Educational Context Matters:
The Development, Foundations, and Use of Consistent, Research-Based Environmental Information in College Admissions

Jessica S. Howell
Michael Hurwitz
Samuel Imlay
Greg Perfetto

College Board Research
October 2022

Abstract

In 1983, the National Commission on Excellence in Education published *A Nation at Risk*, a landmark study that laid out the shortcomings of a K-12 educational system that was failing American youth. In the nearly 40 years since, income segregation across U.S. school districts has accelerated (Owens, Reardon & Jencks, 2016), and metrics and outcomes like test scores (e.g., NAEP, SAT, ACT), college enrollment, degree completion, and employment continue to reflect educational inequities that fall along sociodemographic lines (NCES, 2022). Research reveals that the educational fate of students living in challenging environments is not sealed at birth, as those fortunate enough to move to more resourced neighborhoods or attend colleges that enhance social mobility have improved educational and life outcomes (Chetty, Hendren, and Katz, 2016; Chetty et al., 2017). This paper presents new data that serve as the basis for Landscape, a resource for higher education that quantifies the accumulated educational challenges faced by American youth at the point of high school graduation. We assemble rich data resources that describe the environments where students live and learn. We synthesize the literature on environmental context and educational opportunity to support the creation of normative contextual metrics that supplement college application information for college admissions professionals. We illustrate how these evidence-based measures of environmental context relate to student attributes and postsecondary outcomes and conclude with evidence that information on environmental context demonstrably changes admissions outcomes.

Table of Contents

Introduction

Access to high quality K-12 education is not equitably distributed among America's youth. Over time, income segregation across U.S. school districts has accelerated (Owens, Reardon & Jencks, 2016) and education funding gaps have grown (Meckler, 2019; Baker, Farrie, and Sciarra, 2018). Not surprisingly, metrics and outcomes like test scores (e.g., NAEP, SAT, ACT), college enrollment, degree completion, and employment continue to reflect educational inequities that fall along sociodemographic lines (NCES, 2022). Although increased school funding is no panacea for systemic inequity, research suggests that equalizing funding gaps by increasing school expenditures does have the potential to close gaps in academic achievement (Kriesman and Steinberg, 2019; Rauscher, 2019). Research on the troubling differences in access to high quality education has been expanded by a new wave of research focusing on rural communities, which, depending on geography, represent heterogeneous populations in terms of income, race, and ethnicity. Rural students lack the visibility of urban populations who reside closer to the large cities where policymakers and legislators tend to call home. They also face the expected challenges of unequal access to high quality advanced coursework in the K-12 system, and they also tend to live in "education deserts" far from postsecondary institutions (Hillman and Weichman, 2016). Often lacking access to colleges within commuting distance, rural youth are also more likely to grow up in "child-care" deserts where educational trajectories are dampened by inconsistent or unavailable early childhood educational opportunities (Malik et al., 2018).

The nation's most vulnerable students were dealt yet another blow in 2020 from the covid-19 pandemic. New data offer a sneak peek at what these disparate impacts might look like. Research by the Opportunity Insights team reveals a precipitous decline in usage of the popular online math instruction platform, Zearn, among students in low-income zip codes, but not higher income zip codes (Chetty et al., 2020). New research from Harvard, NWEA, and CALDER finds that remote instruction during the pandemic widened achievement gaps by school poverty and race/ethnicity (Goldhaber et al., 2022). There is little doubt that the research literature will eventually feature many studies documenting learning losses and opportunity gaps that cut across sociodemographic lines. Learning trajectories for students from disadvantaged environments have been derailed, and it remains unclear when or if this trend will reverse course. It will be more important than ever to understand the context in which student learning occurred.

Postsecondary education has long been viewed as the ticket to higher incomes and greater economic stability when society is confronted with economic downturns like the pandemic-induced recession experienced in the U.S. (Ma, Pender and Welch, 2019; Chetty et al., 2017). However, lower-income students who stand to gain the most from postsecondary educational opportunities face both cost barriers and gaps in academic preparation. College admissions professionals see the culmination of these K12 differences, including lower high school GPAs and test scores (Nord et al, 2011; College Board, 2020) and less access to rigorous coursework that results in unequal academic preparation (Theokis and Saaris, 2013). Colleges have recently requested that reliable contextual information be made available to better evaluate applicants' accomplishments within the environmental obstacles they may have faced in their home and school environments. Many colleges believe that access to contextual information can support their efforts to better understand context when evaluating while also benefiting institutional mission goals related to providing opportunities for students from more challenging environments.

I. Environmental Context in College Admissions

Higher education's gatekeepers are well aware of lopsided K-12 systems that impact wide swaths of America's youth. Many have embraced holistic admissions processes that consider a host of factors beyond high school GPA, test scores, and the rigor of high school coursework in an attempt to both widen the set of factors signaling applicants' potential and fit at an institution, and to better understand the context of the educational and environmental opportunities available to them. In a recent study published by the American Council on Education, more than three-quarters of responding colleges reported using holistic admissions (Espinosa, Gaertner, and Orfield, 2015). Although high school GPA, coursework, and college entrance examination scores remain among the most commonly discussed admissions criteria, many colleges rely on a host of other factors to make admissions decisions, including extracurricular activities, college

essays, and teacher and counselor recommendation letters. These non-academic pieces of the college application seem to be promising antidotes to differential opportunity, yet recent research indicates that they may actually work against efforts to level the playing field (Jaschik, 2018; Thornhill, 2018; Akos and Kretchmar, 2016; Kuncel, Kochevar, and Ones, 2014; Alvero et al., 2021). It is easy to imagine the many ways these non-academic pieces of the college application disadvantage the already-disadvantaged. Overworked teachers and counselors at lower-income high schools are often unable to offer the individualized recommendations that communicate each student's unique strengths. First generation students may receive less guidance at home in curating a persuasive personalized essay. Extracurricular activities, particularly the ones that involve extensive travel and expensive equipment, are less available and accessible to students from disadvantaged environments (Wong, 2015).

A longstanding element of holistic admission that *is* expressly intended to counterbalance educational inequity in the service of achieving institutional missions, is the consideration of a student's academic and non-academic accomplishments and experiences in the context of the opportunities available to the applicant (Coleman and Keith, 2018; Perfetto et al., 1999). The use of contextual information in college admissions makes sense in theory but poses some challenges in practice. Annually, U.S. colleges and universities receive over 10 million applications from students attending nearly 30,000 high schools according to IPEDS data (DeSilver, 2019). Colleges that attract predominantly local students have an obvious advantage in using environmental context; they are more likely to be familiar with the neighborhoods and high schools from which their applicants hail. These regional institutions have deep relationships with local community leaders and school administrators, and this familiarity can make the use of environmental context more straightforward. Over the last several decades, however, students have become less geographically constrained in terms of college choice in the sense that college applicant pools have evolved to include more and more students from unfamiliar neighborhoods and high schools (Hoxby, 2009). In the fall of 2018, nearly 500 traditional postsecondary institutions enrolled more first-year out-of-state students than in-state students (IPEDS, Fall 2018). Although first-year college students may be more likely to venture farther from home than they were a generation ago, it is not clear that colleges have branched out accordingly to lesser-known high schools or neighborhoods. Recruitment rosters continue to tilt towards more affluent high schools where students are safer bets in terms of degree completion and less likely to require institutional aid (Han, Jaquette, and Salazar, 2019). College outreach to high schools was severely restricted during the covid-19 pandemic, further limiting their ability to more deeply understand local educational contexts.

Researchers are just beginning to learn about the promises of holistic admissions practices to reshape how enrollment professionals craft incoming classes. With a few recent exceptions, researchers rarely have access to the entire and complete college application portfolios that could shed light on the complexities and nuances of what some consider to be opaque admissions practices (Arcidiacono, Kinsler, and Ransom, 2020). Michael Bastedo and co-authors conducted a series of experiments with more than 300 admissions professionals across the country to offer insights on how environmental context information might affect admissions decisions in practice. They found the provision of information about high school context alongside hypothetical college applications increased the likelihood that admissions professionals would recommend admission of a low-SES applicant from an underserved high school by more than 25% (Bastedo and Bowman, 2017; Bastedo et al., 2018). This work identifies an appetite and a role for robust, consistent data to help admissions professionals better understand where applicants lived and learned.

A commitment to holistic admissions and the ability to execute decisions using a holistic process are not synonymous. Information about the circumstances that potentially shaped a student's academic and non-academic portfolio may appear in student essays, teacher recommendations, or high school profile sheets. But such information may be incomplete and inconsistently available across applicants from different high schools and communities. When College Board surveyed colleges who use contextual information in admissions, they report missing basic high school profile data from approximately 25% of their applicants. Moreover, many admissions professionals are time-constrained and find it difficult to hunt for contextual data outside of the official applications. The majority of admissions readers review more than 100 applications per week during the busy season, leaving little time for the collection of useful contextual information outside of the official application portfolio (Bastedo et al., 2018).

Since 2015, College Board's Future Admissions Tools and Models initiative has brought together practitioners from a wide range of institutions, along with expert researchers, to identify, extend, and scale innovating and promising practices through the development of research-based frameworks and tools. Many of these member institutions value consistent and systematic information about where college applicants live and learn as part of their holistic review process. In describing the need for robust and reliable context information, member colleges specifically requested that the approach, methodology, and data be designed for use by colleges in all states, including those with bans on the consideration of race in admissions.

The effort to systematize the use of context in admission began in 2015 with a series of in-person meetings with colleges and researchers to define the information that enrollment managers identified as indicative of educational challenge. The second stage involved consulting with interdisciplinary research experts to develop and refine measures that could capture these indicators in a systematic and unbiased way, and iterating on a prototype tool for use by admissions professionals. After these measures and the tool were developed, a series of research studies affirmed the promise suggested by the earlier Bastedo and Bowman (2018) experiment—the use of environmental context increased the admissions chances of students from high-challenge neighborhoods and high schools after controlling for standard academic and background variables (Bastedo et al., 2022; Mabel et al., 2022).

The deliberate and collaborative multi-year research effort described above culminated in the 2019 release of an environmental context resource called Landscape. The Landscape resource provides colleges and scholarship organizations with a rich set of data on their applicants' neighborhood and high school environments, to aid practitioners in their quest to better understand context when evaluating applicants in their holistic review process. The tool is based on geodemographic data, similar to other data resources created and utilized in both education and non-education settings (see Section IV), but Landscape has been specifically developed and customized for use by colleges and scholarship organizations. Over 200 institutions now use Landscape in their application process, and we continue to see growing interest in both the Landscape resource and in the use of environmental context information in holistic admissions review.

II. Components of Landscape Context and the Underlying Research Literature

This section provides a detailed description of the data elements underlying the various contextual components of the Landscape data. The information presented in Landscape falls into three categories: (A) General High School Information, (B) Test Score Comparison, and (C) High School and Neighborhood Information. A broad array of research supports the inclusion of these data to describe the environment where a student lives and learns.

A. General High School Information[1]

- *High School*: Name of the applicant's high school
- *Locale*: This measure is based on the high school's location, and relies on the National Center for Education Statistics (NCES) system of classifying geographic areas into 4 categories: City, Suburban, Town, and Rural.[2]
  - City and Suburban types are further divided into Large, Midsize, and Small, based on the population of the city or suburb (e.g., City: Midsize).
  - Town and Rural types are further divided into Fringe, Distant, and Remote, based on the proximity of the town or rural area to an urban area (e.g., Rural: Remote).
- *Senior Class Size*: 3-year average of the senior class size of the applicant's high school (Common Core of Data and Private School Survey, NCES).
- *Percent of Students Eligible for Free and Reduced-Price Lunch*: 3-year average of percentage of students eligible for free and reduced-price lunch at the applicant's high school (Common Core of Data, NCES). Available for public high schools only.
- *Average SAT scores at colleges attended*: Average of the median first-year student SAT scores at 4-year colleges attended by the 3 most recent cohorts of college-bound seniors from the applicant's high school who took any College Board assessments (aggregate College Board and National Student Clearinghouse data). Average SAT scores are calculated using data from the Integrated Postsecondary Education Data System (IPEDS, NCES).
- *AP Participation and Performance*
  - *Seniors Taking AP*: 3-year average of the percentage of the senior class who have taken at least one AP® Exam (aggregate College Board data, NCES)
  - *Average AP Exams Taken*: 3-year average of the number of AP Exams taken by seniors from the high school who took at least one AP Exam (aggregate College Board data)
  - *Average AP Score*: 3-year average of AP Exam scores across college-bound seniors from the high school who took AP Exam(s) (aggregate College Board data)
  - *Unique Exams Administered*: number of unique AP Exams taken by college-bound seniors at the high school over the past 3 years (aggregate College Board data)

Admissions offices often have poor information on high school contexts (Bastedo, 2014), and this is particularly true for high schools that are not geographically proximate or common feeder schools into their applicant pools (Han, Jaquette, and Salazar, 2019; Wolniak and Engberg, 2007). The general high school information described above is grounded in a substantial body of research. For instance, students in rural high schools and those who attend higher-poverty high schools are less likely to have access to Advanced Placement (AP) and other rigorous courses (Attewell and Domina, 2008; Klopfenstein, 2004; Perna, 2004; Mann et al., 2017). Students from affluent families or those who attend private

[1] Data sources include the Common Core of Data (https://nces.ed.gov/ccd), Private School Universe Survey (https://nces.ed.gov/surveys/pss , College Board, and National Student Clearinghouse (https://studentclearinghouse.org). Data are suppressed for any high school that has fewer than ten 12th-grade students or assessment takers.

[2] See https://nces.ed.gov/programs/edge/docs/LOCALE_CLASSIFICATIONS.pdf.

high schools also have better access to college counselors and private tutors (Buchmann et al., 2010; McDonough, 1994). Lastly, high schools' college-going climates also have substantial influence on whether students enroll in college and the types of postsecondary alternatives students perceive as within reach (Holland, 2014; McDonough, 1994, 1998; Roderick et al., 2011).

B. Test Score Comparison

- The applicant's SAT score or ACT score is provided by the college and presented alongside the 25th, 50th, and 75th percentile of SAT scores at the high school, based on the distribution of SAT scores among SAT takers at the high school over the past three senior classes. The College Board translates ACT scores to SAT scores using published concordance tables.[3]
- *Percentage of College-Bound Seniors Taking the SAT*: 3-year average of the percentage of the high school's senior class who have taken the SAT (aggregate College Board data, NCES).

C. High School and Neighborhood Information, Normed Nationally or by State[4]

Neighborhood and high school indicators are provided: (i) at the neighborhood level, which is defined by a student's census tract,[5] and (ii) at the high school level, which is defined by the census tracts of college-bound seniors at a high school.[6] Applicants from the same census tract share the same neighborhood data and indicators; applicants from the same high school share the same high school data and indicators.

The indicators are:

1. *College attendance*: A measure based on the predicted probability that a student from the neighborhood/high school enrolls in a 4-year college (aggregate College Board and National Student Clearinghouse data)
2. *Household structure*: A measure based on neighborhood/high school information about the number of married or coupled families, single-parent families, and children living under the poverty line (American Community Survey)
3. *Median family income*: Median family income among those in the neighborhood/high school (American Community Survey)
4. *Housing stability*: A measure based on neighborhood/high school information about vacancy rates, rental vs. home ownership, and mobility/housing turnover (American Community Survey)
5. *Education level*: A measure based on typical educational attainment of adults in the neighborhood/high school (American Community Survey)
6. *Crime*: The predicted probability of being a victim of a crime in the neighborhood or neighborhoods represented by the students attending the high school (Location, Inc.)

These six indicators are averaged and presented on a 1-100 percentile scale to provide a *Neighborhood Average* and a *High School Average*. A higher value on the 1-100 scale indicates a higher level of challenge related to educational opportunities and outcomes.[7]

---

[3] See https://collegereadiness.collegeboard.org/pdf/guide-2018-act-sat-concordance.pdf.

[4] Data sources include American Community Survey (https://www.census.gov/programs-surveys/acs), College Board, Location, Inc. (http://www.locationinc.com/data), and National Student Clearinghouse. Data from the American Community Survey are 5-year estimates that are updated annually and are not linked in any way to the decennial census.

[5] A census tract is a geographically defined area. Census tracts are statistical areas used primarily to present census data. Census tracts do not cross county boundaries. Fifty percent of census tracts in the U.S. contain between 2,900 and 5,500 individuals.

[6] A high school's college-bound seniors include those who participate in a College Board assessment.

[7] Additional detail about the data methodology can be found at https://secure-media.collegeboard.org/landscape/comprehensive-data-methodology-overview.pdf.

Research suggests that each of these indicators captures important facets of a child's schooling and community environment—distinct from influences within their household from parents and siblings—that shape children's educational development, opportunities, trajectories, and later outcomes (Newburger, Birch, and Wachter, 2011). Local income levels, educational attainment rates, and college attendance patterns in the neighborhood where a child lives and learns are all demonstrably linked to later life outcomes like their own educational attainment and earnings (Chetty et al., 2020). Research shows that the sorts of opportunities that create upward mobility for American youth are predicted by growing up around employed adults (Case and Katz, 1991). High poverty levels in a child's immediate neighborhood are causally related to worse education outcomes (Sampson, Sharkey, and Raudenbush, 2008) and research demonstrates that moving to a lower-poverty neighborhood improves later life outcomes if a child moves before age 13 (Chetty et al., 2016; 2020). Exposure to violence and crime is linked to worse outcomes for underrepresented minorities and children from low-income families (Santiago et al., 2014), including lower test scores (Laurito et al., 2019; O'Brien, 2021). Finally, research suggests that exposure to multiple negative environmental factors may have a cumulative effect on their opportunities and outcomes (Theall, Drury, and Shirtcliff, 2012), highlighting the importance of including a broad array of data that capture multiple facets of the neighborhood and schooling environment in environmental context indicators.

III. Relationships Between Environmental Context and Other Measures of Educational Opportunity and Disadvantage

A key test of validity for the Landscape resource is whether students residing in high challenge environments, as defined by Landscape, are likely to exhibit the characteristics that are associated with educational challenge. In the absence of a universally accepted external standard against which to judge its "validity," we considered two alternative paths, face validity and convergent validity. Face validity was established by surveying Landscape users to gauge how closely the Landscape measures tracked user knowledge about high schools and neighborhoods. More than 80% of admissions readers surveyed in 2020 found the high school and neighborhood context data valuable in terms of their credibility.

The second approach was to quantify how well contextual indicators relate to multiple, widely accepted correlates of educational challenge. In what follows, we show the relationship between Landscape neighborhood challenge levels (typically expressed in deciles) and various individual-level indicators of educational challenge, including postsecondary choices, family financial measures, student race/ethnicity, parental education, and high school/college academic performance.

Figure 1 shows the postsecondary outcomes of the 2012 high school senior cohort as of 2018. First, only about 11 percent of students in the lowest challenge decile did not attend any postsecondary institution, compared to 36 percent among students in the highest challenge decile. Differences also exist in the type of postsecondary institution chosen. Students in the lowest challenge decile were twice as likely to attend any four-year postsecondary institution, compared to students in the highest challenge decile (83 percent versus 42 percent). The most striking difference in Figure 1 involves bachelor's degree completion. About 65 percent of the 2012 high school senior cohort from the lowest challenge decile earned degrees from four-year colleges by 2018, compared to just 17 percent for students in the highest challenge decile.

Figure 1: Postsecondary outcomes of the 2012 high school senior cohort as of 2018, by Landscape neighborhood challenge decile

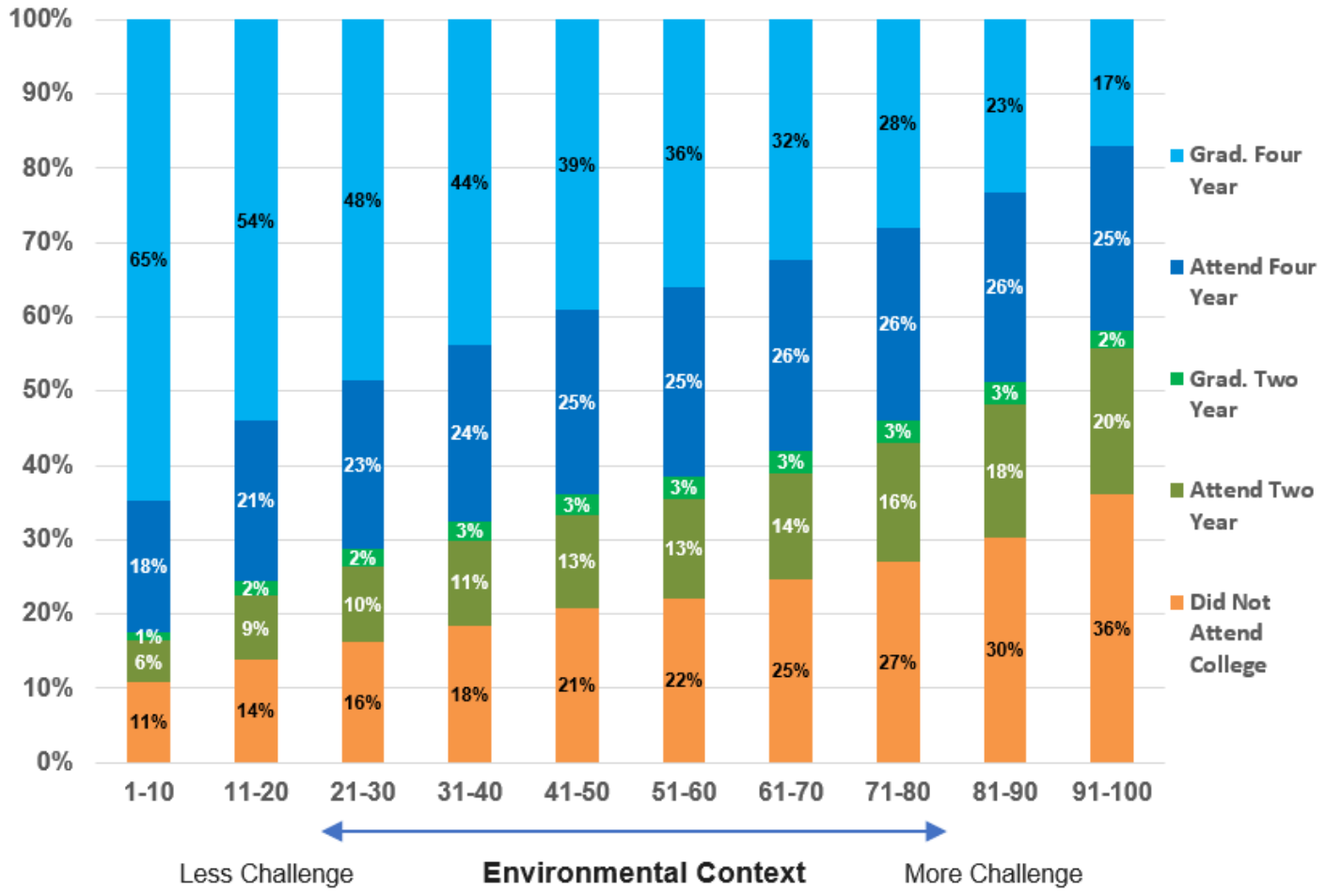
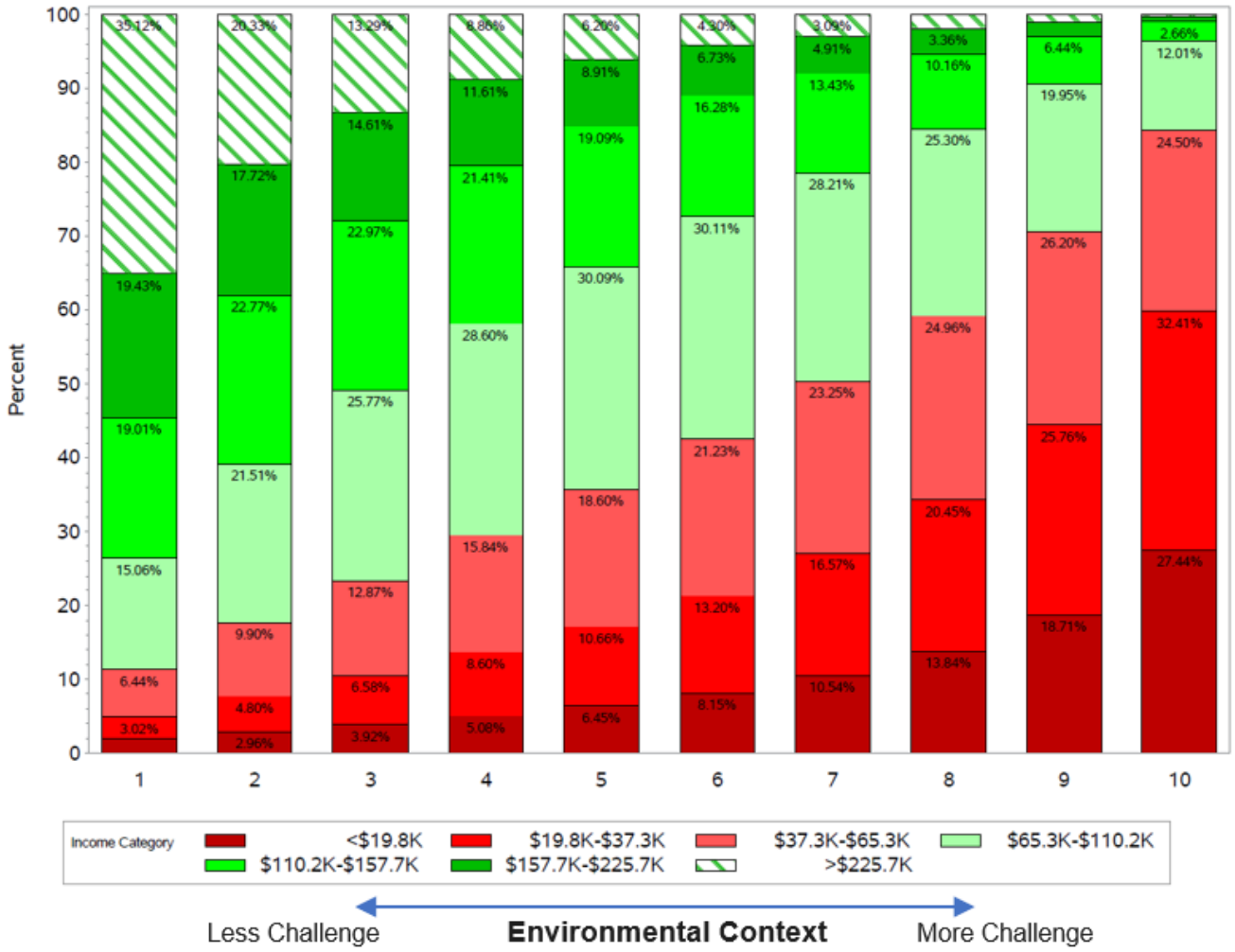


Figure 2 shows the distribution in parental income for SAT takers in the 2005-2015 high school cohorts,[8] expressed in 2015 dollars across the ten challenge deciles. Figure 1 reveals a strong relationship between parental income and neighborhood challenge. Among SAT takers from the lowest challenge decile, more than 35 percent have annual parental incomes in the top ventile, above $225,700. By contrast, virtually none of the SAT takers in the top challenge decile have parental income this high. Only about 10 percent of SAT takers in the lowest challenge decile have parental incomes in the bottom three quintiles (<$65,300), and this figure steadily increases with neighborhood challenge to nearly 85 percent among students in the top challenge decile.

Figure 2: Distribution of parental income, by Landscape neighborhood challenge decile

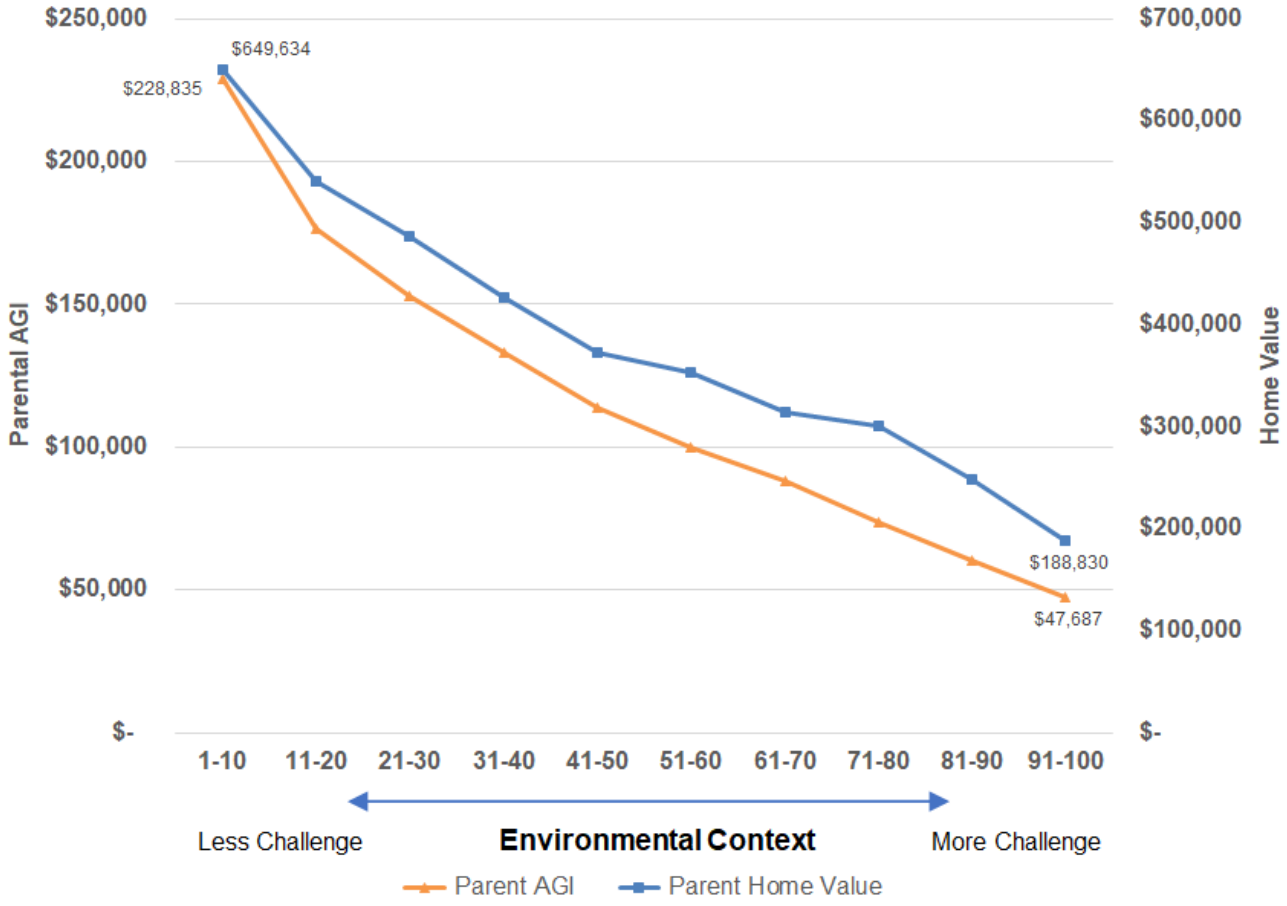


Notes: The data used to construct this figure come from a partnership between the College Board and the Opportunity Insights team. Data represent adjusted gross income in 2015 dollars collected from 1040 tax returns, wage earnings (W-2 forms) and unemployment benefits (form 1099-G). The seven income categories in this figure reflect the bottom four quintiles and the top quintile disaggregated into the 80th-90th percentile ($110.2K-$157.7K), the 90th-95th percentile ($157.7K-$225.7K) and the top ventile (>$225.7K).

[8] Millions of students take the SAT prior to graduating from high school resulting in a large sample that is generally representative of U.S. high school graduates who aspire to a four-year college degree in these years.

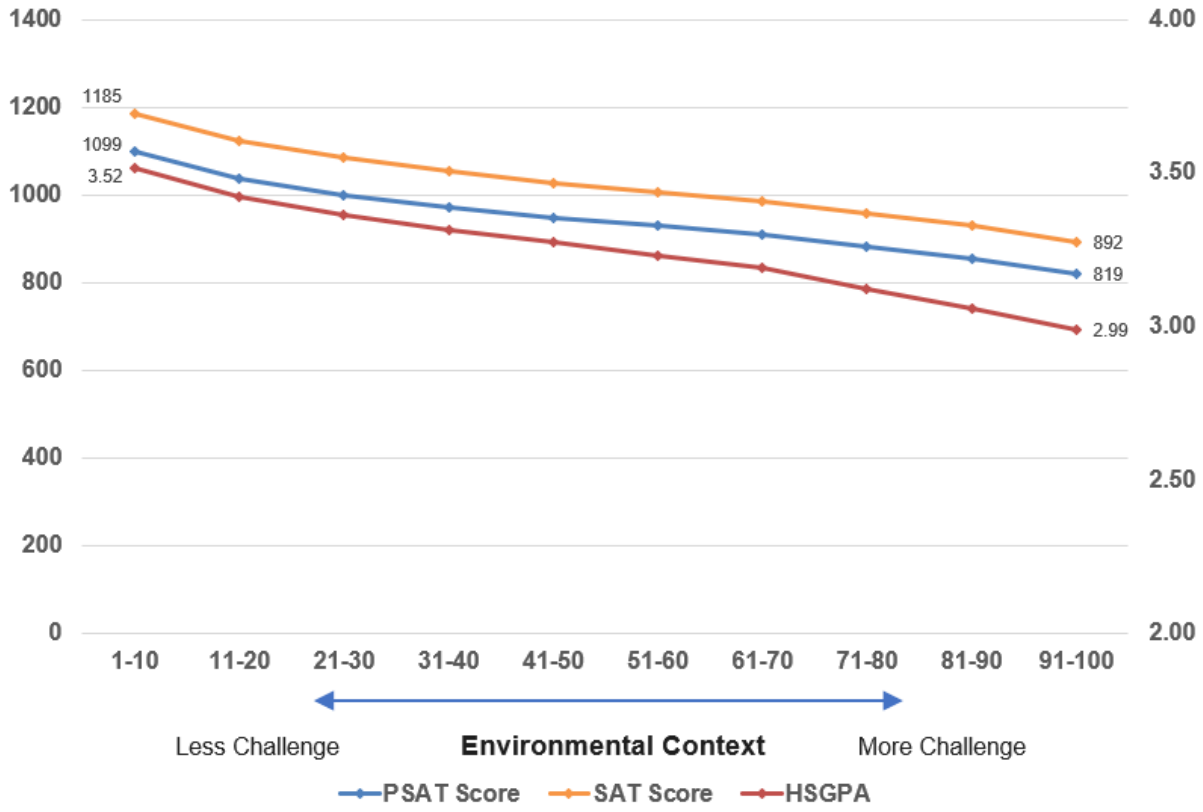
Figure 3 offers additional insight into the connection between a student's financial circumstances and neighborhood challenge. College Board's College Scholarship Service Profile (CSS Profile) is used by nearly 200 colleges to supplement the FAFSA, and these data contain parental income as well as measures of wealth, such as home equity. Among CSS Profile submitters, both home equity and parental income steadily decrease with neighborhood challenge. In the lowest challenge decile, the average parental income and home equity among CSS Profile submitters are $228,835 and $649,634, respectively. These decrease to $47,687 and $188,830, respectively, in the highest challenge decile. Since CSS Profile submitters only include students who are applying for need-based aid, the data in Figure 3 are likely underestimates of the home equity and parental income, particularly in the lowest challenge deciles, since the wealthiest students have no incentive to complete the CSS Profile.

Figure 3: Distribution of parental income and home equity from 2020 CSS Profile first-time submitters, by Landscape neighborhood challenge decile



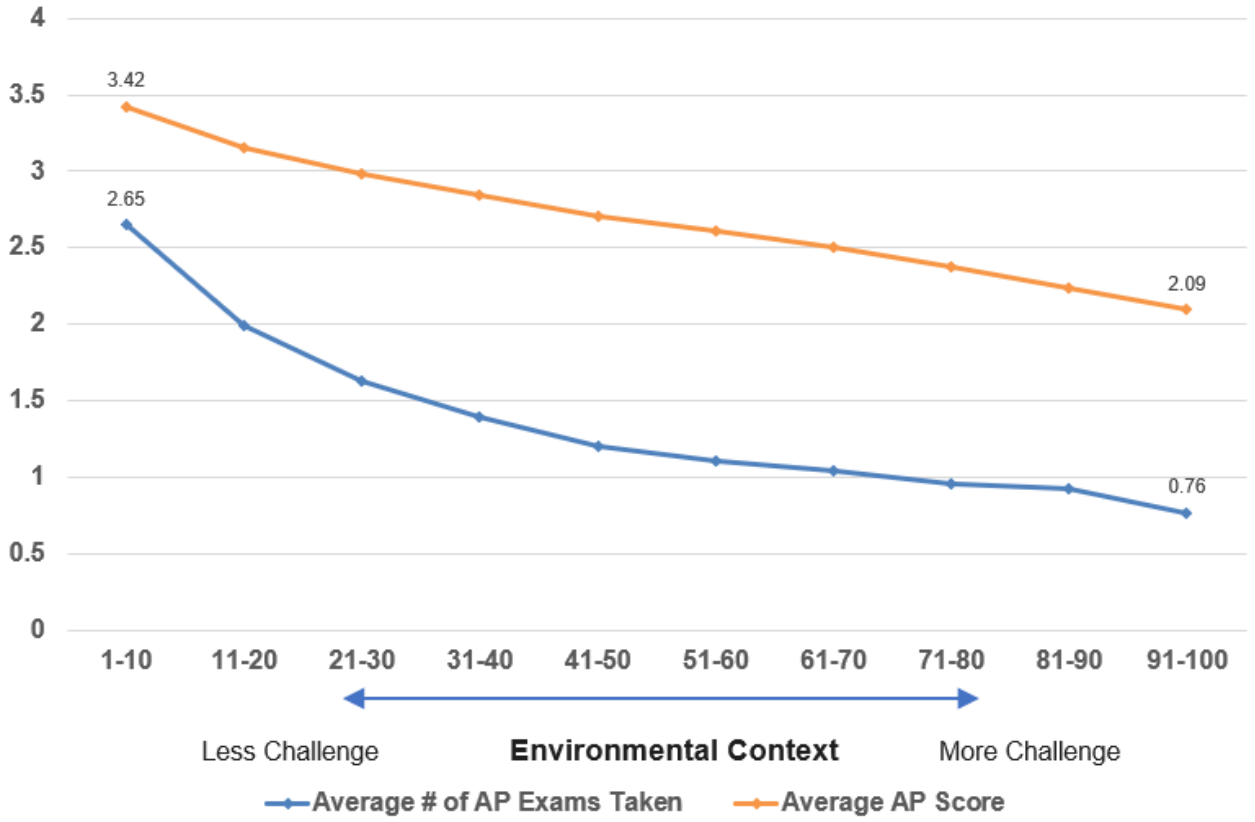
Gaps in academic preparation by student socioeconomic status are well-documented. The National Assessment of Educational Progress (NAEP), commonly referred to as the nation's report card, has documented that such gaps emerge well before high school, and at least as early as 4th grade (NCES Condition of Education, 2020). In Figure 4, we show that these relationships exist between environmental context and HSGPA, PSAT, and SAT scores. Across all three measures, students from the lowest challenge neighborhoods have higher measured achievement than students from the highest challenge neighborhoods. Among high school seniors from the 2020 high school senior cohort in the lowest challenge decile, average SAT and PSAT scores are 1185 and 1099, respectively. For students in the highest challenge decile, average SAT and PSAT scores are 892 and 819, respectively. HSGPA shows a similar pattern of declining as neighborhood challenge increases, from 3.52 in the lowest challenge decile to 2.99 in the highest challenge decile.

Figure 4: Average HSGPA, SAT and PSAT scores among students from the 2020 high school senior cohort, by Landscape neighborhood challenge decile



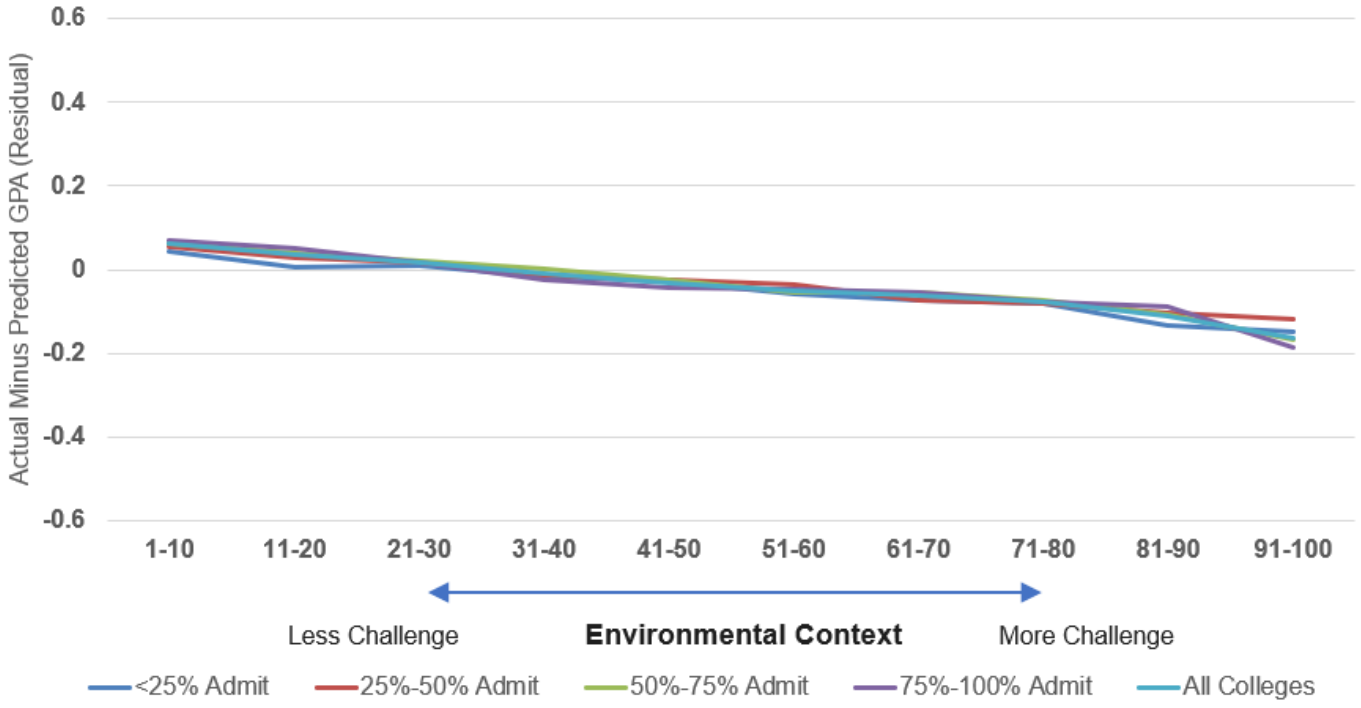
Over the past several decades, the share of high school students with access to Advanced Placement (AP) coursework has continued to increase, particularly in rural areas. By 2015, about three-quarters of public high school seniors in rural schools has access to AP coursework, up from just 56 percent 15 years earlier. In 2015, this access estimate stood at about 90 percent in urban and suburban public high schools (Sponsler et al., 2017). Beyond AP access, there exists a relationship between neighborhood challenge and average AP Exams taken and average AP Exam scores. Figure 5 shows that, on average, students in the 2020 high school senior cohort from the lowest challenge decile took about 2.6 AP Exams with an average score of about 3.4 on the 1-5 integer scale. On average, students in the 2020 high school senior cohort from the highest challenge decile took less than one AP Exam and earned an average score of about 2.1 on the 1-5 integer scale.

Figure 5: Average number of AP Exams and average AP Exam score from the 2020 high school senior cohort, by Landscape neighborhood challenge decile



Figures 4 and 5 clarify that students from high challenge neighborhoods generally have lower levels of academic preparation at the end of their K-12 careers. This gap in academic preparation is tied to differing postsecondary trajectories across the neighborhood challenge deciles visible in Figure 1. Although differences exist in both academic preparation for college and postsecondary trajectories across the neighborhood challenge deciles, college performance is only weakly related to neighborhood challenge once differences in SAT scores and HSGPA are taken into account. Figure 6 shows that students from the lowest challenge neighborhoods only slightly outperform expected first-year college GPA (by less than 0.1 GPA points) and students from the highest challenge neighborhoods only slightly underperform expectations (by less than 0.2 GPA points). We lack the complete data to offer sound explanations for the small differences in over- or under-performance, based on what HSGPA and SAT scores might predict. However, recent literature has documented the stressors that students from disadvantaged backgrounds face once enrolled in college, including work obligations (Carnevale and Smith, 2018), food and housing insecurity (Broton and Goldrick-Rab, 2018), and financial and emotional support from students' families (Roksa and Kinsely, 2019).

Figure 6: Over (+) or under(-) performance relative to predicted first-year college GPA among seniors in the 2017 high school senior cohort, by Landscape neighborhood challenge decile



The data section clarifies that the environmental context measures are constructed without the inclusion of race/ethnicity data. Due to the structural relationships between environmental challenge and the underlying remnants of social segregation, however, we would expect to find a relationship between neighborhood challenge and race/ethnicity. Figure 7 shows this relationship; among students in the lowest challenge decile, about two-thirds of students are white, a percentage that shrinks to 8.5 percent in the highest challenge decile. As the share of white students declines with challenge, the shares of Black and Hispanic students increase. In the lowest challenge decile, 10 percent of students from the 2020 high school senior cohort are Hispanic and 4 percent are Black. These percentages are 47 percent and 30 percent, respectively, in the highest challenge decile.

Figure 7: Distribution of race/ethnicity in the 2020 high school senior cohort, by Landscape neighborhood challenge decile

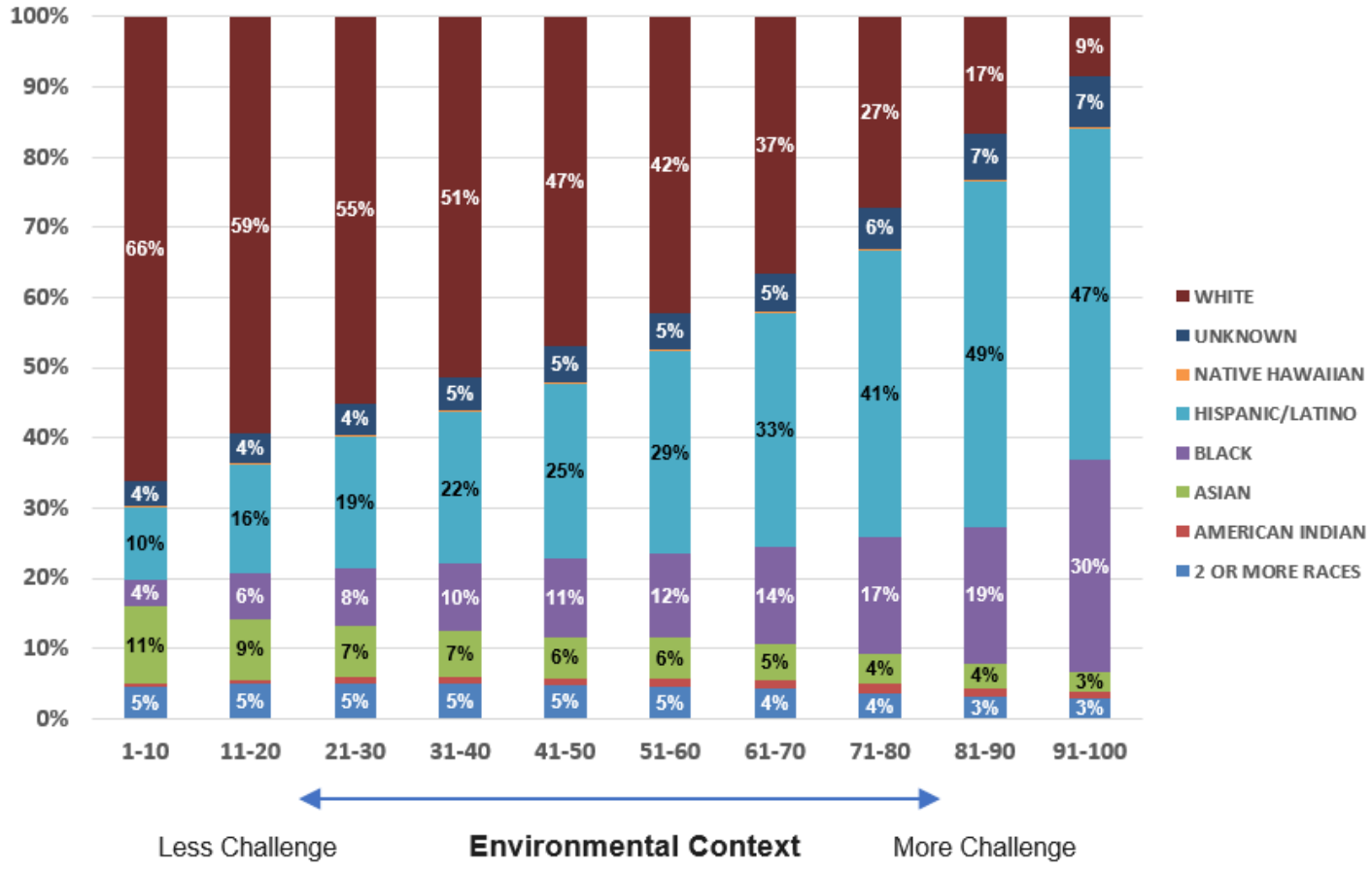
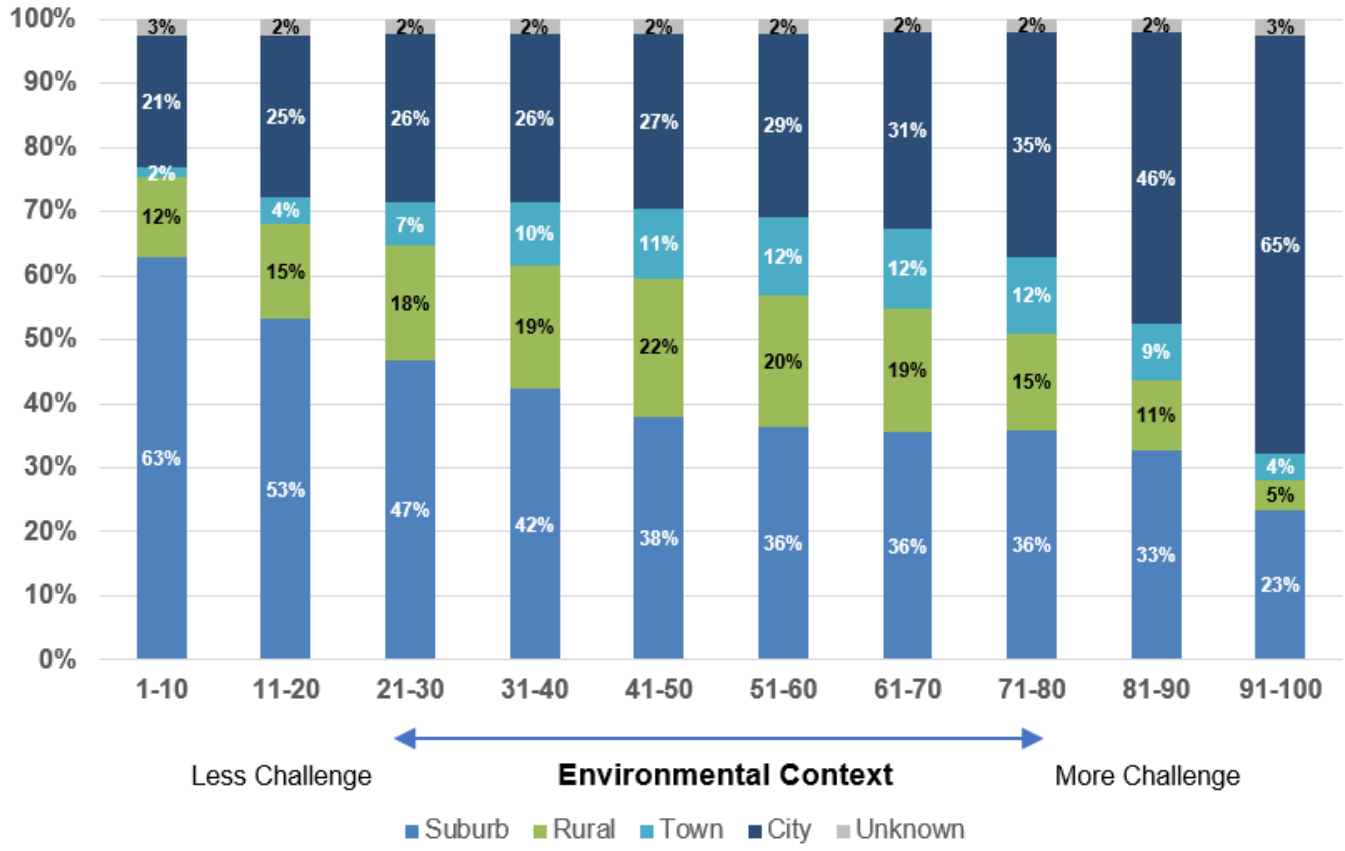


Figure 8 shows the distribution of high school urbanicity among students in the 2020 high school senior cohort. Approximately, 63 percent of seniors in the 2020 high school cohort in the lowest challenge decile attend suburban high schools, compared to just 23 percent in the highest challenge decile. This shift is completely offset by the increases in seniors attending urban high schools as challenge increases. Roughly 21 percent of seniors in the 2020 high school cohort from the lowest challenge decile attend urban high schools, compared to 65 percent in the highest challenge decile. The share of seniors attending rural or small-town high schools is largest in the mid-range of neighborhood challenge, peaking at 33 percent in the fifth challenge decile. By contrast, this percentage is just 14 percent in the lowest challenge percentile and 9 percent in the highest challenge decile.

Figure 8: Student level distribution of high school urbanicity in the 2020 high school senior cohort, by Landscape neighborhood challenge decile



IV. Other Geodemographic Measures of Environmental Context

Landscape is an environmental context resource specifically designed to support holistic processes like those employed in college admissions and scholarship organizations, but there are a variety of environmental context tools based on geodemographic data that have been developed for other educational purposes and uses far beyond education. For example, in 2011, the Centers for Disease Control and Prevention developed the Social Vulnerability Index (SVI) to better identify which communities are likely to need more support during and after natural or anthropogenic disasters or disease outbreaks.[9] A map of public health vulnerability based on SVI reveals very similar locational patterns to a map of educational disadvantage based on Landscape challenge data. Although the SVI is not explicitly about educational opportunity, the 2020 annual update of Landscape incorporated and displayed the SVI to capture the CDC's view of how resilient the applicant's community would be in the face of the covid-19 pandemic.

In 2014, a team of researchers from Brandeis University and the Kirwan Institute for the Study of Race and Ethnicity at The Ohio State University developed the Child Opportunity Index (COI) to explore national patterns of inequity at the neighborhood level.[10] The COI attempted to capture for policymakers and community organizers a data-driven perspective on how differences in resources and conditions influence healthy child development. The COI measure is based on health outcomes and economic opportunities, but also explicitly incorporates some education opportunity metrics (e.g., proximity to and quality of early childhood education centers, high school graduation rates, and student proficiency in Reading and Math at neighborhood schools).

In 2018, university-based researchers joined forces with researchers at the Census Bureau to launch The Opportunity Atlas, a geodemographic data tool designed in the same spirit as the Child Opportunity Index–a tool to better identify which U.S. neighborhoods offer children the best opportunity for upward social mobility.[11] Grounded in research on how children's outcomes vary substantially with the attributes of their neighborhood (Chetty, Hendren, and Katz, 2016; Chetty et al., 2020), the census tract-level tool guides policymakers and communities toward evidence-based solutions for improving life outcomes ranging from higher earnings to lower incarceration rates using data on outcomes for children who grew up in nearly every census tract in the country. The outcomes data focus on economic mobility (employment, income, living in a low-poverty neighborhood as an adult), but also capture educational attainment.

More recently, the National Center for Education Statistics introduced Education Demographic and Geographic Estimates (EDGE) to understand education, social, economic, and housing conditions for school-aged children in U.S. communities.[12] The EDGE data resources are comprised of a variety of NCES spatial datasets and provided to inform a wide array of topics such as school funding, student poverty, and teacher shortages.

All of these geodemographic data resources are grounded in the research evidence that where a person lives matters. The attributes of a person's neighborhood, particularly during their childhood, influences their trajectory in ways that are predictable and can be changed. Landscape attempts to incorporate many of the underlying variables included in these indices and tools via a relevant resource for admissions practitioners.

V. Research on Landscape Use in College Admissions

Currently, over 200 colleges and scholarship organizations use Landscape. Each of these participating institutions entered into a research partnership designed to further our collective learning about the way contextual information can be incorporated into holistic review processes to help organizations achieve their goals as they expand opportunity for students. In the very early years of Landscape's development, an experimental pilot study with eight colleges was conducted to explore how admissions professionals might engage with these context measures. The results of the

[9] The Social Vulnerability Index can be explored at https://www.atsdr.cdc.gov/placeandhealth/svi/index.html.

[10] The Child Opportunity Index can be explored at https://www.diversitydatakids.org/child-opportunity-index.

[11] The Opportunity Atlas can be explored at https://www.opportunityatlas.org/.

[12] The Education Demographic and Geographic Estimates (EDGE) tool can be explored at https://nces.ed.gov/programs/edge/.

experimental pilot were promising; the environmental challenge indicators were deemed by admissions officers to be accurate and reliable, the indicators were highly correlated with other measures of educational challenge, and the experimental research designed affirmed the earlier Bastedo and Bowman (2018) experiment–the use of environmental context increased the admissions chances of students from high challenge neighborhoods and high schools after controlling for standard academic and background variables (Bastedo et al., 2022).

The experimental pilot research was relatively "low stakes" for colleges; participating admissions professionals re-reviewed applications using environmental context data *after* the actual admissions cycle had already completed and yielded official admissions decisions. Going into the next admissions cycle (2018-19), the use of an environmental context tool was scaled to a live, high-stakes, holistic college admissions review process with more than 50 colleges. As in the experimental pilots, the research on live-use of a context tool in admissions revealed that the introduction of environmental context information in the college admissions process increased admissions chances among applicants from higher challenge neighborhoods and high schools (Mabel et al., 2022). On average, applicants from the most challenging environments experienced a 5 percentage point increase in the probability of admission in the year of Landscape adoption, representing a 25 percent increase relative to otherwise similar applicants who applied the previous year.

Research on Landscape continues, but the data and research partnerships with participating colleges also support the creation of detailed historical reports that illuminate the relationship between environmental context and each institution's own data. These historical reports help anchor admissions professionals by showing them what the typical applicant, admit, and enrolling student looks like in terms of Landscape environmental challenge. The historical reports also provide the foundation for a rich training protocol for all Landscape users. Training, which is a required component of any institutions' use of the resource, ensures the accurate interpretation of the data included in Landscape, promotes the proper use of the resource as supplemental to individual applicant information, and helps admissions offices understand best practices that have emerged through the many years of piloting.

College Board convenes the Landscape users multiple times every year to share data and resource updates, to discuss emerging research on environmental context and holistic review, and to create a community for these institutions to discuss and improve upon best practices in their pursuit of better understanding context when evaluating students from all environments. This data- and evidence-minded practitioner community, which now includes over 200 institutions, has never been more critical than in 2020 as the covid-19 pandemic ushered in sweeping changes to instructional, recruitment, and admissions practices. As the pandemic severely reduced opportunities for admissions officers to physically travel to high schools and communities across the U.S., the availability of consistent, systematic information about where every student lives and learns was a critical element to recruitment efforts as well as admissions processes. As the college admissions landscape continues to evolve, the evidence and experience around the use of environmental context is poised to contribute to that evolution.

References

Akos, Patrick, and Jennifer Kretchmar. "Gender and ethnic bias in letters of recommendation: considerations for school counselors." *Professional School Counseling* 20, no. 1 (2016): 1096-2409.

Alvero, AJ., Giebel, S., Gebre-Medhin, B., Antonio, A.L., Stevens, M.L., & Domingue, B.W. Essay Content and style are strongly related to household income and SAT scores: Evidence from 60,000 undergraduate applications. *Science Advances* 7, no. 42 (2021).

Arcidiacono, Peter, Josh Kinsler, and Tyler Ransom. *Legacy and athlete preferences at Harvard*. No. w26316. National Bureau of Economic Research, 2019.

Baker, Bruce D., David G. Sciarra, and Danielle Farrie. "Is school funding fair? A national report card." *Education Law Center* (2018).

Bastedo, Michael N., D'Wayne Bell, Jessica S. Howell, Julian Hsu, Michael Hurwitz, Greg Perfetto, and Meredith Welch. "Admitting Students in Context: Field Experiments on Information Dashboards in College Admissions." *The Journal of Higher Education* 93, no. 3 (2022): 327-374.

Bastedo, Michael N., and Nicholas A. Bowman. "Improving admission of low-SES students at selective colleges: Results from an experimental simulation." *Educational Researcher* 46, no. 2 (2017): 67-77.

Bastedo, Michael N., Nicholas A. Bowman, Kristen M. Glasener, and Jandi L. Kelly. "What are we talking about when we talk about holistic review? Selective college admissions and its effects on low-SES students." *The Journal of Higher Education* 89, no. 5 (2018): 782-805.

Broton, Katharine M., and Sara Goldrick-Rab. "Going without: An exploration of food and housing insecurity among undergraduates." *Educational Researcher* 47, no. 2 (2018): 121-133.

Carnevale, Anthony P., and Nicole Smith. "Balancing work and learning: Implications for low-income students." *Georgetown Center on Education and the Workforce* (2018).

Chetty, Raj, John Friedman, Nathaniel Hendren, and Michael Stepner. *The economic impacts of COVID-19: Evidence from a new public database built from private sector data*. Opportunity Insights Working Paper (2020).

Chetty, Raj, John Friedman, Nathaniel Hendren, Maggie R. Jones, and Sonya R. Porter. *The Opportunity Atlas: Mapping the Childhood Roots of Social Mobility*. Opportunity Insights Working Paper (2020).

Chetty, Raj, John Friedman, Emmanuel Saez, Nicholas Turner, Danny Yagan. *Mobility Report Cards: The Role of Colleges in Intergenerational Mobility*. Opportunity Insights Working Paper (2017).

Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. "The effects of exposure to better neighborhoods on children: New evidence from the Moving to Opportunity experiment." *American Economic Review* 106, no. 4 (2016): 855-902.

Coleman, Arthur L. and Keith, Jamie Lewis. "Understanding Holistic Review in Higher Education Admissions Guiding Principles and Model Illustrations." *College Board* (2018).

College Board. *SAT Suite Assessments Annual Report* (2020).

DeSilver, Drew. "A majority of U.S. colleges admit most students who apply." Pew Research Center (2019). Retrieved 10/28/2020 from: https://www.pewresearch.org/fact-tank/2019/04/09/a-majority-of-u-s-colleges-admit-most-students-who-apply/.

EdBuild. *$23 billion*. (2019). Retrieved 10/28/2020 from: https://edbuild.org/content/23-billion/full-report.pdf

Espinosa, Lorelle L., Gary Orfield, and Matthew N. Gaertner. "Race, class, and college access: Achieving diversity in a shifting legal landscape." (2015).

Goldhaber, D. , T. Kane, A. McEachin, E. Morton, T. Patterson, D. Staiger. The Consequences of Remote and Hybrid Instruction During the Pandemic. Research Report. Cambridge, MA: Center for Education Policy Research, Harvard University (2022).

Han, Crystal, O. Jaquette, and Karina Salazar. "Recruiting the out-of-state university: Off-campus recruiting by public research universities." Report prepared for the Joyce Foundation (2019).

Hillman, Nicholas, and Taylor Weichman. "Education deserts: The continued significance of "place" in the twenty-first century." *Viewpoints: Voices from the Field*. (2016).

Hoxby, Caroline M. "The changing selectivity of American colleges." *Journal of Economic Perspective,s* 23, no. 4 (2009): 95-118.

Hussar, Bill, Jijun Zhang, Sarah Hein, Ke Wang, Ashley Roberts, Jiashan Cui, Mary Smith, Farrah Bullock Mann, Amy Barmer, and Rita Dilig. (2020). The Condition of Education 2020 (NCES 2020-144). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved 10/28/2020 from https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2020144.

Jaschik, Scott. "Recommendation Letters and Bias in Admissions." *Inside Higher Ed.* (2018).

Kreisman, Daniel and Matthew P. Steinberg. "The effect of increased funding on student achievement: Evidence from Texas's small district adjustment." *Journal of Public Economics*, 176 (2019): 118-141.

Kuncel, Nathan R., Rachael J. Kochevar, and Deniz S. Ones. "A meta-analysis of letters of recommendation in college and graduate admissions: Reasons for hope." *International Journal of Selection and Assessment,* 22, no. 1 (2014): 101-107.

Laurito, A., Lacoe, J., Schwartz, A. E., Sharkey, P., and Ellen, I. G. School Climate and the Impact of Neighborhood Crime on Test Scores. *The Russell Sage Foundation journal of the Social Sciences, 5*(2), 141–166. (2019).

Ma, Jennifer, Matea Pender, and Meredith Welch. "Education Pays 2019: The Benefits of Higher Education for Individuals and Society. Trends in Higher Education Series." *College Board.* (2019).

Mabel, Zachary, Hurwitz, Michael D., Jessica Howell, and Greg Perfetto. "Can Standardizing Applicant High School and Neighborhood Information Help to Diversify Selective Colleges?" *Educational Evaluation and Policy Analysis*, 44(3), 505-531. (2022).

Malik, Rasheed, Katie Hamm, Leila Schochet, Cristina Novoa, Simon Workman, and Steven Jessen-Howard. "America's Child Care Deserts in 2018." *Center for American Progress.* (2018).

Mann, Sharmila, Brian Sponsler, Meredith Welch, and Jeff Wyatt. "Advanced Placement Access and Success: How do rural schools stack up?" *Education Commission of the States and College Board.* (2017).

National Center for Education Statistics. "Integrated post-secondary education data system (IPEDS) institutional data." (2018).

National Center for Education Statistics. Young Adult Educational and Employment Outcomes by Family Socioeconomic Status. *Condition of Education.* U.S. Department of Education, Institute of Education Sciences. Retrieved 8/26/2022. (2022).

Newburger H., E.L. Birch, S.M. Wachter. Neighborhood and life chances: How place matters in modern America. Philadelphia: University of Pennsylvania Press. (2011).

Nord, Christine, Shep Roey, Robert Perkins, Marsha Lyons, Nita Lemanski, Janis Brown, and Jason Schuknecht. "The Nation's Report Card™: America's High School Graduates. Results of the 2009 NAEP High School Transcript Study. NCES 2011-462." *National Center for Education Statistics.* (2011).

O'Brien DT, Hill NE, Contreras M. "Community violence and academic achievement: High-crime neighborhoods, hotspot streets, and the geographic scale of "community"." *PLoS ONE*, 16(11). (2021).

Owens, Ann, Sean F. Reardon, and Christopher Jencks. "Income segregation between schools and school districts." *American Educational Research Journal,* 53, no. 4 (2016): 1159-1197.

Perfetto, Greg, Merida Escandon, Steve Graff, Gretchen Rigol, and Amy Schmidt. "Toward a Taxonomy of the Admissions Decision-Making Process: A Public Document Based on the First and Second College Board Conferences on Admissions Models." *College Board.* (1999).

Rauscher, Emily. "Delayed Benefits: Effects of California School District Bond Elections on Achievement by Socioeconomic Status." *Sociology of Education,* 93, no. 2 (2020): 110-131.

Santiago AM, Galster GC, Lucero JL, Ishler KJ, Lee EL, Kypriotakis G. Opportunity Neighborhoods for Latino and African-American Children: Final Report. Washington, DC: U.S. Department of Housing and Urban Development, Office of Police Development and Research. (2014).

Theall K, Drury S, Shirtcliff E. Cumulative Neighborhood Risk of Psychosocial Stress and Allostatic Load in Adolescents. *Am J Epidemiol*, 176(Suppl 7):S164-S74. (2012).

Theokas, Christina, and Reid Saaris. "Finding America's Missing AP and IB Students. Shattering Expectations Series." *Education Trust.* (2013).

Thornhill, Ted. "Black student activists face penalty in college admissions." *The Conversation.* (September 5, 2018).

Wong, Alia. "The activity gap." *The Atlantic.* (2015).