COLORADO DEPARTMENT OF EDUCATION

Growth Percentiles, Achievement & Demographics[1]: Technical Brief #1

Accountability & Data Analysis Unit

The purpose of this research brief is to address to what extent are school-level Median Growth Percentiles correlated with current student achievement, prior student achievement, and current school demographic characteristics? How do these correlations compare to the correlation between current average achievement and the same demographic variables?

Background

The median growth percentiles (MGPs) generated from the Colorado Growth Model (CGM) play a prominent role in the school and district performance frameworks. In 2010, the Colorado Department of Education (CDE) in consultation with stakeholders allocated substantial weight to the MGPs in the school performance frameworks (SPFs). In the elementary and middle SPFs, the growth data drive 60 percent of all possible points that can be earned by a school. For the high school SPF and the district performance frameworks (DPFs), growth consists of 40 percent of total points. One of the key reasons for placing more weight on the median growth percentiles over achievement is that stakeholders contend that compared to average/current achievement, the MGPs "level the playing field" by focusing on how much schools have improved student learning in addition to focusing on students' current performance.

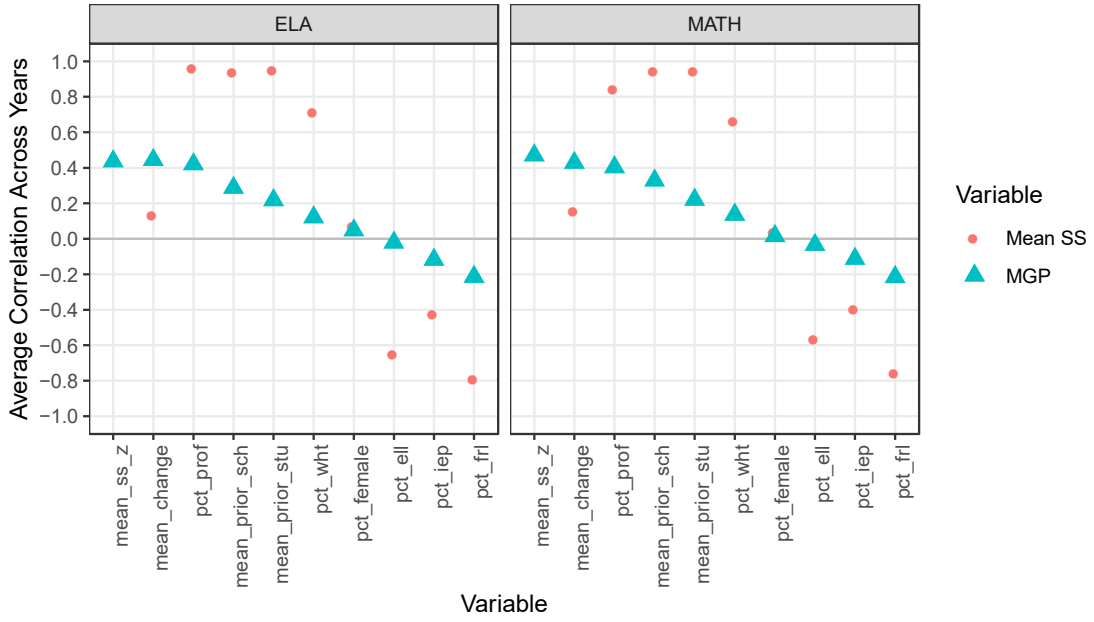
Analysis & Findings

One way to evaluate the assumption that MGPs level the playing field across different types of schools (e.g., high poverty versus low poverty schools) is by comparing the associations between MGPs and other key school-level variables and demographic information of interest. We check this assumption because there is no guarantee that the MGPs will *not* be associated with student demographic variables since these demographic variables are not factored into the growth estimate calculations. Figure 1 presented below, shows the relationships between school growth and achievement measures relative to demographic variables of interest to stakeholders such as community groups, parents, and board of education members. The graph shows the average correlation between growth ("MGP") and achievement ("Mean SS") and a number of other achievement and demographic variables, at the overall school level, for the years 2009-2014 and 2016-2017.

The triangles in Figure 1 represent growth as measured by MGPs and the circles represent achievement as measured by average test scores. The y-axis represents the strength of the correlation and can range from -1 to$+1$. Points located closer to ± 1 indicate stronger relationships with the school-level demographic variables and points located closer to 0 (the horizontal line in the center) indicate weaker relationships. A correlation near 1, such as the relationship between mean scale scores in English Language Arts (ELA) and the percent of students scoring proficient and above, indicates that the rank order of schools using either mean scale scores or percent proficient and above on ELA would be nearly identical. A correlation near 0, such as the relationship between MGPs and the percentage of students who are English Language Learners (ELL) at a school, means that the rank order of schools found on one variable is completely different from the rank order of schools on the other variable. Another way to interpret correlations is to note that if two variables have a correlation of ± 1 it means that knowing the value of one variable would allow us to perfectly predict the value of the other variable; conversely, when correlations are near 0, knowing the value of one variable doesn't help to predict the value of the other variable at all. One can see in the graph that almost all points located closer to ± 1 on the y-axis represent points related to mean scale scores. The correlations that tend to be weak to weakly moderate on demographic variables reflect points related to MGPs or growth.

[1]: this technical brief was prepared by the Center for Assessment Design, Research and Evaluation at the University of Colorado-Boulder for the Colorado Department of Education. Additional related reports are available at: http://www.cde.state.co.us/accountability/research

Figure 1. Average School-Level Correlations between MGPs or Current Mean Scale Scores and Demographic and Achievement Variables, 2009-2017.



Note: mean_ss_z=current year mean scale scores; mean_change=change from prior to current year mean scale scores; pct_prof=% of students scoring proficient or above; mean_prior_sch=school mean prior year scale score; mean_prior_stu=student prior year mean scale score; pct_wht=% of students who are white; pct_female=% of students who are female; pct_ell=% of students classified as ELL; pct_iep=% of students with an IEP; pct_frl=% of students eligible for free or reduced price lunch.

When looking specifically at the correlations between growth and groups typically designated as "underserved" (i.e., free and reduced lunch eligible students, non-white students, English Language learners and students on an individualized education plan), we see that the average correlations never exceed -0.22. What this figure and more detailed tables in the summary report suggest (see Table 2) is that overall, a school with a low or high population of underserved students can be found with higher or lower levels of growth.

In contrast, the much higher correlations found between current achievement and underserved groups communicates a different story. That is, school achievement tends to track very closely with demographic characteristics. For example, the negative correlation close to -0.80 between achievement and the percentage of free and reduced lunch (FRL) eligible student's means that schools with higher percentages of FRL eligible students consistently tend to have lower average test scores than schools with lower percentages of FRL eligible students.

The moderate correlation between growth and achievement (about 0.45-0.50 in both subjects) indicates that the growth and achievement measures represent related but distinct aspects of student learning across schools. Based on these results, the statement that growth "levels the playing field" across different types of schools means that this indicator does not track as closely to school demographic characteristics. Put differently, while schools serving more affluent populations are most likely to be the schools with the highest average test scores, they will not necessarily be the schools with the highest growth ratings.

Where can I learn more?

- For additional questions related to the Colorado Growth Model visit: http://www.cde.state.co.us/accountability/coloradogrowth.
- For questions about this fact sheet, contact Dan Jorgensen, PhD at: Jorgensen_D@cde.state.co.us