Stated Briefly

A comparison of two approaches to identify beating-the-odds high schools in Puerto Rico

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Identifying schools that are beating the odds—schools that are exceeding academic performance expectations, given the composition of their student body—can lead to promising practices that other schools serving similar populations can implement. Regional Educational Laboratory Northeast & Islands used data on high-poverty high schools in Puerto Rico to show how two methods of identifying beating-the-odds high schools led to the identification of two sets of schools with relatively little overlap. These results suggest that it may be useful for state and local education agencies to consider both methods for identifying beating-the-odds schools.

Why this study?

During the past decade states and school districts have focused increasingly on turning around persistently low-performing schools (Duke, Tucker, Salmonowicz, Levy, & Saunders, 2007; Herman et al., 2008). As of 2012 there were approximately 5,000 chronically low-performing schools nationwide that

This brief summarizes the findings of Meyers, C., & Wan, Y. (2016). *A comparison of two approaches to identify beating-the-odds high schools in Puerto Rico* (REL 2017–167). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Northeast & Islands. That report is available at http://ies.ed.gov/ncee/edlabs/projects/project.asp?ProjectID=4468.

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were not providing students with an education that prepares them for lifelong success (U.S. Department of Education, 2012). Students in these schools have lower scores on assessments and graduate at lower rates than do students at other schools. At the secondary level such schools are sometimes called "dropout factories" (Balfanz & Legters, 2004; 2006). Federal policy initiatives, such as School Improvement Grants and Race to the Top, have provided funding to help improve academic outcomes, in particular for the lowest performing schools (Council of the Great City Schools, 2015).

State and local education agencies are under pressure to identify and improve their lowest performing schools by developing and implementing supports, initiatives, and interventions to raise academic performance (Le Floch et al., 2014). Many of these efforts seem to operate under the assumption that successful supports, initiatives, and interventions in high-performing schools are transferable to demographically similar low-performing schools (Murphy & Meyers, 2008).

The challenge of turning schools around is also prevalent in Puerto Rico, where according to the 2013 National Assessment of Educational Progress results, only 5 percent of students in grade 8 performed at or above the basic level in math, and less than 1 percent scored at or above the proficient level (U.S. Department of Education, n.d.). Moreover, only 62 percent of students who entered public high schools in Puerto Rico graduated on time in 2011/12, compared with a national average of 82 percent (Stetser & Stillwell, 2014). Turning around low-performing schools is thus increasingly a priority for educators and policymakers in Puerto Rico.

In response to a request from the Puerto Rico Research Alliance for Dropout Prevention, Regional Educational Laboratory Northeast & Islands compared two methods of identifying beating-the-odds schools —schools that exceed academic performance expectations, given the characteristics of the students enrolled—in Puerto Rico. This study may be useful to Puerto Rico stakeholders and state- and district-level education leaders elsewhere as they consider how to develop and establish statistical methods that reliably identify beating-the-odds schools. The identification of beating-the-odds schools in this report can provide initial information to the Puerto Rico Department of Education as it plans how to examine processes and practices of beating-the-odds schools.

What the study examined

The study used school-level data to identify beating-the-odds public high schools in Puerto Rico from among a sample of 159 high-poverty high schools (schools with at least 40 percent of students from low-income households). The study focused on the performance of the cohort of students who were expected to graduate in the 2012/13 school year. Beating-the-odds schools were identified using two methods: a status method and an exceeding achievement expectations method. Under the status method schools were ranked on their observed performance on two outcome measures: 2012/13 graduation rates and 2011/12 grade 11 combined proficiency rates on reading and math assessments. Under the exceeding achievement expectations method schools were ranked based on the extent to which their observed performance on these outcome measures exceeded or fell short of their expected levels of achievement on the same two outcome measures.

The study also compared the schools identified using each method in order to determine agreement rates —defined as the "ratio of the number of schools that appear on both sets of the lists to the average number of schools across the two lists" (Abe et al., 205, p. B-7; see box 1 for a discussion of data and methods). The report compares the performance of beating-the-odds schools identified using each method and all 159 high-poverty high schools in Puerto Rico.

Box 1. Data and methods for identifying beating-the-odds schools

Data and sample. Publicly available school-level demographic data were retrieved from the U.S. Department of Education (2010, 2013, 2014). Graduation rates, poverty rates, and assessment results were provided by the Puerto Rico Department of Education. The analytic sample that was used to identify beating-the-odds schools included all regular public high schools in Puerto Rico operating during 2011/12 and 2012/13 with at least 40 percent of students from low-income households (vocational schools and alternative schools were not included). The sample comprised 159 schools.

Methodology for identifying and comparing beating-the-odds schools. The analysis focused on the performance of the 2012/13 graduation cohort on two outcome measures: the 2012/13 cohort graduation rate and the 2011/12 grade 11 proficiency rate for reading (in Spanish, the language of instruction in Puerto Rico) and math combined, weighted by the number of students tested in each subject.

Two methods were used to identify beating-the-odds schools: ranking by status and ranking by exceeding achievement expectations.

- *The status method* ranked schools on the basis of their observed performance on each of the outcome measures. Schools that ranked among the top 25 percent on both outcome measures were identified as beating-the-odds schools.
- *The exceeding achievement expectations method* estimated schools' expected performance on each outcome measure using ordinary least squares regressions that controlled for grade 8 achievement levels, school poverty rate, and other student and school characteristics that might be related to school performance. As a proxy for prior achievement, the study used the weighted average school-level proficiency rate in grade 8 reading and math of feeder schools[1] in 2008/09—the year the 2012/13 graduating cohort was in grade 8—as an independent variable. The high schools were ranked based on the differences between their observed performance and expected performance (performance net of expectations). Schools that ranked in the top 25 percent on both outcomes were identified as beating-the-odds schools.

The report includes ranks for each beating-the-odds school on each outcome measure (2012/13 graduation rate and 2011/12 combined reading and math proficiency rate) for both methods. Correlation coefficients were calculated between each outcome across methods. Differences and similarities between the two lists of beating-the-odds schools were measured by computing an agreement rate (the ratio of the number of schools that appear on both lists to the average number of schools across the two lists). Finally, the report presents the performance of beating-the-odds schools as compared with that of all high-poverty high schools in Puerto Rico.

Additional information about the data and methodology can be found in Meyers & Wan (2016).

Note

1. School feeder patterns designate the schools that students attend as they matriculate from one level to the next. The patterns are usually determined by the location of the students' residence and its location within the school boundary. Because the actual feeder patterns from middle schools to high schools in Puerto Rico are not known, the study group identified possible feeder schools for each high school in the sample using information on region, district, school location, and distance between schools.

What the study found

Using the two methods—ranking by status and by exceeding achievement expectations—the study identified two lists of beating-the-odds schools. The agreement rate between the two lists was 38 percent. This section further describes the findings.

The rankings by the two methods—status and exceeding achievement expectations—resulted in different lists of beating-the-odds schools

The status method identified 17 beating-the-odds schools, and the exceeding achievement expectations method identified 15 schools. Six schools were identified as beating the odds by both methods.

The agreement rate between the two methods on each criterion for identifying beating-the-odds schools was 58 percent for the graduation rate and 68 percent for the proficiency rate (table 1). But when the study team identified the schools on the two lists that met both criteria for each method (the beating-the-odds schools), the agreement rate was just 38 percent. The relatively low agreement rate for schools identified using the two methods illustrates how the use of different methods—ranking by status versus ranking by exceeding achievement expectations—affects the school identification results.

School performance varied by method and outcome measure

Beating-the-odds schools identified using the status method had a higher average graduation rate and proficiency rate than beating-the-odds schools identified using the exceeding achievement expectations method. The average graduation rate in 2012/13 was 84 percent for beating-the-odds schools identified using the status method and 77 percent for beating-the-odds schools identified using the exceeding achievement expectations method. Both rates were higher than the average for all schools in the sample (65 percent; figure 1). The average grade 11 proficiency rate was 47 percent for beating-the-odds schools identified using the status method and 36 percent for beating-the-odds schools identified using the exceeding achievement expectations method. The average was 24 percent for all schools in the sample.

Schools that were identified as beating the odds by the status method ranked lower when analyzed by the exceeding achievement expectations method. When the study compared the observed performance of schools identified using the exceeding achievement expectations method with their expected performance after accounting for students' prior achievement and demographic characteristics, the average differences (observed graduation rate or proficiency rate minus expected graduation rate or proficiency rate) were 15 percentage points for graduation rate and 16 percentage points for grade 11 proficiency rate (figure 2). This discrepancy was expected because the exceeding achievement expectations method, by definition, identified schools that ranked at the top on performance-net-of-expectations differences.

The average difference between observed and expected performance for beating-the-odds schools identified using the status method was 8.8 percentage points for graduation rate and 9.3 percentage points for proficiency rate (see figure 2). This suggests that on average the schools identified using the status method also performed better than expected based on their background characteristics. However, some of the schools (three for graduation rate and four for proficiency rate) performed worse than expected, with the difference between observed and expected performance in proficiency rate as large as 15.4 percentage points.

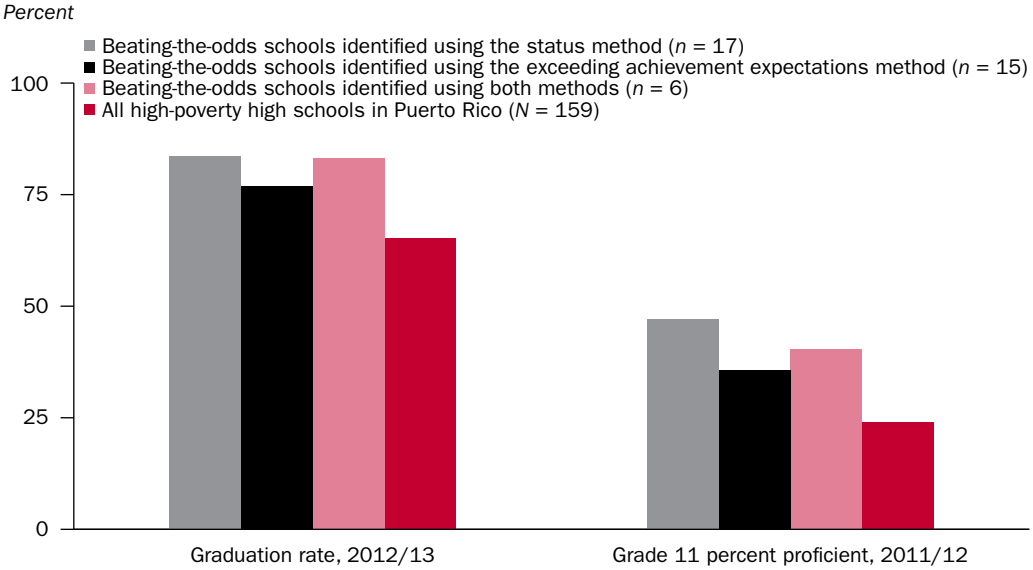
Table 1. Agreement rate on outcome measures for Puerto Rico high schools identified as beating the odds, by identification method, 2011/12 and 2012/13

Outcome measure	Criterion	Number of schools identified			Agreement rate between methods (percent)
		Status method	Exceeding achievement expectations method	Both methods	
Graduation rate, 2012/13	Top 25 percent	40	40	23	58
Grade 11 proficiency rate (reading and math combined), 2011/12	Top 25 percent	40	40	27	68
Both measures (beating-the-odds schools)	Met all criteria	17	15	6	38

Note: The total sample size is 159 schools. The number of students in the cohort by school ranged from 7 to 357. The analyses used data on the 2012/13 graduation rate, 2011/12 grade 11 combined reading and math proficiency rate, 2008/09 grade 8 combined reading and math proficiency rate, 2009/10 school poverty rate, and data on several other school characteristics for the 2012/13 school year.

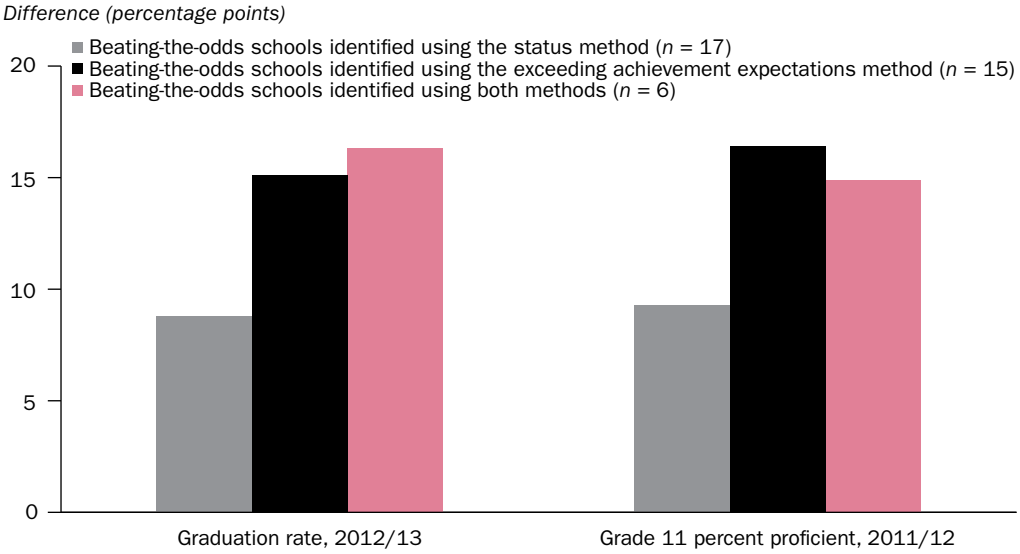
Source: Authors' analysis based on data from U.S. Department of Education (2010, 2013, 2014) and the Puerto Rico Department of Education.

Figure 1. Average observed performance of beating-the-odds schools was higher for schools identified using the status method, 2011/12 and 2012/13



Source: Authors' analysis based on data from U.S. Department of Education (2010, 2013, 2014) and the Puerto Rico Department of Education.

Figure 2. Average differences between observed and expected performance of beating-the-odds high schools in Puerto Rico were higher for the exceeding achievement expectations method, 2011/12 and 2012/13



Note: The difference between the observed and expected performance indicates how much better or worse a school actually performed than its characteristics predicted it would. The height of the bars indicates the mean difference for each group—that is, on average, how much each group of schools performed better than expected. By definition, the mean differences between observed and expected performance for all schools in the sample are zero under the exceeding achievement expectations method.

Source: Authors' analysis based on data from U.S. Department of Education (2010, 2013, 2014) and the Puerto Rico Department of Education.

The findings suggest a potential issue with using the status method: looking at status alone may identify schools that did not perform better than expected (and potentially performed worse than expected) based on their school and student characteristics.

Implications for research and policy and limitations of the study

This report highlights how identification of beating-the-odds schools can be affected by methodological choices. Seventeen schools were identified by the status method, 15 schools were identified by the exceeding achievement expectations method, and 6 schools were identified by both methods (38 percent agreement rate). The analyses suggest that identifying schools with high percentages of students in poverty and high performance (the status method) is a straightforward method of identifying beating-the-odds schools but that considering the exceeding achievement expectations method as well will ensure that schools that are doing better than other schools with similarly challenging circumstances are identified.

The exceeding achievement expectations method adjusts for the potential influence of school background factors, including student prior achievement. By statistically controlling for these factors, this method may produce less biased estimates of school performance than does the status method. But some schools identified using the exceeding achievement expectations method have relatively low overall graduation rates or proficiency rates, which should be no surprise because schools identified using this method are by design not as highly ranked.

The status method identified beating-the-odds schools that ranked in the top 25 percent on observed performance among schools with at least 40 percent of students from low-income households. However, some schools identified using the status method ranked low when the exceeding achievement expectations method was used (and when school poverty level and other student and school characteristics were statistically controlled for). These findings suggest that looking at status alone may identify schools that did not actually perform better (and potentially performed worse) than expected based on their school and student characteristics.

It may thus be useful to consider both methods for identifying beating-the-odds schools. The high schools identified by both methods had high levels of performance and appeared to be achieving higher graduation rates and proficiency rates than might be expected given their demographics.

Still, the analyses using the two methods to identify beating-the-odds schools were limited by the data provided on the performance and characteristics of Puerto Rico high schools. The analyses used graduation rate data for only one student cohort and academic achievement data for only one year because they were the only cohort and year with complete data available. Although school performance tends to show stability over time (Dumay, Coe, & Anumendem, 2014), it may be affected by cohort- or year-specific factors. If at all possible, analyses such as these should be informed by using multiple years of performance data. The analysis for the exceeding achievement expectations method was limited by the data provided on the characteristics of Puerto Rico high schools. Additional school and community characteristics not examined in this study, such as parents' education level or parent or community involvement, also might be important factors affecting school success. Having multiple years of performance data or having data for a more complete set of school characteristics may improve model specifications for the exceeding achievement expectations method and produce unbiased estimates of school performance.

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January 2017

This report was prepared for the Institute of Education Sciences (IES) under Contract ED-IES-12-C-0009 by Regional Educational Laboratory Northeast & Islands administered by Education Development Center, Inc. The content of the publication does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

Meyers, C. V., & Wan, Y. (2017). *Stated Briefly: A comparison of two approaches to identify beating-the-odds high schools in Puerto Rico* (REL 2017–168). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Northeast & Islands. Retrieved from http://ies.ed.gov/ncee/edlabs.

This report is available on the Regional Educational Laboratory website at http://ies.ed.gov/ncee/edlabs.

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