistical model that includes an exogenous, acceptable metric for determining a teacher's grading standard (as in Figlio & Lucas (2004) and Gershenson (2020)) while also controlling for the various factors that could affect the relationship between teacher grading standards and end-of-course exam results, such as race, gender, year of attempt, teacher

THE RIGOR GAP

characteristics, classroom composition, and school effects would enhance our understanding as to what extent student learning could be improved by teachers who grade with greater alignment to student's knowledge of the content standards as illustrated by their EOC performance. That being said, Figlio and Lucas (2004) and Gershenson (2020) both provide explicit evidence that higher teacher grading standards improve students' learning gains.

Further, for the desired aforementioned model to provide a robust explanation of the relationship between teacher grading standards and the corresponding end-of-course exam scores, the data would need to also include students who passed the end-of-course exam. Without this, a statistical model of the student population we currently have would only explain the effect an increase in teacher grading standards has on EOC scores for students who do not pass the EOC. On the other hand, a model which included all students would be able to express the effect, on average, for all students – not just those that did not pass the EOC. Research cannot inform on how to help students reach proficiency if none of those observed have achieved it.

Also, the rigor gap evidenced in the data on students who did not pass the end-of-course exam makes it likely that this is also occurring with students who do pass. While earning a Level 3 on the EOC after receiving an A in the classroom might not be as concerning for students and their parents as earning a Level 2 after receiving a B, they are both examples of contrasting scores creating cognitive dissonance in terms of assessing a student's true knowledge of the content. With 46% of Level 2 ELA Grade 10 FSA students and over 22% of Level 2 Algebra I EOC students earning a course grade of B or higher, many students and their families are not sure which measure to trust as the true indicator of content knowledge. Finding out the

THE RIGOR GAP

full extent to which the rigor gap is occurring necessitates data on students of all performance levels.

Lastly, while our data showed the average grade for a given EOC score slightly decreased in both Algebra I and English 2, we do not believe this should be taken as definitive evidence that grading is trending downward. For example, Gershenson's (2018) research presents the change in median cumulative GPA of students in North Carolina from 2005–16 and finds that, while the median cumulative GPA did clearly trend upward over that time, there were periods throughout that time frame where the median cumulative GPA did fall. More academic years than what is included in our research should be used in determining the overall trend in course grades.

Conclusion

With attaining a postsecondary credential becoming an ever more necessary component of achieving financial self-sufficiency, it is important that students are provided an accurate understanding of how prepared they are while they are in high school for the road that lies ahead. However, it appears that many students and their parents face a cognitive dissonance of sorts as they try to ascertain whether the EOC score or course grade is a better evaluation of the student's content knowledge. If many are choosing to put greater faith in the course grade over the EOC score, they may find themselves less prepared for postsecondary work than anticipated. While our research cannot provide causal evidence that teachers with grading standards more closely aligned with students' EOC scores improve student outcomes, others have found this evidence at the elementary level (Figlio and Lucas, 2004) or in another state (Gershenson, 2020). Therefore, we do believe our work invites further research to be done on the topic in Florida and provides information relevant to the policy discussion surrounding the resumption of statewide, standardized assessments. Lastly, while our research does not include the recent school year impacted by the COVID-19 pandemic, we hypothesize that the lenient grading practices and issues related to delivering high quality distance learning, among other things, present during the pandemic has exacerbated the demonstrated rigor gap with this recent cohort of students.

References

- ACT. (2019). *The Condition of College & Career Readiness 2019: Florida Key Findings*.
<http://www.act.org/content/dam/act/unsecured/documents/cccr-2019/Florida-CCCR-2019.pdf>
- Babcock, P. (2010). Real Costs of Nominal Grade Inflation? New Evidence From Student Course Evaluations. *Economic Inquiry*, 48(4), 983-996.
- Betts, J. (1997). *Do Grading Standards Affect the Incentive to Learn?* (University of California, San Diego Department of Economics Discussion Paper 97–22).
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=76459
- Betts, J. & Grogger, J. (2003). The Impact of Grading Standards on Student Achievement, Educational Attainment, and Entry-Level Earnings. *Economics of Education Review*, 22, 343-352.
- Bonesrønning, H. (2004). Do the Teachers' Grading Practices Affect Student Achievement? *Education Economics*, 12(2), 151-167.
- Clay County District Schools. (2020). *OneClay Secondary Parent Guidance For Exams, Grading, & Promotion*.
<https://docs.google.com/document/d/1SFb2q2Hy6yY9zsJI0tGXYNxDIjVHsYU7GrLrGXCsIio/edit>
- CollegeBoard. (2019a). *SAT Suite of Assessments Annual Report: Florida*.
<https://reports.collegeboard.org/pdf/2019-florida-sat-suite-assessments-annual-report.pdf>
- CollegeBoard. (2019b). *SAT Suite of Assessments Annual Report: Total Group*.
<https://reports.collegeboard.org/pdf/2019-total-group-sat-suite-assessments-annual-report.pdf>

THE RIGOR GAP

Costrell, R. (1994). A Simple Model of Educational Standards. *The American Economic Review*, 84(4), 956-971.

Davidson-Hiers, C.D. (2020, April 28). Leon County Schools: Grades for final quarter will be on a curve as a 'safety net.' *Tallahassee Democrat*.
<https://www.tallahassee.com/story/news/2020/04/28/leon-county-schools-grades-final-quarter-curve-safety-net/3038509001/>

Figlio, D. & Lucas, M. (2004). Do High Grading Standards Affect Student Performance? *Journal of Public Economics*, 88, 1815-1834.

Florida Department of Education. (2019a). *Graduation Requirements for Florida's Statewide Assessments*. <http://www.fldoe.org/core/fileparse.php/7764/urlt/GradRequireFSA.pdf>

Florida Department of Education. (2019b). *Results*.
<http://www.fldoe.org/accountability/assessments/k-12-student-assessment/results/>

Florida Department of Education. (2019c). *Statewide Assessment Program Information Guide 2019-2020*. <http://www.fldoe.org/core/fileparse.php/5663/urlt/swapig.pdf>

Florida Department of Education (2020a). *Archives*. <http://www.fldoe.org/accountability/data-sys/edu-info-accountability-services/pk-12-public-school-data-pubs-reports/archive.shtml>

Florida Department of Education. (2020b). *Common Placement Testing*.
<http://www.fldoe.org/schools/higher-ed/fl-college-system/common-placement-testing.shtml>

Florida Department of Education. (2020c). PK–20 Portal.
<https://edstats.fldoe.org/SASPortal/main.do>

Florida Department of Education. (2020d). *Students*.
<http://www.fldoe.org/core/fileparse.php/7584/urlt/1718NonPromotions.xlsx>

THE RIGOR GAP

Florida Legislature's Office of Program Policy Analysis and Government Accountability. (2013, February 20). *College Remediation*. Presentation before the Senate Education

Appropriations Subcommittee.

Gershenson, S. (2018). *Grade Inflation in High Schools (2005-16)*.

<https://edexcellence.net/publications/grade-inflation-in-high-schools>

Gershenson, S. (2020). *Great Expectations: The Impact of Rigorous Grading Practices on Student Achievement*. <https://fordhaminstitute.org/national/research/great-expectations-impact-rigorous-grading-practices-student-achievement>

Gross, B., & Opalka, A. (2020, June). *Too Many Schools Leave Learning to Chance During the Pandemic*. <https://www.crpe.org/publications/too-many-schools-leave-learning-chance-during-pandemic>

Learning Heroes. (2019). *The Case for an Accurate Picture: Parent Mindsets on Education*.

https://r50gh2ss1ic2mww8s3uvjvq1-wpengine.netdna-ssl.com/wp-content/uploads/2019/10/Learning-Heroes_Trends-Piece-Booklet_R01.pdf

Malkus, N., Christensen, C., & Schurz, J. (2020, June). *School District Responses to the COVID-19 Pandemic: Round 6, Ending the Year of School Closures*.

<https://www.aei.org/research-products/report/school-district-responses-to-the-covid-19-pandemic-round-5-plateauing-services-in-americas-schools/>

National Assessment of Educational Progress. (2013a). *Mathematics 2013 State Snapshot Report: Florida Grade 12 Public Schools*.

<https://nces.ed.gov/nationsreportcard/subject/publications/stt2013/pdf/2014082FL12.pdf>

THE RIGOR GAP

National Assessment of Educational Progress. (2013b). *Reading 2013 State Snapshot Report: Florida Grade 12 Public Schools*.

<https://nces.ed.gov/nationsreportcard/subject/publications/stt2013/pdf/2014081FL12.pdf>

National Assessment of Education Progress. (2019a). *2019 Mathematics State Snapshot Report: Florida*.

<https://nces.ed.gov/nationsreportcard/subject/publications/stt2019/pdf/2020013FL8.pdf>

National Assessment of Education Progress. (2019b). *2019 Reading State Snapshot Report: Florida*.

<https://nces.ed.gov/nationsreportcard/subject/publications/stt2019/pdf/2020014FL8.pdf>

National Assessment of Educational Progress. (2020). *NAEP Data Explorer*.

<https://www.nationsreportcard.gov/ndecore/landing>

News Service of Florida. (2018, May 17). Higher test score standards could lead to drop in graduation rates. *Florida Politics*. <https://floridapolitics.com/archives/263898-higher-test-score-standards-could-lead-to-drop-in-graduation-rates>

Schwartz, S. (2020, May 14). States All Over the Map on Remote Learning Rigor, Detail.

Education Week. <https://www.edweek.org/ew/articles/2020/05/13/enormous-variation-among-state-online-learning-programs.html>

Shapiro, D., Dundar, A., Huie, F., Wakhungu, P., Bhimdiwala, A., & Wilson, S. (2019,

February). *Completing College: A State-Level View of Student Completion Rates*

(*Signature Report No. 16a*). Herndon, VA: National Student Clearinghouse Research Center.

Statewide, Standardized Assessment Program Requirements, F.A.C. 6A–1.09422 (2018).

THE RIGOR GAP

YouthTruth. (2017). *Learning From Student Voice: How prepared do students feel for college and career?* <https://youthtruthsurvey.org/college-career-readiness-2017/#section1>

Appendix A

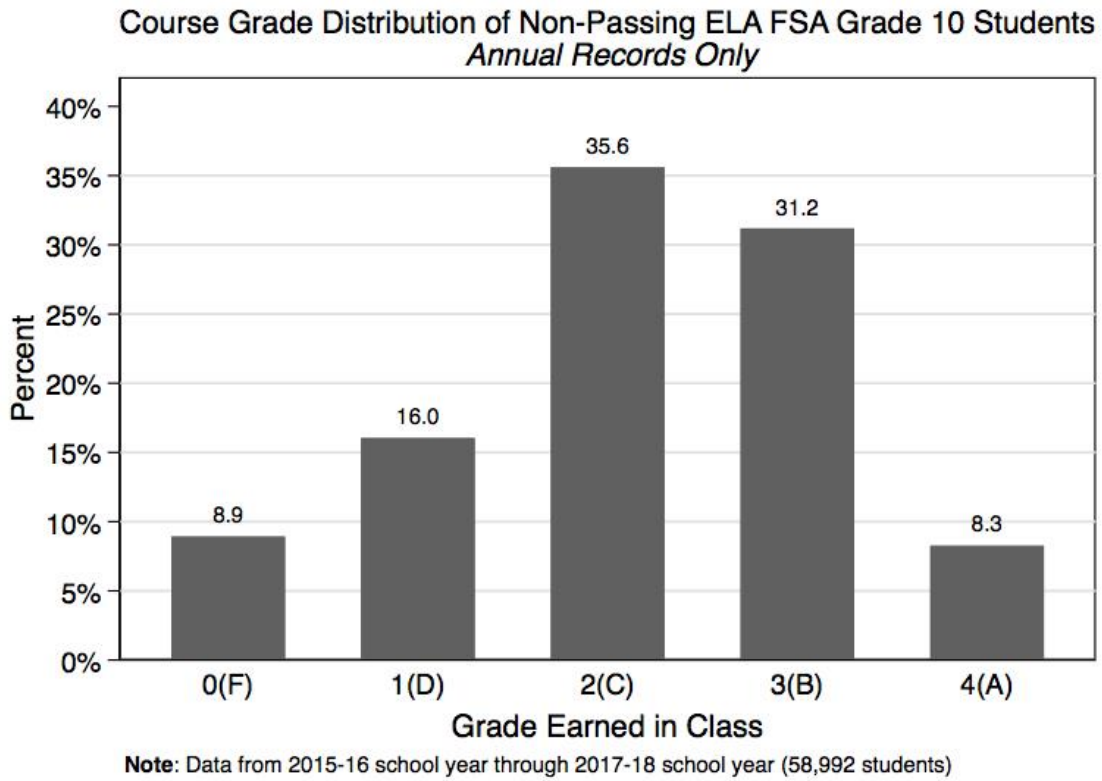


Figure 12

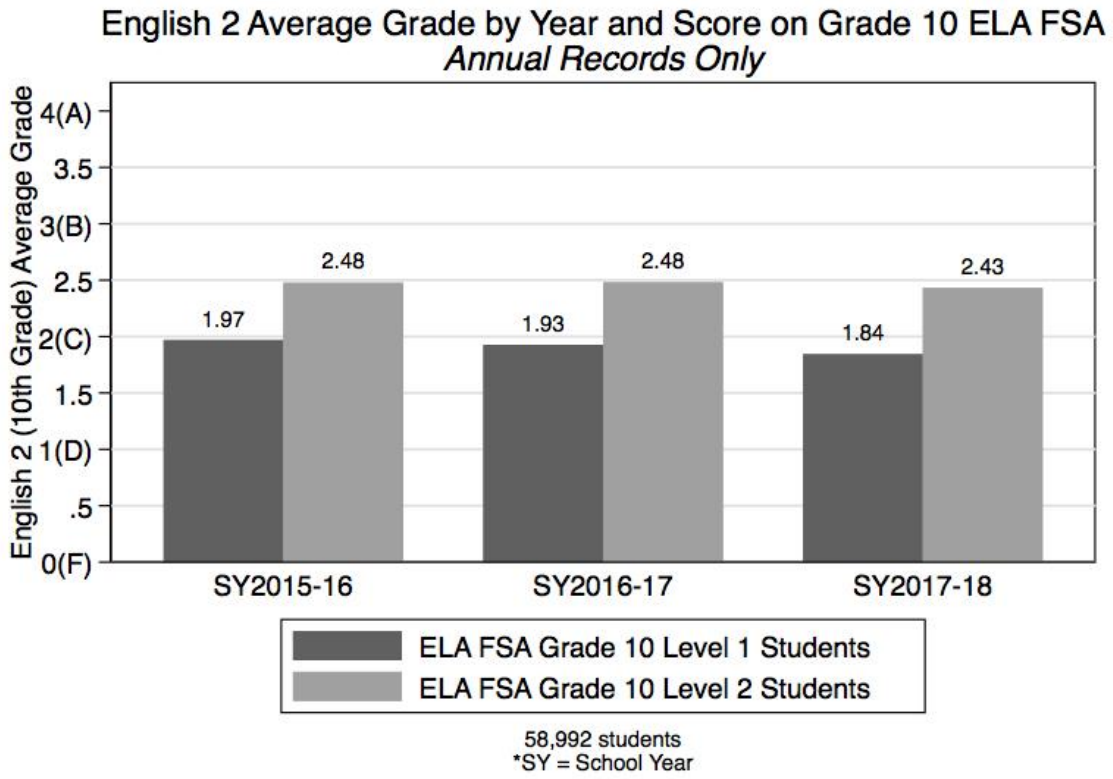


Figure 13

THE RIGOR GAP

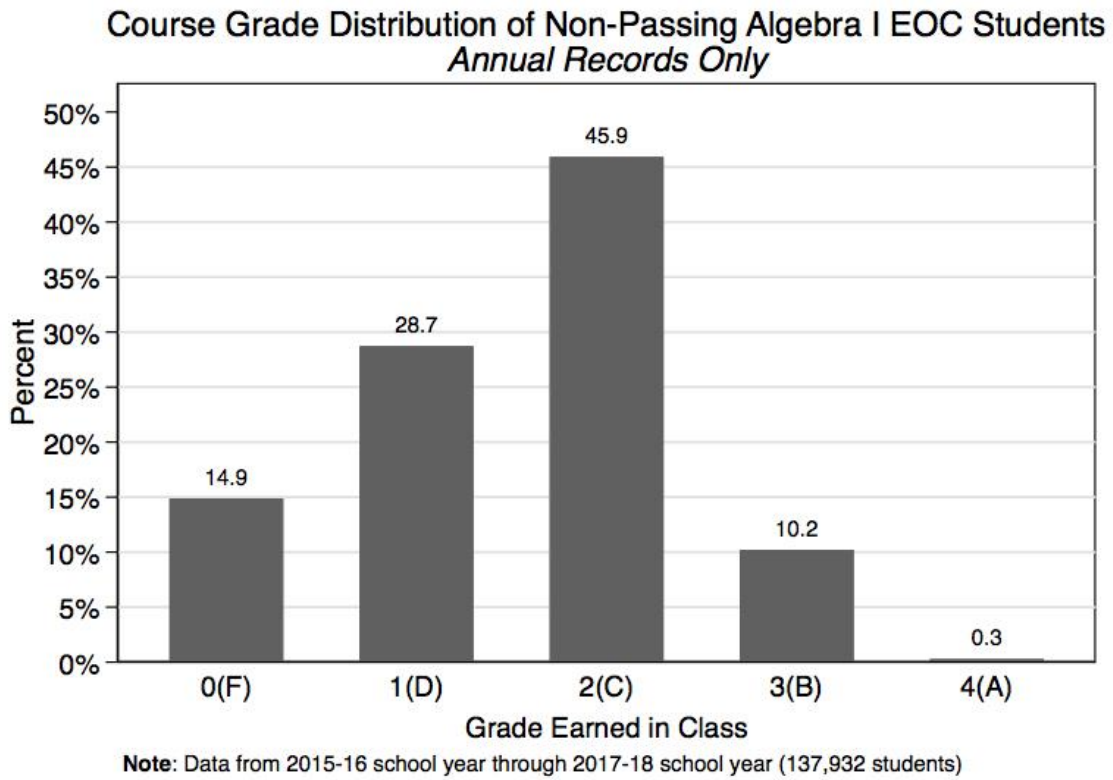


Figure 14

THE RIGOR GAP

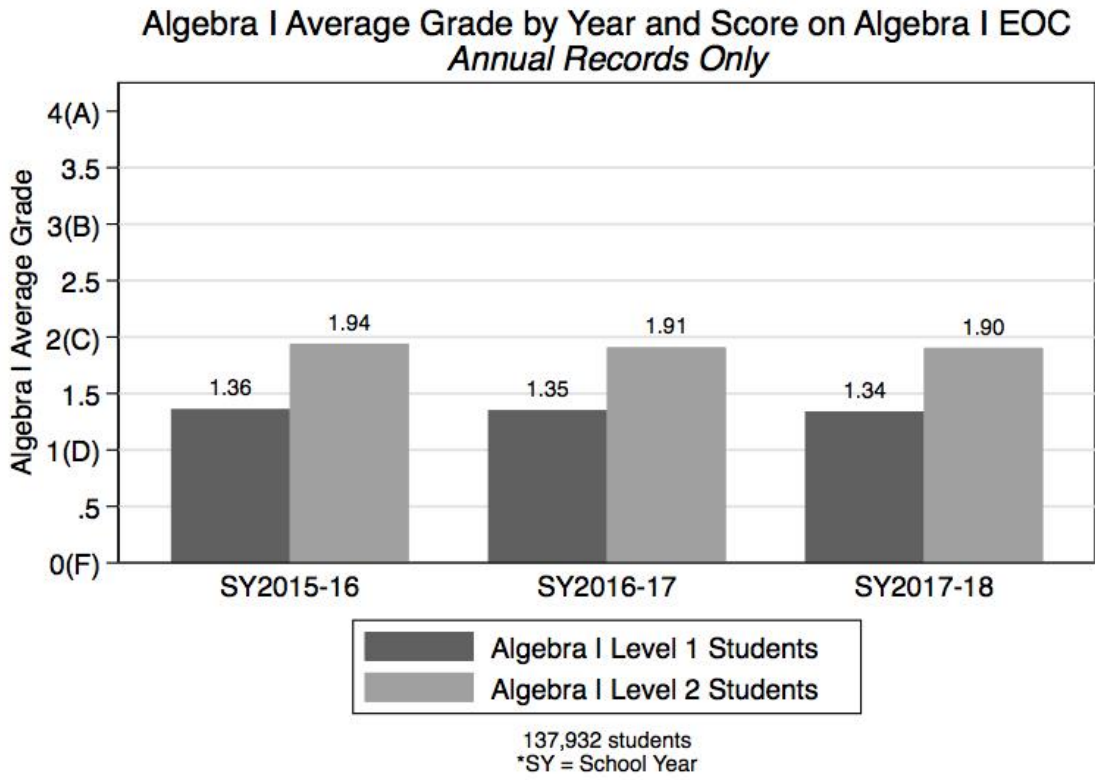


Figure 15