

ENVIRONMENTAL CONTEXT

## **Data-Driven Models to Understand Environmental Context**

Building on a history of partnering with higher education thought leaders, the College Board has launched the Future Admissions Tools and Models Initiative to study and improve the practice of admission, with a special focus on holistic and individualized review, in order to expand student access and success. Developed and structured as a partnership with member institutions, the initiative brings together practitioners from a wide range of colleges and universities, along with expert researchers, to identify, extend, and scale innovative and promising practices through the development of research-based frameworks and tools.

### Executive Summary

This paper provides an initial summary description of the role of environmental context in the admission process as well as an overview of a pilot Environmental Dashboard. A research study examining environmental context will be published as results are finalized, and a full discussion of the dashboard pilot will be delivered at the 2016 College Board Forum.

Throughout our discussions with admission practitioners over the past year, they repeatedly expressed an interest in more systematic information about applicants who may have overcome environmental obstacles before applying to college. This desire is typically related to the recognition that, for many applicants, their sociocultural milieu can limit their ability to reach their full educational potential prior to college. Many colleges' missions also encourage them to consider a wide range of contextual factors beyond student academic performance.

Challenges exist, however, with this approach to the extent that admission practitioners create inferences about context based on personal or institutional knowledge of the applicant's high school or community. Even when based on extensive personal knowledge, the perceptions of the applicant's environment may vary from reader to reader, and certainly across colleges. A more systematic and data-centric approach to assessing context would help bring consistency and a broader scope to what is often an informal process.

During the past year, as part of the Future Admissions Tools and Models Initiative, the College Board developed and is currently piloting a tool that attempts to capture key elements of an applicant's school, neighborhood, and family environments that may signal the presence of environmental obstacles.

The College Board also developed a prototype Environmental Dashboard to:

- Organize contextual data that we have assembled, derived, or estimated; and
- Integrate these data with information specific to an individual applicant (demographics, SAT® scores, location, and attending high school).

The student's location and high school serve as the basis for contextual information about the student's environment. The resulting dashboard is an Excel-based tool intended as a high-level view of the applicant's environment. Analysis from the pilot is ongoing this fall and will be reported at the College Board Forum in October.

## Challenges in Understanding Environmental Context

Some students communicate personal challenges through traditional means — an application essay, personal statement, or letters of recommendation. For many other students, the admission reader is left to infer the environmental adversity that an applicant has overcome.

Frequently, admission practitioners base their assumptions on environmental context — personal or institutional knowledge of the applicant's high school or community. While this can be effective for "feeder schools" that consistently send applicants to the college each year, applications from these well-known schools typically comprise a relatively small percentage of the total applicant pool. **The data we reviewed suggest that, for many high schools and neighborhoods, only a single applicant will be present in the applicant pool for any given year.** For these low-frequency locations, the admission office often has little data or personal knowledge concerning the applicant's school environment or surrounding community.

## Environmental Context Framework

During the past year, we have been developing and piloting a tool that attempts to capture key elements of an applicant's school, neighborhood, and family environments that may signal the presence of environmental obstacles. While developing this tool, which emerged from our consultations with practitioners, we relied on the following framework for environmental context:

**Figure 1. Framework for Environmental Context**

### Neighborhood Environment

- Crime Intensity
- Housing Values
- % Below Poverty
- % Vacant

The social and economic milieu outside the home and school, peer culture, influences, and norms.

### Family Environment

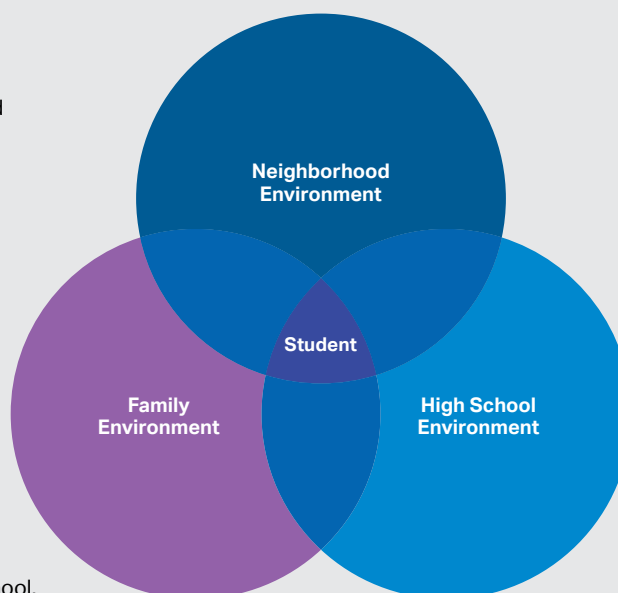
- Median Income
- Single Parent
- Education Level
- ESL

The family culture around educational aspirations, knowledge of the admission process, support for educational attainment, familial models of educational success, financial stresses, and limitations.

### High School Environment

- Undermatch Rates
- Curricular Rigor/AP/IB
- % Free Lunch
- AP® Opportunity

The educational support environment, resources, counseling, and college-going culture of the high school.



This Environmental Context Framework identifies three overlapping sources of environmental influence related to an applicant's access to the educational resources and support needed to maximize potential. The framework spans three areas of the applicant's environment:

- **Neighborhood Environment** — Measures related to the socioeconomic milieu of the applicant as they move between school and home, such as the housing market structure and stability; poverty measures; peer culture; and crime risk.
- **High School Environment** — Measures related to the socioeconomic status of peers at the applicant's high school, such as the percentage of students receiving free and reduced-price lunch; relative academic performance; access to and participation in advanced course work; and relative success in gaining access to college.
- **Family Environment** — Measures related to family influences, such as family income; familial structure and stability; educational attainment; and cultural context.

It is important to note that even systematically and consistently measured data may not represent a student's personal experience. Rather, any data on environmental context merely suggest certain aspects of the school and community environments to which individual students were likely exposed. They are not designed to substitute for firsthand knowledge of the applicant or specific information that is conveyed in an application. Environmental context provides an additional lens through which to view the student's application that may highlight or further explain the detail found in the application — particularly for those high schools or neighborhoods that are less familiar to the admission officer.

## The Environmental Dashboard

The prototype Environmental Dashboard is a tool that:

- Organizes contextual data that we have assembled, derived, or estimated; and
- Integrates these data with information specific to an individual applicant (demographics, SAT scores, location, and attending high school).

The student's location and high school serve as the basis for contextual information about the student's environment. The resulting dashboard is an Excel-based tool intended as a high-level view of the applicant's environment. *Note: The components in the prototype were selected to represent areas that research has demonstrated negatively impact a range of educational and occupational outcomes.*

**Figure 2. Environmental Dashboard Prototype**



The tool was built so that information relevant to a particular application could be displayed by entering the applicant’s ID at the top left. The top rows of the dashboard contain all data specific to an individual applicant; the remainder of the dashboard contains contextual information related to the applicant’s high school or neighborhood. The specific data elements are listed in the paragraph that follows.

**Applicant Information**

Data about the individual applicant include:

- **Name** — Applicant’s name as provided by the admission office (masked in the screenshot above);
- **HS Code** — The CEEB code for the applicant’s high school as provided by the admission office;
- **High School** — Name of the applicant’s high school based on the CEEB code;
- **State** — Applicant’s home state based on the address provided by the admission office;
- **Gender** — Applicant’s gender as provided by the admission office;
- **Race** — Applicant’s race if provided by the admission office;
- **SAT Scores** — The applicant’s scores on the old SAT (Critical Reading, Math, Writing, and Math + Critical Reading), as provided by the admission office. (Note: In future iterations of the Environmental Dashboard these scores will change to new SAT scores.)

## High School Information

Beneath the applicant attributes, the Environmental Dashboard contains contextual information based on a three-year average specific to that applicant's high school, including:

- **High School Name**

- ♦ The average senior class size;
- ♦ Average percentage of seniors taking the SAT;
- ♦ Average freshman SAT score at colleges attended by SAT-taking graduates of the applicant's high school;
- ♦ Percentage of students at the high school who participate in the free and reduced-price lunch program.

- **High School AP® Opportunity**

- ♦ Number of unique AP® courses taught in that high school;
- ♦ Percentage of the senior class who took at least one AP Exam;
- ♦ Average number of AP Exams taken by graduates who sat for at least one exam;
- ♦ Average AP scores across all AP Exam takers and exams.

- **High School Percentiles** — The 25th, 50th, and 75th old SAT percentiles on Critical Reading, Math, and Math + Critical Reading scores for graduates.

- **Vertical Bar Chart** — Applicant's Math + Critical Reading score and the 25th, 50th, and 75th SAT score percentiles among SAT-takers at the applicant's high school.

## Neighborhood and High School Context

Below the high school data in Figure 2 are two horizontal bar charts that contain derived contextual metrics for the applicant's neighborhood (left) and high school (right).

- **The neighborhood context** is based on data from population-based sources and historical participants in College Board programs such as the SAT, PSAT/NMSQT®, and AP. The data are aggregated across previous students from each neighborhood. The neighborhoods were adapted from the College Board's Segment Analysis Service and represent small, physically contiguous geographical areas similar to a census tract (i.e., total population of 4,000–5,000).
- **The high school context** information is similarly based on historical participants in College Board programs and aggregated for past students at that particular high school.

In both the neighborhood and high school context graphs, the horizontal bars measure the **percentile rank** for each attribute based on the national population, where a value of 50 represents the national average and higher values indicate more "adverse" environments.

The dashboard displays percentile ranks, separately for neighborhood context (left) and high school context (right), for the following dimensions of potential adversity:

1. **Undermatch Risk** — Academic undermatch occurs when a student's academic credentials substantially exceed the credentials of students enrolled in the same postsecondary institution. For each neighborhood and high school, we aggregate the difference between the historical SAT scores of individual students from that neighborhood or high school and the average freshman SAT scores of the colleges those students attend. This average difference indicates the degree to which the typical student from a given high school or neighborhood is at risk for academic undermatching in the college enrollment process.

- 2. Crime Risk (neighborhood only)** — The Crime Risk represents the likelihood of being a victim of a crime — *not the likelihood of committing a crime*. The Crime Risk measure is derived from data that include the FBI Uniform Crime Reports and other risk-related data.
- 3. Family Stability** — Family stability is a combined measure based on the proportion of two-parent families, single-parent families, and children living under the poverty line within each neighborhood, or across the neighborhoods of past students attending that high school. It is primarily based on U.S. Census–derived population data.
- 4. Educational Attainment** — Educational attainment is a combined measure that looks at the pattern of educational attainment demonstrated by young adults in the community. It is based largely on population statistics and reflects the overall educational level of recent high school graduates in the student’s environment.
- 5. Housing Stability** — Housing stability is a composite measure that includes vacancy rates, rental versus home ownership, and mobility/housing turnover, again based on aggregate population statistics.
- 6. Median Family Income** — Median family income is based on weighted data from the Census/ American Community Survey, and reflects the general SES of the environment.
- 7. Overall Context** — Overall context is a weighted average of the individual metrics listed above.

Finally, the very bottom of the dashboard displays two additional vertical bar graphs that depict the applicant’s SAT score relative to others who share the applicant’s overall percentile of neighborhood adversity (left) and high school adversity (right), as well as the average freshman SAT score of entering students at the colleges that these respective groups of students attended.

## The Environmental Dashboard Pilot

In the past year, the College Board piloted the Environmental Dashboard with two institutions to understand the impact of the tool on admission decisions, gather feedback, refine the tool, and examine which components of environmental context were most relevant and influential for which types of applications. The two colleges were:

- A private, selective institution that employs a broad, intensive, and personalized holistic review.
- A large, public institution that employs a more limited review focused on academic preparation but has a strong desire to reach a broad and diverse applicant population.

### Methodology

In order to pilot the Environmental Dashboard, we undertook the following approach:

- The College Board pre-populated the dashboard with information on each institution’s applicants from the completed 2016 application cycle, along with the related contextual information for each applicant described above.
- Admission officers were then asked to reread a set of applications that were submitted for the fall 2016 admission cycle. *Note: this pilot was conducted after all admission decisions were made through each college’s normal process, so the actual admission decision was not impacted by the experimental use of contextual information.*
- The applicant folders to be read were selected to represent a range of geographies and applicant characteristics, with a special focus on students “on the bubble” or in the middle of the pool. The applicants selected for the pilot had a 50-50 predicted chance of being admitted.

- ◆ Additionally, for College 1 (the private college), the list of applicant folders assigned to each reader was personalized to insure that it only contained applications that the reader had not seen during the actual admission cycle.

This level of reader assignment was not implemented at College 2 (the public college) because the reader-tracking data were not electronically available from College 2; however, we attempted to provide lists that did not include applicants that the reader had previously seen, and we asked readers to indicate if they had seen the folder before. Given the very large applicant pool at College 2, readers infrequently saw the same applications in the pilot that they had read during the actual admission cycle. Only a small percentage (less than 1 percent) of the applications in the pilot at College 2 were recognized by the readers.

- Admission officers were asked to read the folders and evaluate each applicant for admission using the same criteria and standards they employed during the recently completed actual review cycle. While no specific instructions were given about how they could or should use the information in the Environmental Dashboard, readers were told that the dashboard was intended to complement their normal process by providing additional context about applicants' high school and neighborhood environments. Readers were instructed to view the contextual information for a given applicant prior to reading the application.
- In order to calibrate the admission officers' new ratings, we asked them to review and evaluate the first 25 applications assigned to them exactly as they did during the actual admission cycle — without referring to the Environmental Dashboard (Control Group).
- Finally, admission officers completed two brief questionnaires: one brief pre-pilot survey and a longer survey after they completed the pilot. These questionnaires capture information about admission officers' experience with and impression of the dashboard, as well as feedback on the data included and the design.

## Next Steps

The College Board has collected data from the Environmental Dashboard pilot, and we are in the process of analyzing them. We will deliver a full report of the results during the College Board Forum in late October.

An initial review of the data indicates that:

- Staff and leadership at pilot institutions saw the Environmental Dashboard as giving a helpful summary of environmental context.
- The review process at both institutions was highly reliable, with the vast majority of applicants receiving the same decision during the second independent review.
- The experimental impact of context on admission outcomes varied across the two institutions, but the initial evidence suggests that admission officers made use of the Environmental Dashboard, and that in some cases it influenced their admission decision.
- Upon completion of the first phase of work, we will begin Phase II, which will include: refinement of the dashboard and data, working with an expanded range of colleges, and a more operational focus on deployment models.
- We will be revising the data sources and the tool, based on the feedback and experimental results.
- We plan on working with additional partner colleges on an expanded pilot this year, as we consider options for making Environmental Context information more generally available in the future.

Join us at the College Board Forum to hear more about the results of this pilot.

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