
James A. Johnson Ph.D.
Texas Southern University, College of Education, johnson_ja@tsu.edu

Bernell M. Peltier-Glaze Ph.D.
Texas Southern University, College of Education, glazebm@tsu.edu

Danita Bailey-Perry Ph.D.
Texas Southern University, College of Education, bailey_dm@tsu.edu

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James A. Johnson, Ph.D., Bernnell M. Peltier-Glaze, Ph.D., and M. Danita Bailey-Perry, Ph.D.

“There appears to be two perspectives regarding the nature of the achievement gap and indicated gap reduction actions. One perspective blames the victim. The other calls on the nation’s educational leaders to take responsibility for the results of schooling associated with children and youth of African descent” (Broussard, Cummings, Johnson, Levi, & Bailey-Perry, p. 52).

Every four years the International Association for the Evaluation of International Achievement (IEA) publishes a report titled Trends in International Mathematics and Science Study (TIMSS). According to the 2003 TIMSS Report, at the eighth grade level, one-third to one-fourth of Singapore and Chinese Taipei students reached the advanced benchmark. America had 95% of their student population at the low benchmark. At the fourth grade level, Singapore led in students reaching the advanced benchmark at 25%. The United States had only 13% reach the advanced benchmark.

An earlier TIMSS report stated, “Most United States high school students take no advanced science, with only one-quarter enrolling in physics, and one-half in chemistry … curricula in United States high schools lack coherence, depth, and continuity, [while covering] too many topics in a superficial way.” “Nearly half the states,” according to a report released by the Fordham Institute in 2005 titled The State of State Science Standards, “are doing a poor job of setting high academic standards for science in the public schools… the focus on reading and math as required subjects for testing under the federal law, No Child Left Behind, has turned attention away from science, contributing to a failure of American children to stay competitive in science with their counterparts abroad.”

The most recent TIMSS Report fails to signal improvement, sharing that “A comparison of 1995 and 2007 shows a decline in the 90th percentile cutpoint score for U.S. fourth-graders in science…. In 2007, the 90th percentile score was 11 score points lower than the analogous score in 1995. …At grade eight, the 90th percentile cutpoint score in science showed no measurable differences in comparisons of 2007 to 1995 or 2003, but showed a decrease when the 2007 score was compared to the 1999 score (636 v. 623)…U.S. White, Asian, and multiracial fourth-graders all scored higher in science, on average, than the TIMSS scale average, while Black fourth-graders scored lower. At grade eight, U.S. White, Asian, and multiracial students scored higher,
on average, than the TIMSS scale average in science. Black...eighth-graders scored lower, on average, than the TIMSS scale average.” Findings such as these were encapsulated by Robelen with “The nation’s K-12 education system gets a grade of D for the job it does “engaging and nurturing” minorities to pursue careers in the [Science, Technology, and Math] STEM fields of science....”

The data suggest that Texas is behind with respect to science outcomes of instruction for African American learners. The Spring 2009 administration of the Science TAKS test showed that while the science outcomes of instruction gap between African American and all learners was 12 percentage points. The gap between African American and White learners was 23 percentage points. The performance gap in Biology between African American and all students, as measured by end-of-course tests, was 16 percentage points. The same gap between African American and White students was 28 points. The previously mentioned Fordham Institute report gave the Texas standards a grade of “F” and commented: “The writers of the physical science sections know very little of the subject beyond the fourth –grade level: ‘As the level rises, the incidence of confusion, misunderstanding, and plain ignorance grows rapidly’” It is in this context that we present this critical appraisal of Science outcomes of schooling for African American children and youth enrolled in the Houston Independent School District (HISD). The critical appraisal is guided by the following three issues:

1. How well is the HISD’s science program of instruction meeting the academic needs of enrolled African American children and youth?

2. How valid are common explanations for gaps between actual and expected outcomes of science instruction for African American children and youth found in the literature?

3. What are some research-based best practices elicited from stakeholders in highly successful schools in which high percentages of enrollments are accounted for by African American children and youth?

**Methodology**

HISD schools in the top and bottom thirds of the distribution of HISD schools ranked by the percentage of enrollments accounted for by African American learners served as a convenience sample of schools. A reanalysis of data acquired by visiting the Texas Education Agency’s (TEA) Academic Excellence Indicator System Reports was employed. TEA Annual Reports were reviewed. Data analysis consisted of a reanalysis of TEA data of the First...
Administration only of the TAKS tests. Microsoft EXCEL was used to array TEA data. Terms specific to this critical appraisal follow:

- **Accountability Ratings**: A systematic way of rating schools and evaluating campuses using indicators of performance, including assessment results on the state standardized assessment instruments as well as longitudinal completion rates and annual dropout rates. One of four rating labels may be assigned.

- **Exemplary Schools**: At least 90% passing each subject area (“all students” and each student group).

- **Recognized Schools**: At least 75% passing each subject area.

- **Academically Acceptable Schools**: At least 70% passing Reading/ELA, Writing and Social Studies; at least 55% passing Mathematics; at least 50% passing Science.

- **Academically Unacceptable Schools**: Less than 70% passing Reading/ELA, Writing and Social Studies; less than 55% passing Mathematics; less than 50% passing Science.

- **High-Enrollment Schools**: Schools in the top third of the distribution of HISD schools when ranked by the percentage of enrollments accounted for by African American learners.

- **Low-Enrollment Schools**: Schools in the bottom third of the distribution of HISD schools ranked by the percentage of enrollments accounted for by African American learners.

- **Meaningful Difference**: A difference of at least 15 percentage points between extents to which learners in the two categories of learners met the state’s minimum fifth, eighth, and tenth grade Science standard.

- **2009 Science Standard State Average**: The percentage of learners in the State of Texas who met the 2009 Science Standard.

**Meeting the Science Academic Needs of African American Children and Youth**

In order to judge extents to which the HISD’s Science program of instruction is meeting the Science academic needs of enrolled African American learners with equity the researchers elected to pose the following research questions:

*Research Question 1*: Is there a difference in the effectiveness of Science instruction for all Texas learners versus learners of African descent enrolled in Texas public schools, as measured by extents to which learners in the two categories of learners met the state’s minimum fifth, eighth and tenth grade science standard?
Research Question 2: Is there a difference in the effectiveness of instruction between learners of African descent enrolled in high- versus low-enrollment HISD elementary, middle, and high schools, as measured by extents to which learners in the two categories of learners met the state’s minimum fifth, eighth, and tenth grade science standard?

Research Question 3: Is there a difference in the effectiveness of instruction between learners of African descent enrolled in HISD Exemplary, Recognized, Academically Acceptable, and Academically Unacceptable high versus low-enrollment schools as measured by extents to which learners met the state’s minimum fifth, eighth, and tenth grade science standard?

Research Question 4: Is there a difference in the effectiveness of instruction between learners of African descent enrolled in HISD elementary versus secondary schools as measured by extents to which learners in the two categories of schools met the state’s minimum fifth, eighth, and tenth grade science standard?

Research Question 5: Is there a difference in the effectiveness of instruction between learners of African descent enrolled in HISD enrolled in HISD Exemplary, Recognized, Academically Acceptable, and Academically Unacceptable schools as measured by extents to which learners in the two categories of learners met the state’s minimum fifth, eighth, and tenth grade science standard?

Research Question One

The State of Texas administers its science test in its elementary schools at grade 5. In 2009, 85% of all Texas fifth grade public school students and 82% of African American learners met the state's fifth grade minimum science standard. The State of Texas administers its science test in its middle schools at grade 8. In 2009, 73% of all Texas eighth grade public school students and 59% of African American learners met the state's eighth grade minimum science standard. The State of Texas administers its science test in its high schools at grade 10. In 2009, 67% of all Texas tenth grade public school students and 46% of African American learners met the state's tenth grade minimum science standard. In 2009, 51% of all combined Texas fifth, eighth and tenth grade public school students and 45% of African American learners met the State’s minimum science standard. Given these outcomes we find that the higher the grade level, the greater the gap between the effectiveness of science instruction for all Texas learners versus learners of African descent enrolled in Texas public schools.
Research Questions Two through Five

Data and information specific to Research Questions Two through Five are presented below in Table One.

Research Question 2

The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 34 or 53 percent of the 64 high-enrollment HISD schools. This was the case for 22 or 36 percent of the 39 low-enrollment schools. The performances of the high-enrollment schools were meaningfully better than were the performances of the low-enrollment schools with learners of African descent.

Table One: Data specific to Research Questions Two through Five

<table>
<thead>
<tr>
<th>School Levels</th>
<th>Accountability Ratings</th>
<th>African American Enrollments</th>
<th>Totals</th>
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</thead>
<tbody>
<tr>
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<td>Schools</td>
<td>Low-Enrollment Schools</td>
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<td></td>
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<td>Number of schools in which the percent of African American learners meeting the 2009 TAKS Science Standard was equal to or greater than the State average.</td>
<td>Number of schools in which the percent of African American learners meeting the 2009 TAKS Science Standard was less than the State average.</td>
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<td>Number of schools in which the percent of African American learners meeting the 2009 TAKS Science Standard was equal to or greater than the State average.</td>
<td>Number of schools in which the percent of African American learners meeting the 2009 TAKS Science Standard was less than the State average.</td>
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<tr>
<td>Elementary</td>
<td>Exemplary</td>
<td>14</td>
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<td></td>
<td>Recognized</td>
<td>09</td>
<td>12</td>
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<td></td>
<td>Academically Acceptable</td>
<td>01</td>
<td>02</td>
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<td>Academically</td>
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<tr>
<td><strong>Totals Elementary Schools</strong></td>
<td>24</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Middle</td>
<td>06</td>
<td>10</td>
<td>03</td>
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<tr>
<td>High</td>
<td>04</td>
<td>06</td>
<td>02</td>
</tr>
</tbody>
</table>

The performances of HISD elementary schools were meaningfully better than school system averages. The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 24 or 63 percent of the 38 high-enrollment schools. This was the case for 17 or 45 percent of the 38 low-enrollment elementary schools. The performances of high-enrollment elementary schools were meaningfully better than was the performances of low-enrollment elementary schools with learners of African descent.

The performances of HISD middle schools were meaningfully worse than school system averages. The percentage of African American learners meeting the 2009 science standard was
equal to or greater than the state average in 6 or 38 percent of the 16 high-enrollment middle schools. This was the case for 3 or 23 percent of the 13 low-enrollment middle schools. HISD High schools were also meaningfully worse than school system averages. The percentage of African American learners meeting the 2009 Science standard was equal to or greater than the state average in 4 or 40 percent of the 10 high-enrollment high schools. This was the case for 2 or 20 percent of the 10 low-enrollment high schools. It is evident, then, that the performances of the HISD high-enrollment schools were meaningfully better than were the performances of HISD low-enrollment schools with learners of African descent. Given these findings we sought to determine if this was the case with respect to schools sorted by the four State of Texas Accountability Ratings: Exemplary, Recognized, Academically Acceptable, and Academically Unacceptable.

**Research Question 3**

*Exemplary Schools.* The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 19 or 100 percent of the 19 HISD high-enrollment Exemplary HISD schools. This was the case for nine or 56 percent of the 16 HISD low-enrollment Exemplary HISD schools.

*Recognized Schools.* The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 14 or 52 percent of the 27 HISD high-enrollment Recognized HISD schools. This was the case for 13 or 48 percent of the 27 HISD low-enrollment Recognized HISD schools.

*Academically Acceptable.* The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 1 or 8 percent of the 12 HISD high-enrollment Recognized HISD schools. This was the case for none of the 6 HISD low-enrollment Academically Acceptable HISD schools. These findings hardly describe schools that are academically acceptable.

*Academically Unacceptable.* No HISD elementary school was judged to be Academically Unacceptable. Of the six HISD middle schools rated as Academically Unacceptable, three were high and three were low-enrollment middle schools. Of the four HISD high schools rated as Academically Unacceptable, two were high and two were low-enrollment high schools.
It is evident from the above that the performances of the HISD high-enrollment Exemplary schools were meaningfully better than were the performances of HISD low-enrollment Exemplary schools with learners of African descent. There were virtually no differences in the performances of the HISD high-versus low-enrollment Recognized, Academically Acceptable, and Academically Unacceptable secondary schools with learners of African descent.

Research Question 4

The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 14 or 54 percent of the 76 HISD elementary schools. This was the case for 9 or 31 percent of the 29 HISD middle schools, and six or 30 percent of the 20 HISD high schools. We learn, from our response to Research Question 4 that the performances of HISD elementary schools were meaningfully better than were the performances of HISD middle and high schools with learners of African descent. Given this finding we sought to determine if this was the case with respect to all HISD schools sorted by the four State of Texas Accountability Ratings.

Research Question 5

Exemplary Schools. The performances of HISD elementary schools were meaningfully better than were the performances of HISD Exemplary middle and high schools with learners of African descent. The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 21 or 75 percent of the 28 HISD Exemplary elementary schools. This was the case for 3 or 43 percent of the seven HISD Exemplary middle and high schools.

Recognized Schools. The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 19 or 45 percent of the 42 HISD Recognized elementary schools. This was the case for the six HISD Recognized middle schools but for 2 or 33 percent of the six HISD Recognized Exemplary high schools.

Academically Acceptable. The percentage of African American learners meeting the 2009 science standard was equal to or greater than the state average in 1 or 14 percent of the 6 HISD Academically Acceptable elementary schools. This was the case for none of the 14 HISD
Academically Acceptable middle schools and none of the six HISD Academically Acceptable Exemplary high schools.

_Academically Unacceptable_. No HISD elementary school was judged to be academically Unacceptable. Six HISD middle schools were rated as Academically Unacceptable. Four HISD high schools were rated as Academically Unacceptable.

We are thus led to believe that the performances of HISD elementary schools without regard to rating were meaningfully better than were the performances of HISD middle and high schools with learners of African descent. To summarize our findings, we learned the following:

- The higher the grade level, the greater the gap between the effectiveness of science instruction for all Texas learners versus learners of African descent enrolled in Texas public schools.

- The performances of the HISD high-enrollment schools were meaningfully better than were the performances of HISD low-enrollment schools with learners of African descent (See Harpalani, below, for a possible explanation).

- Performances of HISD high-enrollment Exemplary schools were meaningfully better than were the performances of HISD low-enrollment Exemplary schools with learners of African descent.

- There were virtually no meaningful differences in the performances of the HISD high-enrollment Recognized, Academically Acceptable, and Academically Unacceptable secondary schools with learners of African descent.

- The higher the grade level, the less effective the science instruction for learners of African descent enrolled in the HISD.

- The performances of HISD elementary schools without regard to rating were meaningfully better than were the performances of HISD middle and high schools with learners of African descent.

In the next section of this paper two explanations for the apparent inability of educators to eliminate the estimated gap in academic competence between learners of African descent and other learners are considered: challenges beyond and internal to the school. With respect to challenges beyond the school walls explanation we consider heredity, family background, and the single parent families negatively impact estimated academic competence. Factors internal to the school on which we focus include the bi-dialectical incompetence of school staff, and testing challenges associated with labeling; test bias, content validity, and predictive power.
Explanations for Gaps between Actual and Expected Outcomes of Science Instruction

In her paper titled “Reframing the Affirmative Action Debate” Professor Lani Guinier uses a canary metaphor to reposition the affirmative action discussion from “affirmative action as wedge” to “affirmative action as platform.” The authors of this critical appraisal recently employed a canary metaphor to better understand teacher performance as it is informed by conditions in which teachers are caused to practice. In that paper, titled “Teachers as Canaries: Lacking Control over Classroom Conditions but Continuing to Teach Anyway” we explained that:

The phrase living like a canary in a coal mine is often used as a metaphor for the capacity to sound an early alarm when environmental toxicity approaches unacceptable levels. As one writer put it, “The actual canary in a coal mine had little control over its fate, but it continued to sing anyway.” That thought was furthered by stating, “As long as the canary in a coal mine kept singing, the miners knew their air supply was safe. A dead canary in a coal mine; however, signaled an immediate evacuation.”

Guinier also uses the canary metaphor to differentiate between blaming the victim and the environment. “We know that it is not the canary that needs to be fixed,” she writes. “It is the atmosphere in the mines that is poisoning not just the canary, but eventually all of us.” Likewise, as signaled by the quotation prefacing the body of this paper, probable causes of the gap between actual and expected outcomes of science instruction in the HISD may be laid at the feet of the victim or assigned to the school. Put in Guinier’s terms, “The miner’s canary signals us that the atmosphere in the mine is dangerous, but the warning also tells us to start thinking about new ways of fixing not the canary but the mine.”

The Nature of the Gap in Academic Competence

The term “estimated gap in academic competence” is used by design. This is because estimated and actual academic competence is, typically, at variance. Estimated “academic competence” is connotated by scores on paper and pencil tests or teacher opinion. Actual “academic competence” refers to knowledge, skills, beliefs, values and attitudes acquired as a result of interactions with environments.” This construction is consistent with the position taken by Steele: “…it is clear that the items on these tests measure what has to be substantially learned or “developed” skills and knowledge.” This construction is not new as it was addressed, sociologically, sixty years ago by Allison Davis with:
The child’s social learning takes place chiefly in the environments of his family and its friends, and of his own play group. All these groups, we now know are restricted in the range of their soil and cultural participation by social-class barriers. Thus, the culture of both the child’s family and his play-group become class-typed. This social-class patterning of the child’s learning, as exerted through the family, extends from control of the types of food he eats and of the way he eats it to the kinds of sexual, aggressive, and educational training he receives…”

Thus, the student’s actual knowledge, skills, beliefs, values and attitudes may or may not be measured by paper and pencil tests or teacher opinion. The accuracy and legitimacy of estimated academic competence may vary as a function of extents to which estimated and actual knowledge, skills beliefs, values and attitudes measured are coterminous. Therefore the extent to which there is a Black-White gap in actual academic competence is not known and that gap is not the subject of this paper. What is known is that a roughly 10 per cent Black-White test score gap in estimated academic competence does exist and that gap is the subject of this paper. Commenting on this more or less 10 percent gap, Berlak observed that:

Most people assume that the statistical gap in scores between persons of color and Whites is enormous. It is not. Depending on the test the difference varies but hovers in the range of 10%. This difference in average scores has persisted over time, regardless of the type of test, whether it is an ‘IQ test, norm-referenced or proficiency test, regardless of the test’s publisher, or regardless of the educational level or the test-taker, be it kindergarten or graduate school”

Going further, Steele submits that using one type of test, the SAT, only increases one’s prediction of freshman grades by about 3% or 4% over what one could predict using high school grades alone.” Of at least equal significance is a finding reported by Guinier that “nationwide the LSAT is about nine percent better than random in predicting the variation in first year law school grades.

Competing Explanations

Common explanations for the gap in school performance are typically rooted in factors that are either external or internal to the locus of control of the school and its agents. There generally are two beliefs associated with the external to locus of control of the school and its agent’s explanation: heredity or the belief that intellectual genes of White people are inherently superior to that of African Americans and family background or the belief that parental levels of education and the single parent families negatively impact estimated academic competence.
Factors internal to the school include the bidialectical incompetence of school staff, testing challenges associated with labeling bias, content validity, and predictive power, and negative beliefs, values and attitudes that are embedded in the culture of the school.

**Factors External to the School**

The first explanation, put another way, is that the locus of control is so external to the school and its agents that one can only hold school administrators and teachers accountable for the outcomes of instruction with difficulty. Two ways in which this theory is framed are in terms of: heredity impacts educability (the genetically inferior argument), and family background impacts educability (the cultural deficit argument). This first belief: “The education of students from African American families and low income families is negatively impacted by challenges beyond the school walls” is addressed with regard to three beliefs: heredity or belief that the intellectual genes of White people are inherently superior to Black people, family background or the belief that parental levels of education and the single parent families negatively impact estimated academic competence, and cultural—the beliefs that “academically successful Black students [are] disparaged by their Black peers for acting White” and a phenomenon known as “stereotype threat” negatively impact estimated academic competence.

**The belief that intellectual genes of White people are inherently superior to that of African Americans**

The belief that “The genes of White northern European Anglo-Americans are superior to those of Americans of African descent” is deeply embedded in sectors of American culture and appears to have had three major heydays—a first occurring during the 1930s Eugenics movement. Not widely known or acknowledged is the fact that some of the same individuals giving leadership to this racist movement gave leadership to the emerging field of “scientific” mental measurement leaving the believers in the “White northern European Anglo-American superiority” thesis in charge of the mechanism by which “scientific” support for the belief was generated. The Eugenics movement and its leaders were discredited by some following the defeat of the Nazis. The phrase “by some” is used because in 1969 a revival of the scientific bases for racism was seen in work published by Arthur Jensen and in the “Bell Curve” published in 1994 by Murray and Herrnstein.
Nevertheless, the “White northern European Anglo-American superiority” theory is rejected from at least three additional perspectives. First is a study cited by Viadero in which no differences in IQ among “German children fathered by African American and White American soldiers during WWI” were found. “All children in the sample” according to Viadero, “were raised by White single [German] mothers. Second is a finding reported by Jencks and Philips that “Blacks raised in White households have higher test scores than Blacks children raised in Black households.” Jencks and Phillips further report that “Black children who look White and live within White communities” (Black children who are passing for White) “do not have lower test scores than ‘authentic and bone fide’ Whites.” Jencks and Philips wrote “we find it hard to see how anyone reading these studies with an open mind could conclude that innate ability played a large role in the Black-White [achievement] gap.”

**Family Background**

The “conditions over which the school and its agents do not exert control” explanation that “family background impacts educability” is equally problematic. Two popular and pervasive place holders for this explanation are the beliefs that: parental levels of education impacts estimated academic competence and the single parent family negatively impacts estimated academic competence. Jencks and Phillips address this first belief with respect to the level of education of the mother when they conclude “The effect of mothers’ education does not appear to be very large on their children’s test scores.” With respect to the effect of the level of education of Black fathers on estimated academic competence, Jencks and Phillips found that “Differences in Black and White father’s levels of education appear to have even less impact on their children’s test scores.” With respect to the beliefs that being raised in a single parent home and parenting strategies negatively impact estimated academic competence Jencks and Phillips report having found that “The effects of being raised in a single-parent family are ‘never large enough to be of any substantive importance’ once other family characteristics are taken into accord.”

**Learned and Perceived Consequences of Demonstrating Academic Competence**

Some who put forward the “beyond the school walls” explanation argue that patterns of estimated academic competence found among learners of African descent are reflections of processes of resistance that enable them to mainstream their humanness in the face of a
stigmatized identity and that “academically successful Black students [are] disparaged by their Black peers for acting White.” Jencks and Phillips go on with “So, the argument goes, Black students may not try to achieve for fear of being teased by their peers.” The two researchers rebut this argument in two ways. First they share “being academically successful has both social costs and benefits for Black and White students” and that “Academically successful White students might also teased for being ‘nerds’”—leaving the writer wondering if being Black and being a nerd are mutually exclusive categories. The second argument put forward by the two researchers is “Getting A’s in math is almost completely unrelated to feeling popular, being physically threatened, or being put down by other students.” Fordham and Ogbu, who articulated this construction in their Urban Review paper titled “Black Students’ School Success: Coping with the Burden of Acting White”, said:

Apparently, Black children's general perception that academic pursuit is “acting White” is learned in the Black community. The ideology of the community in regard to the cultural meaning of schooling is, therefore, implicated and needs to be reexamined.

In other words Fordham and Ogbu asserted that the Black community does not give education a high priority and conceives of academic competence as the property of the White community. This “acting White” construction and probable consequences have, in the view of Harpalani “gotten much attention, often uncritically, in the media,” observing that “while several commentators have critiqued Fordham and Ogbu's work, they generally have not undertaken a broad reinterpretation of the phenomenon.” She goes on to address two fundamental Fordham and Ogbu contentions: (1) Black communities have not valued education and that (2) this devaluation is a reaction to White American racism. Harpalani addresses these two contentions from three perspectives: historical, empirical and conceptual.

With respect to historical evidence, Harpalani, citing the works of Carter G. Woodson, W.E.B. DuBois and others, concludes that “historical evidence clearly does not support Fordham and Ogbu's contention that Black communities have not valued education and that this devaluation is a reaction to White American racism. Indeed, these accounts highlight the resilience that African Americans have displayed in pursuing educational attainment.” Empirical studies that reject the Fordham and Ogbu ‘acting White’ hypothesis that assumes that Black Americans do not value education include work by Cook and Ludwig in Harpalani who found:
“No differences in the number of Black and White tenth graders who expect to attend college, and after controlling for socioeconomic status, Blacks expect to stay in school longer than Whites. Also, when adjusting for family characteristics, Blacks are absent from school for fewer days than Whites”. The researchers went on to report that “Black students were also more likely to report parental involvement in their schools in the form of contacts with teachers or attendance at school meetings….Blacks parents were also more likely to check their children’s homework.

Harpalani reports that Ainsworth-Darnell and Downey in their 1998 American Sociological Reviews paper reached similar conclusions contradicting the assumptions of Fordham and Ogbu. Thus the Fordham and Ogbu “acting White” hypothesis that assumes that Black Americans do not value education is contradicted on historical and on empirical grounds.

The third ground on which Harpalani addresses the Fordham and Ogbu hypothesis is conceptual. This argument depends heavily on a model put forth by Cross, Parham and Helms that includes four stages Black Americans purportedly transact in the process of forming racial identities. The stages include a Pre-encounter stage during which Black individuals view the world from a White, Eurocentric frame of reference, consciously or unconsciously espousing pro-White and anti Black attitudes. As Black individuals experience an event or series of events causing them to realize that they cannot fully be accepted in White society they enter a second stage: the Encounter Stage. Some Blacks never enter this stage as a result of skin color, wealth, and/or social status privilege. A third stage: Immersion-Emersion, involves reactive Afrocentrism. During this stage Black individuals react to Encounter Stage experiences, become increasingly aware of racism, more interested in their own Black identities, and increasingly anti-White. During the fourth and final stage, Internalization, Black individuals experience proactive Afrocentrism. They achieve security with their own Black identities and move toward a more pluralistic perspective in which African Americans represent the primary reference group but have attitudes that are not anti-White.

It is in the context of this four stage model that empirical evidence that contradicts the second Fordham and Ogbu contention: the failure of Black communities to value education is a reaction to White American racism is presented. The contradiction is found in a study titled Identify and School Adjustment: Revisiting the ‘Acting White’ Assumption where the following is reported: “Individuals with a Eurocentric orientation, as indicated by a high score in Cross’s Pre-Encounter stage, showed lower academic achievement and self-esteem than those
individuals who have a proactive Afrocentric orientation which is marked by the Internalization stage.” Harpalani, went on to share that “individuals with a reactive Afrocentric orientation (Immersion-Emersion Stage) performed poorly.” The study indicates that “a strong, proactive sense of Black cultural identity is associated with positive academic achievement for Black youth.” Thus the “beyond the school walls” argument that “academically successful Black students [are] disparaged by their Black peers for acting White” is neither supported historically, empirically, nor conceptually.

This conclusion is further supported by language in Fordham’s and Ogbu’s own paper. Quoting a student they write:

“We ‘posed to be stupid…We all have it thought up in our heads we ‘pose to be dumb so we …go ahead and be dumb…most of the thing we learn won’t help us in life anyway…what good is a quadratic equation gonna do me if I’m picking up garbage cans.”

It would seem that school agents would ponder the implications of the student’s reference to a “quadratic equation” and reject this excuse for the apparent inability to eliminate the estimated gap in academic competence between learners of African descent and other learners.

A related but different belief held by some is that Black learners underperform because they have been exposed to and have bought into the stereotype that Blacks are not as smart as Whites. For perspective with respect to this belief we turn to Carter G. Woodson who wrote in 1933 that “The thought of inferiority of the Negro is drilled into him in almost every class he enters and in almost every book he reads. If he happens to leave school after he masters the fundamentals, before he finishes high school or reaches college, he will naturally escape some of this bias and may recover in time to be of service to his people.” More than sixty years later, Claude Steele shared the outcome and impact of the “drilling” referred to by Woodson stating “in testing situations Black students know that they are especially likely to be seen as having limited ability” as did Jencks and Phillips with “When Black students were asked to record their race before they took a test, they tended to make lower scores.” Relatedly, Steele reports that in his studies, “Students most likely to do poorest on tests were not the least able and prepared academically. They tended to be the more highly motivated and academically prepared.”

To summarize our findings regarding the position taken by some that the education of students from African American families and low income families is negatively impacted by challenges beyond the school walls we find that: White people are not more intelligent than
Black people, mothers’ education does not appear to have a very large effect on their children’s test scores, the effect of the level of education of Black fathers on estimated academic competence appears to have even less impact on their children’s test scores, and the belief that learners of African descent perceive that academic pursuit is "acting White" is rejected on historical, empirical and conceptual grounds.

Factors within the school

Bidialectical Incompetence. In some ways and to some extent school performances with learners of African descent are influenced today by the beliefs, values and attitudes of Rudolf Flesch as they were manifested in his book titled “Why Johnny Can’t Read: And What You Can Do about It.” The book was a focused critique of the ‘look-say’ method of teaching reading and advocated a return to phonics: “an instructional method for teaching children to read [European] English. Phonics involves teaching children to connect the sounds of spoken [European] English with letters or groups of letters…and teaching them to blend the sounds of letters together to produce approximate pronunciations of unknown words.”

A problem with using this method when teaching some learners who are of African descent, put simply is that they neither consume nor generate the same language as do many school agents. Thus, the teaching of learners who neither consume nor generate European English to connect and blend the sounds of spoken [European] English with letters or groups of letters to produce approximate pronunciations of unknown words by school agents who neither consume nor generate the language of learners of African descent with competence represents a problem area in serious need of investigation.

Ebonics-incompetent educators are faced with learners who competently and coherently communicate with their parents, relatives and friends using such rule governed language as rat or raht and not “right”, tahm and not “time”, mow and not “more”, dough and not “door”, flow and not “floor”, souf and not “south”, mouf and not “mouth”, norf and not north, dis, dat and dem and not this, that and them, jus and not just, tes and not “test”, han and not “hand”, bat and not “bath”, and mudder and not “mother”. Such school agents will surely encounter such grammatically and structurally correct phrases as “The dog, he look funny”, “He be hollering at us”, “he was gon tell but changed he mind”, “She been gone”, “They in the house”, “My brudder name John”, and “I know it good when he ask me” as well.
Many school agents are incompetent consumers of the language that the learners on whom we focus in this paper bring to the school house. Moreover, the language that school agents generate may be inconsistent with the language and contexts which learners about whom we are concerned here have demonstrated communicative competence in their homes, neighborhoods and communities years prior to going to school.

Suffice it to say here that Black children and youth receive schooling in environments where a different dialect from theirs is valued, different knowledge, skills and dispositions than their own are expected, and different behavior from that which they have learned to present with competence is valued. Barten raises this question with: “Whose knowledge are we teaching and whose knowledge is of most worth?”

**Labeling Bias, Content Validity, and Predictive Power**

Related to school goals and methodology is school assessment. Recall that it was previously revealed that the same gang that gave leadership to the eugenics movement gave leadership to the field of so-called scientific mental measurement. It is not widely known that while these practitioners modified IQ tests because it was found that gender-specific sample tests resulted in different scores for boys versus girls, they failed to modify tests in such a way that the curve in the standardized sample for Blacks and Whites was identical. This assertion is supported by language found in *Larry P. v. Wilson Riles* where the court found that:

> “Tests were never designed to eliminate cultural biases… it was assumed…that Black children were less “intelligent than Whites…the tests were standardized and developed on an all-White population… IQ tests had been standardized so that they yielded no bias because of gender... when sample tests yielded different scores for boys and girls, the testing experts…modified the tests so that the curve in the standardized sample for boys and girls was identical. No such modification on social grounds has ever been tried by the testing companies...The experts have from the beginning been willing to tolerate or even portray minorities, especially Blacks as intellectually inferior.”

Having established bias by design and not serendipity, let us look at three additional assessment-specific ways in which the education of students from African American families is negatively impacted by challenges within the school: labeling bias, content validity, and predictive power.

With respect to labeling bias, Jencks and Phillips arrive at conclusions similar to those earlier reached specific to the genetically inferior theory submitting that “IQ tests claim to
measure innate ‘ability’ but actually measure developing ability,” “Developing ability is informed by environment,” and “People who learn a culture different from the White culture valued by IQ tests will score lower than Whites.” Jencks and Phillips further submit that IQ tests claim to measure one thing but actually measure another noting that “Tests measure content relevant to the White culture.” “The extent to which a person is not genetically or culturally White is the extent to which a person will be disadvantaged [when taking IQ tests].”

Regarding the predictive power of tests, the following perspectives and findings are brought to the attention of the reader. Jencks and Phillips report two germane findings: “Outcomes of college instruction for Blacks who score as well as Whites on the SAT are lower for Blacks” and “Black workers get slightly lower ratings from their supervisors than White workers with the same test results.”

Berlak reports the following four findings:

“Test scores do not predict future success in school, the university or workplace” “Some standardized tests, the SAT, for example, do correlate statistically to future grades. But this correlation is short lived. What standardized achievement tests appear to predict best are parent’s wealth and scores on other similarly constructed tests.” “Socio-economic class accounts for approximately 50 percent of the variance in SAT test scores…for every additional $10,000 in family income, a person on average gains 30 points on the SAT score.” And, “There is no evidence to support the claim that standardized tests are valid and credible measures of academic achievement or intellectual capacity.”

Finally, Steele reports that “There is no demonstrable connection between observed academic performance and standardized test scores.” For these reasons it must be concluded that test scores do not predict performance.

But we would be remiss if we did not share a finding reported by Meyers located at the Roy Wilkins Institute for Human Relations and Social Justice at the University of Minnesota on the performance of schools with Black and White students and cited by Berlak: “Test scores were not statistically related to school poverty, neighborhood poverty, racial concentration, or even ranking of schools (except for Whites).” Relatedly, Robelen shares that “science teachers play a larger role than parents and others in inspiring an interest in science, with 70% saying teachers have the most influence at the elementary level, and nearly 90% saying teachers have the most influence at the high school level.”

Thus we are caused to question the reliance on paper and pencil tests by school agents. Is the school using test data to teach the “estimated” learner of African descent? If so, the educator
is indeed a part of the problem. Perhaps these questions must also be viewed from a different perspective.

Two research studies specific to children of African descent are cited in relation to this assertion. First is a finding reported in a study titled “The Effects of African American Movement Styles on Teachers’ Perceptions and Reactions:” “teachers perceived students with African American culture-related movement styles as lower in achievement, higher in aggression, and more likely to need special education services than students with standard movement styles” (Neal, McCray, Webb-Johnson & Bridgest, 2003). A second and related finding was reported in a study titled Teachers’ Beliefs and Sense of Responsibility for Student Learning: The Implications of Race, Class, and Context: “when students are African American and low-income their educational deficits are emphasized and teachers reduce their sense of responsibility for student learning. However, in contrast when students are middle-income, white or Asian their assets are emphasized and teachers’ sense of responsibility for student learning is increased” (Diamond, Randolph & Spillane, 2004).

This perspective was echoed by Robinson who found that “We need more educators, especially educators of color, to speak out on these issues and to serve as models for others on how to get the job done.”

To summarize our findings regarding the position taken by some that the education of students from African American families and low income families is negatively impacted by challenges internal to the school walls we find that: school agents may be negatively impacting the education of students from African American families because (1) they are unable to competently generate and consume the language of the student, and (2) paper and pencil tests used by school agents to assess educational growth may be biased, claim to measure innate ability but actually measure developing ability, may not be predictive and may not be valid and credible measures of academic achievement or intellectual capacity. Thus we conclude that school agents do indeed have opportunities to manage in-school factors. Put in Guinier’s terms, “The miner’s canary signals us that the atmosphere in the mine is dangerous, but the warning also tells us to start thinking about new ways of fixing not the canary but the mine.”

**Research-Based Best Practices**

The assessment of student learning outcomes has emerged as a primary focus for education institutions in today’s political environment. As a result, input and feedback from
various stakeholders are becoming crucial ingredients for effective assessment and continuous improvement programs. To address this issue the researchers relied on research documents that share, excellent outcomes of instruction for learners of African descent. Several practices in the sample were elicited from members of stakeholder groups in predominately Black exemplary schools under the leadership of Dr. Shirley Iso-Newsome, Area Superintendent, Area 2 Dallas Independent School District, and appear in a report titled “Research-Based Best Practices Associated with Excellent Outcomes of Instruction for Learners of African descent.” A sample of the stakeholder-group-specific best practices is now presented.

**Sample Stakeholder-Group-Specific Best Practices**

Parents should be involved in math and science nights and workshops during which instructional strategies are modeled and fully explained and parenting tips are provided that ensure school success of their children and youth. In addition parents should take their children to outdoor venues to review the science present in the natural world, as well as encourage their children to develop projects to participate in science fair competitions and parents should show their support by accompanying students to science competitions.

Administrators should plan and implement beginning of school year assessment of science programs where all students are tested on their science levels to assess growth or potential future problems. Administrators should also support before and after school intensive tutoring where teachers plan assessment-driven “hands on” lessons and activities that address multiple intelligences and/or learning styles. Ensuring that teachers have the necessary science background, training, and experience to be successful with students, along with partnering with parents and community members to ensure students receive exposure to field experiences that encompass scientific inquiry is also critical. Finally, administrators should receive training on the implementation of the 5E instructional model, and science best practices.

Community, business and religious leaders should donate incentives of value to motivate perfect attendance. Donating funds to the school to reward students for excellent performance in academics and sponsoring after-school science-specific enrichment activities for students is another way the community can help close this achievement gap. Another critically needed area is role models to talk to students about careers and goal setting. Additional ways the community and businesses can help is to permit employees to provide weekly tutoring to students to assist in student mastery of science-specific grade level objectives; develop partnerships with area
schools and positively reinforce student science-specific outcomes; and provide opportunities for field experiences by which students may see and experience science in their environments.

Teachers should engage in data-driven instruction, utilize hands-on experiments, utilize high-level questioning, create and maintain interests/learning centers, build mathematical and science foundations, have students demonstrate their mathematics and science knowledge, skills and attitudes through illustration, use a variety of strategies to teach students solve problems, and engage in small-group instruction. Additionally, teachers should integrate technology, attend training and conferences on best practices, constantly “sharpen the saw” so that they deliver the kind of instruction that will best reach their students and that will result in increased academic achievement, focus on student understanding and use of scientific knowledge, ideas, and inquiry processes, guide students in active and extended scientific inquiry, and provide opportunities for scientific discussion and debate among students.

Students should have “ambition, drive, motivation, and hunger to succeed…intense involvement in extracurricular activities, willingness to ask for help, the tendency to reflect on one’s work and revise it, and the ability to prioritize and juggle tasks.”

Involving stakeholders in the assessment process is critical for several reasons. It insures that what is being assessed is valued by the campus and its larger community, i.e., employers, boards of regents, trustees, graduate schools, state legislatures, parents, administrators, community, business and religious leaders, and teachers. Stakeholder participation strengthens accountability by creating a shared understanding of the language of assessment, assessment results, and interpretation of those results.

After Words

In the course of developing this critical appraisal, the authors became increasingly aware of a somewhat nagging question crystallized by Guinier with “do [(tests] measure success in life?” Guinier suggests“…we are taking performance on these paper-and-pencil tests to be an accurate predictor of success. The discrepancy between test scores and actual performance in …school or ultimate success after graduation serves as the miner’s canary. It is the miner’s canary because Black and Chicano students, despite their weak performance on these timed paper-and-pencil tests, have the capacity to succeed. Their experience is the miner’s canary because it is telling us that we are using the wrong instrument to measure everyone’s capacity to succeed, not just theirs.” Measuring extents to which knowledge, skills, beliefs, values, attitudes
and dispositions have been taught and learned may require the employment of non-empirical and
authentic approaches to instruction.

This Critical Appraisal of Science Outcomes of Schooling for African American Children
and Youth Enrolled in the Houston Independent School District has resulted in the following
outcomes:

Outcome 1: There is a difference in the effectiveness of Science instruction for all Texas
learners versus learners of African descent enrolled in Texas public schools, as measured by
extents to which learners in the two categories of learners met the state’s minimum fifth, eighth
and tenth grade science standard.

Outcome 2: There is a difference in the effectiveness of instruction between learners of
African descent enrolled in high- versus low- enrollment HISD elementary, middle, and high
schools, as measured by extents to which learners in the two categories of learners met the state’s
minimum fifth, eighth, and tenth grade science standard.

Outcome 3: There is a difference in the effectiveness of instruction between learners of
African descent enrolled in HISD Exemplary, Recognized, Academically Acceptable, and
Academically Unacceptable high versus low-enrollment schools as measured by extents to which
learners met the state’s minimum fifth, eighth, and tenth grade science standard?

Outcome 4: There is a difference in the effectiveness of instruction between learners of
African descent enrolled in HISD elementary versus secondary schools as measured by extents
to which learners in the two categories of schools met the state’s minimum fifth, eighth, and
tenth grade science standard?

Outcome 5: There is a difference in the effectiveness of instruction between learners of
African descent enrolled in HISD Exemplary, Recognized, Academically Acceptable, and
Academically Unacceptable schools as measured by extents to which learners in the two
categories of learners met.

We invite reflection on these two outcomes by HISD agents and by other scholars in the
academy.
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ABOUT THE AUTHORS

James A. Johnson, Ph.D., Professor
Texas Southern University
College of Education

James A. Johnson is currently a Professor in the Department of Chemistry for Texas Southern University. Dr. Johnson received his Ph.D. in 1973, in Comparative Culture from the University of California, a MS in Computer Applications from Nova University, Ft. Lauderdale, FL in 1985 and his BA in Education in 1961 from Brooklyn College, Brooklyn, NY. Dr. Johnson’s research interests include areas related to Philetic Pedagogy. He is certified in Special Education and has taught numerous courses on the development of teaching in urban schools and communities.

Danita Bailey-Perry, Ph.D., Director of Certification; Associate Professor
Texas Southern University
College of Education

Dr. Danita Bailey-Perry is the Director of Certification and an Associate Professor in the College of Education at Texas Southern University. She holds a Bachelor’s degree from Fisk University, a Master’s degree from George Peabody College for Teachers (Vanderbilt-Peabody University) and a Ph.D. from The University of Texas at Austin. She has also served as the Director of The Center for the Development and Study of Effective Pedagogy for African American Learners (CPAL), a school improvement initiative whose mission was to promote educator and institutional responsibility for the excellent and equitable education of African American learners. Dr. Bailey-Perry co-authored Cultural and Educational Excellence Revisited: Knowing, Doing, Being and Becoming as Though Saving The African American Child Matters and has published several articles on the cultural performance of African Americans, factors related to secondary students’ success in schools, teaching and leadership in urban schools and the urban school experience.

Bernnell Peltier-Glaze, Ed.D., Assistant Professor
Texas Southern University
College of Education

Bernnell Peltier-Glaze is currently an Assistant Professor in Department of Educational Administration and Foundations for Texas Southern University. Dr. Peltier-Glaze received her Ed.D. in Educational Leadership and Counseling from Sam Houston State University, her Masters from Texas Southern University and her Bachelor of Arts from Louisiana State University. Dr. Peltier-Glaze’s research interests include areas related to Culturally Responsive Leadership, Ethics and Efficacy in Education, Educator Preparation, and Early Childhood. She has presented at several local, state and national conferences. Her publications include “The Role of the Principal in Teacher Retention” in Texas Study of Secondary Education.