

Using Data from Schools and Child Welfare Agencies to Predict Near-Term Academic Risks

Pittsburgh Public Schools (PPS), the Propel Schools charter network, and the Allegheny County Department of Human Services (DHS) want to better identify students at risk for academic problems in the near term. The stakeholders partnered with the Regional Education Laboratory Mid-Atlantic to develop an approach for identifying at-risk students using school data linked with data on child welfare events, justice system involvement, and other human services involvement and public benefits receipt. Identifying the students most likely to have certain types of academic problems in the near term can support an early warning system that allows educators and human services staff to better target resources and lessen risks before they become more serious.

The study included students in all grades in PPS and Propel Schools in the 2015/16 and 2016/17 school years. Predictive models used linked school and Allegheny County DHS data to generate risk scores indicating the probability that each student would experience certain academic outcomes: chronic absenteeism, out-of-school suspensions, failure of a core subject course, term grade point average (GPA) below 2.2, or a score below the basic level on state tests in the upcoming school period. Accuracy of predictions was examined for each outcome using school data only and combined school and Allegheny County DHS data (out-of-school data) to make predictions. Models predicting outcomes in PPS identified at-risk students at a level that is generally considered strong in social science.¹ Most models for Propel Schools also met this threshold, despite the smaller sample sizes.

Key findings

- *Prior academic problems are strongly related to future academic problems.* Students who experience one of the academic problems examined in this study are substantially more likely than other students to experience that problem again in the next term or year. For example, PPS high school students who had a low term GPA in the prior period were 64 percentage points more likely to have a low GPA in the following period than students who did not have a low GPA in the prior period.
- *Some out-of-school variables, as reflected in human services data, are strongly related to students' future academic problems.* For example, PPS high school students who started an out-of-home placement were 45 percentage points more likely to be chronically absent in the next quarter than students who did not. Emergency shelter stays of seven days or more and active juvenile justice cases also have strong relationships with academic problems in the following months. Educators and human services staff may be able to use this information to understand and address underlying challenges in students' home lives and reduce the related academic problems.
- *Accuracy of predictions is better for course and test performance outcomes.* The available predictor data are better able to identify students who will have a low GPA, course failures, or scores below the basic level on state tests. The predictor data are not as effective at identifying students at risk for chronic absenteeism and suspensions. Those outcomes are likely more affected by random events or events not captured by available school and human services data systems.

1. Rice, M. E., & Harris, G. T. (2005). Comparing effect sizes in follow-up studies: ROC area, Cohen's *d*, and *r*. *Law and Human Behavior*, 29(5), 615–620.