

Analysis of Dismissal and Dropout Rates for the 2009-2011 First Time Freshmen Cohorts

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Approximately 30% of CSU Chico First Time Freshmen (FTF) fail to graduate. An even higher percentage of Underrepresented Minorities (URMs) fail to graduate compared to non-URM FTF. This analysis looked at the relative role of dismissals (sometimes referred to as “academic disqualification”) and “dropping out” – leaving the university while in good academic standing – on overall graduation rates, and the URM gap in graduation rates. The key finding of this analysis is that while only 40% of the FTF that fail to graduate do so because of dismissal, all of the URM graduation gap is caused by a much higher rate of dismissal for URM FTF than for non-URM FTF. However, there is no difference between URM and non-URM FTF in their risk of dropping out. So, while dropping out is an important factor in overall graduation rates, it is not relevant to the issue of the URM gap. Additional analysis of FTF grades shows that the risk of doing poorly in a class – a grade of D, D+, F, W or WU (DFW) has exactly the same pattern for URMs and non-URMs as dismissal rates, suggesting that DFW rates can be used as an early proxy for the eventual graduation rate gap. There is also an important problem of late dropouts by seemingly successful students, that while not relevant to the URM grad gap, does represent a significant waste of resources and a potential avenue to increase overall grad rates.

Summary of Results:

- Both dismissal and dropping out are important factors in determining overall graduation rates, with ~60% of FTF who fail to graduate dropping out while ~40% are dismissed.
- Dropout rates show an odd pattern of starting out high, declining until the end of year three, and then rapidly increasing late
 - There is no URM gap in dropout rates and the only gender gap is between non-URM males (high) and non-URM females.
 - Thus, the most likely dropouts, especially late, is white males.
 - While many early dropouts have poor grades and are probably dropping out before they can be dismissed, late dropouts have GPAs above 2.0 and have accumulated over 100 units.
 - The causes of the late dropouts are currently unknown.
- Dismissal rates start out high and then bottom out after year three so the majority (75%) of dismissals occur early.
 - There are large URM and gender gaps in dismissal rates

- HS eligibility scores are strongly correlated with dismissal rates
 - There are still URM and gender gaps even when controlling for HS eligibility scores
- DFW rates are strongly correlated with dismissal and graduation rates and are almost certainly casual to dismissal and graduation rates.
 - DFW rates can be used as a proxy for the eventual graduation rates, allowing for much earlier and easier assessments of interventions intended to increase graduation rates or reduce the URM gap
- Reducing high DFW rates in lower division classes is an important strategy for increasing graduation rates.
 - Where significant differences exist in the DFW rates of URM and non-URM students, these need to be addressed.

Methodology

The data used for this analysis was a combination of data on FTF persistence, dismissal, dropout or graduation status from Fall 2009 to Spring 2016 (provided by Robin Donatello) with initial enrollment information on student characteristics - ethnicity, gender, initial major, etc. (data extracted from CRA #508 by Jeff Bell), for all FTF from Fall 2009 to Fall 2015. Students are primarily dismissed due to a failure to maintain a 2.0 GPA, though students can also be dismissed for cheating or other infractions of University policies. Dropouts are students in good standing who fail to return without graduating. All calculations and figures were done using Tableau 10.4. For some analyses only the three FTF cohorts for the Fall, 2009 to Fall, 2011 years were used as those three cohorts had at least 5 years to graduate, a long enough time that most students who are going to graduate will have graduated. One potential problem with this data set is that the 2009 to 2011 years were unusual due to the recession, so one year had faculty furloughs, while the 2010 year had an unusually low number of FTF. These FTF cohorts were also from before the large increase in URMs, so the sample size for URMs is much lower than for non-URMs, and the change in URM proportion might also have effects on the outcomes analyzed here. The DFW rates used in one figure come from “Analysis of DFW Rates”.

Out of the ~6,000 students in the combined Fall, 2009 to Fall, 2011 cohorts, 4,201, 70%, had graduated by Spring 2016 while 1,061, 18%, had dropped out, and 723, 12%, had been dismissed (see Figure 1). Thus, of the students lost to graduation, ~60% dropout while ~40% are dismissed. While the number dropping out is higher than the number dismissed, some of the dropouts are likely the result of poor grades causing the student to give up on college or switch to a community college, especially for the early dropouts.

FTF Dismissals and Dropouts for 2009-2011 Cohorts

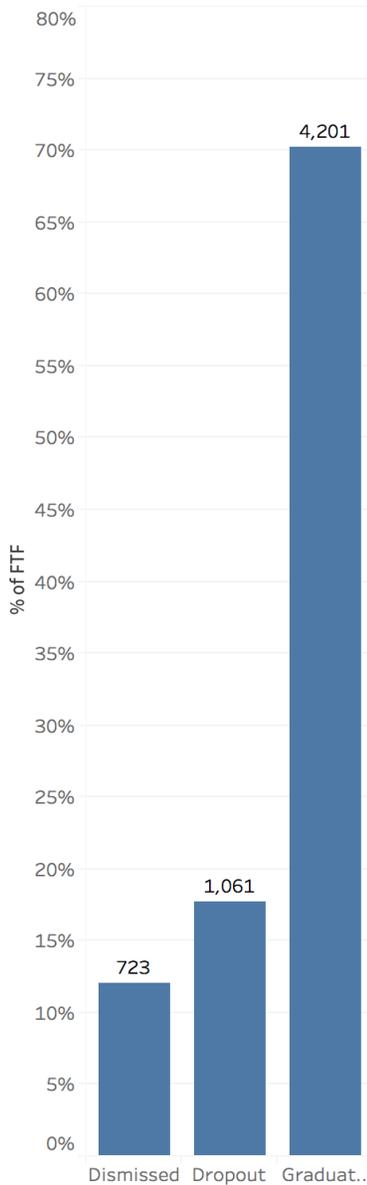


Figure 1. Percentage of FTF Dismissals, Dropouts, and Graduates for the Fall, 2009 to Fall 2011 cohorts. Numbers over the bars are the total number of FTF in that category.

Separating out URMs from non-URMs, Fig. 2, shows, surprisingly, that there is no difference in dropout rates between URMs and non-URMs, with 18% of both groups dropping out, while there is a large difference in dismissal rates, with over 18% of URMs lost to dismissal while only 10.4% of non-URMs are dismissed. Thus, all of the graduation gap between URMs and non-URMs is explained by dismissals.

Dismissals and Drops by URM Status

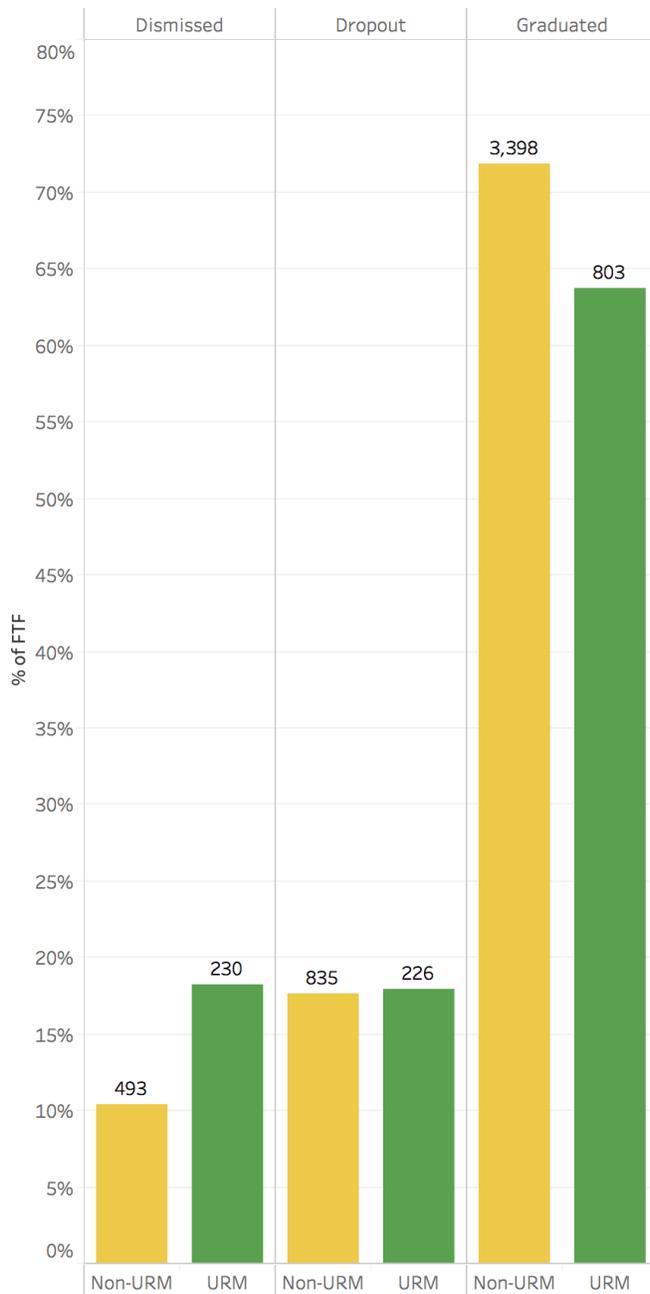


Figure 2. Dismissals, Dropouts, and Graduates by URM Status. Numbers over the bars are the totals for each category.

Gender is more complicated, with 20% of males dropping out while only 16% of females dropout, and 16% of males are dismissed compared to only 9% of females. Thus, while most of the gender gap is caused by differences in dismissal rates, some of the gender graduation gap also comes from differences in dropout rates, Fig. 3.

Dismissals and Dropouts by Gender

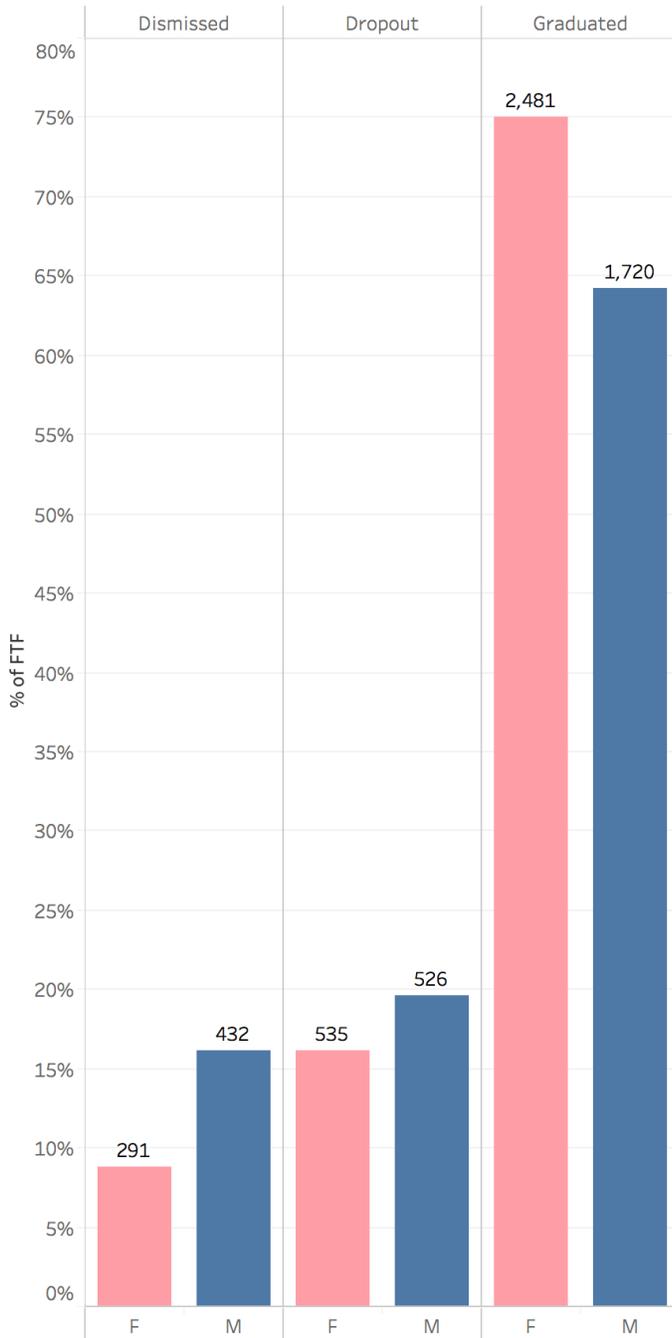


Figure 3. Dismissals, Dropouts, and Graduates by Gender. Numbers over the bars are the totals for each category.

Using both URM status and gender reveals that all of the gender differences in dropout rates are caused by non-URM males dropping out at a much higher rate than non-URM females, 20% vs. 15.5%, while there is no significant difference in dropout rates between URM males and females. Why white males are disproportionately likely to drop out is unknown. Dismissal rates showed the same gender pattern for both URMs and non-URMs with 22% of URM males being dismissed, 15% of URM females, 15% of non-URM males, and only 7% of non-URM females. Thus, white males are twice as likely to be dismissed as white females and URM males are three times as likely to be dismissed as white females. As non-URM males have a higher dropout rate but the same dismissal rate as URM females, URM females actually graduate at a slightly higher rate than non-URM males (Fig. 4)

Dismissals and Dropouts by URM and Gender

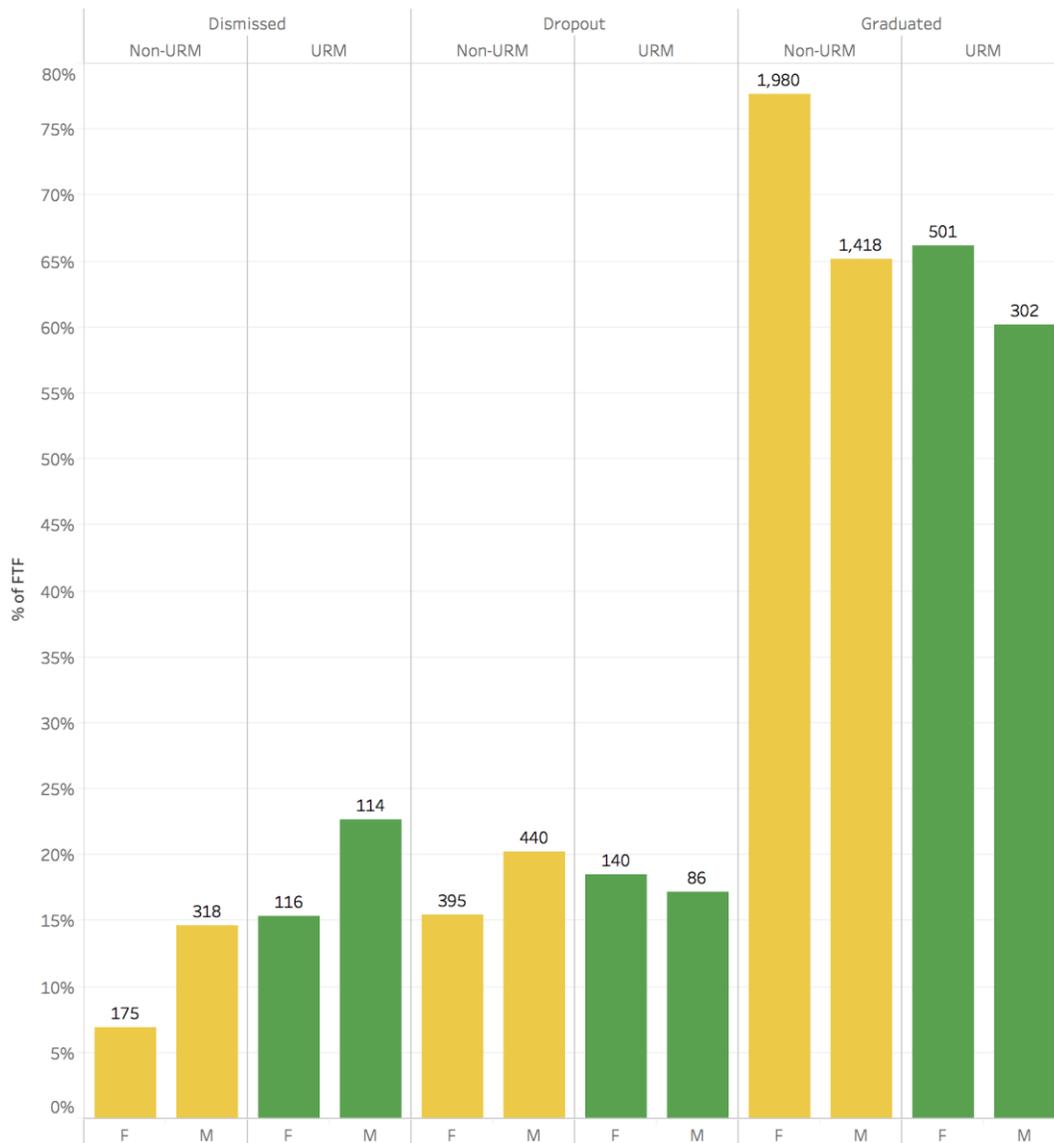


Figure 4. Dismissals, Dropouts, and Graduates by URM Status and Gender. Numbers over the bars are the totals for each category.

To examine the pattern in dismissals and dropouts over the duration of a student’s college career the number and percentage of initial cohort students who were dismissed or dropped out in each year was plotted for the combined Fall, 2009 to Fall 2011 cohorts (Fig. 5). The risk of dismissal is highest in the first year at ~5.5% and then rapidly drops to a plateau at ~1% for years 3 and on. As a result, ~75% of all dismissals occur in the first two years. The dropout rate also declines over the first three years, but then the number dropping out increases rapidly in years four and five. Only ~50% of dropouts occur in the first two years, so dismissals are the biggest problem early, but in later years dropouts become the major cause of lost students. This is an important issue as late dropouts are expensive for both the University and the students.

Dismissals and Dropouts by Year in College

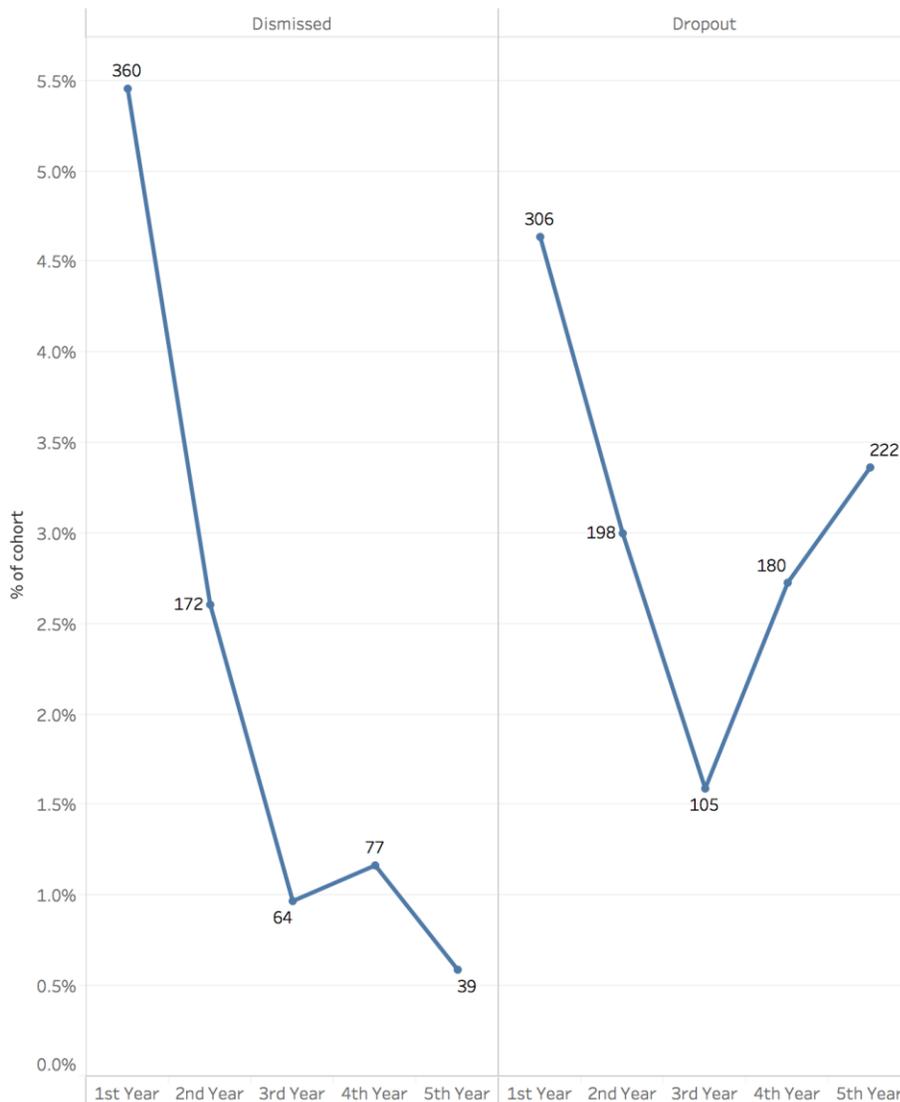


Figure 5. Dismissals and Dropouts by Years in School for the 2009 to 2011 FTF cohorts. The Y-axis shows the percentage of the initial FTF cohorts who were dismissed or dropped out, while the numbers along the lines show the total students dismissed or dropping out in that year.

Plotting the numbers as a percentage of the remaining students to get the risk of dismissal or dropping out and separating out the URM and non-URMs shows that for all years URM are about 60% more likely to be disqualified than non-URMs, Fig. 6 (note that the percentages shown in the figure are averages of Fall and Spring semesters, so they should be doubled to get the annual percentages). As expected, the risk of dropping out is the same for URM and non-URMs, and increases rapidly once students fail to graduate in four years.

Dismissals and Dropouts by Years and URM Status

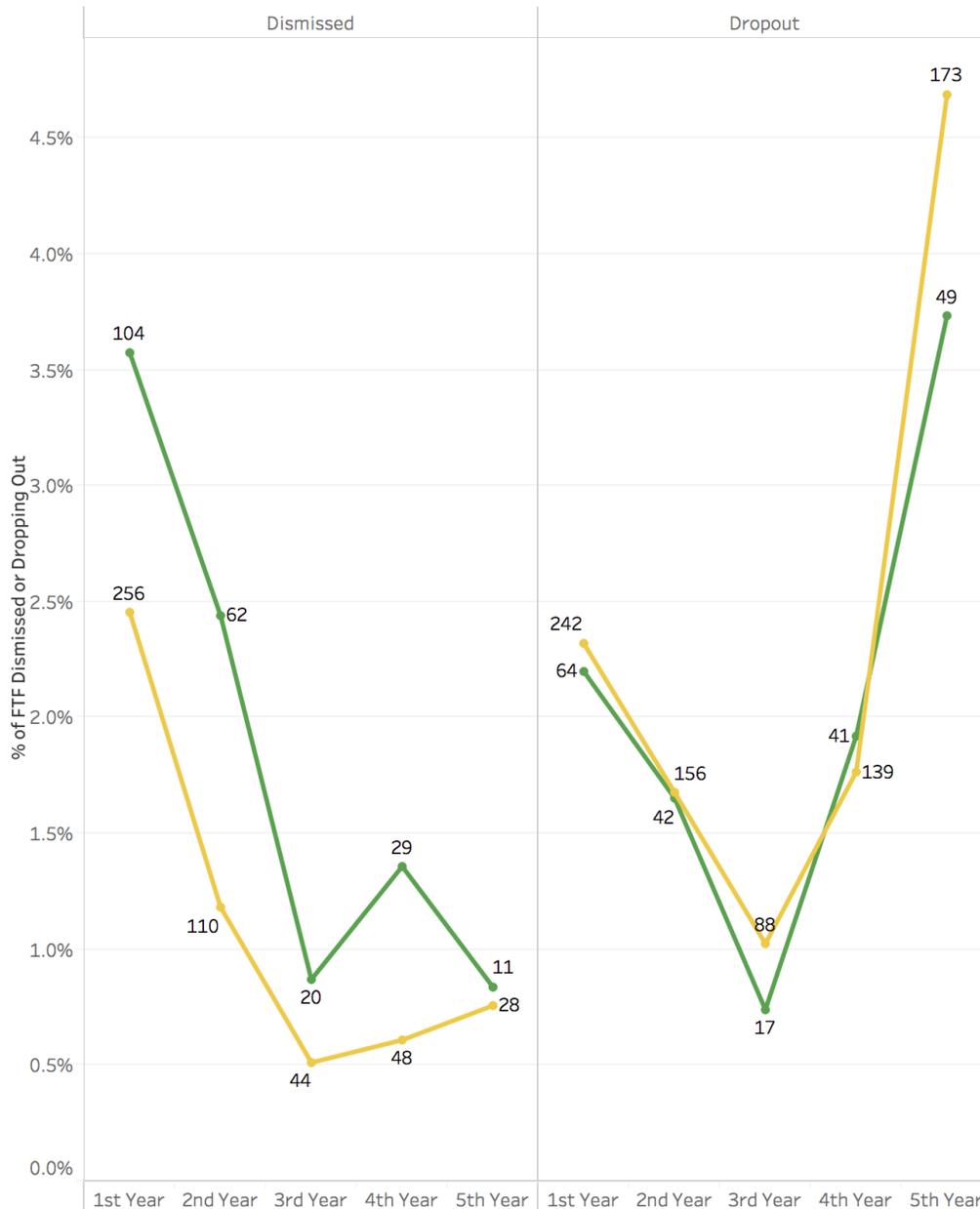


Figure 6. Dismissals and Dropouts by Years in School for the 2009 to 2011 FTF cohorts. The Y-axis shows the percentage of remaining FTF who were dismissed or dropped out, while the numbers along the lines show the total students dismissed or dropped out in that semester.

The distribution of cumulative GPAs for by the last semester before dropping, Fig. 7, shows that while there were some poor performing students among the early drops, the average cumulative GPA is 2.5 and there are many students dropping, even after 8 semesters, with GPAs above 3.0. While most drops occur after a spring semester (even semesters below), there are a large number after 9 semesters. Thus, most of the FTF dropping out late had good enough grades to graduate, but appear to drop out when they fail to graduate.

Cumulative GPA of Dropouts by Semester

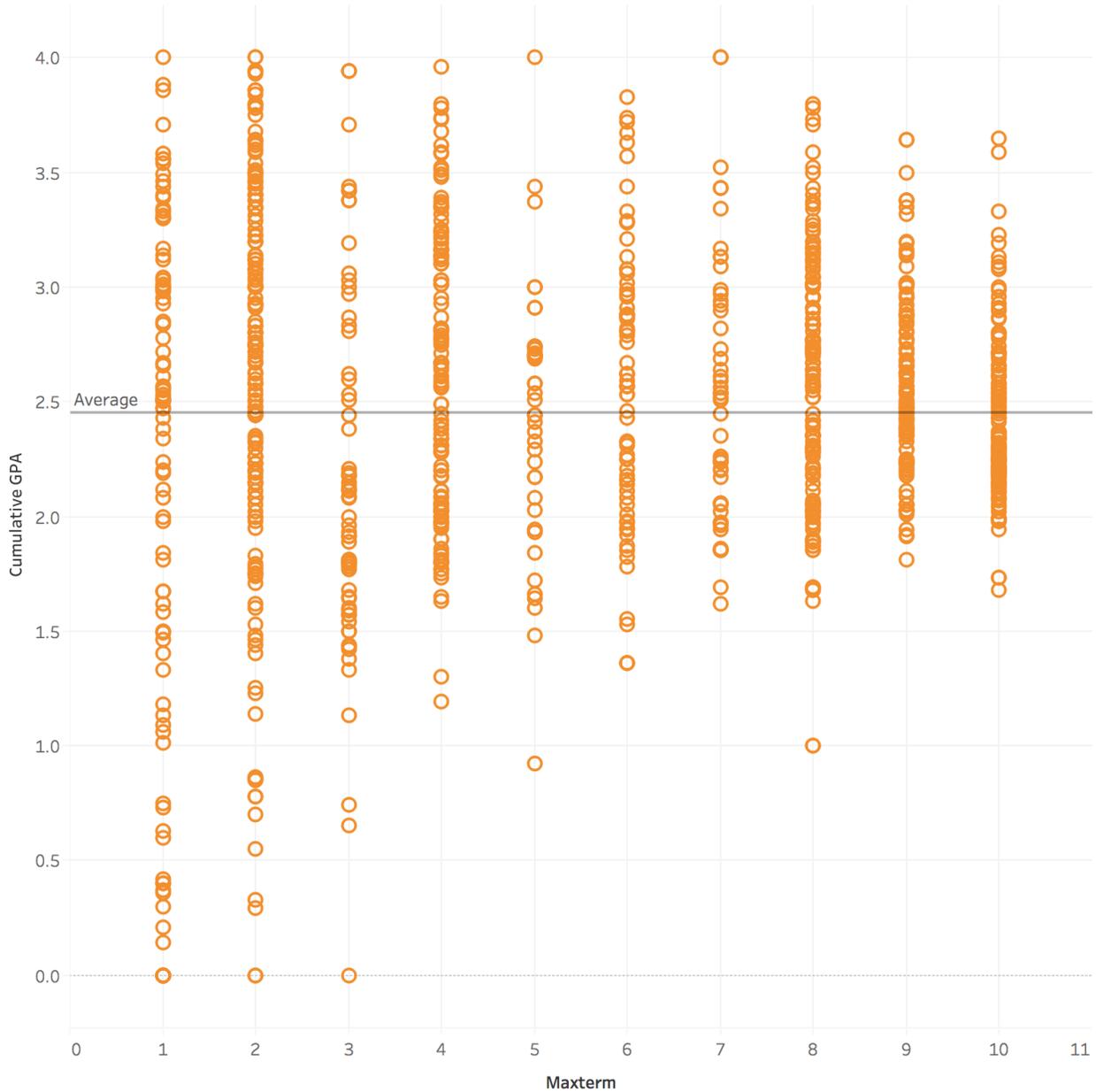


Figure 7. Cumulative GPAs of FTF after their last semester before dropping out.

Most FTF dropping out after 8 or more semesters have 90 or more units with many having more than 120 and GPAs above 3.0, Fig. 8. Many of the dropouts with more than 120 units also had GPAs over 2.5, so presumably the problem keeping them from graduating is missing requirements for any degree.

Cumulative Units for Dropped Out FTF by Semester

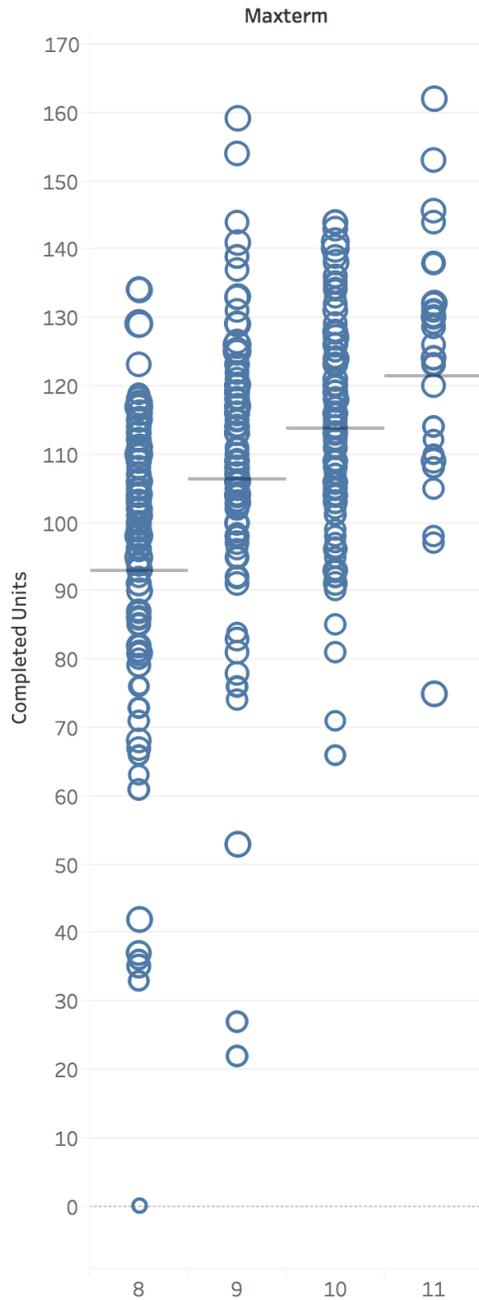


Figure 8. Cumulative Units of FTF by their last semester before dropping out. The larger the circle the higher the GPA

The HS Eligibility index is highly correlated with graduation rates. The HS Eligibility index is lower on average for URM FTF (3.39 for the 2009-2011 cohorts vs 3.53 for the non-URM FTF). There is a strong linear correlation between HS Eligibility scores and the risk of dismissal with a 0.1 increase in HS Eligibility giving a decrease of 3 percentage points in the dismissal rate (Figure 9). However, there is little or no correlation with dropout rates or differences between URMs and non-URMs dropout rates. Even correcting for HS Eligibility score, URM FTF have higher dismissal rates, on average about 3-4% higher. Thus the URM gap in dismissals is approximately half from a lower starting average HS Eligibility score, and half from unknown causes that lead to higher dismissal rates for URMs with the same HS Eligibility scores as non-URMs.

Dismissals and Dropouts by HS Elig and URM Status

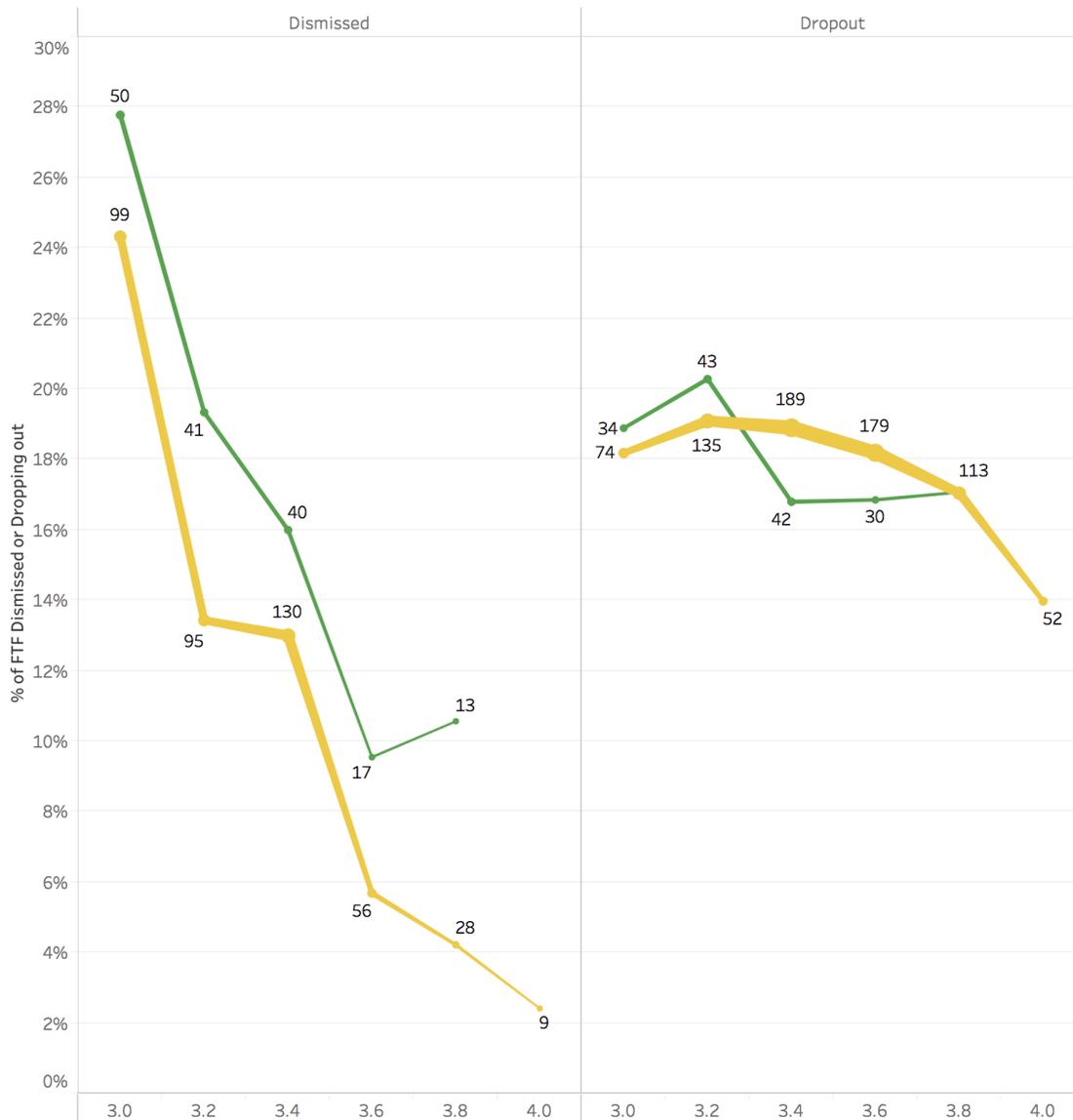


Figure 9. Dismissal and Dropout Rates for the 2009-2011 FTF cohorts vs HS Eligibility scores. FTF were grouped by HS Eligibility scores, all FTF with scores from 2.81 to 3.00 in the “3.0” group, 3.01 to 3.2 in the “3.2” group, etc.

Given that poor grades are the primary cause of dismissals, the pattern of DFW rates (percentage of D+, D, F, WU, or W) by URM status and gender for FTF was compared to the dismissal and graduation patterns, see Fig. 10. The correlation between HS eligibility scores and DFW, Dismissal, and Grad rates are compared in Fig. 11. The pattern of DFW rates, with non-URM females having the lowest rate, non-URM males and URM females with similar but higher rates, and URM males with the highest rates, is mirrored by the dismissal rates and is the inverse of the pattern for graduation rates. As a greater risk of poor grades should logically lead to a greater risk of dismissal, and as a higher rate of dismissals should logically lead to a lower graduation rate, these correlations are almost certainly causal. Thus, the URM graduation gap is caused by the difference in DFW rates for URMs and non-URMs, as is most of the gender gap between males and females. The correlation between HS Eligibility scores and DFW, dismissal, and graduation rates for URMs and non-URMs also shows the same pattern. This also shows that even correcting for differences in average HS Eligibility scores still leaves approximately half of the URM gap for DFW, Dismissal, and Graduation rates, unexplained.

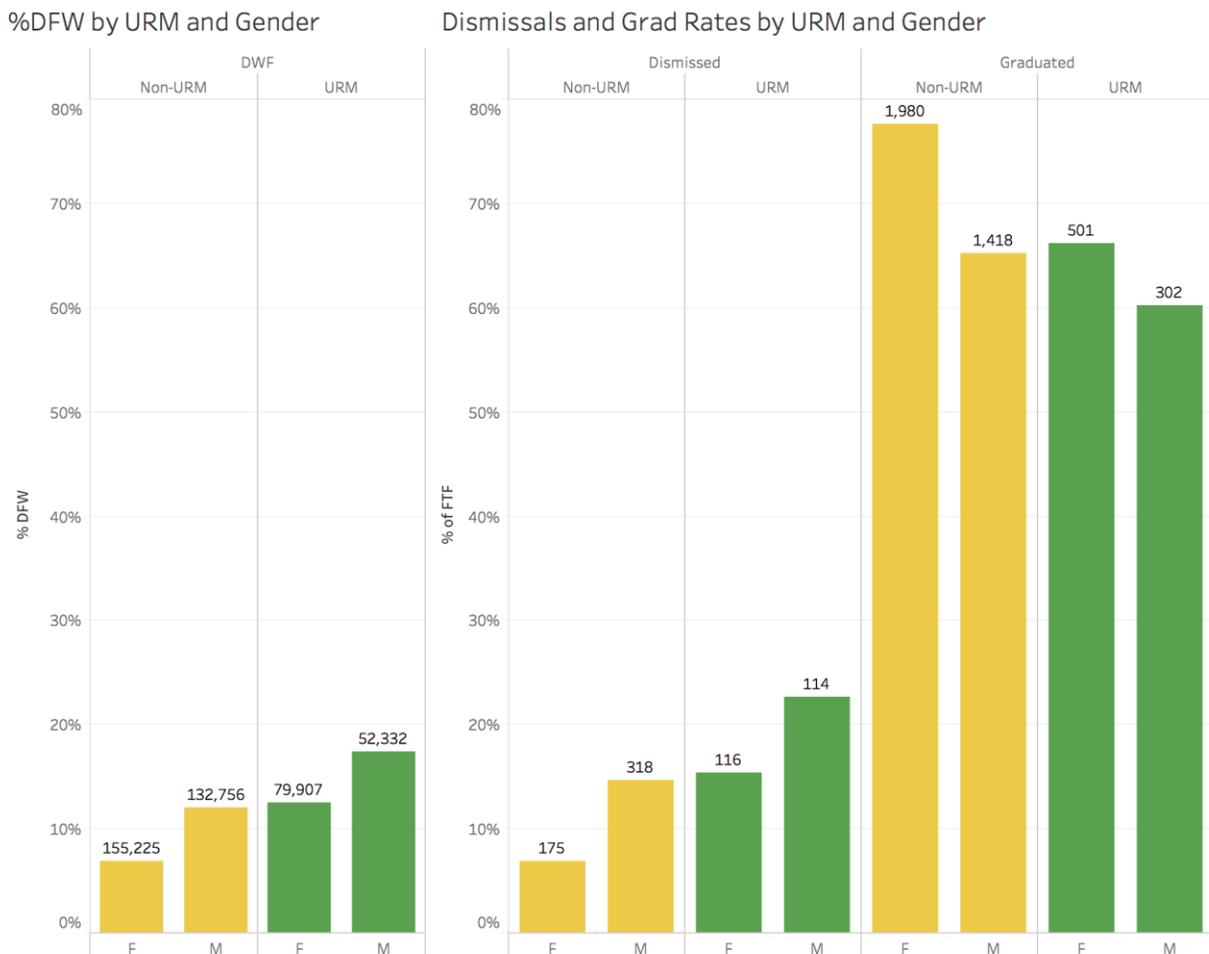


Figure 10. DFW, Dismissal, and Grad Rates by URM Status and Gender for the 2009-2011 FTF cohorts. DFW rates are for FTF from the combined Fall, 2013 through Spring 2017 semesters.

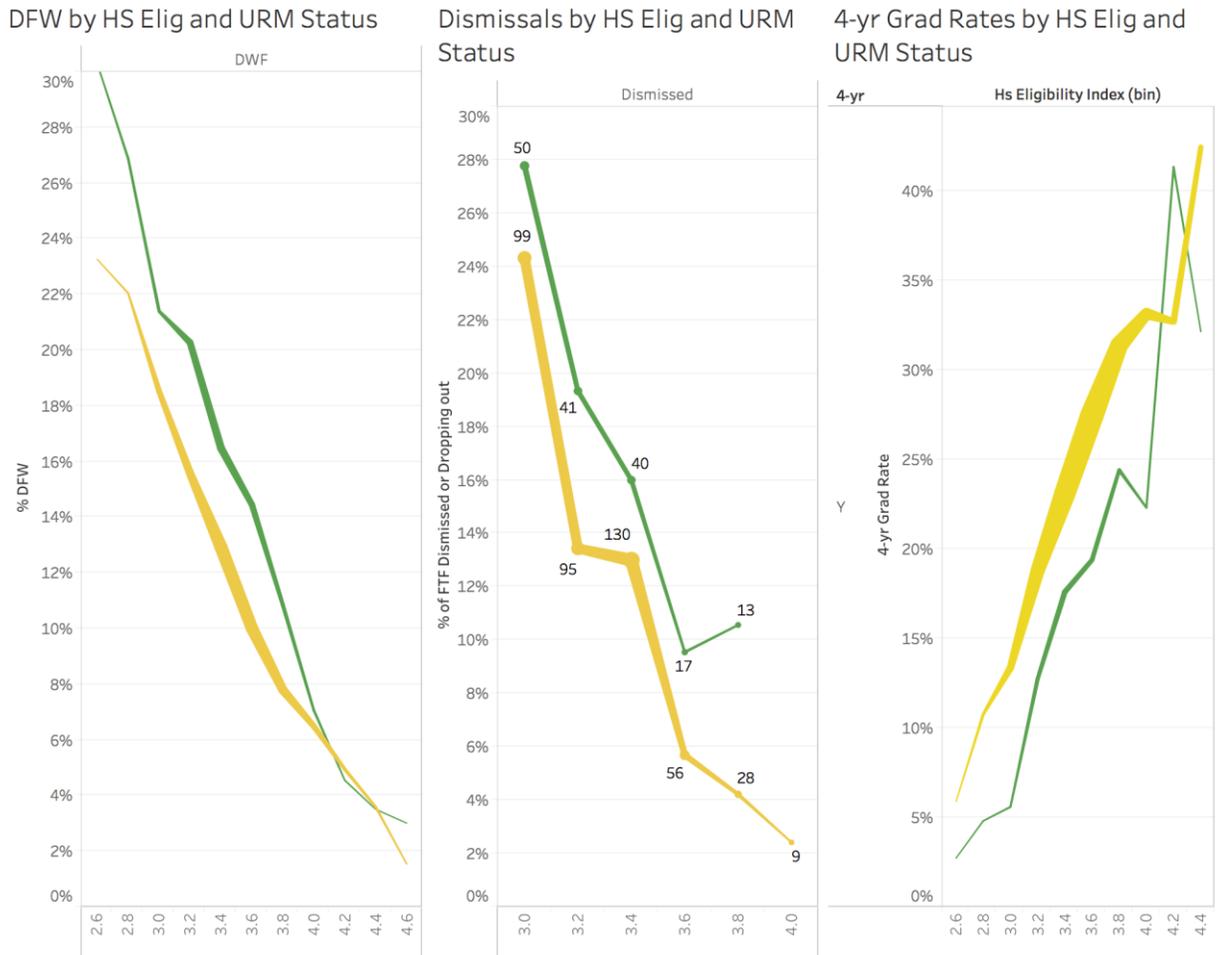


Figure 11. DFW, Dismissal, and Grad Rates by URM Status and HS eligibility scores. DFW rates are for FTF from the combined Fall, 2013 through Spring 2017 semesters while Dismissal and Grad rates fare for the 2009-2011 cohorts.

Conclusions

This analysis of dismissal, dropout and graduation rates shows that dismissals and dropping out are both major causes of the ~30% of FTF not graduating, with ~40% of FTF that fail to graduate being dismissed, and ~60% dropping out. While both are of approximately equal importance in determining graduation rates, there are important differences between these two causes both in their pattern over time and their effects on the URM and gender gaps.

The rate of students dropping out starts out high with over 4% of FTF dropping out after their first year, but then declines rapidly to a low at the end of year three where only 1.5% dropout. The dropout rate then increases rapidly as FTF who fail to graduate in 8, 9, or 10 semesters dropout instead, with, for instance 3% of the initial FTF dropping out during year five. As most FTF have graduated or already been lost by then, the risk of dropping out is over 10% for FTF who have stayed in school this long without graduating. Most of these late dropouts have GPAs

above 2.0 (average is 2.5) and have accumulated over 100 units, with many having more than the minimum 120 units needed for graduation. Unlike dismissals, there is little evidence for a URM gap in dropout rates, and the only gender gap is between non-URM females and non-URM males. Also unlike dismissal rates, there is little correlation with HS Eligibility scores.

That both the state and the student has put so much time and money into college without getting a degree is a tragedy. We do not currently have any good data explaining why so many students dropout late, or why white males would be the group most likely to dropout late. That white males are the most at risk population for late dropouts suggests that this isn't solely a financial issue. Further research is needed to determine the causes of these late dropouts.

The rate of dismissals also starts out very high in year one with over 5% of the FTF class being dismissed, and then declines after years two and three. Unlike dropouts, the rate then plateaus at ~1% a year. Thus, 75% of all dismissals occur in the first two years. This is probably an underestimate as many of the year one dropouts have below 2.0 GPAs and probably dropped out as a result of their poor classroom performance. Also unlike dropouts, there are strong URM and gender gaps in the dismissal rates. Controlling for HS eligibility score shows that while some of the URM gap can be explained by lower HS eligibility scores for URMs, there are still URM and gender gaps.

The strong correlations between patterns of DFW rates and dismissal rates and basic logic mean that the key to reducing the URM graduation gap will be reducing the gap in DFW rates, especially in lower division courses. Reducing overall DFW rates in LD course will also be necessary for us to hit our 2025 graduation targets. This also means that we now have a way to easily measure our progress towards reducing the URM graduation gap—any intervention that reduces the gap in DFW rates in LD course should lead to a reduced gap and higher 4- and 6-yr grad rates. Thus, we no longer need to wait four to six years to determine what is working and what isn't, even one semester may give enough information to decide whether something is working or not.

Future research needed: Much more work is needed to understand why students dropout late and why URMs and males are so much more likely to fail courses than white females. A more detailed analysis of the late drop out population might provide indicators that can be used to understand why they dropout and to identify them before dropping out, but we will also probably need to somehow collect survey data from these students. A detailed analysis of factors effecting the risk of students failing courses is needed, we especially need to know why URMs and males do worse than white females, and how courses can be changed to improve the success of these populations. A substantial body of research exists on some of these factors; implementation of known best practices should probably start now.