Tracking in Virginia: How state and district policies sort students

Abstract—250 word max, structured abstract

Purpose

Our purpose is to understand the relationship between the high school course enrollment patterns of students of different ethnicities and tracking systems in Virginia. Tracking, the sorting of students into course levels, has a long racialized history and Virginia, which has a long history of segregation, is a critical case for understanding how tracking and course access have evolved in the 21st century.

Research Methods/Approach

We analyzed publicly available district, state, and federal information on academic tracking and advanced course access in Virginia from 2017 to 2018 in this mixed methods study. District documents provided information on high school course offerings, while state documents yielded information on diploma options and state programming. Federal data showed which students are taking advanced, math, and science courses in the state. All data sources were analyzed quantitatively with additional qualitative analysis of state and district documents.

Results

Advanced courses in Virginia erect formal barriers to enrollment and are more segregated than schools in Virginia. The segregation of these courses increases as the number of levels of state tested courses increases. Further, the number of levels of state tested courses offered by districts increases as the racial diversity of the district increases.

Implications for Research and Practice

This study draws attention to the importance of state-level policies in shaping tracking systems as well as the relationship between tracking and district level racial diversity.

*Key words:* Tracking, in-school segregation, Virginia, advanced course access, empirical study

**Introduction**

Over fifty years since segregation formally ended in the United States, access to elite courses in our high schools remains segregated. Of students who entered high school in 2009, 6% of White students, 3% of Black students, and about 3% of Latinx students took advanced level courses in Biology, Chemistry, or Physics. White students were three times more likely than Black students and almost twice as likely as Latinx students to have Calculus be their highest math course while Black and Latinx students are more likely to have Algebra or Geometry be their highest math course (Musu-Gillette et al., 2016). Further, Black and Latinx students often take foundational courses like algebra 1 later than their peers, which can restrict their access to advanced courses (Allensworth, Nomi, & Montgomery, 2009; Domina, Penner, Penner, & Conley, 2014). White students are similarly overrepresented in Advanced Placement and International Baccalaureate courses that allow students to earl college credits in high school, while Black and Latinx students are underrepresented (College Board, 2014; Gordon, VanderKamp, & Halic, 2015). Advanced courses in America remain, for the most part, the domain of white students.

Black and Latinx students’ underrepresentation in advanced classes persists even when students have high test scores and want to be in those courses. After controlling for achievement of students in one school district, researchers found that there were about half as many Black students in advanced courses as there should be based on test scores (Corra, Scott, & Carter, 2011) and researchers have had similar findings for Latinx students (Oakes, Selvin, Karoly, & Guiton, 1995). Furthermore, Black and Latinx students are encouraged to enroll in advanced courses at lower rates than other students (Kurlaender & Yun, 2007) and report actively being discouraged from enrolling in advanced courses and facing hidden barriers to course enrollment (Irizarry, 2007; Modica, 2015; Yonezawa, Wells, & Serna, 2002). At even the most diverse of schools, advanced courses fail to mirror that diversity and remain islands of segregation (Burris, 2014; Oakes, 2005).

Academic tracking, the sorting of students within schools in levels of courses from remedial to advanced, underpins the disparities we see in access to advanced courses. Academic tracking began as a way to keep the children of wealthy families and the children of low-income, immigrant families apart in newly created comprehensive high schools (Tyack & Cuban, 1995). White and wealthy students were overwhelmingly sorted into high tracks while students of color and from low-income backgrounds were sorted into the lower tracks (Oakes, 2005). While tracking systems have evolved since their origins, tracking continues to perpetuate segregation within schools (LaPrade, 2011; Oakes, 2005). What modern tracking systems look like within individual states however and how tracking systems, access to courses, and racial diversity intersect are all less clear. Kelly (2007) and Kelly and Price (2011) looked in depth at tracking systems within North Carolina, but similar work has not been done in other states and the data they draw on is from 1997 and 2007. Further, Kelly and Price’s (2011) and Lucas and Berend’s (2002) work on the relationship between tracking and racial diversity came to opposing conclusions. We need more state focused work to understand what tracking systems look like today, the relationship between tracking and diversity, and to better understand what access to advanced courses looks like today within states.

This mixed methods study brings together district, state, and federal data on Virginia to understand what courses are offered in the state, who has access to advanced courses, and what the relationship is between tracking and diversity within the state. Virginia is a critical state for understanding tracking and course access. In 1927, *Buck v Bell* affirmed the state of Virginia’s right to sterilize those viewed as feeble minded and drew on the work of prominent Virginian eugenicists (Lombardo, 1985). Following *Brown v Board* (1953), officials within Virginia launched Massive Resistance and closed down schools rather than allowing their integration with some schools remaining closed for three full years (Day, 2016; Lewis, 2006). Segregation of students by ability and by race have a long history in Virginia, making it a critical case for examining modern day practices of tracking and racialized patterns of course access. This study brings together a wide variety of public data sources to paint a comprehensive picture of what tracking and access to courses looks like in Virginia today, over fifty years after the end of Massive Resistance.

**Academic Tracking**

Through academic tracking, students at high schools across the United States are sorted into different levels of courses by perceived achievement, ethnicity, and socioeconomic status (Burris, 2014; Oakes, 2005). Teachers of lower-level courses spend more time on discipline and teach less content than do teachers of higher levels of courses, making it hard for students sorted into low-level courses to ever move to high-level courses (Burris, 2014; Oakes, 2005; Watanabe, 2008). Once students with similar profiles are placed into different levels of courses, their academic trajectories diverge, with students sorted into high-level courses excelling relative to the students sorted into low-level courses (Oakes, 2005). Overall, students enrolled in low-level courses graduate from high school and begin college at lower rates than their peers (Beattie, 2011; Oakes, 2005). Tracking harms students in lower-level courses while offering few benefits to students in higher-levels (Burris, 2014; Oakes, 2005).

Tracking began as a way to keep the children of wealthy families and the children of low-income, immigrant families apart in newly created comprehensive high schools (Tyack & Cuban, 1995). White and wealthy students were overwhelmingly sorted into high tracks while students of color and from low-income backgrounds were sorted into the lower tracks (Oakes, 2005). During the Civil Rights era, pushback against the discriminatory nature of tracking led to changes in tracking structures, in theory making tracking systems more flexible and less discriminatory, although in practice tracking remains discriminatory (Burris, 2014; Corra et al., 2011; LaPrade, 2011).

While the racially discriminatory nature of tracking is clear, the relationship between the racial diversity of a school and tracking is less clear. In 2002, Lucas and Berends found that more racially diverse schools had more rigid tracking structures, where students were more likely to take courses at the same level, than did less racially diverse schools. In 2011, Kelly and Price found that in North Carolina, there was no relationship between the racial diversity of schools and the tracking structures outlined in their programs of study.

While different researchers emphasize different aspects of a school’s tracking system from the number of course levels to the severity of prerequisites, to the consistency in levels of students’ courses, it is clear that tracking remains common in the United States (Kelly, 2007; Lucas & Berends, 2002; Oakes, 2005; Schmidt & McKnight, 2012). In the 1990s, over 80% of American high school students took classes that were offered at multiple levels of difficulty (Oakes, 2005). In 2007, 92% or more of students in North Carolina attended schools with two or more levels of geometry and science courses (Kelly & Price, 2011). The number of levels of courses however varied between departments and over time. In 1997, 54% of schools studied in North Carolina offered 3 or more levels of English courses at each grade level. In 2007, only 33% of schools in the sample offered 3 or more levels of English. Conversely, in 1997 39% of the schools offered only one level of most Social Studies courses while in 2007 only 12% of the schools offered only one level of the course (Kelly 2007; Kelly & Price, 2011). There were differences between departments and changes over time in course offerings. Watanabe and colleagues (2007) found that the actions of a determined teacher could change the tracking structure of an academic department over time. Most of the data however on local tracking structures is over a decade old. What do course offerings look like today and what do they look like in a state other than North Carolina?

In addition, what are the formal barriers set for course entry? In 1997 and 2007, the practice of using prerequisites to restrict entry into high-level courses was common in North Carolina. Common prerequisites at the time included prior course work, grade point averages (GPAs), test scores, and teacher recommendations (Kelly, 2007; Kelly & Price, 2011). Schools also limited when students could change course levels and required co-requisite courses that further limited who could enroll in advanced courses (Kelly, 2007). Too much is unknown about what tracking looks like today and how it interacts with racial diversity in schools. The purpose of this study is to learn about the relationship between high school course offerings and racial diversity in Virginia. Specifically, this study answers:

1. What trends exist across Virginia in district tracking systems and in access to advanced courses?
2. What is the relationship between district tracking systems and district diversity?
3. What is the relationship between district tracking systems and advanced course access?

**Methods**

To answer our research questions, we chose a convergent mixed methods research design (Creswell & Plano Clark, 2011), using publicly available district, state, and federal documents and focusing on Virginia as a critical case for understanding tracking and patterns of course access.

**Context**

Over a million students attend Virginia schools. Virginia has 131 different school districts, including the state’s consolidated districts. Districts in Virginia vary in size and in per pupil expenditures. Over 80 school districts have only one high school, 40 have three or more high schools, and five have ten or more (VDOE, n.d.), and enrollment similarly varies from over 100,000 to under 10,000. Similarly, per pupil expenditures range from $9,000 to $20,000 across districts, despite supplemental state funding for districts that receive less local funding (VDOE, 2018c). In this study, we used districts as the level of analysis for course offerings. In Virginia, each district creates a program of study, which is a document that lists graduation requirements, courses offered, and, often, information about tracking policies, course levels, and prerequisites. These programs of study apply to all high schools in a district, although some larger school districts will indicate if a certain course is available at only some of the district’s high schools. This, however, is rare and even high schools in larger districts will typically reference the district program of study for course information. As most programs of study in the state are located at the district level, we used district as the level of analysis for course offerings.

**District Document Analysis**

We analyzed programs of study from 120 of the state’s 131 districts to understand course offerings, prerequisites, and tracking structures at the district level. One hundred twelve districts posted a digital program of study and, when there was a choice of program of studies, we selected the 2017-2018 program to match the Office of Civil Rights data. We contacted the 19 districts without posted programs of study. Eight responded by sending copies of student enrollment forms or reading us their master schedules, leaving us with 120 district programs of studies to analyze, 91.6% of the possible districts in the state. Because some of the programs of study included only lists of courses offered in the district, we went to the websites and student handbooks of these districts to find supplemental information. For two districts, we were unable to find any information on prerequisites. This left us with 118 districts with prerequisite and course information and two districts with only course information.

Within each program of study, we focused on understanding the prerequisites and number of levels of state tested courses as these are courses that are likely to be offered at every high school and taken by large numbers of students in the state. The state test in Virginia is the Standards of Learning (SOL) tests, which in high school students can take in Biology, Chemistry, Earth Science, Algebra 1, Algebra 2, Geometry, World History 1, World History 2, Virginia and US History, and World Geography. For English, students in high school take reading and writing SOL tests at the end of tenth or eleventh grades, but not in 9th grade, although we counted all three courses as SOL courses because they prepare students for the test and because of the variability in when students take the reading and writing SOLs. World Geography is the only SOL tested course that we found to be rarely offered within the state and we found that, when it was offered, it was often offered in place of World History 1. When World Geography was offered in place of World History 1, we coded it as World History 1, which happened in 10% of districts. When it was offered with World History 1, we did not code the course to prevent double coding of the course. Similarly, for Fairfax County, we coded Geosystems as Earth Science due to similarity in tested content and in Falls Church, we counted as high school World History 1 an SOL tested 8th grade World History 1 class.

***Analysis***

We began our analysis by coding all 120 programs of study using the rubric in Appendix A. In each program of study, we coded the number and types of levels of state tested courses, the number and types of prerequisites for state tested courses, the number and type of college credit bearing courses, and district statements about tracking and course levels. We double coded all of the programs of study with 82% reliability with differences between the two raters discussed and reconciled. We used the number of levels of state tested courses to create a measure of trackedness that had information on the number of levels for each state tested course by department, course, and district. We summed the prerequisite information, including the number and type of prerequisites, across districts and created percentages that allowed us to descriptively compare different departments and different levels of courses. Finally, we used the qualitative data analysis program Nvivo to analyze statements in each program of study about tracking and course levels, looking for patterns in how course changes, honors courses, AP courses, and course weighting were discussed. We found wide variability in where and how districts discussed tracking with some districts not discussing it at all, some writing extensively about tracking in one part of the program of study and not at all in another, some sounding intensely tracked but offering almost no advanced classes, and some featuring heavy discussions of tracking in one department and nowhere else in the program of study. Overall, we did not find consistent patterns in how tracking was framed within programs of studies and focused our final analyses on course levels and prerequisites.

**State Document Analysis**

In addition to gathering public information from districts, we also gathered public information from the Virginia Department of Education (VDOE), including district and school level information on graduation rates, urbanicity (rural, semi-urban, and urban), and diversity (racial, ethnic, and economic). We also gathered state level information on specialized programs, including Governors’ schools, alternative schools, and virtual courses.

***Analysis***

We analyzed information from the VDOE both quantitatively and qualitatively. Quantitatively, we used state information to create a diversity index using a metric of diversity from Kelly and Price (2011) to quantify the racial and ethnic composition of each district. In this metric, a minimally diverse school (d-index of zero) is a school with only one racial or ethnic group, whereas a maximally diverse school (d-index of 1) has equal proportions of all extant racial and ethnic groups in the state. Qualitatively, we analyzed the differences between diploma types as well as information on Governors’ schools, alternative programs, dual enrollment, and virtual courses, focusing on guidance on who was eligible for each program and any barriers to entry.

**Federal Data Analysis**

The final source of data came from the US Department of Education through their Office of Civil Rights (OCR) Civil Rights Data Collection project. Every two years, OCR collects educational and civil rights information from schools and districts across the country, which it collates and publishes publicly on its website (Office of Civil Rights, 2020). The data includes district and school level data on course enrollment, including who enrolls in AP courses, who takes AP tests, who takes chemistry, algebra 2, and biology, and when students take algebra 1. OCR does not collect information on English or social studies courses and information is reported out by special education status and ethnicity, but not by socioeconomic status. The 2017 to 2018 OCR data was released in October 2020 and is the most current data set.

***Analysis***

We downloaded and cleaned all OCR course enrollment data for Virginia districts and schools. We then looked at state level trends for each course, calculating the percentage of students from each ethnic group that took a course and comparing it to the percentage of students from that group enrolled in the state’s schools. Then, we calculated d-indexes for each school and for each course within a school so that we could compare course and school diversity and repeated those analyses at the district level. We then calculated what percent of each course at each school was white and Black and compared those percentages to the overall percentage of students at each school taking that course using a heteroskedasticity-robust standard error robust model and controlling for the size of the school.

**Combined Analysis**

***District and State Data***

To investigate the relationship between the number of levels of state tested courses and the diversity of the school, we ran a regression model using the diversity index, calculated from the state data, to predict the number of levels of classes in districts, calculated from the district data. We included additional predictor variables including as covariates percent free and reduced-price lunch and the logarithm of student enrollment. We initially considered factors of urbanicity and per-pupil expenditure, but excluded them when these factors proved not to be meaningful predictors. We used clustered standard errors on the eight regional divisions assigned by the VDOE to account for geographic effects and the heteroskedasticity produced by this clustering.

***District and Federal Data***

To investigate the relationship between the number of levels of courses offered and the enrollment of Black students in advanced courses, we ran a \_\_\_\_ model comparing the tracking metric, calculated from the district data, to the relative under enrollment of Black students in advanced courses, calculated from the federal data. We included additional predictor variables including as covariates percent free and reduced-price lunch and the logarithm of student enrollment. We initially considered using reduced-price lunch as a covariate, but excluded them because of the high correlation between FRPL and …

**Limitations**

Despite our efforts to collect complete data sets and to triangulate findings across data sets, the study has significant limitations. First, we drew exclusively on public records, which means that we do not have any student level data. We report trends at the school, district, and state levels, but the voice of students and individual student experiences are missing from the study, as are staff perspectives on and insights into course offerings. Second, the data sets are incomplete. The federal OCR data does not have information on social studies and English courses or on socioeconomic status, which limits our abilities to run comparisons across data sets, and the program of studies data set is missing over ten districts. Third…….. Despite these limitations, we believe that the combination of the district, state, and federal data in this study create a novel picture of how course offerings and racial diversity interact in Virginia.

**Results**

**District Tracking Structures**

Districts make decisions about the number of courses to offer, the number of levels of offer for each course, and how challenging it is to enroll in any given course. Districts varied widely in the number of courses they offered that could give students college credit. Statewide, AP courses were offered in 110 districts, Dual Enrollment (AP) courses were offered in 106 districts, and IB courses were offered in 17 districts. The number of AP courses offered at districts ranged from 1 to 58, with an average of 21 courses while the total number of DE courses offered by districts ranged from 1 to 86. Both AP courses and DE courses were offered in person and online, although this was much more common for AP courses which were frequently offered as part of Virtual Virginia, a state platform for remote AP courses. Unlike college credit courses, almost every district in Virginia offers the SOL tested courses. The variation for these courses comes in how many levels of the courses are offered and how challenging it is to enroll in a particular class.

Across the state, districts offer an average of 1.90 levels of SOL tested courses (SD 0.53), meaning that most districts offer SOL tested courses like World History 1 at close to two levels. Typically, a district with two levels of a course like World History 1 are offering it at the standard, the default, and the honors, an advanced, level, although remedial levels are fairly common in the state for classes such as Algebra 1, which 77 districts offered at the remedial level. Across all districts, there were only a few incidences where the standard level was not offered for a course, which was not true for honors level courses, which were slightly less commonly offered. The third most common level was remedial, a course level typically reserved for students who have struggled with or might struggle with the standard version of the course. The fourth level in our analyses, and the least common, is a self-contained special education class, which is only taken by students with identified special needs. While most school districts offer co-taught special education courses where students with special needs are in classrooms with students without special needs, some districts also offer self-contained special education courses that correspond in name or content to SOL tested courses. As shown in Table 1, there was a wide range in the percent of districts and academic departments offering SOL tested courses at each level.

Overall, the number of levels of courses offered by districts ranged from one level per course to over four levels per course. Departments within districts varied in the number of levels of courses they offered (F() = 4.829, p = 0.003; see Table 1). In general, English departments offered more levels of courses than did other departments and Science departments offered slightly fewer levels of courses. In part, this variation between departments represents differences in how many students have access to the SOL tested courses. While all students have access to English 9, 10, and 11, not all students have access to chemistry, one of the three SOL tested science courses we looked at. In order to take chemistry, students in most districts have to have either passed or currently be enrolled in algebra 2. Taking algebra 2 in turn requires that students have passed algebra 1, which students in the state take in grades from 8th through 12th. As a result, while over 65,000 students in Virginia take biology, under 33,000 take chemistry. The tracking for chemistry primarily happens in access to the course rather than between levels of the course

**Table 1**

*Percent of Districts Offering Honors, Remedial, and Self-Contained Special Education Courses for SOL Tested Subjects*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Standard | Honors | Remedial | Special education |
| Overall | 98.3% | 59.8% | 17.2% | 6.1% |
| English | 100% | 85.3% | 15.0% | 12.4% |
| Math | 99.4% | 42.0% | 44.6% | 3.4% |
| Social Studies | 94.3% | 50.0% | 3.1% | 4.2% |
| Science | 99.7% | 61.9% | 6.2% | 4.5% |

Pre-requisites, the barriers that districts erect to course enrollment, in general vary widely across the state and between departments. Overall, 112 of the 118 districts in the sample included information about prerequisites for individual courses. Across districts, prior coursework was the most common prerequisite for course enrollment, required for enrollment in one-third of all SOL tested courses. The other common prerequisites were grade point average (GPA), teacher recommendation, and test scores. The number of prerequisites varied by department with social studies departments typically requiring fewer prerequisites for course enrollment than math and other departments requiring more prerequisites.

In general, most districts required one or no prerequisites for enrollment in SOL tested courses. However, this varied by course level. While 52% of standard courses had no prerequisites for course entry, only 22% of honors courses had no prerequisites. Inversely, 48% of honors courses and only 10% of standard courses required two or more prerequisites for course entry. The type of prerequisite as well as the number of prerequisites required for course entry varied by course level. While only 6% of standard courses required a certain GPA in prior coursework for enrollment, 46% of honors courses had the same requirement. Similarly, 4% of standard courses and 33% of honors required a teacher recommendation and 3% of standard and 24% of honors courses set a cut off test score for enrollment. Remedial courses had almost no prerequisites. Prerequisites in these districts limited which students had access to the advanced levels of courses, but not to the lower levels of courses.

**Access to Advanced Courses**

Across the state, enrollment in AP courses, biology, chemistry, and algebra 1 and 2 varied by student ethnicity. White students are on more advanced academic trajectories than Black and Latinx students as measured by disparities in diploma types, gifted identification, AP enrollment, and enrollment in chemistry courses. The Commonwealth of Virginia offers three different diploma types, including advanced studies and standard diplomas for all students and applied diplomas for students with special needs, with different coursework required for each diploma type. While some districts specified that students pursuing either the advanced studies or the standard diploma could pursue college, others indicated that only students pursuing an advanced diploma were on track for college. In Virginia, white students are 49% of the population but 64% of those receiving advanced diplomas while Black and Latinx students both receive advanced diplomas at disproportionately low rate compared to their percentage of the school population. This mirrors trends in gifted identification. At 49% of the population, white students are 58% of those identified as gifted while Black students are 22% of the population and 12% of those identified as gifted and Latinx students are 16% of the population and 10% of those identified as gifted. These trends are equally true in course enrollment where white students are significantly overrepresented and Black and Latinx students underrepresented in AP and Dual Enrollment (DE) advanced courses (t(300) = -3.96, p < 0.001).

The disparities exist only, however, in access to elite opportunities. When it comes to lower level courses and diplomas, Black and Latinx students are over, not under, represented (see Table 2 for detailed course enrollment information). At times, the racial disparities between groups relates to the timing of courses. White students tend to take algebra 1 in 8th grade while Black and Latinx students are significantly more likely to take the course in 9th grade or even later (t(300) = -11.96,. p < 0.001). The timing of algebra 1 then impacts students’ timing for algebra 2. Black and Latinx students take algebra 2 at close to the population rates, meaning that they are almost proportionately represented in algebra 2 (t(360)= -2.20, p < 0.05). Because Black and Latinx students, however, are taking algebra 1 later, they are also taking algebra 2 later if they take it at all, which inhibits their ability to take advanced science and math courses later on.

**Table 2**

*Course Enrollment by Ethnicity*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | School population | Biology | Chemistry | AP classes | Algebra 1 8th grade | Algebra 1 9th-10th grade | Algebra 2 |
| Black | 22.39% | 23.46% | 16.24% | 12.40% | 17.65% | 29.59% | 20.10% |
| Latinx | 15.69% | 14.10% | 12.70% | 9.94% | 12.61% | 21.34% | 13.58% |
| White | 48.99% | 49.75% | 54.66% | 58.58% | 55.65% | 40.41% | 49.03% |

These disparities exist at the state level and are driven in part by disparities between schools. Overall, regardless of the diversity of a school, as measured by Kelly and Price’s (2011) d-index, advanced classes are generally slightly less diverse than the school as a whole. For chemistry, the difference is 0.07 on a diversity index of 0 to 1, a significant (p < 0.001), but very small difference in diversity. Lower rates of enrollment by Latinx and Black students attending mixed race high schools is not enough to explain the state level disparities—the state level differences in enrollment are too large to be explained by small disparities at racially diverse high schools.

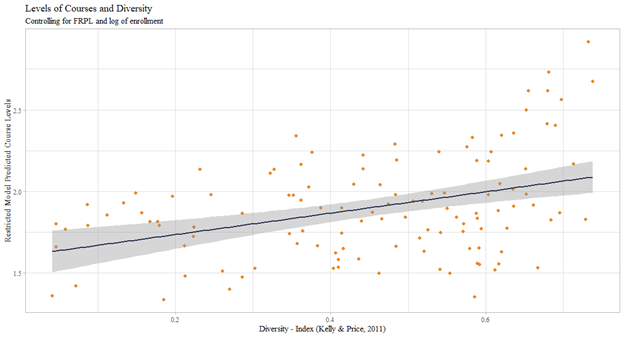
**Racial Diversity and Tracking Systems**

We found that the level of tracking by school districts was related to the district’s overall racial diversity and, separately, to the extent of underrepresentation of Black students in that district in advanced courses. We found that the number of levels of courses offered by a district is predicted by the racial diversity of the district (Figure 1). The diversity index from Kelly and Price (2011). describes a minimally diverse district (d-index = 0.00) as one that is entirely homogeneous and a maximally diverse district (d-index = 1.00) as one that has all racial groups in equal proportions. Districts across the state varied in how racially diverse they were, although no district in our data set was either maximally or minimally diverse. The least diverse district in the data set was Craig county, which reported that 99% of its students were White. The largest non-White group in that district were African American and Biracial students, each of which group represented 0.3% of the district. The most diverse district in Virginia is Prince William County, with an enrollment of 31% white students, 34% Latinx students, 20% Black students, and 15% of students from other groups.

We found that the difference between a d-index of 0.00 and a d-index of 1.00 is 0.71 levels per course when controlling for poverty and district size (Table 2). If either a minimally or maximally diverse district existed, we would extrapolate that the average difference between them would be 0.71 tracks per course offered. Given that no maximally or minimally diverse district existed in Virginia, we found that the more racially diverse districts offered half of a course level more in each SOL tested area than the least racially diverse district, when controlling for the size, urbanicity, and socioeconomic status of the district. In an additional model, we controlled for factors of urbanicity, using rural districts as a reference group. This variable proved to not be a significant predictor of course offerings when controlling for the remaining factors. Overall, districts with larger populations offered more levels of courses (p = 0.002). Finally, the percent of students within a district qualifying for free and reduced-price lunch (FRPL) was a significant predictor of number of course levels. In a district in which no students qualified for FRPL, our model predicted the district would have one half of a level morefor each course, on average, than a district wherein all students qualified for FRPL. That is, when controlling for diversity and size, districts with poorer students offer fewer levels of state-tested courses. Students’ racial diversity and income levels predict how many levels of courses their district would offer.

**Figure 1**

*Number of Levels of State Tested Courses and District Racial Diversity*

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**Table 3**

*Results from Regression Models with Clustered Standard Errors With and Without Urbanicity*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Levels of Courses | | | Levels of Courses | | |
| Predictors | Estimates | CI | p | Estimates | CI | p |
| Intercept | 0.08 | -1.11 – 1.27 | 0.893 | 0.21 | -1.36 – 1.78 | 0.783 |
| Diversity Index | 0.71 | 0.17 – 1.25 | 0.008 | 0.69 | 0.11 – 1.28 | 0.018 |
| Percent FRPL | -0.49 | -0.93 – -0.05 | 0.027 | -0.53 | -1.01 – -0.05 | 0.027 |
| Log Enrollment | 0.21 | 0.07 – 0.34 | 0.002 | 0.19 | 0.02 – 0.37 | 0.029 |
| Urban |  |  |  | 0.05 | -0.19 – 0.28 | 0.706 |
| Mostly rural |  |  |  | 0.01 | -0.32 – 0.30 | 0.947 |
| Observations | 120 | | | 119 | | |
| R2 / R2 adjusted | 0.398 / 0.382 | | | 0.396 / 0.369 | | |

The amount of tracking in a district is also related to the gap in enrollment in advanced courses between Black students and their peers. Taking chemistry for example, we find that on average chemistry classes are four percentage points whiter than the schools that enroll them (p < 0.001) when controlling for the diversity of the district. In more tracked districts, this discrepancy is even larger (p = 0.029). The pattern persists for other advanced courses including Algebra 2 and AP courses, However, crucially this pattern is not evident in Biology, which is not considered advanced relative to pre-requisite heavy courses such as Chemistry, Algebra 2, and AP courses. Black students are underrepresented in advanced courses in most schools in Virginia, but this problem is even larger at more tracked schools.

**Table 4**

*Multilevel Model Results for Percent Black in Courses Relative to School Enrollment*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **(1)** | **(2)** | **(3)** | **(4)** |
|  | **Algebra 2** | **AP Class** | **Biology** | **Chemistry** |
| **Intercept** | -.00  (.16) | -.11  (.14) | .03  (.17) | .01  (.16) |
| **Course a** | -.02\*  (.01) | -.08\*\*\*  (.01) | .01  (.01) | -.04\*\*\*  (.01) |
| **Tracks b** | -.08\*  (.04) | -.08\*  (.03) | -.08\*  (.04) | -.08\*  (.04) |
| **Diversity c** | .59\*\*\*  (.10) | .51\*\*\*  (.09) | .63\*\*\*  (.10) | .57\*\*\*  (.10) |
| **Census (log)** | .02  (.04) | .05  (.04) | .01  (.04) | .02  (.04) |
| **Random Effects:** |  | | | |
| Within-District Variance | .01 | .02 | .02 | .02 |
| Between District Variance | .03 | .02 | .03 | .02 |
| ICC | .64 | .55 | .65 | .61 |
| N | 118 | 118 | 118 | 118 |
| Observations | 676 | 637 | 690 | 667 |
| **R-squared (Conditional)** | 0.713 | 0.650 | 0.717 | 0.682 |

\* The individual coefficient is statistically significant at the \*5% level, \*\*1% level, or \*\*\*0.1% level.

a This is the binary comparison between the racial composition of that course and the percent Black of the enrolling school, where the enrolling school is the comparison baseline. b Tracks in this case refers to the number of available course tracks for all SOL-eligible courses in the district. c Refers to the diversity index in Kelly & Price (2011).

Tracking, as measured by the number of levels of state tested courses, therefore is related both to the diversity of school districts and to the percentage of Black students in a district taking advanced courses. Tracking occurs more at more racially integrated schools and is higher at schools that have lower percentages of Black students enrolled in advanced courses. Tracking in Virginia continues to serve a racially discriminatory function.

**Discussion**

In Virginia in 2017, advanced courses remained disproportionately white and academic tracking seemed to continue to play a racially discriminatory function. In this paper, we looked at statewide trends in tracking structures and in access to advanced courses and investigated the relationship between tracking structures and measures of diversity and equity. We found that Black and Latinx students continue to be underrepresented in advanced coursework and tracking remains prevalent and problematic, increasing as districts became more diverse and relating to the underrepresentation of Black students in advanced courses.

On average, school districts offer almost two levels of most state-tested courses, indicating that tracking, as measured by the number of course levels, remains prevalent in the state as it does in others (Kelly, 2007; Kelly & Price, 2011). The number of levels of courses however varies across the state. Some districts offer up to four levels of most courses while others only offer one, indicating that tracking practices vary across Virginia, as Kelly (2007) and Kelly and Price (2011) found was true in North Carolina. Districts, departments, and courses across the state varied in prerequisites and levels, indicating, as Kelly and Price (2011) found, that tracking structures are not fixed by state or by district. Academic departments within districts however vary in how tracked they are. Like Kelly (2007) we found that English departments offered the largest number of levels of courses. Unlike Kelly (2007), who found that social studies departments offered the lowest numbers of levels of courses, we found that in Virginia science departments offered the fewest number of levels of courses on average. Instead, we found that science departments engage in a different form of tracking.

Rather than offering multiple levels of chemistry, the most advanced of the state-tested science courses, districts instead restricted access to that course. Students cannot enroll in chemistry unless they have passed or are concurrently enrolled in algebra 2. In Virginia, Black and Latinx students are significantly more likely than other students to take algebra 1 in 9th grade or later. Because students cannot take algebra 2 until they have passed algebra 1, Black and Latinx students do not have the opportunity to enroll in algebra 2 until later in their high school career than other students. Taking algebra 1 later restricts students access to advanced courses like chemistry. Researchers have studied the importance of taking algebra 1 in 8th grade and the challenges that state-wide initiatives to provide all students with algebra 1 before high school have encountered (Allensworth, Nomi, & Montgomery, 2009; Domina, Penner, Penner, & Conley, 2014). Our findings support the importance of early algebra access and highlight the discriminatory function that late enrollment in algebra can serve within schools.

More broadly, however, our findings indicate that tracking today in Virginia continues to serve a discriminatory function. Tracking evolved as a way to segregate students by race and class within schools (Oakes, 2005). During the Civil Rights era, activists pushed back against tracking because of the racial segregation it was creating within schools (LaPrade, 2011; Oakes, 2005). From the 1980s onwards, educational leaders advocated against tracking because of its racially discriminatory functions (Burris, 2014; Oakes, 2005). Despite this history of advocacy, we find that today not only are Black and Latinx students in Virginia underrepresented in advanced diploma tracks, gifted programs, and advanced courses but also in districts that are more diverse, students are sorted into more levels of courses. Our finding supports that of Lucas and Berends (2002) on the relationship between racial diversity and tracking and differs from that of Kelly and Price (2011). Given that each group of researchers looked at different subsets of courses and used different techniques, it is clear that we need more research on the relationship between racial diversity and school tracking. We need research that brings in the voices and experiences of students. This study is a surface level analysis of what is happening in Virginia. We did not interview students, study student records, or investigate the enrollment in courses in Virginia. Each of these is vitally important to understanding not just what is happening in the state, but why these things are occurring.

Our findings go further than those papers however and looks at the relationship between tracking and advanced course access. We find that in more tracked districts, fewer Black students, as a percentage of overall school enrollment, take advanced courses.

Given the negative impact of tracking on many students (Burris, 2014; Oakes, 2005), our finding that tracking varies by place and by department indicates that these structures are not immutable. In 2007, Watanabe and colleagues found that one teacher could alter the tracking structure of a science department. That teacher and school do not need to be an isolated case. Our finding of variability indicates that there is room for change within departments and school districts. Our findings on the relationship between district racial diversity and the number of course levels offered and the relationship between tracking and the percentage of Black student taking advanced courses serves as a reminder of the racially discriminatory nature of tracking and a reminder of why these systems need to change.

In a state and society where Black and Brown students continue to too often be offered a second-class education, research on the opportunities that students are offered or denied within their school districts is vital. In this paper, we were able to expose what is happening with tracking in Virginia and how it relates to racial diversity. We were able to uncover links between our measure of how tracked a district is, the racial diversity of the district, and, separately, the percentage of Black students enrolled in advanced classes. In Virginia, tracking is related to race both in terms of which districts are the most tracked and who has access to the most advanced courses. To address the problems within our schools however we need to know more about how these systems are maintained and change and how students perceive these systems. Our paper begins a new conversation on tracking in Virginia and has implications for people studying within school segregation in other localities. We hope however that this is just the beginning of a rich conversation that can lead to meaningful change in policy and practice.

**References**

Burris, C. C. (2014). *On the Same Track: How Schools Can Join the Twenty-First-Century Struggle against Resegregation*. Boston, MA: Beacon Press.

College Board (2014). The 10th annual AP report to the nation. Retrieved from https://research.collegeboard.org/programs/ap/data/nation/2014

Corra, M., Scott C., & Carter, S. (2011). The interactive impact of race and gender on high school advanced course enrollment. Journal of Negro Education, 80(1), 33-46.

Creswell, J. & Plano Clark, V. (2011). *Designing and conducting mixed methods research* (2nd ed). Washington D.C.; SAGE Publications.

Day, J. K. (2016). The Southern Manifesto: Massive resistance, growth liberalism, and the interpretation of Brown II. *Journal of School Choice, 10*(4), 420-435.

Gordon, M., VanderKamp, E., & Halic, O. (2015). Research brief: International Baccalaureate programs in Title 1 schools in the United States. International Baccalaureate Organization. Retrieved from https://www.ibo.org/globalassets/publications/ib-research/title-1-schools-research.pdf

Irizarry, J. (2015). What Latino students want from school. *Educational Leadership, 72*(6), 66-71.

Kelly, S. (2007). The contours of tracking in North Carolina. *The High School Journal, 90*, 15-31.

Kelly, S. & Price, H. (2011). The correlates of tracking policy: Opportunity hoarding, status competition, or a technical-functional explanation? *American Educational Research* *Journal, 48*(3), 560-585.

Kurlaender, M. & Yun, J. (2007). Measuring school racial composition and student outcomes in multiracial society. *American Journal of Education, 113,* 213-242.

LaPrade, K. (2011). Removing instructional barriers: One track at a time. *Education, 131*(4), 740-752.

Lewis, G. (2006). Virginia's northern strategy: Southern segregationists and the route to national conservatism. *Journal of Southern History, 72*(1), 111-146.

Lombardo, P.A. (1985) Three generations, no imbeciles: new light on Buck v. Bell. *New York University Law Review,* 60(1) 30-62.

Lucas, S. & Berends, M. (2002). Race and track location in U.S. public schools. *Research in Stratification and Mobility, 25*(1), 169-187.

Modica, M. (2015). “My skin color stops me from leading": Tracking, identity, and student dynamics in a racially mixed school. *International Journal of Multicultural Education, 17*(3), 76-90.

Musu-Gillette, L., Robinson, J., McFarland, J., KewalRamani, A., Zhang, A., & Wilkinson-Flicker, S. (2016). Status and trends in the education of racial and ethnic groups 2016. Institute for Education Statistics, National Center for Education Statistics.

Oakes, J. (2005). *Keeping track: How schools structure inequality* (2nd ed.). New Haven, CT: Yale University Press.

Oakes, J., Selvin, M., Karoly, L., & Guiton, G. (1995). *Educational matchmaking: Academic and vocational tracking in comprehensive high schools*. National Center for Research in Vocational Education; Berkley, CA.

Office of Civil Rights (2020). Civil rights data collection (CRDC) for the 2017-2018 school year. U.S. Department of Education. Retrieved from https://www2.ed.gov/about/offices/list/ocr/docs/crdc-2017-18.html

Schmidt, W. & McKnight, C. (2012). *Inequality for all: The challenge of unequal opportunity in American schools*. New York, NY: Teachers College Press.

Siegel-Hawley, G. & Fleisher, P. (2009, August 12). Maggie Walker’s diversity complex. Style Weekly. Retrieved from <https://www.styleweekly.com/richmond/maggie-walkerandaposs-diversity-complex/Content?oid=1372245>

Tyack, D. & Cuban, L. (1995). *Tinkering toward utopia: A century of public school reform.* Cambridge, MA: Harvard University Press.

Virginia Department of Education (2017a). Gifted annual report, 2016-2017. Retrieved from <http://www.doe.virginia.gov/statistics_reports/gifted/index.shtml>

Virginia Department of Education (2017b). Fall membership reports. Retrieved from <https://p1pe.doe.virginia.gov/apex/f?p=180:1:7224984712187:::::>

Virginia Department of Education (2018a). Virginia cohort reports: Class of 2017 state summary. Retrieved from <http://www.doe.virginia.gov/statistics_reports/graduation_completion/index.shtml>

Virginia Department of Education (2018b). Statewide results: 2017-2018 test administration. Retrieved from <http://www.doe.virginia.gov/statistics_reports/sol-pass-rates/index.shtml>

Virginia Department of Education (2018c). Superintendent's annual report 2017-2018. Retrieved from <http://www.doe.virginia.gov/statistics_reports/supts_annual_report/2017-18/index.shtml>

Virginia Department of Education (n.d.). Virginia public school listing-- by region. Retrieved from <http://www.doe.virginia.gov/directories/schools/school_info_by_regions.shtml>

Watanabe, M. (2008). Tracking in the era of high stakes accountability reform: Case studies of classroom instruction in North Carolina. *Teachers College Record, 110*(3) 489-534.

Watanabe, M., Nunes, N., Mebane, S., Scalise, K., & Claesgens, J. (2007). “Chemistry for all, instead of chemistry just for the elite”: Lessons learned from detracked chemistry classrooms. *Science Education, 91*(5), 683-709.

Yonezawa, S., Wells, A., & Serna, I. (2002). Choosing tracks: "Freedom of choice" in detracking schools. *American Educational Research Journal, 39*(1), 37-67.

**Appendix**

**Program of Study Coding Rubric**

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| --- |
| **Coding the number of levels of SOL tested courses**  For each district POS, follow the following steps. |
| **1. Identify the SOL tested courses. Code them by course in Nvivo AND note if they are virtual.**   * Algebra 1 * Algebra 2 * Geometry * English 9 * English 10 * English 11   + AP English and DE English can be coded as English 11 if it says 11th graders can take it. Note that DE writing is generally a 12th grade class so check grade levels before coding DE classes. * Earth science   + If earth science is not listed, check for an equivalent course like Geosystems and see if it says SOL tested) * Biology   + Do not code AP bio as SOL tested. AP bio normally requires bio as a prerequisite. * Chemistry   + Do not code AP chem as SOL. AP chem normally requires chem as a prerequisite. * World History 1   + Not all schools offer WH1. Some schools offer World Geography instead of WH1. If you do not see WH1, check for World Geography and code it as WH1. Make a note if that happens. Note: Do not code for World Geography outside of this instance. * World History 2   + Code World History AP courses as WH2 as they generally can be taken for SOL credit. Do NOT code AP European History as WH2 even if it says WH2 SOL. Sometimes districts list it as WH2 SOL and sometimes they do not and we want to be consistent in our coding and so are not coding it as WH2 at all. Note in Nvivo however that AP European history was offered in that district. * US and Virginia history   + Code any class here that offers the US history SOL. This can include US history DE and AP courses—but not US government courses. Verify and only code if the course description mentions the SOL. |
| **2. Code the levels of the SOL tested course in Nvivo and on the course levels spreadsheet.**   * Self-contained special education classes   + These courses are typically at the end of course guides. To find them, you need to look both within department and grade course offerings AND to check the full program of study for special education offerings.   + Only code a special education course as an SOL course if the name maps on. For example, social studies 9 would not be coded as an SOL course but biology for students with special needs would be.   + Only code a course here if the course is exclusively for students with disabilities. It might state IEP, special education, special needs, alternative diploma. Co-taught courses are coded as standard or remedial based on the course description. * Remedial   + Code a course as remedial is it described as being longer, slower, or more simple than other courses. The course description might specify that it is for students who failed the 8th grade English SOL or that it is for students who need extra time. * Standard   + Code a course as standard if there is no description of the course level, if it is the only course offering for that subject, or if it says standard, academic, or basic. * Honors   + Code any non-college credit bearing advanced course as honors. This includes honors, advanced, pre-AP, and pre-IB classes. If the district offers multiple advanced courses like honors and pre-IB, code both so that you list 2 honors courses for that district. * AP/DE/IB   + These courses are only coded if they state that students in them can take the SOL. AP and DE biology and chemistry are NOT coded as SOL tested. |
| **3. Code the prerequisites of SOL tested courses in Nvivo and on the prerequisites’ spreadsheet.**   * See the pre-requisite code sheet for how to code pre-requisites. * For each course, code the full prerequisite statement and note the code number on the prerequisite spreadsheet. For example, if a course just requires a teacher recommendation, code it as a 4 on the spreadsheet. If instead the course requires a GPA, test score, and teacher recommendation, code it as a 20. * *Note:* Check district and department prerequisites as well as course prerequisites. Some districts set district level requirements for advanced courses that should be applied to every advanced course for that district. A few set departmental level requirements for advanced courses that should also be applied to each course in the department. |
| **4. Count and code college credit courses on Nvivo and the college credit course spreadsheet. Note which are virtual.**   * Key word and visually search the course guide for Advanced Placement (AP), International Baccalaureate (IB), and Dual Enrollment (DE) courses. * Code each under the course type (AP, IB, DE) in Nvivo. * Count the total number of AP, DE, and IB courses and note it on the college credit course spreadsheet. * *Note:* Virtual Virginia courses count as AP courses. These are typically at the beginning or end of programs of study and not in the department and grade level areas of the programs of study. * *Note:* DE courses include career and technical education courses such as HVAC maintenance. Check the entire program of study for DE courses as they can be located anywhere in the POS. |
| **5. Code statements about tracking in Nvivo**   * Look for statements about level changes (typically at the beginning of the POS near graduation requirements). * Look for any descriptions of the level system including comments on weighting courses and descriptions of AP, DE, or Honors courses. * Look for department level statements on course levels like an English department statement on who should take honors courses. * Look for any other statements about tracking, course levels, or who belongs in challenging courses. District equity statements, if they include comments on courses, should also be coded here. |