

The Relative Performance Matrix:

A Framework for Evaluating School-Level Performance on Standardized Tests

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Introduction: The South Carolina Department of Education intends to release its inaugural volley of "School Report Cards" for elementary and middle schools this November, an evaluation based solely on Palmetto Achievement Challenge Test (PACT) scores. While many schools and districts are confident of positive evaluations, others face what may be regarded as yet another measurement of the degree of their failure. Opponents of the School Report Cards have a valid concern--Is it truly a fair practice to assess performance and school and teacher quality based exclusively on a set of test scores? The only way we answer "yes" to this question is if we assume equality of learning opportunities at all of our schools, and such an assumption in South Carolina would be profoundly wrong.

With few exceptions, we can expect this when the School Report Cards are sent: Schools receiving a rating of "excellent" will be relatively affluent, will have relatively fewer minority students, and will have better trained, more experienced, and higher paid teachers. Schools rated "below average" and "unsatisfactory" will be relatively poor, relatively heavily populated by minority students, and staffed by relatively lower paid, less trained, and less experienced teachers. More simply, poorer schools, in general, have reason to dread arrival of the School Report Cards.

School-level poverty, racial composition, and teacher salary, training and experience all significantly effect standardized test performance, with the most significant of these effects being related to school-level poverty¹. On the PACT battery, a two-percentage point increase in student enrollment in free- or reduced-lunch programs translates into a one-percentage point decrease in the percentage of a school's students meeting or exceeding state minimum standards on the test. Consider the magnitude of this effect--For a school with 80% of its students in a free- or reduced-lunch program (unfortunately, a figure that is not at all uncommon in South Carolina), we can expect approximately

¹ H.G. Hawkins. "Understanding 'Poor' Performance: Palmetto Achievement Challenge Test (PACT) Scores and Poverty." Jim Self Center on the Future, Clemson University.
<http://www.scfuture.clemson.edu/education/pact/pact2001.pdf>. (2001)

40% of those students to fail to meet PACT standards. Given the unmistakable negative relationship between poverty and PACT performance, and the vast differences in school affluence across the state, we must seriously question the immediate and long-term social justice of levying such grave consequences based solely on raw test scores.

Relative Performance Matrix: Over the past year, the Jim Self Center on the Future has measured and reported the effects of various extraneous factors on Scholastic Aptitude Test (SAT)² and Palmetto Achievement Challenge Test (PACT) performance.³ After identifying the measured relationships between these factors and test performance, we have been able to ask and answer the question, "How would our schools perform on these tests if they were operating with comparable circumstances?" By adjusting scores to account for the effects of extraneous factors, a more legitimate basis for gauging school-level standardized test performance can be achieved than merely ranking raw scores. Even many testing standards advocates support "opportunity to learn" standards that consider and adjust for inequities of learning opportunity.⁴

However, we would neither be sufficiently served by an evaluation methodology that considers only performance relative to expectations based on circumstance. Given high poverty, we may expect only 60% of a school's students to meet PACT standards, but we obviously desire and work toward a much higher level of success. We should therefore consider performance relative to standards, pursuing high-level performance regardless of circumstance. These two considerations offer a framework for fair and rigorous evaluation of PACT performance:

1. Performance Relative to Expectations: Actual compared to expected percentage of a school's students who meet or exceed minimum standards on PACT.
2. Performance Relative to Standards: School-level performance compared to statewide average performance on PACT, measured by the percentage of students meeting or exceeding state minimum standards.

The **Relative Performance Matrix** (RPM) is a framework for evaluating school-level performance on standardized tests, such as PACT. RPM assessment considers how well a school performs relative to expectations, accounting for its circumstances or "opportunities to learn," and how well it performs relative to the statewide performance average. Below is the RPM model, key definitions, and an interpretation guide.

² H.G. Hawkins. "Comparison of Actual and Predicted Scholastic Aptitude Test (SAT) Performance Accounting for the Effects of Racial Composition, Poverty, Class Size, and Teacher Characteristics." Jim Self Center on the Future, Clemson University.

<http://www.scfuture.clemson.edu/education/sat/SATperf.pdf>. (2001)

³ H.G. Hawkins. "Understanding 'Poor' Performance: Palmetto Achievement Challenge Test (PACT) Scores and Poverty." Jim Self Center on the Future, Clemson University.

<http://www.scfuture.clemson.edu/education/pact/pact2001.pdf>. (2001)

⁴ N. Kober. "It Takes More than Testing: Closing the Achievement Gap." Center for Education Policy. (2001)

Relative Performance Matrix

Performance Relative to Expectations

Significantly Higher

Meets

Significantly Lower

Performance Relative to Standards

Significantly Higher

Meets

Significantly Lower

<i>Champion Schools</i>	<i>Good Schools</i>	<i>Fail-to-Fully Capitalize on Assets Schools</i>
<i>Over-Achieving / Value Adding Schools</i>	<i>Adequate Schools</i>	<i>Laggard Schools</i>
<i>High-Performing / Hindered Schools</i>	<i>Hindered Schools</i>	<i>Failing Schools</i>

Relative Performance Matrix

A. Key Definitions

1. **Performance Relative to Expectations:** Actual compared to expected percentage of a school's students that meet or exceed state minimum standards on the Palmetto Achievement Challenge Test (PACT). "Expectation" value is determined by statistically modeling the effects of intervening variables on PACT achievement.
2. **Performance Relative to Standards:** School-level performance compared to statewide average performance on PACT, measured by percentage of students meeting or exceeding state minimum standards on PACT.
3. **Significantly Higher:** School performance (relative to expectations and / or standards) is statistically higher than the state average on the performance measure at 0.1 level of significance (two-tailed).
4. **Meets:** School performance (relative to expectations and / or standards) is not statistically different than the state average on the performance measure at 0.1 level of significance (two-tailed).
5. **Significantly Lower:** School performance (relative to expectations and / or standards) is statistically lower than the state average on the performance measure at 0.1 level of significance (two-tailed).

B. Matrix Interpretation Guide

1. **Champion Schools:** Schools exhibiting significantly higher than expected performance and a significantly higher than state average percentage of students meeting or exceeding state minimum standards on PACT. These schools may overcome substantial barriers to success, such as high poverty levels, or may be understood as enjoying favorable circumstance yet still cultivating great effort among students. Champion Schools manifest performance traits worthy of recognition, praise, and award at the highest level.
2. **Good Schools:** Schools that are expected to show high-level performance, given their circumstances, and that perform at expected levels. They exhibit higher than average performance, but do not appear to excite exceptional effort or performance beyond what one may expect. These schools should be recognized for high-level performance, but should not receive excessive praise since they typically have favorable circumstances and merely meet expectations.

3. **Fail-to-Fully-Capitalize on Assets Schools:** Schools that exceed state average performance, but do not satisfy expectations. These schools typically represent schools with favorable circumstances (such as low levels of poverty), but do not appear to fully capitalize on those circumstances. This relatively high-level performance should be acknowledged, but these schools should be strongly encouraged to nurture greater effort from staff and students.
4. **Over Achieving / Value-Adding Schools:** Schools that perform well beyond expectations, but that do not significantly differ from the state performance average. These schools typically overcome performance barriers (such as high poverty levels) to approximate statewide performance averages, exciting laudable levels of effort from students and staff, and are worthy of high praise, award, and possibly additional support. They show the equivalent of a high return on investment.
5. **Adequate Schools:** Schools that meet expectations and show performance comparable to statewide average. They neither over- nor under-achieve.
6. **Laggard Schools:** While performing at levels comparable to the statewide average, these schools are under-performing. These schools typically have favorable circumstances, but do not generate student performance at expected levels. Leadership is likely an issue for these schools, and staff and students should be strongly encouraged to put forth greater effort.
7. **High-Performing / Hindered Schools:** Schools that show performance levels significantly below the state average, but significantly higher than expected given their circumstances. These schools typically face substantial barriers to high-level performance, but exhibit high levels of effort and, possibly, highly effective leadership. The state should invest in strategies to mitigate the impact of performance barriers at these schools, as these schools show a predisposition for achievement.
8. **Hindered Schools:** Schools that score significantly below statewide performance average, but that meet performance expectations given their circumstances. These circumstances are highly debilitating, such as very high levels of poverty, however these students and staff do not appear successful in overcoming these hindrances. Attention should be directed toward encouraging leadership and mitigation of performance barriers.
9. **Failing Schools:** Schools that score significantly below statewide performance average and significantly below expectations. There is little or no reason or excuse for such dismal performance, as the effects of unfavorable circumstances have been largely accounted for. Even accounting for performance barriers, these schools are under-performing. Should performance at this level continue, intervention is necessary.

Sample Relative Performance Matrix Report: Research at the Jim Self Center on the Future has documented the effects of school-level poverty on PACT performance.⁵ Using regression analysis statistics and predictive modeling techniques, we are able to identify which schools significantly exceed expected performance levels using poverty level as an adjustment consideration. This provides a measure of *performance relative to expectations*. By comparing each school's average percentage of students meeting or exceeding minimum standards on PACT to the statewide average, we can measure *performance relative to standards*.

Below is a summary Relative Performance Matrix showing how South Carolina school's fared over a two-year PACT testing cycle, framed around performance relative to *expectations* and relative to *standards*. Following the summary RPM model is a table showing the distribution of schools within the matrix.

⁵ H.G. Hawkins. "Understanding 'Poor' Performance: Palmetto Achievement Challenge Test (PACT) Scores and Poverty." Jim Self Center on the Future, Clemson University.
<http://www.scfuture.clemson.edu/education/pact/pact2001.pdf>. (2001)

Relative Performance Matrix

Performance Relative to Expectations

Significantly Higher

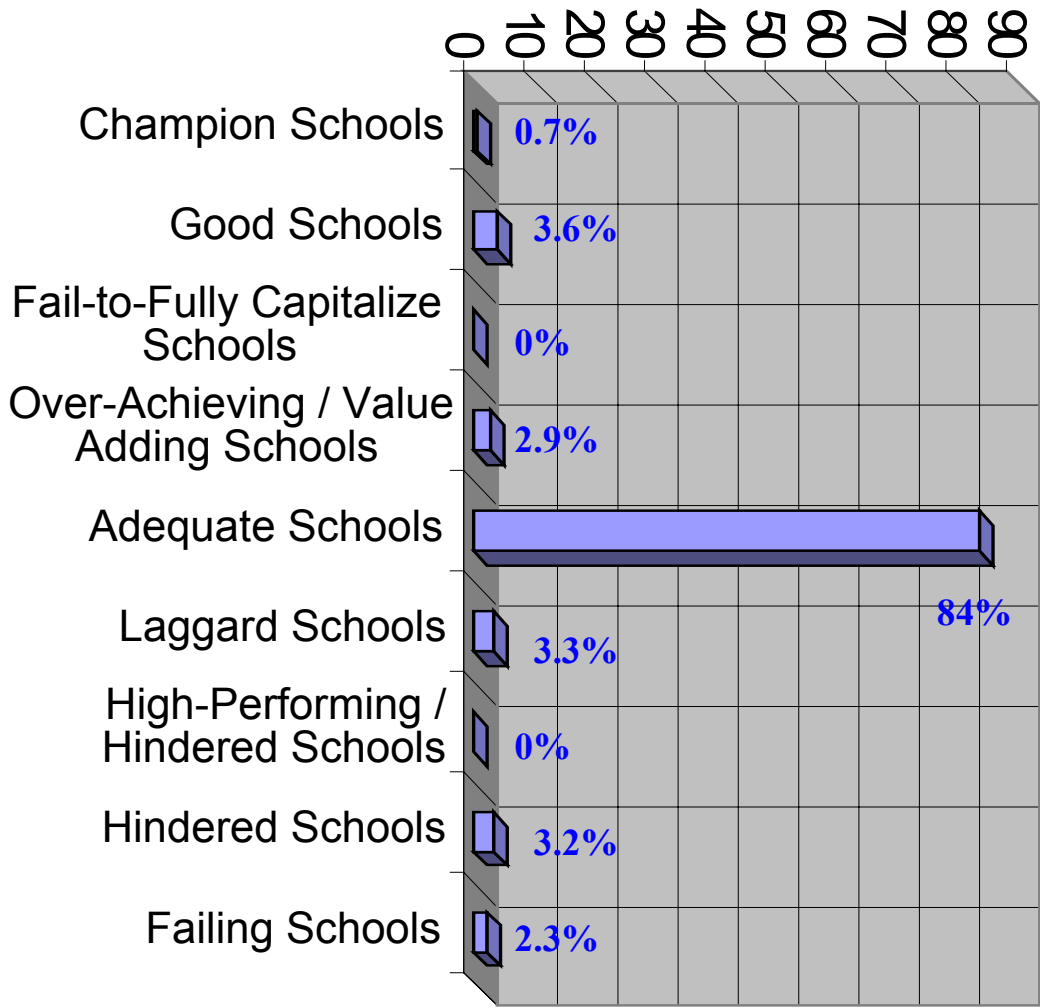
Meets

Significantly Lower

Performance Relative to Standards	Significantly Higher	<p><u>Champion Schools</u> (0.7% of all schools)</p> <p>Buist Academy (Charleston) HollyHill-Roberts HS (Orangeburg 3) Wright Elementary (Anderson 2) Cedar Grove Primary (Anderson 1) Forestbrook Elementary (Horry) Bethany Elementary (York 2)</p>	<p><u>Good Schools</u> (3.6% of all schools)</p> <p>Mt. Pleasant Academy (Charleston) Irmo Elementary (Lexington 5) Midway Elementary (Lexington 1) Bethel Elementary (Greenville) Charleston School of Arts (Charleston) Pine Street Elementary (Spartanburg 7) Sullivans Island Elementary (Charleston) Chukker Creek Elementary (Aiken) Oakview Elementary (Greenville) JB Edwards Elementary (Charleston) Gold Hill Elementary (York 4) Belle Hall Elementary (Charleston) Charles Pinckney Elementary (Charleston) River Springs Elementary (Lexington 5) Lake Murray Elementary (Lexington 5) Bookman Road Elementary (Richland 2) Dutch Fork Elementary (Lexington 5) Simpsonville Elementary (Greenville) Buena Vista Elementary (Greenville) Harbor View Elementary (Charleston) Lake Murray Elementary (Lexington 1) Ashley River Elementary (Charleston) LB Nelson Elementary (Richland 2) Rice Creek Elementary (Richland 2) Lexington Intermediate (Lexington 1) Moultrie Middle (Charleston) Wren Primary (Anderson 1) North Springs Elementary (Richland 2) Brushy Creek Elementary (Greenville) Leaphart Elementary (Lexington 5) Crowders Creek Elementary (York 2)</p>	<p><u>Fail-to-Fully-Capitalize on Assets Schools</u></p> <p style="font-size: 24pt; font-weight: bold;">No Schools</p>
	Meets	<p><u>Over-Achieving / Value-Adding Schools</u> (2.9% of all schools)</p> <p>New Prospect Elementary (Spartanburg 1) Marrington Elementary (Berkeley) Hemingway Primary (Williamsburg) Bakers Chapel Elementary (Greenville) Johnsonville Elementary (Florence 5) Stono Park Elementary (Charleston) Walker-Gamble Elementary (Clarendon 3) Anderson Primary (Williamsburg) Beaufort Elementary (Beaufort) St. James-Gaillard Elem. (Orangeburg 3) Lockett Elementary (Orangeburg 4) Manning Elementary (Clarendon 2) East Elementary (Dillon 2) South Elementary (Dillon 2) Delaine Elementary (Sumter 2) Mayesville Elementary (Sumter 2) St. Helena Elementary (Beaufort) St. John Elementary (Calhoun) Charleston Progressive (Charleston) Rafting Creek Elementary (Sumter 2) St. James-Santee Elementary (Charleston) Memminger Elementary (Charleston) St. Mark Elementary (Williamsburg) Watkins Elementary (Richland 1) Carver / Lyon Elementary (Richland 1)</p>	<p><u>Adequate Schools</u></p> <p style="font-size: 24pt; font-weight: bold;">84% of Schools</p>	<p><u>Laggard Schools</u> (3.3% of all schools)</p> <p>Indian Land Elementary (Lancaster) Greer Middle (Greenville) York Jr HS (York 1) Buford Elementary (Lancaster) Buford Middle (Lancaster) HE McCracken Middle (Beaufort) Berea Middle (Greenville) Lewisville Middle (Chester) Ware Shoals HS (Greenwood 51) Harbor School for Art (Georgetown) JE Ewing Jr HS (Cherokee) Granard Jr HS (Cherokee) Woodmont Middle (Greenville) Whitmire HS (Newberry) Hopkins Middle (Richland 1) Excelsior Middle (Union) Tamasse-Salem Middle (Oconee) Bell Street Middle (Laurens 56) Lake View HS (Dillon 1) Great Falls Middle-HS (Chester) WG Sanders Middle (Richland 1) Jonesville HS (Union) Newberry Middle (Newberry) McColl Elem-Middle (Marlboro) Lakeview Middle (Greenville) Tanglewood Middle (Greenville) Fairfield Middle (Fairfield) Chester Middle (Chester)</p>
	Significantly Lower	<p><u>High-Performing Hindered Schools</u></p> <p style="font-size: 24pt; font-weight: bold;">No Schools</p>	<p><u>Hindered Schools</u> (3.2% of all schools)</p> <p>Scotts Branch HS (Clarendon 1) RE Howard Middle (Orangeburg 5) Crane Creek Elementary (Richland 1) Sunset Park Elementary (York 3) Mary Ford Elementary (Charleston) Holly Hill Middle (Orangeburg 3) Cainhoy Middle (Berkeley) Estill Elementary (Hampton 2) Johnson Middle (Florence 4) Fairfax Elementary (Allendale) Scotts Branch Elementary (Clarendon 1) Denmark-Olar Elementary (Bamberg 2) South Fant St. Elementary (Anderson 5) Lower Lee Elementary (Lee) Brockington Elementary (Florence 4) Bowman HS (Orangeburg 5) Spaulding Elementary (Darlington) Whitlock Jr HS (Spartanburg 7) Elloree Elementary (Orangeburg 3) Brookdale Middle (Orangeburg 5) Denmark-Olar Middle (Bamberg 2) Fleming Elementary (Lee) Gibbes Middle (Richland 1) Clyde Sanders Elementary (Charleston) EA Burns Elementary (Charleston) Elloree HS (Orangeburg 3) Courtenay Middle (Charleston)</p>	<p><u>Failing Schools</u> (2.3% of all schools)</p> <p>West Hardeeville Elem. (Jasper) Choppee HS (Georgetown) Alcorn Middle (Richland 1) JV Martin Jr HS (Dillon 2) Brentwood Middle (Charleston) RD Schroder Middle (Charleston) Morningside Middle (Charleston) Estill Middle (Hampton 2) Rivers Middle (Charleston) Allendale-Fairfax Middle (Allendale) James Island HS (Charleston) Ridgeland Middle (Jasper) WA Perry Middle (Richland 1) Parker Middle (Greenville) Allendale Elementary (Allendale) Estill HS (Hampton 2) Bishopville Jr HS (Lee) North Charleston HS (Charleston) Education Redirection (Charleston) Phoenix Center (Clarendon 2)</p>

Relative Performance Matrix

Distribution of Schools



Education Policy Implications: In the current political environment, education assessment is an issue at the forefront. With a shrinking budget surplus and a stumbling economy, the two arenas expected to receive emphasis from the Bush administration are education reform and defense. And President Bush is a staunch advocate of accountability through testing.

District and school funding, district superintendent and teacher employment, and student advancement are all likely to be substantially affected by standardized testing outcomes, and the manner by which we interpret test scores is of paramount importance and impact. With sufficient justification, Americans and their leadership have moved to improve what we teach our youth and to carefully gauge our effectiveness. However, lofty benchmarks for student achievement and myopic measurements of the degree to which students fall above or below standards based solely on raw test scores are problematic.

To fairly assess school performance on standards-based testing, including distribution of performance awards and penalties, it is necessary to incorporate the influences of highly relevant, highly influential factors such as poverty. Conceptualizations of "exceptional performance" should be sufficiently broad to include schools that, despite seemingly low raw scores, excite performance that exceeds expectations when the effects of poverty are accounted for. Likewise, the biblical axiom that "from he who has been given much, much will be expected" should hold true when assessing school performance. It should not be sufficient for a school with extremely favorable circumstances to merely post seemingly high raw scores, we should hold them accountable for extracting performance commensurate with their circumstance.

School funding, whether operational funds or performance awards, represent a public investment in a merit good, and therefore is subject to close scrutiny. As such, we are compelled to identify and invest in models of success, those showing the greatest marginal return. For example, schools classified in the matrix as "High Performing / Hindered" exhibit significantly higher than *expected* performance, but test averages are significantly lower than the state average. These schools are impeded by circumstance, but show a capacity for overcoming performance obstacles. With additional supports, we could likely expect scores to increase. Such additional investments in schools classified as "Laggard Schools" would not likely yield comparable marginal returns.

Expansions to the predictive *expectations* model could help to further identify specific directions and expected returns for school-level investments, such as enhancements to teacher pay, teacher training, or alterations to class size. However, the relative influence of these factors is far less than the impacts of poverty conditions on standards-based test performance. The Relative Performance Matrix could also be used to identify schools and communities to be targeted for community interventions to enhance social and family capital. Recent research suggests that portions of public funding for education could yield more positive results if applied to non-school systems institutions to improve health and

nutrition, quality of childcare, substance abuse interventions, and environmental conditions.⁶

If we fail to acknowledge the impacts of significant contextual factors on standardized test performance, we essentially are resigning substantial sectors of challenged students and schools--those with more poverty and less qualified teachers--to the realm of "below average" and "unsatisfactory" performance levels, a practice that is at best bad public policy, and at worst socially unjust. In sports, we acknowledge differences in performance capacities by pitting schools of similar size (consider talent pools as a resource) against one another in football and basketball, and we dare not expect a ninety pound wrestler to compete with a two hundred pound wrestler. It is equally reasonable and far more imperative that we level the academic performance playing field.

⁶ R. Rothstein. "Finance Fungibility: Investigating Relative Impacts of Investments in School and Non-School Institutions to Improve Student Achievement." www.financeproject.org/achievement.htm