Analysis of Texas achievement data for elementary African American and Latino Females

Patricia J. Larke
Texas A&M University

Gwendolyn Webb-Hasan
Texas A&M University

Teresa Jimarez
University of Texas- Pan America

Yeping Li
Texas A&M University

ABSTRACT

This study provides a critical look at achievement of African American (AA), and Latino (L) females in third and fifth grades on the Texas Assessment of Knowledge and Skills (TAKS) in reading, mathematics and science. Descriptive statistics were used to analyze the 2007 and 2011 TAKS raw data. Data analyses indicate that AAL females had the lowest mean scores in reading, mathematics and science. This study brings light to the lack of preparation of AAL females in their early school experiences for a trajectory in STEM careers.

Keywords: Achievement African American and Latino Elementary Females

INTRODUCTION

Issues about African American and Latino (AAL) females have become as Sue Books' (2009) calls "invisible" in the discourse about students of color. While there are many anecdotes about AAL females, very little research has been done that highlights the academic performance of this group (Bell, 2012; Lim, 2008; Lubienski & Bowen, 2000; Sparks, 2011). While most of the studies have been conducted with a focus on AAL males, very few, if any, have focused on females at the elementary school level. In fact, gender studies compare females to males, but few highlight within ethnic group, gender or social economic (SES) differences. While AAL females account for 25% of the school age population--- and in some states like Texas, the percentage is even higher---studies about their academic achievement at the elementary level are almost non-existence.

The shortcomings of gender studies are centered on three issues: 1) self-esteem, 2) career pathways and career choices and 3) college recruitment, retention and graduation rates (Larke, Young & Young, 2011). While these studies address the population in general, many do not address AAL females in particular. Addressing studies at the elementary level is important since STEM pathway studies indicate that success in mathematics at the elementary level is a strong predictor in girls' preparation for Science, Technology, Engineering and Mathematics (STEM) careers (Alvarez, Edwards, Harris, 2010). To increase the participation of AAL females in STEM, it is imperative to examine their academic achievement in reading, mathematics and science at the elementary level. Therefore, the disaggregation of national and state exams by race, class and gender, by subject matter objectives, seeks to provide a deeper understanding of the academic achievement of AAL females. We examined Texas Assessment of Knowledge and Skills (TAKS) data, because Texas has the second largest number of AA females and second highest percentage of L females among the 50 states. In fact, AAL females account for one-third of the K-12 school age population (National Center for Educational Statistics (NCES, 2011). As such, the purpose of this article is to examine the achievement of AAL females to: a) discuss the achievement gap, critical race theory and critical race feminism; b) examine the Texas Assessment of Knowledge and Skills, 2007 and 2011; and c) analyze AAL girls' performance in elementary math and science through the lens of CRT.

ACHIEVEMENT GAP, CRITICAL RACE THEORY AND CRITICAL RACE FEMINISM

The examination of the educational achievement of AAL females at the elementary level includes three frameworks: (a) the achievement gap, (b) critical race theory, and (c) critical race feminism. We believe that achievement gap experienced by AAL females can be situated in the constructs of critical race theory and critical feminism.

Achievement Gap

The achievement gaps -- or, what some term the receivement gaps (Venzant-Chambers, 2009)-- are a continuous concern amongst those interested in the United States' educational system. The achievement gap is defined as a persistent, pervasive and significant disparity in educational achievement and attainment among group of students as determined by a standardized measure (Anderson, Medrich, & Fowler, 2007). When achievement is analyzed by race/ethnicity, gender and class there is a consistent disparity that produces negative outcomes

for poor children and children of color (Kao & Thompson, 2003). Researchers have provided a long list of correlations linked to the achievement gaps concerning students of color (Boykin & Noguero, 2011; Howard, 2010; Orfield, 2004). Jencks and Phillips (1998) found that achievement gaps go beyond just socioeconomic status. Such findings situate culture, race, and power at the forefront of discussion as noted by Howard:

> The future prosperity, safety, economic infrastructure, technological competitiveness, and political vitality of the country rely heavily on the manner in which we prepare all citizens, but have increased importance for those individuals who will make up the nation's core in the decades to come—culturally, racially, and linguistically diverse students (p. 149).

Gender-specific performance gaps have been a concern for researchers, educators, and society for decades. Studies note that critical research that examines the intersections of race/ethnicity, gender, socioeconomic status, and other variables are needed to respond to and eradicate performance gaps (Lubienski & Bowen, 2000; Lubienski & Gutiérrez , 2008). Lubienski (2002) further reiterates that without this critical analysis of the intersectionality of student achievement patterns and trends, then opportunities for instructional interventions to enhance future student performance may be lost. Further, Boykin and Noguero (2011) posit that interventions for "all" students should be accessed in high quality schools, by high quality teachers. As a result, educators are obligated to situate themselves in an understanding the interventions needed by AAL females and in what contexts if the eradication of performance gaps are to occur. Critical Race Theory provides a framework to the situation of such contexts for AAL females in elementary school.

Critical Race Theory (CRT)

The work of Delgado and Stefancic (2001) proposed five tenets of CRT. In the first tenet, they noted that racism is ordinary, not aberrational. This means that even though race is socially constructed, racism is entrenched deeply both in current and historical social structures in society. Therefore, racism is viewed as an ordinary function of society and is supported and maintained through a colorblind perspective." The second tenet --- that emerged from the scholarship of the late Derrick Bell (1980) -- is interest convergence. Bell proposed that school desegregation from the *Brown v. Board of Education* resulted from the expected benefits of European Americans and some elite people of color. Interest convergence suggests that European Americans and some people of color only participate and support societal growth toward an antiracist society to the degree that it benefits them in some way (Delgado & Stefancic, 2001).

The third tenet posits that race is socially constructed, which means race holds no biological reality to support the structural categories of race and that racial categories are invented out of convenience to benefit a certain racial group of people (Delgado & Stefancic, 2001). The fourth tenet is differential racialization, which notes that a racial group with power imposes characterizations or content various groups of people, at different historical points in time, are viewed negatively (Delgado & Stefancic, 2001). The fifth tenet of CRT is the unique voice of people of color, which means that histories must include the voices of the suppressed and oppressed groups and not just of the dominant group (Delgado & Stefancic, 2001). In fact, the fifth tenet has opened pathways for scholarship related to storytelling/counter-storytelling (Lynn & Parker, 2006).

Although CRT is guided by five universal tenets, educational researchers have reconceptualized and reconfigured these concepts to better align with the field of education. Educational researchers suggest that CRT can inform educational research by: (a) recognizing the intercentricity of race and racism with other forms of subordination, (b) challenging the dominant ideology, (c) advocating a commitment to social justice, (d) placing experiential knowledge at the center of the investigation, and (e) applying a transdisciplinary perspective (Solorzano & Yosso, 2002). However, the scholarship of Ladson-Billings and Tate (1995) pioneered CRT in educational research and teaching (Lynn & Parker, 2006). Ladson-Billings and Tate (1995) provide three propositions for a CRT framework to be utilized in educational research: (a) race continues to be a significant factor in determining inequity in the U.S.; (b) U.S. society is based on property rights, and (c) the intersection of race and property creates an analytic tool through which we can understand social (and, consequently, school) inequity" (p. 48).

Critical Race Feminism (CRF)

The CRF framework can be used to examine how racial oppression can undermine gender oppression within AAL communities plagued with issues of racial inequality (Wing, 2003). Wing (2003) suggested that CRF has four major components. First CRF adopts a progressive perspective of the law in the U.S. and society. As a result, CRF critiques both conservative and liberal ideologies as they relate to the female gender. Secondly, similar to CRT, CRF notes that racism is an innate part of U.S. society that the law cannot rectify. Thirdly, under the umbrella of CRT, CRF serves as a "feminist intervention" by deconstructing the notion that the experiences of women and men of color are the same as other groups. Finally, CRF works to highlight the situations of women of color by debunking the idea that there is an essential female voice that speaks for all women.

According to Evans-Winters and Esposito (2010), CRF guides research on AAL females as its conceptual lens and movement, purporting that experiences of women of color are different from the experiences of men of color and those of White women. CRF embodies the belief that the lives faced by women of color experience multiple forms of discrimination involving the intersections of race, class, and gender within a system of White male patriarchy and racist oppression. The authors further note that CRF is multidisciplinary in scope and breadth; and calls for theories and practices that study and combat gender and racial oppression (Evans-Winters & Esposito, 2010).

TEXAS ASSESSMENT OF KNOWLEDGE AND SKILLS (TAKS)

The Texas Assessment of Knowledge and Skills (TAKS) stemmed from the state legislature in 1999 to create a more rigorous assessment program while also eliminating social promotion. The 1999 law mandated that students meet certain criteria to exit certain grade levels. Students must pass TAKS grade three reading assessment as well as receive passing grades to be promoted to the fourth grade. In grades five and eight, students must meet state requirements on TAKS mathematics and reading assessments while maintaining passing grades. In the eleventh grade, students must pass TAKS reading, mathematics, science, social studies, and writing while earning enough high school credits to be eligible to receive a high school diploma.

The TAKS assessment program began testing in 2003 and continued until 2011. This

study utilized 2007 and 2011 TAKS reading, mathematics and science assessments. These assessments had a specific number of items for each objective that ranged from four to six, depending on the subject matter. The test objectives were the same for both third and fifth grade levels. Objectives difficulties increased as well as the number of objectives according to the grade level.

TAKS Reading Objectives

The TAKS' third and fifth grade reading items were divided among four objectives with third grade having 36 items and fifth grade, 42 items. For Objective One - Basic Understanding, there were 15 items in third grade and 13 items in fifth grade. For Objective Two -Applying Literary Elements, there were seven items in third grade and 8 items in fifth grade. For Objective Three - Analysis of Reading Strategies, there were six items in third grade and eight items in fifth grade. For Objective Four - Using Critical Thinking Skills, there were eight items in third grade and 13 items in fifth grade

TAKS Mathematics Objectives

The mathematics TAKS tests for both third and fifth grade had six objectives. In grade three, there were 40 test items and 44 test items in grade five. On Objective One- Numbers, Operations and Quantitative Reasoning, there were 10 items in third grade and 11items in fifth grade. On Objective One -Patterns, Relationships and Algebraic Expressions, there were six items in third grade and seven items in fifth grade. For Objective Three - Geometry and Spatial Reasoning Strategies, there were six items in third grade and seven items in fifth grade. For Objective Four - Measurement, there were six items in third grade and seven items in fifth grade. On Objective Five - Probability and Statistics, there were four items in third grade and four items in fifth grade. On Objective Six - Mathematical Processes and Tools, there were eight items in third grade and eight items at the fifth grade level.

TAKS Science Objectives

In science, the TAKS test was given at the fifth grade level only. (Third grade did not test in Science.) On Objective One - Nature of Science, there were 13 items, while on Objective Two-Life Science, there are nine items. Both Objective Three- Physical Science and Objective Four - Earth Science, had nine items.

THE STUDY

Methodology

The research question that guided the study was: "What was the academic performance of African American and Latino females on TAKS for the years 2007 and 2011 by respective reading, mathematics and science objectives?" The quantitative methodology, using descriptive statistics, was used in the study. Permission to analyze the raw data was received from Texas Education Agency (TEA).

Population

The selected population in this study included all third grade and fifth grade 2007 and 2011 AAL female test takers, as noted in Table 1. The numbers vary according to grade level and test year. In 2007 the total number of third grade AAL female test takers for reading was 90,591. The total number of AAL female test takers for mathematics in 2007, was 86,815. Third graders were not tested in science. In 2011, the total number of third grade AAL female test takers for reading was 96,112, while mathematics 103,042 AAL females were tested. Third graders were also not tested in science in 2007.

The total number of fifth grade AAL female test takers for reading in 2007, was 95,815, while there were 96,993 test takers in math, and 97,399 in science. In 2011, there were 106,431 fifth grade AAL female test takers in reading, 109,645 in mathematics, and 109,016 in science.

Data Analysis

Data from 2007 and 2011 years were downloaded from the TEA raw data sets and uploaded in SPSS. The data were disaggregated by race (African American and Latino), gender and grade level. Descriptive statistics such as mean scores and standard deviations were calculated for each ethnic group under study.

RESULTS

Third and Fifth Grade Female Reading TAKS Mean Scores, 2007and 2011

Table 2 and Table 3 include third grade AAL female reading 2007 and 2011 mean scores for objectives One through four for Native Americans (NA), Asian Americans (AS), African Americans (AA), Latinos (L) and European Americans (EA). In 2007, for Objective One, Basic Understanding (15 items), AA females had the mean scores (11.57; 12.00) for 2007 and 2011 and while L females had means scores of 11.85 and 12.35 for the years 2007 and 2011. EA females had mean scores of 12.96 (2007) and 13.12 (2011). In Objective Two, Applying Literary Elements (7 items) AA females had the mean scores of 5.54 and 5.44 for the years 2007 and 2011 while L females had means scores of 11.85 and 12.35 for the years 2007 and 2011. EA females had mean scores of 6.14 (2007) and 6.08 (2011). In Objective Three, Analysis Of Reading Strategies (6 items), AA females mean scores were 4.37 (2007) and 4.37 (2011) and L females mean scores were 4.53 (2007) and 4.97 (2011) while EA females mean scores were 5.06 (2007) and 5.34(2011). In Objective Four, Using Critical Thinking Skills (8 items), AA females mean scores were 5.66 (2007) and 6.11 (2011) and L females mean scores were 5.77 (2007) and 6.28 (2011) while EA females mean scores were 6.62 (2007) and 6.93(2011).

Similar patterns can be found in reading at the fifth grade level as noted in Tables 4 and 5. In 2007, for Objective One, Basic Understanding (13 items), AA females had the mean scores (9.34; 11.03) for 2007 and 2011 and while L females had means scores of 9.38 and 10.98 for the years 2007 and 2011. EA females had mean scores of 10.54 (2007) and 11.79(2011). In Objective Two, Applying Literary Elements (8 items) AA females had the mean scores of 6.16 and 6.55 for the years 2007 and 2011 while L females had means scores of 6.27 and 6.45 for the years 2007 and 2011. EA females had mean scores of 6.14 (2007) and 6.08

(2011). In Objective Three, Analysis of Reading Strategies (8 items), AA females mean scores were 5.68 (2007) and 6.67 (2011) and L females mean scores were 5.79(2007) and 6.72 (2011) while EA females mean scores were 6.52 (2007) and 7.25 (2011). In Objective Four, Using Critical Thinking Skills (13 items), AA females mean scores were 8.58(2007) and 10.40 (2011) and L females mean scores were 8.70 (2007) and 10.42 (2011) while EA females mean scores were 9.97 (2007) and 11.33(2011). Again when comparing third and fifth grade AAL females to EA, NA and AS females on all four reading objectives for the years, 2007 and 2011, the means scores of AAL females means scores are lower than the mean scores of EA, NA and AS girls.

Third and Fifth Grade Female TAKS Mean Scores for Mathematics, 2007 and 2011

Third grade female mathematics 2007 and 2011 mean scores for objectives 1-6 are in Tables 6 and 7. In Objective One, Numbers, Operations and Quantitative Reasoning with 10 items, AA females had the mean scores (7.53 (2007) and 7.88 (2011) while L females had means scores of 7.92 and 8.29 for the years 2007 and 2011. EA females had mean scores of 8.63 (2007) and 8.73(2011). In Objective Two, Patterns, Relationships And Algebraic Expressions (6 items) AA females had the mean scores of 4.51 (2007) and 4.59 (2011) and L females had means scores of 4.73 and 4.76 for the years 2007 and 2011. EA females had mean scores of 5.02 (2007) and 5.95 (2011). In Objective Three, Geometry and Spatial Reasoning (6 items), AA females mean scores were 4.70 (2007) and 4.86 (2011) and L females mean scores were 4.98(2007) and 5.09(2011) while EA females mean scores were 5.29 (2007) and 5.24(2011).

In Objective Four, Measurement (6 items), AA females mean scores were 4.33 (2007) and 4.55 (2011) and L females mean scores were 4.71(2007) and 4.92(2011) while EA females mean scores were 5.01 (2007) and 5.23(2011). In Objective Five, Probability and Statistics (4 items), AA females mean scores were 3.23 (2007) and 3.20 (2011) and L females mean scores were 3.32 for both 2007 and 2011 while EA females mean scores were 3.59 (2007) and 3.57(2011). Lastly in Objective Six, Mathematical Process (8 items), AA females mean scores were 4.93 (2007) and 5.22 (2011) and L females mean scores were 5.14 (2007) and 5.46(2011) while EA females mean scores were 6.05 (2007) and 6.25(2011). In mathematics at the third grade level, AAL females had the lowest mean scores in each of the six mathematics objectives as compared to EA females.

Fifth grade female mathematics 2007 and 2011 mean scores for objectives 1-6 are shown in Tables 8 and 9. In Objective One, Numbers, Operations and Quantitative Reasoning with 11items, AA females had the mean scores 8.05 (2007) and 8.46 (2011) while L females had means scores of 8.57 and 8.83 for the years 2007 and 2011. EA females had mean scores of 9.29 (2007) and 9.41(2011). In Objective Two, Patterns, Relationships and Algebraic Expressions (7 items) AA females had the mean scores of 4.51 (2007) and 5.20 (2011) and L females had means scores of 4.82 and 5.37 for the years 2007 and 2011. EA females had mean scores of 5.35 (2007) and 5.95 (2011). In Objective Three, Geometry and Spatial Reasoning (7 items), AA females mean scores were 5.26 (2007) and 5.58 (2011) and L females mean scores were 5.62(2007) and 5.92(2011) while EA females mean scores were 5.97 (2007) and 6.31(2011).

In Objective Four, Measurement (7 items), AA females mean scores were 4.49 (2007) and 5.15 (2011) and L females mean scores were 4.96(2007) and 5.43(2011) while EA females mean scores were 5.56 (2007) and 5.96(2011). In Objective Five, Probability and Statistics (4 items), AA females mean scores were 2.76 (2007) and 2.96 (2011) and L females mean scores were 3.00 (2007) and 3.13 (2011) while EA females mean scores were 3.27 (2007) and

3.40(2011). Lastly in Objective Six, Mathematical Process, (8 items), AA females mean scores were 5.33 (2007) and 5.38 (2011) and L females mean scores were 5.71 (2007) and 5.72(2011) while EA females mean scores were 6.38 (2007) and 6.56(2011). As similar to third grade, the fifth grade level, AAL females had the lowest mean scores in each of the six mathematics objectives as compared to their EA females.

Fifth Grade Female TAKS Mean Scores for Science, 2011 and 2007

Since science is tested at fifth grade, no mean scores for third grade are included. Tables 10 and 11 will provide the mean scores for fifth grade science scores among female test takers for the years, 2011 and 2007 in the four objectives. In Objective One, Nature of Science (13 items) AA mean scores were 9.71 (2007) and 10.78 in 2011 and L mean scores were 10.05 (2007) and 10.93(2011) while EA females mean scores were 11.22 (2007) and 11.77(2011). In Objective Two, Life Sciences, (9 items) AA mean scores were 6.81 (2007) and 7.60 in 2011 and L mean scores were 10.05 (2007) and 10.93(2011) while EA females mean scores were 11.22 (2007) and 11.77(2011). In Objective Three, Physical Science, (9 items) AA mean scores were 6.74 (2007) and 7.47 in 2011 and L mean scores were 6.91 (2007) and 7.54 (2011) while EA females mean scores were 7.61 (2007) and 7.97 (2011). In Objective Four, Earth Science (9 items) AA mean scores were 5.42 (2007) and 7.01 in 2011 and L mean scores were 5.67 (2007) and 7.34 (2011) while EA females mean scores were 6.64 (2007) and 7.79(2011). AAL females continued to have the lowest mean scores for 2007 and 2011, but made the greatest gains in Objective Four, Earth Science.

DISCUSSION

On every assessment, AAL females scored the lowest in comparison to their EA, AS and NA female counterparts on all objectives of the reading, math and science TAKS during 2007 and 2011. While all females made gains on reading, mathematics and science TAKS, still with increased performance from the years, 2007 and 2011, AAL females continued to have the lowest mean scores of all sub-groups. As reading, math and science skills become more complex in more advanced grades seven through eleven , it is imperative that they develop these skills to learn more complex skills at the third and fifth grade levels.

CRT and CRF Analyses

CRT and CRF look beyond the superficial explanations of how and why the educational system is not working and seeks to interrogate cultural and political aspects of education to reveal disparities of perception and expectations among students of color. This interrogation is not merely for the purpose of comparing AALs to their EA and AS counterparts. It is important so that their academic development can be critically examined as a part of their growth model. While the process of addressing these disparities is not easy, if there is a desire to work toward more just and equitable educational systems, then the examination of achievement gaps by gender among ethnic groups must be done. It is evident here that three of the components of CRT are prevalent in the findings as related to interest convergence, permanence of racism, and counter storytelling. These tenets clarify why CRF lens are applicable to this study of AAL females STEM achievement.

Interest Convergence

There is no doubt that the achievement of AAL females has gone unnoticed and maybe, in part, it is that their educational performance is not of interest to the larger society. When beginning this research to examine the achievement of AAL females through a GOOGLE search, the response was, "do you mean AA males?" Further exploration into educational data bases (i. e. ERIC), revealed the paucity of systematic study of AAL females in elementary school. Until there is an interest in the achievement within the larger society, then they will continue to be invisible. What Claude Steele (2010) eloquently shares as the impact of stereotype threat on the achievement of AAL students in college can be applied to AAL females at the elementary level. If we as teachers are not strategic in our foci on academic engagement -- respecting the integrity of every child, teaching critical thinking and higher level cognitive academic skills and having high expectations-- then student attention and behavior may become more focused on trying to avoid engagement. These perceptions may fulfill a stereotype that AAL females are not smart enough. Such stereotype gives nonsupport for interest convergence.

While there is a slight increase in the academic achievement of AA boys, and we are not negating their importance, we believe that there is a need to have gender specific discourse on the interest convergence on AAL females as well. This interest convergence will help to support the need for more attention on the academic achievement of AAL girls.

Permanence of Racism

Clearly within this study there exists a permanence of racism so deeply ingrained in the fabric of an educational system that continues to perpetuate inequality in the disguise of equality. While this study examined TAKS data for 2007 and 2011, the trend since its implementation shows a pattern of negative performance for AAL girls. Such a pattern illuminates what Ladson-Billings (2004) addresses in key areas such as curriculum, instruction and funding while reinforcing the permanence of racism. Let us expound on instruction and funding as an example.

Instruction

It has been overwhelmingly documented that high quality instruction is key to student performance. For example, in the TAKS Reading Objective One , Basic Understanding, according to the TEA manual (2005): students should be able to learn how to read for the basic meaning of a text. Students should be able to develop an initial understanding of what they read.

The objective advocates that effective instruction should result in students who: (1) use context and other word-identification strategies to help them understand the meaning of the words they read; (2) recognize important supporting details; and (3) understand the main idea of a selection. Effective instruction should help students to develop these skills. The results of the reading mean scores of AAL females in this study indicated that there is a need to examine the quality of reading, mathematics and science instruction that AALs females receive at the elementary level. In a previous study, Webb-Hasan, Jimarez and Larke (2013) explored the perceptions of school experiences among ten AAL elementary girls, students stated that when asking questions during instruction, they were ignored or more time was spent on discipline rather than on instruction. Further, while they liked their teachers and school, enthusiasm and

excitement about reading, science and mathematics were not a dominant part of the discourse during the interviews.

Funding

Funding is critical in finding solutions to investigating academic improvement among AAL females in reading, mathematics and science. While STEM projects have addressed mathematics and science initiatives, most have addressed issues about increasing the number of AAL females in STEM careers at the high school or collegiate level. While these initiatives are important, they only account for about less than one to two percent of AALs females (Espinosa, 2009). A focus on high school and collegiate AAL females indicates that they have the mastered the basic skills of reading, mathematics and science at the elementary level. Many who are among the one or two percent are resilient. They often become the "token" and are not representative of the total group. There is no doubt that funding can impact their achievement, but there should be caution on how funding recipients are selected. Funding sources have to strategically and purposely seek and fund initiatives to address the achievement of this group of elementary learners. Research and development (R&D) centers, research institutions and colleges and universities budgets are strategically aligned to funding. In fact, professors are denied tenure and promotion and dismissed because of their inability to secure continuous funding. As a result, caution and integrity and the motives of the researcher must become an integral component of the funding process.

Counter Story-Telling

This form of counter story-telling is called cri-quant as noted by Sullivan (2007). Here the numbers "tell the story." On every assessment, AAL females scored the lowest in comparison to their EA and AS peers on all objectives of the reading, mathematics and science TAKS during 2007 and 2011. While both groups made gains from 2007 to 2011, these gains continue to indicate the need for more effective teaching and learning in reading, mathematics and science concepts. As reading, mathematics and science skills become more complex in more advanced grades, it is imperative that AAL females develop their skills in the earlier years and learn more complex skills at the third and fifth grade levels. More stories about their educational performance are necessary and critical to their achievement (Webb-Hasan, Jimarez & Larke, 2013).

CRF Analysis

This research only captures a glimpse of the academic achievement of two vulnerable groups who in the State of Texas represent one-third of the school-age population. The AAL female population in elementary school is growing; they are often from economically challenged families, and they have the lowest academic performance. The educational outcomes of these two groups clearly illustrate the impact of institutionalized racism in education. This can best be explained that the educational experiences of females of color are not the same as boys of color, nor of EA girls. To recognize that females of color faces multiple forms of discrimination is a central focus of CRF. AAL females encounter school structures different from boys of color, and EA females and males. Many incidents are described as what Williams (1991) defines as

"spirit-murder" which are "social structures centered around fear and hate." One AA girl provided an example when she stated that: "I thought my teacher was mean at first, because she says I was talking a lot or not following directions…sometimes I just wanted to try to understand…" (Webb-Hasan, Jimarez & Larke, 2013).

CONCLUSION

In summary, the overall educational performance of AAL females in reading, mathematics and science at the elementary level must be a concern of the entire educational community if they are to be viewed as viable players in the STEM careers. It is crucial that AAL females increase their gains in mathematics, reading and science to develop literacy skills and further their aspirations in considering careers in the STEM fields. Research overwhelmingly supports that when students develop a foundation of reading, mathematics and science skills, they will have the academic preparation for a trajectory to a successful STEM pathway (Epstein & Miller, 2011). In fact, success in mathematics and positive belief about mathematics ability is developed in early grades and such experiences lead to STEM pathways.

When AAL females continue to perform the lowest among the females, then it becomes evident that most of the females in STEM are EAs and ASs. Unlike EA females, many AAL females are impacted by "triple jeopardy-- gender, race and social class." This triple jeopardy has a ripple effect that impacts their quality of life presently and in the future. Sadly, unless AAL females are viewed as an interest convergence for STEM pathways, then increasing the number of AAL females in STEM careers will continue to be rhetoric. Therefore, while we noted the performance on the TAKS, we believe that the brilliance of AAL females at the elementary level must be acknowledged and affirmed with attitudes and beliefs, policies, programs, and practices necessary to improve the quality of their educational outcomes.

References

Alvarez, C. A., Edwards, D., & Harris, B. (2010). STEM specialty programs: A pathway for underrepresented students into STEM fields. *NCSSSMST Journal*, 16(1), 27-29.

American Association of University Women. (2010). *2010 AAUW Annual Report.* American Association of University Women.

Anderson, S., Medrich, E., & Fowler, D. (2007). Which achievement gap? *Phi Delta Kappan*, *88*(7), 547-550.

Bayer Corporation (2010). Bayer facts of science education XIV: Females and minority chemist and chemical engineers speak about diversity and underrepresentation in STEM. Retrieved from http://www.womenscolleges.org/files/u1/BayerFactsofScienceEducation.pdf.

Bell, C. M. (2012). Closing the achievement gap: Identifying social, societal, familial and psychological factors affecting Black student's academic performance. The Public Purpose. Retrieved from https://american.edu/spa/publicpurpose/upload/Bell_12.pdf.

Bell, D. (1980). *Brown v. Board of Education and the interest convergence dilemma*. Harvard Law Review, 93, 518-533.

Boykin, A. W. (1994). Harvesting culture and talent: African American children and educational reform. In R. Rossi (Ed.), *Educational reform and at-risk students* (pp. 116-138). New York, NY: Teachers College Press.

Boykin, A. W. & Noguera, P. (2011). *Creating the opportunity to learn: moving from research to practice to close the achievement gap.* Alexandria, VA: ASCD.

Books, S. (Ed.). (2007). *Invisible children in the society and its schools*. (3rd ed.). New York: Routledge.

Darling-Hammond, L. (2010). *The flat world and education: How America's commitment to equity will determine our future.* New York: Teachers College Press.

Delgado, R., & Stefancic, J. (2001). *Critical race theory: An introduction*. New York, NY: University Press.

Epstein, D., & Miller, R. T. (2011). Slow off the mark: Elementary school teachers and the crisis in STEM education. *Education Digest: Essential Readings Condensed for Quick Review*, 77(1), 4-10

Espinosa, L. L. (2009). *Pipelines and pathways: Women of color in STEM majors and the experiences that shape their persistence*. (Doctoral dissertation, University of California) Retrieved from http://www.proquest.com/en-US/products/dissertations/individuals.shtml.

Evans-Winter, V, & Esposito, J. (2010). Other people's daughters: Critical race feminism and black girls' education. *Educational Foundations*, *24*(1), 11-14-10

Ford, P., & Strawhecker, J. (2011). Co-teaching math content and math pedagogy for elementary pre-service teachers: A pilot study. Issues in the undergraduate mathematics preparation of school teachers, 2. Retrieved from Grant, C. A. (2009). *Teach! change! empower!: Solutions for closing the achievement gaps.* Thousand Oaks, CA: Corwin.

Howard, T. C. (2010). *Why race and culture matter in schools: Closing the achievement gap in America's classrooms*. New York, NY: Teachers College Press.

Jencks, C., & Phillips, M. (1998). The Black-White test score gap: An introduction. In C. Jencks & M. Phillips (Eds.), *The Black-White test score gap* (pp. 1-52). Washington DC: Brookings Institute

Jennings, M. & Lynn, M. (2005). The house that race built: Critical pedagogy, African American education and the re-conceptualization of critical race pedagogy. *Educational Foundations*. 19(3-4),15-32.

Kao, G. & Thompson, J.(2003). Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology*. 29, 417-442.

Ladson-Billings, G., & Tate, W. F. (1995). Toward a critical race theory in education. *Teachers College Record*, 97(1), 47-58.

Larke, P., Young, J. L., & Young, J. R. (2011). Making a case to LEARN: Linking emphasis on the

achievement and reporting of the needs of African American Females on NAEP test results. In L. Howell, C. Lewis, & N. Carter (Eds.), *Yes we can! Improving urban schools through innovative education reform (*pp. 145-168). Charlotte, NC: Information Age

Lim, J. H. (2008). The road not taken: Two African-American girls' experiences with school mathematics. *Race, Ethnicity and Education, 11*(3), 303-317.

Lubienski, S. T. (2002). A closer look at Black-White mathematics gaps: Intersections of race and SES in NAEP achievement and instructional practices data. *Journal of Negro Education,* 71(4), 269-287

Lubienski & Bowen. (2000). Who's counting? A survey of mathematics education re-search 1982–1998. *Journal for Research in Mathematics Education*, 31, 626–633.

Lubienski, S. T., & Gutiérrez, R. (2008). Bridging the gaps in perspectives on equity in mathematics education. *Journal for Research in Mathematics Education, 39*, 365–371.

Lynn, M., & Parker, L. (2006). Critical race studies in education: Examining a decade of research on U.S. schools. *Urban Review: Issues and Ideas in Public Education, 38*(4), 257-290.

National Center for Education Statistics. (2011). The condition of education 2010.Washington, DC: U.S. Department of Education. Retrieved at http://nces.ed.gov/programs/projections/projections2021/tables/table_03.asp.

Obama, B. (2010). Personal responsibility is important for academic achievement. In KMiller (Ed.), *The achievement gap* (pp. 135-143). Detroit, MI: Greenhaven Press.

Orfield, G. (2004). *Dropouts in America: Confronting the graduation crisis*. Cambridge,MA: Harvard Education Press.

Solórzano, D.G. & Yossa, T. (2002). Critical race methodology: Counter-storytelling as an analytical framework for education research. *Qualitative Inquiry, 8*(1), 22-44.

Sparks, S.D. (2011). Study finds gaps remain large for Hispanic students, *Education Week,* June 23, 2011.

Retrieved from http://www.edweek.org/ew/articles/2011/06/23/36hispanic.h30.html.

Steele, C. (2010). *Whistling Vivaldi: And other clues to how stereotypes affect us*. NY: W. W. Norton and Company, Inc.

Sullivan, E. L. (2007). *A critical policy analysis: The impact of zero tolerance on out-of-school suspensions and expulsions of students of color in the State of Texas by gender and school level.* Unpublished dissertation.

Texas Education Agency. (2012). Academic excellence indicator system report. Retrieved from http://ritter.tea.state.tx.us/perfreport/aeis/index.html

Texas Education Agency. (2005, September). Texas assessment of knowledge and skills (TAKS) blueprint for grades 3-8 mathematics. Retrieved from http://www.tea.state.tx.us/student.assessment/taks/blueprints/.

Vanzant Chambers, T. (2009). The "receivement gap": School tracking policies and the fallacy of the "achievement gap". *The Journal of Negro Education, 78*(4), 417-431

Webb-Hasan, G., Jimarez, T. & Larke, P. (2013). Identity and school perceptions of African American and Hispanic girls:Is it a charm? Paper presented at Southwest Educational Research Association.

Williams, P. (1991). *The alchemy of race and rights: The diary of a law professor*. Cambridge: Harvard University Press.

Wing, A. (Ed.) .(2003). *Critical race feminism: A reader*. (2nd Ed.) NY: New York University.

.

APPENDIX

Table 1: Total AAL Test Takers in Grades, 3 and 5, 2007, 2011

Year	Grade	Reading		Mathematics		Science	
		AA	L	AA	L	AA	L
2007	3rd	23,058	67,533	22,368	64407	*****	*****
2011	3rd	21,864	74,248	21,872	81,170	*****	*****
2007	5th	23,257	72,558	23,535	73,458	23,282	74,117
2011	5th	21,882	84,549	21,774	87,871	21,834	87,182

Table 2: Third Grade Female TAKS Reading Mean Scores, 2007

Ethnicity	N	O1=15 M(SD)	O2=7 M(SD)	O3=6 M(SD)	O4=8 M(SD)
NA	567	12.54 (3.58)	5.91 (1.74)	4.85 (1.57)	6.27 (2.08)
AS	5,612	13.18 (3.31)	6.16 (1.63)	5.13 (1.46)	6.71 (1.93)
AA	23,508	11.57 (3.90)	5.54 (1.90)	4.37 (1.75)	5.66 (2.15)
L	65,733	11.85 (3.73)	5.69 (1.83)	4.53 (1.68)	5.77 (2.17)
EA	57,325	12.96 (3.30)	6.14 (1.61)	5.06 (1.47)	6.62 (1.94)

Table 3: Third Grade Female TAKS Reading Mean Scores, 2011

Ethnicity	N	O1=15 M(SD)	O2=7 M(SD)	O3=6 M(SD)	O4=8 M(SD)
NA	720	12.63 (2.52)	5.77 (1.39)	5.13 (1.39)	6.49 (1.67)
AS	6,541	13.14 (2.77)	6.07 (1.45)	5.37 (1.22)	6.91 (1.71)
AA	21,864	12.00 (2.77)	5.44 (1.55)	4.78 (1.40)	6.11 (1.86)
L	74,248	12.35 (2.55)	5.58 (1.47)	4.97 (1.29)	6.28 (1.74)
EA	53,559	13.12 (2.11)	6.08 (1.23)	5.34 (1.05)	6.93 (1.44)

Table 4: Fifth Grade Female TAKS Reading Mean Scores, 2007

Ethnicity	N	O1=13 M(SD)	O2=8 M(SD)	O3=8 M(SD)	O4=13 M(SD)
NA	533	10.03 (3.27)	6.62 (2.10)	6.20 (2.13)	9.46 (3.26)
AS	5,478	10.84 (3.11)	7.02 (1.93)	6.76 (1.99)	10.21 (3.12)
AA	23,527	9.34 (3.63)	6.16 (2.35)	5.68 (2.37)	8.58 (3.60)
L	72,558	9.38 (3.45)	6.27 (2.23)	5.79 (2.26)	8.70 (3.46)
EA	58,098	10.54 (3.13)	6.88 (1.97)	6.52 (2.05)	9.97 (3.15)

Table 5: Fifth Grade Female TAKS Reading Mean Scores , 2011

Ethnicity	N	O1=13 M(SD)	O2=8 M(SD)	O3=8 M(SD)	O4=13 M(SD)
NA	612	11.36 (1.97)	6.78 (1.30)	6.94 (1.36)	10.77 (2.13)
AS	6,560	11.59 (2.97)	6.07 (1.45)	7.01 (1.88)	11.18 (2.98)
AFA	21,882	11.03 (2.17)	6.55 (1.49)	6.67 (1.54)	10.40 (2.35)
L	84,549	10.98 (2.25)	6.45 (1.57)	6.72 (1.58)	10.42 (2.38)
EA	54,537	11.79 (1.68)	7.10 (1.18)	7.25 (1.13)	11.33 (1.85)

Table 6: Third Grade Female TAKS Mathematics Mean Scores, 2007

Ethnicity	N	O1=10 M(SD)	O2=6 M(SD)	O3=6 M(SD)	O4=6 M(SD)	O5=4 M(SD)	O6=8 M(SD)
NA	546	8.28 (1.91)	4.87 (1.21)	5.08 (1.07)	4.85 (1.10)	3.42 (.82)	5.68 (1.92)
AS	5,570	8.95 (1.48)	5.33 (.95)	5.48 (.86)	5.27 (.96)	3.67 (.64)	6.48 (1.68)
AFA	22,368	7.53 (2.15)	4.51 (1.34)	4.70 (1.30)	4.33 (1.36)	3.23 (.93)	4.93 (2.03)
L	64,407	7.92 (1.99)	4.73 (1.22)	4.98 (1.71)	4.71 (1.19)	3.32 (.88)	5.14 (1.98)
EA	55,440	8.63 (1.66)	5.02 (1.09)	5.29 (.97)	5.01 (1.04)	3.59 (.70)	6.05 (1.81)

Table 7: Third Grade Female TAKS Mathematics Mean Scores, 2011

Ethnicity	N	O1=10 M(SD)	O2=6 M(SD)	O3=6 M(SD)	O4=6 M(SD)	O5=4 M(SD)	O6=8 M(SD)
NA	730	8.39 (1.81)	4.79 (1.20)	5.08 (1.04)	5.04 (1.20)	3.38 (.81)	5.75 (1.83)
AS	6,541	9.10 (1.52)	5.39 (.96)	5.47 (.89)	5.36 (.97)	3.66 (.67)	6.69 (1.65)
AFA	21,872	7.88 (2.09)	4.59 (1.33)	4.86 (1.22)	4.55 (1.46)	3.20 (.92)	5.22 (2.01)
L	81,170	8.29 (1.89)	4.76 (1.24)	5.09 (1.08)	4.92 (1.24)	3.32 (.83)	5.46 (1.94)
EA	53,585	8.73 (1.61)	5.01 (1.13)	5.24 (.98)	5.23 (1.06)	3.57 (.70)	6.25 (1.73)

Table 8: Fifth Grade Female TAKS Mathematics Mean Scores, 2007

Ethnicity	N	O1=11 M(SD)	O2=7 M(SD)	O3=7 M(SD)	O4=7 M(SD)	O5=4 M(SD)	O6=8 M(SD)
NA	530	8.84 (2.83)	5.05 (1.91)	5.84 (1.78)	5.20 (1.90)	3.05(1.15)	6.11 (2.07)
AS	5,491	10.04 (1.95)	5.99 (1.44)	6.38 (1.27)	6.14 (1.38)	3.55 (.83)	6.91 (1.60)
AFA	23,253	8.05 (3.27)	4.51 (2.06)	5.26 (2.04)	4.49 (2.15)	2.76(1.27)	5.33 (2.35)
L	73,458	8.57 (2.96)	4.82 (1.96)	5.62 (1.83)	4.96 (2.00)	3.00(1.16)	5.71 (2.21)
EA	58,136	9.29 (2.69)	5.35 (1.84)	5.97 (1.71)	5.56 (1.82)	3.27(1.08)	6.38 (1.99)

Table 9: Fifth Grade Female TAKS Mathematics Mean Scores, 2011

Ethnicity	N	O1=11 M(SD)	O2=7 M(SD)	O3=7 M(SD)	O4=7 M(SD)	O5=4 M(SD)	O6=8 M(SD)
NA	612	8.94 (2.23)	5.59 (1.51)	6.06 (1.34)	5.58 (1.55)	3.21 (.90)	6.07 1.85)
AS	6,560	9.74 (2.52)	6.15 (1.69)	6.32 (1.61)	6.14 (1.67)	3.46 (1.05)	6.83 (1.99)
AFA	21,882	8.46 (2.37)	5.20 (1.71)	5.58 (1.55)	5.15 (1.63)	2.96 (1.06)	5.38 (2.09)
L	84,549	8.83 (2.30)	5.37 (1.71)	5.92 (1.42)	5.43 (1.57)	3.13 (1.01)	5.72 (2.06)
EA	54,537	9.41 (1.87)	5.95 (1.38)	6.31 (1.10)	5.96 (1.31)	3.40 (.83)	6.56 (1.65)

Table 10: Fifth Grade Female TAKS Science Mean Scores, 2007

Ethnicity	N	O1=13 M(SD)	O2=9 M(SD)	O3=9 M(SD)	O4=9 M(SD)
NA	534	10.68 (2.54)	7.41 (1.95)	7.35 (1.84)	6.26 (2.08)
AS	5,483	11.25 (2.84)	7.71 (2.06)	7.75 (1.99)	6.79 (2.18)
AFA	23,282	9.71 (2.96)	6.81 (2.21)	6.74 (2.10)	5.42 (2.23)
L	74,117	10.05 (2.95)	6.84 (2.21)	6.91 (2.10)	5.67 (2.25)
EA	54,522	11.22 (2.46)	7.76 (1.81)	7.61 (1.79)	6.64 (2.06)

Table 11: Fifth Grade Female TAKS Science Mean Scores, 2011

Ethnicity	N	O1=13 M(SD)	O2=9 M(SD)	O3=9 M(SD)	O4=9 M(SD)
NA	618	11.26 (2.09)	7.89 (1.45)	7.69 (1.49)	7.57 (1.67)
AS	6,560	11.83 (1.99)	8.11 (1.43)	8.06 (1.40)	8.00 (1.55)
AFA	21,834	10.78 (2.20)	7.60 (1.45)	7.47 (1.49)	7.01 (1.77)
L	87,182	10.93 (2.13)	7.59 (1.47)	7.54 (1.46)	7.34 (1.65)
EA	54,522	11.77 (1.79)	8.14 (1.25)	7.97 (1.31)	7.79 (1.50)

This study is the results of a grant funded by National Science Foundation (#1048544).