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Fixing the Academic Performance Index

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Thirteen years ago, the California State Senate passed the *Public Schools Accountability Act* (PSAA) which created the Academic Performance Index (API) as the primary measure for accountability. The PSAA was intended to hold schools accountable for students' achievement and progress, in order to ensure that all students were prepared to become lifelong learners able to succeed in the 21st century. Shortly after the implementation of PSAA, the federal government reauthorized ESEA, also known as the No Child Left Behind Act of 2001. Since then, schools have operated under a dual-accountability system with both state and federal achievement benchmarks. Although only the federal NCLB system includes real monetary and other sanctions, schools are still very responsive to their performance under PSAA, and specifically to their API scores and growth. The local media, realtors, and other stakeholders look to the API as a measure of school progress. Schools' API scores have been used in the allocation of high profile interventions and sanctions, such as the Quality Education Improvement Act (QEIA), District Assistance Intervention Teams (DAIT), and School Improvement Grants (SIG). They are sources of pride for local schools and districts, and even a few points worth

Executive Summary

The Academic Performance Index (API) is the centerpiece of California's state assessment and accountability system. With the recent passage of SB1458 and the pending reauthorization of both state and federal accountability legislation, there is now an unprecedented opportunity to improve the API for next generation accountability in California. In this policy brief Morgan S. Polikoff and Andrew McEachin draw on their own previous work and more than a decade's worth of research on effective accountability policy design to describe the lessons that have been learned and to propose policy changes that would improve the API.

The research literature on accountability systems has produced a number of key findings with regard to API and API-like measures of school performance. For instance, the API is heavily influenced by student demographics, as are other status measures of achievement. Year-to-year changes in API, often heralded by schools and the media, are highly unstable and do not reflect sustained improvement. The API is biased against small schools and

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Executive Summary (Cont.)

high schools and in favor of larger schools and elementary schools. Perhaps most importantly, the API is too narrowly focused on test-based measures of performance. Fortunately, many of these problems are relatively simple to fix, as the operation of current accountability systems in other states and some school districts has made clear.

The authors conclude with a number of recommendations for improving the API, including a) tracking the achievement of individual students across years; b) using multiple years of school-level data to measure growth in achievement; c) incorporating both growth and levels of achievement in identifying schools for intervention/support; and d) exploring alternative measures of school performance. While these solutions will not solve all of California's educational problems, they will certainly help make our state's assessment and accountability systems more effective in determining where to target improvement efforts.

of gains in API scores are often cause for celebration.

The API serves an important purpose in California's accountability system, but researchers have learned quite a lot about the design and impact of school performance measures in accountability systems since it was initially introduced (e.g., Kane and Staiger, 2002; Linn, 2004; McEachin and Polikoff, 2012). A number of these findings are directly relevant to the API and the future of California's accountability system. These lessons question the underlying assumptions of the API and the utility of the index for helping the state improve underperforming schools; they also challenge stakeholders' ability to effectively use the API as a means of assessing school quality (e.g., parents deciding where to buy a house). Our purpose in this brief is to discuss existing research and present new evidence as to the potential improvement of the API. Beyond merely criticizing the measure, we offer a set of detailed suggestions for revising the API in the next round of California accountability policy.

Governor Brown recently signed legislation (SB1458) that calls for a thorough revision of the API, particularly in the state's high schools. SB1458 requires that student test scores comprise no more than 60 percent of the API in high schools, with the remaining 40+ percent to include other measures of school and student performance. In elementary schools, student test scores must comprise *at least* 60 percent of the API. SB1458 opens the door to a reconsideration of the way California uses test scores to measure school performance—the main focus of this policy brief—and also to consideration of the kinds of indicators that might be included in the API to measure other important educational goals. The state should capitalize on this moment to make improvements in the PSAA, and specifically in the API.

PSAA and API

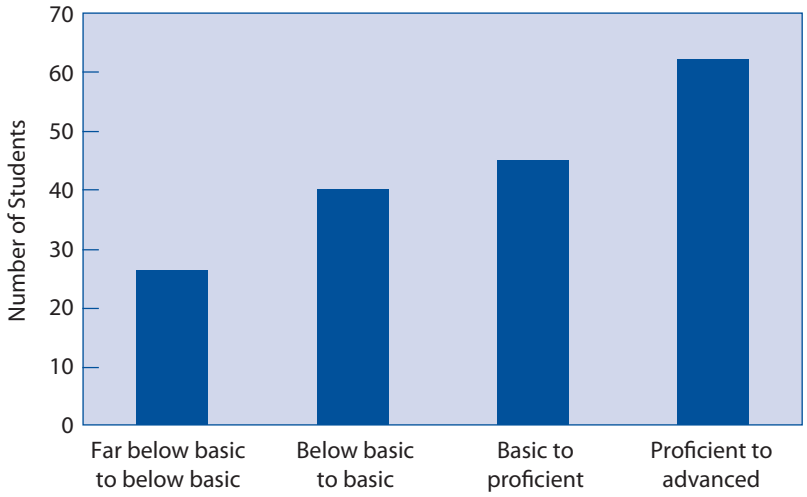
The California State Senate passed SB376 in 1997, which created the Standardized Testing and Reporting (STAR) system and the California Standards Tests (CST). The CSTs are offered in grades 2 through 11 in math, English Language Arts (ELA), history, and science. Students receive both a scale score between 150 and 600 and one of five performance levels: Far Below Basic (FBB), Below Basic (BB), Basic (B), Proficient (P), and Advanced (A). A score at the proficient level is the state goal and is considered on grade-level for accountability purposes. The CSTs are the primary assessments used in the API and Adequate Yearly Progress (AYP) performance measures in PSAA and NCLB, respectively.

The API is a weighted average of students' ELA, math, history, and science CST performance levels, which is calculated each year for each public school in the state. Each student's score on each state exam is translated into a point value: 1000 for advanced, 875 for proficient, 700 for basic, 500 for below basic, and 200 for far below basic. Schools receive only a single API score between 200 and 1000, calculated using an algorithm that weights students' performance in each subject, while heavily favoring mathematics and ELA. In the 2009-10 school year, the weights for the grade 6-8 API were 51.4 percent for ELA, 34.3 percent for math, 7.1 percent for science, and 7.1 percent for history. High schools are also evaluated on student performance on the California High School Exit Examination.

The PSAA establishes the API as the primary measure for state accountability. Schools are expected to have an API score of 800; those with an API lower than 800 are expected to make up at least five percent of the difference between their current API and 800 each year. Schools that meet or exceed the API requirements can apply for special recognition as a California Distinguished School, a National Blue Ribbon School, or a Title I Academic Achievement Award School. Schools that do not meet their API goals are subject to interventions and sanctions from the state, although these may not occur in practice due to lack of funding.

Unlike the performance measure used in the federal accountability system (NCLB's AYP) schools under PSAA benefit from moving students to higher performance levels along the entire achievement distribution. However, schools benefit more from moving lower performing students to higher proficiency levels than moving higher performing students. Schools benefit the most from moving students from Far Below Basic to Below Basic, as is evident in the fact that the gap between the points allotted for these two levels is the largest. For example, assume school A is only held accountable for one subject and has 1000 students with 20 percent of students at each level, advanced through far below basic. This school would have an API of approximately 655, with a goal of raising its API score 8 points the following year. As shown in Figure 1, the school would reach this goal if it only moved 26 Far Below Basic students to Below Basic, while it would have to move 62 students from Proficient to Advanced to meet the API growth goal.

FIGURE 1. Number of students in a school of 1000 at each performance level required to move a school 8 points in API in one year.



Similar to the subgroup provisions in NCLB's AYP system, schools also receive API scores and growth targets for racial and ethnic subgroups, English Language Learners, socioeconomically disadvantaged students, and students with special needs, which are calculated in a similar manner as the school-wide API scores and growth targets. The intent of the subgroup API scores and growth targets is that schools will have incentives to focus on traditionally lower performing subgroups of students, and, in turn, reduce achievement gaps.

Lessons Learned

There are several serious problems with API that limit its potential utility and effectiveness (McEachin & Polikoff, 2012). Most of these problems also apply to federal accountability measures, but the California system is the focus of this brief. In the next section, we present results drawing from our own work and the work of others that highlight what we believe are the most important lessons learned. Where possible, we illustrate the lessons using statewide school-level performance data from the last decade.

Lesson 1: API Scores Primarily Measure Student Demographics

The API first holds schools accountable according to whether they have an API score above 800. As is well known in education research, student test scores are very highly correlated with student poverty and racial/ethnic characteristics (Linn, 2004). This is especially true of measures of achievement *levels* (e.g., API) rather than achievement *growth* (e.g., value-added). For example, there is a strong

negative correlation (approximately -.7) between the percent of students in a school who qualify for the federal Free/Reduced Price Lunch (FRPL) program and the school's API level. The average school in California has about 58 percent FRPL students and an API of 780. A school with one standard deviation more FRPL students (a school with approximately 83 percent FRPL) would be expected to have an API of approximately 716.

Although NCLB's AYP measure often receives more criticism, the relationship between student poverty and school performance is equally strong under both the API and AYP systems. In short, the measures of school quality used under both NCLB and PSAA are biased against schools that serve impoverished students, as are all measures based on student test score levels (Balfanz et al, 2007). The correlation between API scores and student demographics would be less problematic if schools could also meet their API goals by demonstrating meaningful growth over time, using a measure of growth that was both stable and unrelated to student demographics.

To be sure, the growth in API from one year to the next (e.g., a school's Growth API in 2011 minus its Base API in 2010) is not as strongly related to student characteristics. In fact, there is almost no relationship (correlation less than .1) between a school's growth in API over two years (henceforth, API Growth) and its share of FRPL students. However, this measure of growth comes at a significant cost, which we discuss next.

Lesson 2: API Growth is a Highly Unstable Measure

The API growth targets were created to provide schools with API scores below 800 an opportunity to demonstrate improvement over time. The growth targets can also be used to differentiate between schools making significant progress towards the goal of 800 and those with both low API scores and low growth. Although this is a desirable goal, API Growth is an unstable measure of changes in school performance. Conceptually it is a weak measure of school growth because it does not track the performance of individual students, but rather successive cohorts of students. It is straightforward to see that such a measure would be heavily affected by changes in student demographics and performance across cohorts, rather than reflecting the contributions of schools to individual students' learning (Ho, 2008; Kane & Staiger, 2002; Linn, 2004). Such a measure is also strongly affected by measurement error – much more so than measures based on achievement levels.

There are a number of ways to illustrate the less than desirable characteristics of API Growth. One way is to think about the intent of the measure – to identify schools consistently improving toward a goal of API 800. Our analysis finds that the measure is unable to consistently identify schools that are improving – or not improving. Rather, it tends to reward single-year aberrations in test scores in a school. For instance, the correlation of one year's API growth (e.g., 2009-2010) with the next year's (2010-2011) is -.29. This means that schools with large API gains in one year are likely to have among the smallest API gains in the next year. The judgment of school performance based on a "noisy" measure that fluctuates from year-to-year does not inspire confidence in the possibility that the measure would contribute to an effective accountability system (McEachin & Polikoff, 2012).

Lesson 3: API and API Growth Appear Biased Against Middle and High Schools

While it is undoubtedly difficult to compare schools at different levels to one another, it is problematic that API scores are so strongly biased against middle and high schools. For instance, 58 percent of middle schools and 82 percent of high schools had API scores below 800 in 2011, as compared to just 45 percent of elementary schools. If high schools are in fact doing a much worse job than elementary schools in educating students, then these patterns are perhaps not problematic. However, it is far from clear that this is the case.

There are a number of potential reasons why middle and high schools fare worse under the PSAA system. For example, it may be that the tests used in elementary grades in the API system do not account for skills and knowledge students need in order to learn the more difficult material in middle and high school. If this is so, then the current system sends the

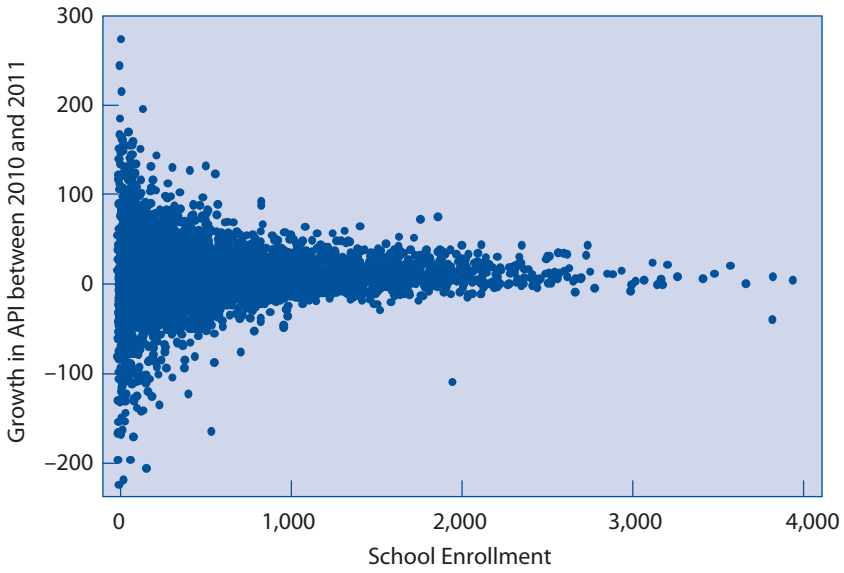
signal that a majority of elementary schools are meeting the stated goals under PSAA, while a majority of their students are in fact not ready for the more difficult material presented in later years. This would partially explain the dramatic performance differences among elementary, middle, and high schools.

Lesson 4: API Growth Appears Biased Against Small Schools

In addition to the bias against middle and high schools it is well known that growth measures of achievement, of which API Growth is an example, are biased against small schools—those serving fewer students (Kane & Staiger, 2002). Conceptually, in a school serving just 100 students, one student's fluctuation in scores will have a greater impact on overall school performance than in a school serving 1000 students. Smaller schools are therefore also more susceptible to measurement error and to differences in cohort composition.

A straightforward way to see this bias against small schools is to examine the scatterplot in Figure 2. This scatterplot shows school size (on the horizontal axis) against the school's 2011 API Growth score (on the vertical axis). As is clear from the figure, smaller schools are much more likely to have the lowest API growth scores than are larger schools. They are also more likely to have the highest growth. Unless we really believe that smaller schools have such dramatic swings in effectiveness from year to year, these results do not benefit the long-term improvement of California's schools.

FIGURE 2. Schools' Growth in API and School Enrollment



Lesson 5: API Creates a Disincentive to Improve Achievement for High-Achievers

Because of the API's point system for calculating the index, a design decision by the original authors of the index, the API diminishes the importance for schools of raising the achievement of high achievers (i.e., advanced students). For students at the proficient level, the bump for schools getting those students to score advanced is just 125 points, 58 percent smaller than the bump for schools to raise a far below basic student to below basic. For students at the advanced level, the school cannot possibly gain anything by raising those students' achievement (these students have already earned the maximum 1000 points), so there is no incentive to do so. Given the extensive literature on high stakes accountability and students "on the bubble," it is rational that schools would respond to these pressures by targeting their efforts on low-achieving students at the expense of higher achieving students (Booher-Jennings, 2005; Neal & Schazenbach, 2010). While it is important to increase the achievement of schools' lowest performing students, it is also important to acknowledge the potential unintended consequences of the differential incentives in the API calculations. Recently, some scholars have begun to question whether the focus on proficiency has harmed the performance of high-achievers, with some evidence suggesting that it has (Ladd & Lauen, 2010; Neal & Schazenbach, 2010).

Lesson 6: API Does Not Track the Achievement of Individual Students

This problem in fact underlies many of the problems we have already discussed, but it also poses its own, more conceptual problem. The API and API Growth systems measure school performance based on the test

scores of their current students. Who these students are, including their backgrounds and prior test scores, has no bearing on the API calculation. Without student-level longitudinal data, however, it is impossible to conduct more sophisticated analyses of the school's impact on that portion of student achievement that is under its control. Even without a vertical scale, student-level longitudinal data can be used to investigate school performance much more directly than the current cohort-based achievement data, as is the case with the Colorado Growth Model, for instance.

Lesson 7: API Focuses Too Narrowly on Test Scores

As is true for NCLB's AYP, the API rating schools receive is based entirely on student test performance. SB1458 requires the state to incorporate graduation rates into the API for high school calculations, but other important goals of schooling should also be acknowledged and measured in California's accountability system, including especially students' readiness for college and careers after they leave high school. Given the well-known negative consequences associated with focusing accountability exclusively on test scores (teaching to the test, test score inflation, and others) it makes sense to broaden the kinds of measures included in the API calculation. Possible indicators might include attendance and promotion rates, expulsion and suspension rates, completion rates in specific courses or sequences of courses, results from parent and student surveys, and work and college placement outcomes. As is being done now for multiple-measure teacher evaluations, researchers must investigate the uses and effects of these various indicators of school and student performance. But the move to broaden the measures used to hold schools accountable that SB1458 requires is an important next step in the accountability movement.

Solutions

Given the variety and scope of these problems, reforming the California accountability system may seem an impossibly daunting task. However, there are several straightforward solutions to these problems that could be implemented with relatively little effort and that would have important, positive impacts on the API system. We now discuss several of these solutions, which follow directly from the weaknesses in the API identified above.

Solution 1: Track the Performance of Individual Students and Replace API Growth

Of all our proposed policy recommendations, this is the most fundamental to the success of the next generation API. Tracking individual student progress over time is essential to measure more precisely the contribution of schools to student performance. The new state assessments emerging from the SMARTER Balanced Assessment Consortium (SBAC) should provide superior assessment data to use in determining districts' and schools' effectiveness. For example, their use of computer adaptive assessment techniques will allow for greater precision in identifying high and low achievers. The California Longitudinal Pupil Data System (CALPADS) can already track individual students and includes multiple years of CST data, so following students over time for the purposes of measuring growth in achievement should not require great technological investments, nor does it require a vertical scale.

California does not need to reinvent the wheel on the analysis of longitudinal student-level achievement data. A number of states and districts including North Carolina have based their accountability systems on growth in individual student learning for many years. The state could look at the alternatives currently in use, consider the research on value-added measurement, and select a system with the ideal properties given the state's goals. The revised growth measure should replace the current API growth measure, which does not fulfill its goal of measuring growth in student proficiency.

Tracking individual students over time would also help solve the problem of limited incentives for improving high-achievers' achievement by making the growth in *all* students' achievement part of the accountability equation—high achievers can readily be compared with other high achievers in estimating relative growth over time. These student growth measures could easily be rolled into a school-level performance measure. In conjunction with the higher-quality computer-adaptive assessments emerging from the SBAC, such a change would be a welcome contributor toward helping ensure high

achievers are not neglected in California's schools.

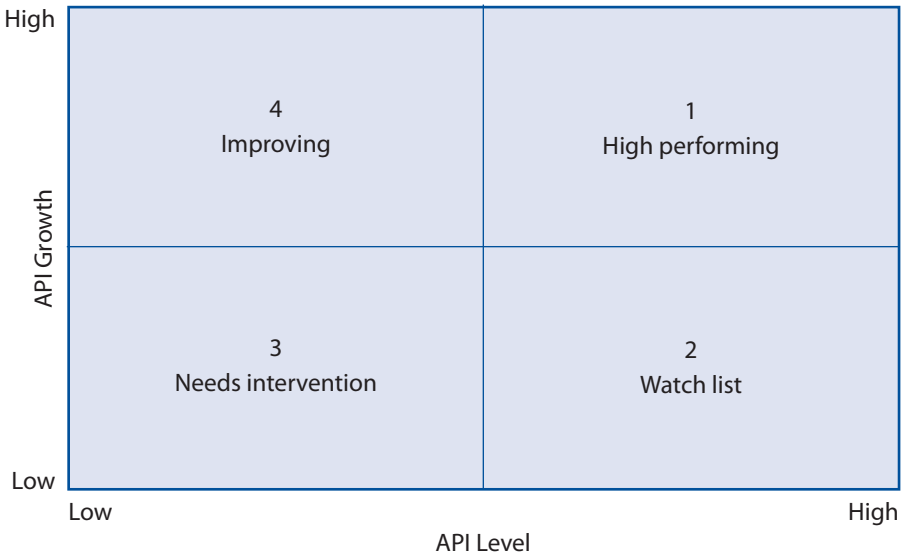
Solution 2: Improve the Stability of Growth Measures Using Multiple Years of Data

No matter what growth measure is chosen, there will be instability in the estimates with a single year of data. The literature on this topic suggests that a straightforward approach to addressing this problem is to take multiple years of data into consideration in estimating contributions to student learning. For instance, the state could create a value-added score for each school in each year and then average the results across three consecutive years. This rolling average would smooth out the year-to-year variations in achievement gains and contribute to a clearer, more stable measure. And because each student would be used as his own control in each year's calculations, it would not matter that different cohorts of students would be included in the rolling averages. Increased stability is necessary in order to send consistent messages to schools about their performance.

Solution 3: Use Level and Growth in Achievement to Identify Interventions Tailored to School Performance Types

With the revised growth measure, a new accountability system should combine level and growth in achievement to identify schools in need of intervention. One approach to combining the two pieces of information would be a two-by-two matrix, such as the one in Figure 3. On the horizontal axis is the school's level of achievement, based on the API. On the vertical axis is the school's growth in achievement, based on the revised student-level growth measures. Schools can be in any of the four quadrants.

FIGURE 3. Matrix of School Performance for New Accountability System



In the first quadrant (upper-right) are schools that are high-achieving and high-growing. These schools are true high performers and need no intervention. Schools that demonstrate performance in this box for several years in a row might be exempted from accountability provisions for a certain number of years, reducing administrative burden and increasing flexibility.

Perhaps the next best performing schools are those in the fourth quadrant (upper-left). These are schools that are low-achieving and high-growing. These schools likely do not need intervention, but they do need to be monitored and supported to ensure their growth trajectories remain positive. They should also be examined by researchers to learn about the best practices that could be applied to low-achieving, low-performing schools.

In the second quadrant (lower-right) are schools that are high-achieving and low-growing. These will be schools with strong inputs that are not, for one reason or another, contributing to large achievement gains. These schools might need a particular set of intervention strategies, perhaps drawn from the successful schools identified in the first quadrant. These schools are unlikely to need punitive accountability sanctions unless their achievement growth drops to severely negative, but they should be monitored and encouraged to improve.

Finally, in the third quadrant (lower-left) are schools that are low-achieving and low-growing. These are schools with weak inputs that are not improving

outcomes—they should be the primary targets of accountability from the state. These schools are likely to need more serious interventions, which could be chosen by the state and perhaps based on the practices in place in schools with similar inputs but stronger growth. Given their poor track record of improving performance, these schools will likely not benefit from simply providing additional resources.

A straightforward way to report results to schools would be to pare down each school's performance to two measures – an achievement level score similar to an API score and an achievement growth score, perhaps in the form of a percentile rank. Thresholds could then be established on the two measures for separating schools into the quadrants described above. These two measures could be made clear and understandable to parents and educators.

Solution 4: Administer Accountability Separately by School Level and Size

Even with the adjustments just proposed, it is likely that the revised API system would remain biased against middle and high schools and small schools. Even if we believe that middle and high schools are worse than elementary schools, it should be clear that there are many elementary schools in need of improvement. Furthermore, research suggests the returns on early investment and accountability in earlier grades will be higher than in later grades. Thus, it makes sense to ensure than any accountability system fairly identifies low-performing schools of all levels and sizes.

A simple approach to solving this problem is to separate schools into groups based on size and level before making determinations about effectiveness. For instance, schools could be separated into the three levels and then into quintiles based on school size. Then, the two performance measures could be calculated based on the schools in each group, and accountability provisions could be applied accordingly. California currently generates a similar schools index which compares the relative API performance for schools with similar student characteristics. Each school receives a similar school index score of 1 to 10, with 10 indicating that the school is performing in the top 10 percent of schools with similar characteristics and a 1 indicating the school performing in the bottom 10 percent of schools with similar characteristics. The school's actual API score is left unadjusted. Our approach, however, would adjust schools' API scores based on school type and size. If the three-year averages we mentioned previously were also included, it would increase the stability of these classifications as well.

Solution 5: Explore Alternative Measures of School Performance

Relying solely on test scores (and, as of next year, high school graduation rates) is likely to lead to continued narrowing of the curriculum and focus on the subjects and material that are tested. SB1458 requires the California Department of Education to initiate a process that will consider alternative measures of school performance. Some possible indicators were suggested above, but that list was by no means exhaustive. To the extent that we want schools to focus on a particular outcome – because we view it as an important outcome for our students – we should find ways to reliably measure that outcome and use it to guide improvement and accountability. The adage "What gets measured gets done" is nowhere truer than in education policy and accountability.

Conclusion

California is now at an important juncture in the history of state accountability. Several trends or policies including the adoption of the Common Core State Standards and the development of new and better assessments, the pending reauthorization of NCLB and of PSAA, and the opportunities presented by a federal government that seems to be moving away from a one-size-fits-all model of accountability have converged to present a unique opportunity to revise and improve our state's school accountability system. The recent passage and signing of California SB1458 also requires a rethinking of API, and our suggestions fit nicely in the framework laid out in that legislation. Finally, the public remains supportive of accountability in education, and there is bipartisan agreement that previous accountability systems were weak in a number of obvious ways. The proposals sketched here represent a potential path forward to the next generation of California accountabil-

ity. Given this opportunity, California should learn from the mistakes of the past and improve the API.

Of course, improving the API will not magically solve California's educational problems. The design of accountability systems is but one piece of a much larger education policy framework that supports K-12 education in the state. Nevertheless, the identification of schools needing improvement and support is at the heart of efforts to improve education through accountability, and it is essential that California do this as fairly and accurately as possible. The improvements that we have proposed in the API will go a long way toward building a foundation for future improvement in educational performance for the state's schools.

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