

SEPARATE SCHOOLING FOR BLACK ADOLESCENT MATHEMATICS LEARNERS

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“Discrimination? [No.] There aren’t any White kids!”
(Student excerpt, Nyamekye, 2010, p.189)

The question of whether all adolescent Black students should attend separate schools is not a light one, but one that must be asked, when so many young Black students are not able to succeed within the current educational structure in the United States. My data from a 1.5-year study of Black adolescent mathematics learners in an African-centered school highlights the benefits for young Black mathematics learners of attending intentionally separate schools.

Over the years, separate schooling has been implemented in the US for girls, boys, Jewish students, Catholic students, and more recently for Black students. These schools are able to navigate better the sexism, racism, and religion-based discrimination and stereotyping that predominantly white institutions, mixed race, mixed gender, and mixed-religion institutions sometimes cannot.

For mathematics learning, this kind of schooling is critical for empowering Black adolescents. In the current system, Black students are not fulfilling their potential in mathematics. Mathematics is often used as a marker for intelligence and Black students are typically constructed as being at the bottom of the intelligence hierarchy. Thus young Black students are quite vulnerable (Spencer, 1995). I contend that their identities as mathematics learners and as Black individuals need specialized support, given that both identities are under constant social assault.

In this article, I use the framework of critical race theory to highlight how separate schooling supports mathematics identity for Black students. Critical race theory critically examines the relationships between race, racism, and power (Delgado & Stefancic, 2001). Later in the article, I engage in a wider debate about separate African-centered schools for young Black mathematics learners.

Historical underpinnings

Prior to 1954, students of African descent in the United States were forced to attend separate schools. These segregated schools often had inferior resources and reduced access to quality education. In 1954, a landmark decision by the US Supreme Court (*Brown vs. Board of Education*) ruled that segregated public schooling was unconstitutional. Post-Brown, Black students integrated into majority white public schools. Subsequently, a white-flight phenomenon occurred where white students began leaving schools that had larger populations of Black students and schools thus became, in effect, segregated once again. Schools with high populations of Black students tend to have sub-par teach-

ers, curricula, and resources (Oakes, 1990). Black students attending programs or schools with low populations of Black students typically have access to higher quality education, which sometimes comes at the cost of racial isolation, racial identity confusion [1], and experiences of racism (Berry, Thunder & McClain, 2011).

During the US Black Power movement of the 1970s, many Black parents became tired of the poor quality of education their children were receiving. Some began to advocate for a separate or segregated schooling system for their children (Bush, 2004; Lomotey, 1992; Shujuaa, 1992). This independent schooling, however, would be decidedly different from the segregated schooling that occurred before the Supreme Court ruling. Unlike the “traditional” public school system, which privileges and perpetuates the dominant culture, this non-traditional, African-centered schooling would be designed around both Black American and African culture and provide children of African descent with high quality education.

In my study, I researched Black adolescent mathematics learners in one African-centered school, which I will refer to as Flower Academy. Over the course of the study, conducted in 2008 and 2009, I worked with 8 student participants at the school. All 8 participants were Black [2]. I followed these students from seventh grade mathematics to eighth grade mathematics (ages 12-13 years old). Four of the student participants were male and four were female. These students were not attending Flower Academy on the basis of any special mathematics ability. Adult participants (all of whom were Black) included the school principal Mama Cheryl, the mathematics teacher, Mama Roshanda, the mathematics consultant Baba John, and the parents of the students.

I wanted to understand the school environment and school practices that served as supports and/or barriers to students’ development of a strong mathematics identity. Mathematics identity refers to the dispositions and deeply held beliefs that individuals develop about their ability to participate and perform effectively in mathematical contexts and to use mathematics to change the conditions of their lives. A mathematics identity encompasses a person’s self-understandings of himself or herself and how they are seen by others in the context of doing mathematics. Therefore, a mathematics identity is expressed in narrative form as a negotiated self, is always under construction, and results from the negotiation of our own assertions and the external ascriptions of others (Martin, 2007, p. 41).

I employed culturally sensitive research approaches to the data collection. Data included self-portraits with written

descriptions, collages, a journal entry, observations, interviews, a survey (Multidimensional Inventory of Black Identity-teen) and school and classroom artifacts (NICHD, 2002). I employed several methods to analyze the data, including graphic organization, memo writing, and coding.

The African-centered school as a safe space

In the other schools that I go to *they're usually American* so it's good to go to a school that has a different culture (Student excerpt, Nyamekye, 2010, p. 250)

Critical race theory asserts that traditional educational systems in the US currently serve the interests of whites and that school desegregation is promoted in ways that give whites an advantage (Ladson-Billings, 1998). The African-centered school by nature is designed to do the exact opposite. African-centered schools implement education “which is rooted in the cultural image and interest of African people and which represents and reflects the life experiences, history and traditions of African people as the center of analyses” (Madhubuti & Madhubuti, 1991, p. 8). They emphasize the development of a strong Black identity and self-concept and superior academic achievement (Lee, 1992; Lomotey, 1992). Teachers in African-centered schools, the majority being of African descent, draw on the richness and positive aspects of the culture of the African ancestors and the derived Black culture (Lomotey, 1992).

In traditional educational structures, Black students do not have enough exposure to quality mathematics and images of successful people doing mathematical work. According to Stiff and Harvey (1988), “Black role models will help Black students to understand that careers in science and technology are possible and desirable” (p. 194). At Flower Academy, both Mama Roshanda and Baba John served as role models for the students because of their mathematics backgrounds; both held degrees in mathematics fields.

The tenet of critical race theory that is perhaps the most salient for this article, is that of empowerment and voice. More specifically, empowerment and voice are fostered through the development of counterspaces or safe spaces where marginalized groups can be free from microaggressions (Ladson-Billings, 1998; Solorzano, Ceja, & Yosso, 2000; Delgado & Stefancic, 2001). Microaggressions can be thought of as visual, verbal and non-verbal, conscious or unconscious racism directed towards Blacks (Solorzano, Ceja & Yosso, 2000; Delgado & Stefancic, 2001). Moody (2003) provides an example of the kinds of microaggressions that Black mathematics learners experience:

My best friend [Amber] and I were the only Black students in his class. We could tell that Mr. Miller was burning with anger because we were smart enough to be in his class. When Amber asked him for help, he would just say, “Go figure it out; you have a book.” On the other hand, I refused to ask him for anything because I was determined to be successful without his help. His racist jokes, ugly glares, and superior feelings only gave me the power I needed to defeat him. What I mean by defeating him was proving that I could make good grades and learn algebra despite his feelings. (p. 34)

Other studies on Blacks students’ mathematical experiences in the US, England, and Canada, have documented similar microaggressions (e.g., Berry 2003, 2005; Berry, Thunder & McClain, 2011; Codjoe, 1997, 2001; Foster, 2005; Martin, 2006; Moody, 2003). I found that the experiences of students at Flower Academy were not marred by the racial hostility and ignorance experienced by students post-Brown vs. The Board of Education.

The safe space at Flower Academy was created in two major ways. First, the environment was made purposefully same-race. I observed that there was a sentiment of comfort on the part of the students that seemed to come along with having a qualified same-race mathematics teacher and same-race classmates. Student participants described Mama Roshanda specifically, as being very invested and committed to them. My data revealed that African-centered schools are safe spaces in terms of blatant racism but less safe in terms of negative adolescent remarks about Black classmates with darker skin colors. The second way that the safe space was created was through the elimination of tracking. In traditional settings, tracking limits the kinds of mathematics exposure that is ideal for students and contributes to the beliefs held by young Black students that Blacks are not good at mathematics since few Blacks can be found in higher level mathematics courses. African-centered schools do not engage in this limiting practice.

Challenging the dominant ideology

Critical race theory suggests that the traditional structure of education is designed to maintain the dominant white master script (Ladson-Billings, 1998). Flower Academy abandoned the master narrative in many ways. One way was via school practices. Cultural practices were Afrocentric in nature and involved the recital of African American traditional prayers in the morning and African cultural patterns of interaction, in particular call and response. For example, when staff wanted to get students attention, they would call “Ago” and wait for students to respond with “Ahme.” A parental relationship was cultivated between students and parents. Students were required to refer to female teachers and staff as Mama and male teachers and staff as Baba. This “village” mentality is not often cultivated in traditional school settings, but may be needed for vulnerable populations like Black students. Below, a student describes her experiences with exposure to non-traditional culture in this safe space:

- Chantel:* Here it's like, based on a African culture, in the other school no African stuff was talked about.
- FN:* Do you feel like that's good for you?
- Chantel:* Yes [...] because I need to learn about my Black culture instead of learning about [any] stuff, but here it's like they actually spoke some African languages.
- FN:* So in your other school, did they not talk about African culture at all.

Chantel: No.
(Nyamekye, 2010, p. 250)

In this space, the culture that is perpetuated is Black culture, the culture of the student population. The culture and identity of the school match the school's population.

Racialized conversations were a part of the cultural discourse that contributed to students' dispositions about education and learning. One of the students in my study stated that the teachers at Flower Academy motivated students to do work with phrases like "they got beat up for [you]" so that you could have a "free education" (Nyamekye, 2010, pp. 204-205). This is an illustration of what critical race theory might call speaking from an experience framed by racism or naming one's reality (Ladson-Billings, 1998). The following is another example of the kinds of racialized conversations teachers had:

Some of the teachers at the school [say] "ya'll got to prove to people that Black people are not stupid" and stuff like that [...] get working [...] sometimes they [say], as Black students you should want to do the work. (Nyamekye, 2010, 215)

The teachers, in essence, aim to empower students by getting them to challenge Black inferiority and trying to cultivate in them a desire to learn mathematics *because* of their racial identity.

The second way the master narrative was challenged was through exposure to African or Black contributions to mathematics. In traditional school settings, Black students are provided with a false sense of their historical contributions to mathematical knowledge. Few mathematics textbooks contain images of people of African descent or convey the contributions that they have made to the field of mathematics. The master narrative is one of Pythagoras and Gauss. There is usually little mention of Black mathematicians (*e.g.*, Evelyn Granville, Benjamin Banneker) in these texts and, if discussed, any mention is usually very brief. In turn, this scarcity of representation may lead some Black youth to form beliefs that Black people do not do mathematics, in turn leading to disengagement and resistance to learning in mathematics classes (Fine, 1991). In the African-centered setting, African and Black American contributions to mathematics are made explicit.

Flower Academy countered notions about who can participate in mathematics, through visual messages and conversations. The principal describes the visual messages about careers in mathematics in the following excerpt:

There is consistent mention of Blacks in math and Blacks in sciences and posters and pictures of people who have done well in math and gone on to make a career out of their mathematical skills. Just putting that information in front of children and letting them know that you can do just as well in life based upon your ability to do math well. Letting them know that going all the way back to Benjamin Banneker and even prior to that, to the Egyptians, is something that I think is really important for them to understand, because they have to. (Nyamekye, 2010, p. 108)

Baba John, the mathematics consultant, describes the kinds of conversations he has with students about Blacks and doing mathematics:

One of the things I try to do is expose them and let them know that African Americans and people of color, we are into this stuff, too and show them there's a Black female astronaut, you know what I mean? They don't hear about that kind of stuff. (Nyamekye, 2010, p. 332)

In the following excerpt, Baba John describes his attempts to address careers as mathematicians and counter the dominant stereotypes pertaining to Blacks with his students:

So, just trying to get them to embrace who they are and not hate it and think that it's negative. Think that we're no good and think that we can't be scientists. And think we can't do mathematics and the only thing we can do is rap [...] You ask them, 'What do you want to do?' 'I want to play basketball.' I say, 'Well, everybody can't ball their way out of the ghetto.' 'I'm gonna rap.' 'Everybody can't rap their way out of the ghetto.' [...] I mean, if you can do it, great [...] So I said, 'You better get something on your mind.' [...] 'You better learn something' (Nyamekye, 2010, pp. 341-342).

Blacks who worked in mathematical fields were brought in to speak with students about mathematics. Baba John described one instance in which a speaker came to Flower Academy to discuss African origins in science and mathematics and new paradigms of scientific thinking. The practice of having people of African descent speak about the African origins of mathematics and their involvement in the field of mathematics serves as a tool to develop and internalize beliefs about who is mathematically literate (Martin, 2009).

Critical race theory suggests that traditional instructional strategies in schools operate on a premise of Black intellectual deficiency (Ladson-Billings, 1998). White pre-service teachers in particular have been documented as holding negative beliefs about high poverty Black students. Most of the mathematical discourse surrounding Black students falls along the lines of Black students having cultural deficits, ability deficits, and minority status issues (Nyamekye, 2010). A third way the master narrative was challenged at Flower Academy was through positive beliefs about adolescent Black mathematics learners, many whom were of low socioeconomic status. Mama Roshanda describes one of the student participants in the following narrative:

Maxwell, like a lot of the other students I talked about, was a student where his skills were phenomenal. He could make connections that were-that sometimes I was like 'Wow.' He'll have me blown away by some of the things that he'll say. His answers are always advanced. Very, very advanced, in mathematical terms. [...] Excellent critical thinker, excellent mathematician. (Interview, June 24, 2009)

From her counter-narrative, we have an image of a student whose abilities are exceptional, abilities which are too often overshadowed by the master-narrative about Black mathe-

matics learners. Mama Roshanda goes on to talk about the mathematical ability of her Black students in general:

I think they're very capable. I think I have a very bright set of kids who are very hard working. Of course they're kids so some of them you have to push, but they're not kids who'll see a failing grade and just be okay with it. (Nyamekye, 2010, p. 124)

Pros and cons of separate schooling for adolescent Black mathematics learners

Non-traditional settings like Flower Academy have been successful in creating positive mathematical experiences and helping Black students develop positive racial and mathematics identities (Abelman & Dalessandro, 2007; Kim & Conrad, 2006; Perna *et al.*, 2008). Abelman and Dalessandro (2007) found that more than 40% of graduates from historically Black colleges and universities held degrees in STEM fields (science, technology, engineering, and mathematics) and pursued graduate and postdoctoral studies in these fields compared to students in predominantly white institutions. Some potential implications here for middle and high schools are that in these schools, students were able to counter stereotypes that Blacks are not good at mathematics and likely had the supports that were needed for them to do so. Research suggests that for Blacks, mathematics success and racial identity are connected (Martin, 2000). Studies show that there is a positive relationship between a strong racial identity and academic success (Fordham, 1996; Robinson & Biran, 2006; Harper, 2007). Dee (2004) found that for Black students, having teachers of the same race led to achievement gains. In mathematics specifically, Dee found increases in scores from 2 to 4 percentile points.

At the adolescent level, messages that teachers convey often shape students' perceptions of their own abilities (Erikson, 1968; Jussim, Eccles & Maddon, 1996; Martin 2000). When prompted about how they saw themselves as mathematics learners, the student participants in my study stated:

I am proficient.

I'm advanced in math.

I feel smart and above the class.

I'm confident about the work. I'm the best in my class. In my work [I'm superfly] A's and Bs [...] I was the Math queen.

(Nyamekye, 2010, pp. 107-108)

These comments bring to mind Berry *et al.*'s (2011) study, where high achieving Black boys reported having more positive engagement and feeling confident in their single race two-week summer mathematics program than when they were in their daily mathematics class of mainly white students. The program provided these boys with supports of high teacher expectations and scaffolding and the students were in turn able to view themselves as mathematically intelligent. The statements of the students in my study strongly reflect Mama Roshanda's expectations. The students internalized their teachers' beliefs about them and were able to hold positive views of themselves as mathematics learners.



Figure 1. Ashley's math collage (Nyamekye 2010, p. 295).

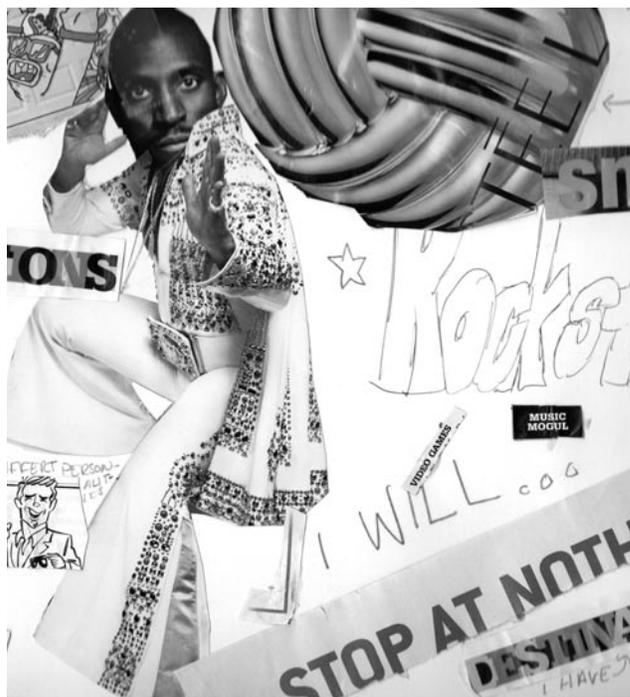


Figure 2. Maxwell's math collage (Nyamekye, 2010, p. 106).

Pedagogy that contributed to the students' positive feelings included Mama Roshanda placing exceptional student work on her wall of superstar geniuses, engaging students in competitive mathematical activity, and extending verbal praise (e.g., "Good job").

The influence of this positive reinforcement of mathematics identity as a Black student is highlighted by the student collages and collage descriptions shown in Figures 1 and 2.

I asked Ashley to explain each word on her collage (Figure 1):

In my math class, who am I in math class? I'm a person who approaches my goals, I'm a superstar in math, I feel beautiful in math, I glow in my math, I'm an almighty person in my math class. (Collage description, June 11, 2008)

For his collage (Figure 2), Maxwell explained:

Well, in this picture, I chose him because he's a basketball player, and he's such a team player that I wanted to show that I'm a team player. So I put him in, and in

math, I'm really good in math, so I put a rock star. I'm a rock star in math, then I put I will stop at nothing, because I will not stop at anything to get my education. I have a destination. (Collage description, October 11, 2009)

These students are examples of young Black students who value learning and education and view themselves in ways that are exceptionally positive. These students and the other students in the study attributed their positive mathematics journey and positive views of self to their parents, their teacher Mama Roshanda, and Flower Academy. When I asked one student, Chantel, how she felt about school and education she stated "school is a fun place to be; on the weekends, when I'm not doing nothing I wish I was at school" (Nyamekye, 2010, p. 254). She goes on to say, "I love Mama Roshanda, I love Mama Willis, and I love Mama Tamara." (p. 254). Echoing these statements, student participant Ashley stated, "I love school. [...] like to learn new stuff [...] "I love my teachers... [be]cause they support me in any way I need help" (p. 254). This professed love of school seems almost strange in light of mainstream culture and views about school as a hated place that one must go to out of obligation rather than choice. In this African-centered safe space students did not seem to hold the kinds of anxieties described by students in other studies. Table 1 summarizes findings from my study that contrast how students in the African-centered space described mathematics with how students in studies of mathematics anxiety described it.

The student participants at Flower Academy saw themselves as having the ability to do well in mathematics, regardless of their racial status and did not succumb to what some scholars refer to as stereotype threat. These students did not reject mathematics because of beliefs that it was something that white people did, but instead described mathematics as being universal and for everybody. Further, they also saw themselves as powerful mathematical agents, as evidenced by their adoption of an assertive rather than pas-

sive stance towards mathematics, a stance that was facilitated by their engaging mathematical experiences and positive teacher beliefs. They also performed well. This all-Black safe space seemed to be successful in removing the "threat" of negative racial stereotyping.

Mathematical environments that nurture

Separate schooling for adolescent Black mathematics learners is a controversial topic. Large-scale movements to implement this type of schooling might be viewed as militant or separatist. One could argue that in a multi-cultural society, young Black students attending separate schools would not be well-rounded. In real life they have to learn to work with and interact with people from all cultures, so why isolate them? Furthermore, certainly not all Black students who have attended predominantly white schools have had negative experiences. In addition, some Black students may not view their racial identity as being connected to their academic identities. Some Black students do not feel pressured to act dumb for fear of being accused of acting white. Concerns by traditional educators might arise regarding whether mathematical rigor would be sacrificed in an African-centered counter space. Though valid, in the final section of this article, I argue that the pros of this space may far outweigh the cons.

While most Blacks would agree that Black youth (particularly low-income) are often shortchanged in traditional educational systems, not all would necessarily advocate intentionally segregated schools. Some members of Black communities believe there is a cultural mismatch in traditional schools and have advocated for meeting the needs of children of African descent through culturally responsive pedagogy within these schools (Gay, 2000; Ladson-Billings, 1994; Martin & McGee, 2009). These members believe that cultural groups have common specialized styles and modes of learning and communication. Other members of Black communities who have the monetary means have opted to send their children to private schools in affluent areas,

Responses by students with math anxiety	Responses by students in my study
I just don't like math; it's the same thing and big numbers, and I don't like big numbers. Brian, aged 13 (Furner & Duffy, 2002).	You get to learn more stuff, and it's challenging (Malcom).
It's really hard for me I'm not that good at it. Paula, 7th grade (Bishop & Pflaum, 2005).	In math, it feels much easier and relaxing (Chantel).
Math was really my least favorite subject. Nad, 5th grade (Bishop & Pflaum, 2005).	Math was always one of my favorite subjects. [...] I feel like it's great for me to learn math (Robert).
When I think of math I don't get nervous, I get bored. Chad, aged 11 (Furner & Duffy, 2002).	I like math because it is interesting (Elizabeth).

Table 1. Comparison of student responses on feelings about mathematics (Nyamekye, 2010, p. 97).

believing that these schools will give their children access to particular social structures, cultural capital, and virtually guarantee pathways to college. Though approaches differ, the point of convergence seems to lie in a shared belief that Blacks will be marginalized within current structures.

Given the current mathematical climate of racism, I contend that adolescent Black mathematics learners should attend high quality African-centered schools. Post-slavery, attendance in segregated schools was a result of racism and discrimination rather than a choice made by Blacks. Racism and discrimination still exist in public schools and the mathematics environments they contain. This existence highlights the fundamental tenet of critical race theory, that racism is normal, ordinary, and will not be cured. It has become so normal, in fact, that Black students themselves have dangerously internalized the myth that Asians (the “model minority”) and white students are innately better at mathematics than they are, and that Blacks are not good at mathematics (Lee, 1996). In some instances, Black mathematics learners think that only other racial groups hold negative beliefs about their mathematical abilities. In other cases, however, Black mathematics learners buy into the negative belief about themselves. The aim should not be for Blacks to think they can be “smart like whites”, but rather just smart, period (Codjoe, 1997, pp. 147-148).

Critical race theorists suggest that negative stereotypic images are constructed by society in order for the dominant culture to maintain their power (Ladson-Billings, 1998). Media images, in particular, reinforce myths about Blacks’ intellectual and academic inferiority. Society is heavily influenced by media and portrayals of Blacks as primarily athletes and entertainers. These depictions lead young Black students to think that mathematics is not something their racial group does. Textbooks send the message that Black people do not do mathematics, and teachers’ behaviors send messages that Black students are not intelligent enough to learn mathematics. In traditional school settings, there is typically no mechanism for affirming racial identity and helping students bridge Black racial identity with mathematics identity. Unlike many teachers in traditional settings, teachers in African-centered schools help students embrace their Black racial identity, take as a premise that Black students have the potential to achieve greatness and, in most cases, share the same race as their students. African-centered schools support students’ construction of mathematics identities by showing them that Black people do indeed participate in mathematics and that mathematics is an accessible path.

My study revealed that although the African-centered mathematics setting is not absent of myths about Asian mathematical superiority and other stereotypes, mechanisms were in place to counter these thinking patterns. Through racialized discourse, teachers were able to let students know that they were holding negative stereotypes, and proactively addressed them. My findings support the benefits of spaces where adolescent Black students can construct their racial identity and mathematics identity through engaging mathematical activity without the burdens of racial discrimination, racism and stereotypes that often come with the traditional school space.

One of the most telling findings of my study was that the students’ dispositions towards school and mathematics countered those described by Ogbu (1988). Ogbu contended that because Blacks are involuntary minorities (brought to various locations via enslavement rather than by choice), they psychologically opposed the “white man’s” education. The students at Flower Academy, however, did not feel that they were somehow betraying their race in being adept mathematics learners. Because of the racialized conversations, they understood and verbalized the importance of acquiring education that was prohibited from being attained by their ancestors. These students wanted an education and were happy to attend their African-centered school.

Extreme problems call for extreme solutions. The invisibility of Blacks in mathematics warrants a closer look at separate schools for adolescent Blacks. The student and teacher collages and narratives highlight how an African-centered school is one type of space where myths about who can do mathematics can be countered and stereotypes can begin to be deconstructed. The importance of African-centered schools for the mathematics learning of young Black students lies in the ways in which they foster the construction of strong identities as mathematics learners.

Notes

[1] Racial identity in this case refers to the ways in which Blacks view themselves in relation to their larger community and other communities, how they think others view them, how they understand their own position in society and the way others have positioned them, and their meanings and importance of race (Helms, 1990).

[2] The Black students in my study were descendants of Africans and were born in the United States rather than in Africa or the Caribbean.

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Institutions do the culture's serious business. But for all that, they do so through an unpredictable mix of coercion and volunteerism. I say "unpredictable" because it remains perpetually unclear both to participants in a culture and to those who observe it from "outside" when and how the power of enforcement will be brought to bear by those delegated or otherwise thought privileged to use it. So if it can be said that a culture's institutions do "serious business," it can equally be said that it is often ambiguous and uncertain business.

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