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Narrative theories of personality help elucidate the complexity of success.

Science Success, Narrative Theories of Personality, and Race Self Complexity: Is Race Represented in the Identity Construction of African American Adolescents?

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From what I have learned I mean there are African Americans that are pretty much proud of their race, and see themselves as somebody, and strong minded, intelligent, um hard working people.

—Malcolm

This research was supported in part by a grant to the first author from the National Science Foundation CAREER award (no. 0238485), by fellowship support to the first author while at Brown University from the Howard Hughes Medical Institute, and by grants to Jacquelynn S. Eccles and Arnold J. Sameroff from the MacArthur Network on Successful Adolescent Development in High-Risk Settings and the National Institutes for Child Health and Human Development. The authors would like to thank the following individuals for their comments on earlier drafts of this chapter: A. Wade Boykin, Jacquelynn Eccles, Kimberley Edelin Freeman, James Jones, Robert Sellers, Gina Paige, Judith Winston, Michael Winston, and James Wyche. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Well when I was younger, I feel I didn't have to prove myself, but as I got older found that it. . . . that you have to. . . . kind of do have to prove yourself, so. More when I got older I found that out, but not when I was younger.

—Karen

We have an attitude. . . . you're always, you just. . . . mad. You feel like you have to get back at everybody else for all the years of oppression and stuff like that. A lot of African Americans feel that because of what their ancestors went through with slavery, that this is supposed to, now that we're free, we're supposed to fight back. Not necessarily fight back physically, but fight back in, um, like to succeed. Do all the things that other, like white people told us we couldn't do, or never could do, stuff like that. I feel, it's not, it shouldn't be. I mean that was in the past.

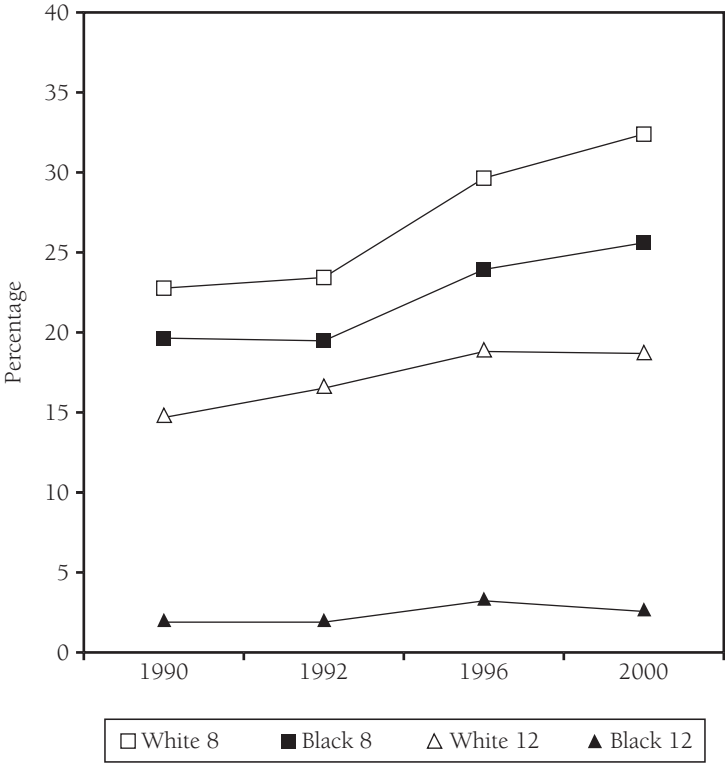
—LaToya

Prince George's County MADICS Study
High-achieving science and mathematics high school students

Given the critical role of science, mathematics, and technology in society, the success of all U.S. students in these areas is fundamental to their future success and quality of life, as well as to the economic well-being, standard of living, and national security of the United States. The current science and mathematics performance of African American students in the nation's schools raises considerable concern about their opportunities to participate fully in society in ways that allow them to have a high-quality standard of living and to make contributions to the advancement and well-being of the society. Among all U.S. elementary and secondary students, African American students have the lowest science performance in the nation on national assessments. According to the Nation's Report Card from the 2000 National Assessment of Educational Progress, only 7 percent of African American eighth graders and 3 percent of African American twelfth graders are proficient in mathematics (National Center for Educational Statistics, 2002). The low mathematics performance of African American students has persisted for more than a decade (see Figure 4.1).

The trend of low performance in science and mathematics among African American students in elementary and secondary education is not surprising, given the failure of the nation's schools to reach full excellence and equity in educating all its students. It is well established that African Americans have fewer opportunities than other students to learn science and mathematics. Compared to their White counterparts, African American students in the nation's schools experience less extensive and less demanding science and mathematics curricula and programs; low expectations and judgments of their ability that lead to tracking; fewer precollege programs; less qualified science teachers; less access to resources such as science facilities and equipment; and fewer opportunities within the classroom to

Figure 4.1. Percentage of Black and White 8th and 12th Grade Students Proficient in Mathematics



develop problem-solving and inquiry skills (Adelman, 1998; Anderson, Bruschie, & Pearson, 1994; Camara & Schimdt, 1999; Campbell, Denes, & Morrison, 2000; Clewell, Anderson, & Thorpe, 1992; Finn, 1999; Darling-Hammond, 1985, 1987; Maton, Hrabowski, & Schmitt, 2000; Oakes, 1987, 1990). In schools serving primarily students who are poor and have minority status, less than 50 percent of science and mathematics teachers are certified in the subject (National Commission on Mathematics and Science Teaching for the 21st Century, 2000).

Of all the self and social processes that could be examined in relation to science and mathematics achievement, identity is particularly important. It is well established that identity formation is a major developmental task of adolescence and one of the most important aspects of personality development. Moreover, for African American adolescents race has the potential to play a critical role in their identity formation. There is mounting empirical evidence that racial identity of African American students is related to their overall academic performance (Chavous et al., 2003; Grantham & Ford, 2003). However, there are inconsistencies about the nature of this

relationship across studies (Arroyo & Zigler, 1995; Fordham & Ogbu, 1986; Lockett & Harrell, 2003). These inconsistencies may be explained through conducting research that focuses on an in-depth understanding of the identity of African American adolescents, including how race is represented in identity construction. Studying the identity of African American adolescents who have achieved success would allow researchers to understand the nature of identity of those who have demonstrated high academic achievement. One study that examined the identity construction of successful African American adolescent males revealed the complexities and function of identity construction and how it can serve as an integral dimension of adolescent males' motivation for success (Rice, 2004).

The focus of research to date that has examined the relationship between racial identity and academic achievement does not specifically focus on science and mathematics achievement. However, it is likely that racial identity is as important, if not more important, in achievement in these two subjects. Science and mathematics are subjects often perceived to be based on innate intellectual ability. Within U.S. society, there are pervasive intellectual stereotypes about African Americans' intellectual inferiority (Bobo & Kluegel, 1997; Jones, 1997; Steele & Aronson, 1995). How then do African American adolescents reconcile these negative stereotypes in the context of striving for success in science and mathematics?

In this chapter, we make three theoretical arguments regarding new directions for research on how identity is related to the science and mathematics achievement of African American adolescents. First, we contend that more research on science and mathematics achievement should focus on studying the identity construction of African American adolescents like Malcolm, Karen, and LaToya (see the quotations that opened the chapter), who are successful in these subjects. Second, we suggest that race is a *psychological* context for personality development and, therefore, must be considered in all analyses of the human development of African American adolescents. Third, we argue that narrative theories of personality have been underutilized in research on identity in general, as well as specifically within research on African American adolescents; yet they offer opportunities to answer important theoretical questions about the identity of African Americans who have succeeded in science and mathematics. In concluding this chapter, we recommend the development of a new theoretical framework that explains how race adds complexity to the self in ways that shape the identity construction of individuals who have achieved success in science and mathematics.

In this chapter, we adopt a distinctive approach to making these three theoretical arguments about the identity of African American adolescents who have achieved success in science and mathematics. Throughout the chapter, we will use the discourse of three adolescents who have high science and mathematics achievement to provide support for these theoretical arguments. The discourse of these adolescents will also be used to raise

questions about new directions for research on the identity of African American adolescents who are succeeding in science and mathematics.

In articulating what this theoretical chapter will address, it is equally important to describe what will not be included. First, we will not provide an in-depth description of the research study that includes Malcolm, Karen, and LaToya (see Chavous et al., 2003, for study description). The use of their narratives and discourse is designed to provide support and illustrations for the theoretical arguments that are made and to raise questions for future research. Second, unlike the other chapters in this volume, we will not explicitly identify variables that predict science achievement of African American adolescents. Rather, our ultimate goal is to argue that the way race is represented in African American adolescents' identity construction is theoretically important in understanding their success in science and mathematics. Finally, one argument made in this chapter is that race is a psychological context for personality development of African American adolescents. Critical to this argument is consideration of variation in how race is experienced, understood, and socialized across historical, generational, gender, and socioeconomic lines (Stewart, 2003). However, due to the scope of the arguments advanced and space limitations, there will not be a theoretical discussion of these variations.

Science Success and African American Adolescents: Why Should More Research Be Conducted on Adolescents Who Have Achieved Success in Science and Mathematics?

Although the current achievement status of African American students (as a population) in science and mathematics is alarming, there is some good news. Emerging empirical evidence from both national and regional data indicates that on average, African American adolescents are optimistic and have high expectations for their success in science and mathematics, believe that high science and mathematics performance is important for their future success, and believe they have the ability to perform well in science and mathematics (Winston & Eccles, 2001; Freeman & Winston, 2001; Winston, Eccles, Senior, & Vida, 1997).

We argue that given the inequity in educational opportunity, coupled with the fact that a small percentage of African American students are succeeding, researchers interested in science and mathematics achievement of African American students should study more often those who have achieved success in these subjects. Psychological research on the academic achievement of African American students is more likely to pursue questions oriented toward why students fail rather than how students succeed. Knowing why a student fails will not necessarily lead to direct answers about how he or she can succeed. Thus we argue that to increase the success of African Americans in science and mathematics we need to make a

more concerted effort to understand the educational and psychological experiences of those who have achieved success.

There are at least two distinct approaches that can be adopted to study the aspects of identity related to the science and mathematics achievement of adolescents who have demonstrated successful performance in these subjects. In the first approach, a survey research design coupled with discriminant analysis can be used to identify the identity variables that discriminate between students who are successful in science and mathematics those who are not. In the second approach, record data of grades could be combined with a case study or narrative research design. Using this approach, the record data would be used to identify students who have high science and mathematics achievement. Then narrative and case study research designs could be coupled with discursive, content, thematic, or grounded theory analysis to understand the identity of these successful students.

It is our position that this latter approach can complement the first and should be considered more often by researchers interested in understanding identity related to African American adolescents' science and mathematics achievement. Moreover, as the rest of the chapter will illustrate, this latter approach is more likely than the first to advance theory development through capturing the complexities of how race is represented in the identity construction of African American adolescents who have succeeded in science and mathematics. In other words, case study and narrative research designs are by nature better suited than other strategies of inquiry and research methods for understanding complexity, episodes of nuances, the sequentiality of experiences in context, and the wholeness of individuals (Camic, Rhodes, & Yardley, 2003; Denzin & Lincoln, 2000; Stake, 1995; Yin, 2003).

Moving Beyond a Category: Can Race Serve as a Context for Personality Development?

How has race been conceptualized in developmental research on African American adolescents?

With the exception of research on racial and ethnic identity, the majority of published research in developmental psychology that includes African American adolescents largely conceptualizes race as a demographic category to which individuals belong. Although some researchers integrate analysis and interpretation of the experiences that are linked to this category, few directly investigate how race is represented in African Americans' identity or how this relates to other aspects of their psychological functioning. Several scholars have reviewed extensively the research on African American children and adolescents (see Boykin & Ellison, 1995; Graham, 1994; Lee, 2003; McLoyd, 1991; McLoyd & Randolph, 1984; McLoyd & Steinberg, 1998). These scholars have recommended that researchers integrate culture and ecological considerations in the conceptual and interpretative frameworks.

However, these suggestions have been slow to be incorporated into the theoretical and methodological orientation of most of the published research on African American adolescents.

We contend that race, from a psychological perspective, should be conceptualized as a context for human development. The relationship between the individual and his or her environment has been the focus of psychological inquiry for some time. Within the last decade, there has been an increasing emphasis among developmental researchers that the incorporation of context is critical to a comprehensive understanding. Peers, families, neighborhood, and schools have been the primary developmental contexts emphasized. For African Americans, however, the nature of how race is experienced makes it something that should be considered as a dynamic context for development. Damon (1996) argues that developmental psychologists often conceptualize social context and its variation as a factor that has an external impact on individuals rather than as a dynamic set of practices in which the individual actively participates.

In this chapter, we hope to demonstrate that for researchers who have the goal of understanding the development of African American adolescents, neglecting race as a psychological context is short sighted, because it will lead to an incomplete understanding of how race is understood, experienced, and socialized. Consideration of race as a context of personality development will require clarity on the question, "What is race?"

Toward Two New Psychological Perspectives: What Is Race?

If race is a context for personality development for African American adolescents, researchers must articulate explicitly what they are referring to when using the term *race* in research. We have developed two new psychological perspectives of race that we contend are useful for research on African Americans. Although some dimensions of these perspectives may have applicability to other social and cultural groups, we have developed them in the context of the unique historical, social, and political experiences of African Americans in the United States. We acknowledge that the inherent complexities and difficulties of the issue of race in society make it impossible to create absolute conceptually definitive perspectives of race. We believe, however, that the two psychological perspectives of race we offer are useful. It is important to acknowledge that these two perspectives of race are developed in the context of full recognition that scientific evidence confirms that there are no biological races (Long & Kittles, 2003).

The Biopsychological Perspective of Race. We argue that from a biopsychological perspective, race has meaning for African Americans in terms of phenotypic variation and visibility. A biological process occurs in which melanosomes inside cells, called the melanocytes, produce melanin in the skin. This in turn produces a wide spectrum of skin color among

human beings, with individuals of African descent having the largest range of skin tone variation among human populations. In many social contexts within the United States that are not predominantly Black, an individual's brown skin can create a certain type of visibility that has the potential to shape the attitudes and behavior of other people. In other social contexts that are predominantly Black, skin tone variation among African Americans also can shape others' attitudes and behaviors (Bradshaw, 2004; McClair, 2003). Therefore, for most African Americans phenotypic visibility and variation provide a link between biology and their psychological functioning. This link requires African Americans to make sense of the meaning they themselves as well as others attach to skin color visibility and variation.

Stereotype activation and stereotype application are psychological processes that provide an example of how the biopsychological perspective of race is relevant to the identity of African American high-achieving science and mathematics students. Within social psychological research, stereotype activation is the extent to which a stereotype is accessible in one's mind; stereotype application is the extent to which one uses a stereotype to judge a member of a stereotyped group (Kunda & Spencer, 2003). In interpersonal situations or interactions between students and teachers, stereotypes of African Americans can be elicited with a skin color cue or stimulus that signals that a person is an African American. An example of a pervasive stereotype in society is the intellectual inferiority of African Americans (Bobo & Kluegel, 1997). In a science or mathematics classroom, this is one stereotype that could be elicited by a teacher or other students. The basis of this stereotype activation could be largely based on categorization based on the skin color of the student. Category accessibility is a state of perceptual readiness that makes the category available for use in judgments such as identification, categorization, and inference about category members (Kunda & Spencer, 2003). If stereotype activation occurs, it could influence a teacher's expectations of what that student could achieve, which is a well-established pattern in science and mathematics classrooms (Oakes, 1987, 1990). Another possibility is that the societal stereotype that African Americans do not work hard (Bobo & Kluegel, 1997) could be elicited in the context of a science or mathematics classroom. This could lead to stereotyped judgments about the amount of effort a student will expend on studying science and mathematics.

Within a science or mathematics classroom, how can a teacher's stereotype activation shape how an African American student constructs his or her identity? There is evidence that teachers can communicate their low expectations of students through their behaviors as well as nonverbal expression (Jussim & Eccles, 1995). If an African American student perceives that a stereotype about his or her intellectual ability or work ethic is activated and applied, he or she can either accept that stereotype as defining his or her intellectual ability or work ethic, or can reject that stereotype as a self-definition. In either case, it is possible that the student's

achievement motivation in science and mathematics would be undermined. Another possibility is that this perception of a stereotype could facilitate success by serving as a challenge that the student decides to take on to “prove” herself or himself in much the same way Karen describes. There is preliminary evidence that for some African American students in certain learning contexts, stereotype activation promotes mathematics performance (Harris, 2003) rather than undermines performance as with stereotype threat (Steele & Aronson, 1995). Considerably more research is needed to unravel these patterns of relations between teachers’ stereotype activation based on skin color cues; students’ perception of the stereotype activation; and students’ identity construction, achievement motivation, and performance. Given that the majority of research in social psychology on stereotypes focuses on those who hold stereotypes rather than on the “target” of the stereotype, little is known about how and when African Americans perceive that someone has either activated a stereotype, applied a stereotype, or both (Shelton, 2000).

We contend that science and mathematics are important subjects for more in-depth examination of these patterns. One reason is that there is already evidence that low expectations of African American students are pervasive in science and mathematics classrooms. Yet there may be some students for whom these low expectations do not undermine their achievement motivation and performance. Can this be explained by how they construct their identity within these classrooms? The continued practice of tracking in U.S. public education also make science and mathematics important subjects in which to examine these patterns of relations. Within large integrated middle schools and high schools, African American students who are high achievers in science and mathematics are often tracked. As a result, they frequently find themselves in science and mathematics classrooms in which they experience racial isolation. Racial isolation in classrooms where success in these subjects is all too often perceived by the teacher and learner to be based on innate ability could cause adolescents to struggle with constructing an identity that will facilitate their achievement motivation and success. Adopting a biopsychological perspective of race acknowledges that skin color is a visible physical characteristic that is based on a biological process, which in turn requires African Americans to make sense of the meaning they themselves, as well as others, attach to what it means to be Black in U.S. society.

The Cultural Historical Perspective of Race. The cultural historical perspective of race recognizes that human development is a cultural process that occurs within the context of structured socioeconomic, political, and legal relations across time. In the United States, such relations have developed over time in distinctive ways because of the prominent role that race has played in the stratification of social groups and economic behavior (Jaynes & Williams, 1989). In the first two centuries of the country’s history, this was largely attributable to the use of slave labor and to the fact that

slaves were racially identifiable. After the abolition of slavery, race and racial classifications became even more important in the political and social system of the United States because of the rise of the white supremacy ideology (Jaynes & Williams, 1989). This doctrine structured society in such a way that with few exceptions, African Americans were in the lowest strata of the racial hierarchy and Whites were in the highest. This system was institutionalized by the adoption of statutory segregation in the South and its acceptance by the Supreme Court of the United States and the Congress. These social structures, born out of segregation by law and custom, created the disparities in income, housing, education, and other aspects of daily living that became for at least a century the social context of cultural development for African Americans.

This system of racial stratification in the United States has created differences in the life experiences of African Americans, compared to Whites and other groups with minority status. African Americans tend to reside in communities that have higher jobless rates and lower employment growth, as well as reduced access to employment (Wilson, 1987). The unemployment rate of Black men is three times the rate for White men (DeBarros & Bennett, 1997). For those who are employed, Black men earn seventy-eight cents for each dollar earned by their White counterparts (U.S. Bureau of Labor Statistics, 1997). As a result, the median income for Black families is only 55 percent of the median income for White families (Conley, 1999). When comparing White and African American families of the same income, White families have a significant advantage in terms of wealth, such that at the upper income levels, White families have a median net worth almost three times that of upper-income African American families. At the lower income levels, African American families have no assets, whereas the White family of the same income has \$10,000 worth of equity (Survey Research Center, 1994).

Over time, these life experiences and their associated adaptive responses, coupled with retentions of African culture, have created a unique cultural context in which African American adolescents develop. Jones (2003) defines culture as psychological, symbolic, historical, and dynamic. The cultural historical perspective of race recognizes that development is a cultural process and that the unique historical and contemporary experiences of African Americans give race psychological meaning that is incorporated into cultured patterns of thought, feelings, and actions. The unique historical experiences of African Americans demand that African Americans develop a conception of who they are within a cultural historical frame of reference. This conception of race is similar to aspects of Vygotsky's socio-cultural theory (1978), which posits that an individual's development must be understood within its social and cultural historical context and cannot be separated from it. This perspective of race does not equate culture and race. Rather, it assumes that the psychological significance of race evolves over time within cultural communities such that ways of thinking about race can eventually become part of a culture.

Jones (2003) describes a universal context of racism as one dimension of the cultural context in which African Americans develop; African Americans live daily with the possibility of threat, bias, denigration, denial, and truncated opportunities. Racism is a psychological reality at any given time for targets, and it that reality consists of the target's personal, as well as collective, racial pasts and futures, and their construal of the racial nature of their immediate experience. There are two types of motivational consequences that are triggered by the universal context of racism: self-protective motivations and self-enhancing motivations. Both of these motivational tendencies are triggered by the universal context of racism (Jones, 2003, p. 220).

LaToya's construction of her identity, as reflected in the following passage, represents one way in which a cultural historical conceptualization of race may be useful in research on the identity of African American adolescents who have achieved success in science and mathematics.

We have an attitude. . . . you're always, you just. . . . mad. You feel like you have to get back at everybody else for all the years of oppression and stuff like that. A lot of African Americans feel that because of what their ancestors went through with slavery, that this is supposed to, now that we're free, we're supposed to fight back. Not necessarily fight back physically, but fight back in, um, like to succeed. Do all the things that other, like white people told us we couldn't do, or never could do, stuff like that. I feel, it's not, it shouldn't be. I mean that was in the past.

LaToya seems to construct an understanding of herself and success that is linked to the unique historical experience of African Americans in terms of what they "went through with slavery." Thus, even though slavery was a legal institution more than a hundred years ago and was not something that LaToya experienced directly, it is represented in her construction of both herself and African Americans. It is also linked to her motives for success. Initially she selects language to describe a collective *we*, then moves to an individual *you are* ("you're"). Then she makes a decision to use what could be considered a qualifier, "a lot of African Americans." Does understanding LaToya's motives for her success require serious consideration of her conception of who she is within a cultural historical frame of reference?

In sum, we have argued that race from a psychological perspective is a context for personality development of African American adolescents and that any consideration of race within research requires a clear rationale for how it is conceptualized and defined within the context of research. Toward this end, we propose a conceptualization of race that can serve to guide thinking about human development of African Americans. Although the two psychological perspectives of race that we have developed to guide research are not exhaustive, they are important to advancing the arguments made in this chapter. These perspectives can move research beyond conceptualizing race in terms of a category to which an individual belongs and

can provide new directions in informing the types of research questions that are posed in research on the identity of African American adolescents who achieve success in science and mathematics.

Narrative Theories of Personality

What is the utility of narrative theories of personality in research on identity?

Narrative has long been of interest to scholars interested in personality. McAdams (1999) asserts that narrative assumptions are explicit within some of the field's most well known "grand theories" of personality, including those of Adler (1927), Jung (1969), Murray (1938), and Erikson (1950). He characterizes all these theories as expressing "considerable interest in the temporal nature of human lives, how lives develop over time and how human beings understand that development" (p. 483). Although researchers often think of narrative as a research method or product of data collection, narrative can also be conceptualized as a psychosocial construction coauthored by the individual and the cultural context in which that person's life is embedded and given meaning (McAdams, 2001). As such, narrative integrates the cognitive, affective, and motivation systems of personality and is a part of personality and psychological functioning (Singer, 1995).

Narrative theories of personality emphasize that as humans develop they create internalized narratives and stories. There is a diversity of overlapping narrative theories of personality. Some of the more widely studied narrative theories of personality include the following: identity as a life story (McAdams, 1985); script theory (Tomkins, 1979); the dialogical self (Hermans, 1988); and self-defining narrative memory (Singer, 1995).

Several researchers have adopted narrative theories of personality in research on the identity of adolescents (Habermas & Bluck, 2000; McKeough & Genereux, 2003); however, these theories have been largely underutilized to date. Yet narrative theories of personality have utility for understanding three psychological issues related to identity that are important for understanding individuality, one of the goals of personality psychology. These three psychological issues are identity construction, function, and complexity. We will discuss how narrative theories of personality are valuable theoretical guides for understanding each of these, particularly during the period of adolescence.

Narrative theories of personality have utility for guiding conceptualization of identity as a construction. This construction reflects individuality and is performed by an individual. Advances in cognitive development enable adolescents to engage in formal operational thinking, which psychologically positions them not just for possessing or having an identity but also for creating identity. Narrative theories of personality have utility for understanding identity because they focus on the way individuals configure or shape the self. Internalized stories of self serve to bring into focus the recollected past,

perceived present, and anticipated future. Thus the narrative constructed is a selective, interpretive representation of self.

Narrative theories of personality place the individual on center stage with interpretive power as an author of identity. From this perspective, questions arise about the psychological function narrative serves for the person. In general, narrative theories of personality assert that the creation of an internalized narrative of self is motivated by a need for psychological unity and purpose (McAdams, 1999, 2001; Singer, 1995). Adolescence is arguably one of the most theoretically interesting times in the life course in which to pose questions about identity construction and the function of identity, yet it is also one of the most psychologically complex. Adolescence serves as a biological, psychological, and social bridge between childhood and adulthood. It involves simultaneous biological, cognitive, social, and emotional changes.

Considerable development and experience have occurred before the individual reaches adolescence. Therefore, these changes converge with an already well-developed personality. As a result, identity is very complicated and complex for adolescents, who often experience a struggle between their psychological individuality and their similarity with others. Narrative theories of personality, with their focus on questions about the hows and whys of construction and function, inherently take on the challenge of complexity as essential for full understanding of identity and the systems of personality.

Habermas and Bluck (2000) argue that the prerequisite cognitive tools for constructing global coherence in a narrative, as well as the social and motivational demands to construct a narrative, develop during adolescence. They suggest that this psychological readiness for creation of an internalized narrative converges with societal and adult pressures for adolescents to “get a life.” Therefore, adolescence is in a sense the infancy of the narrative, making it an ideal developmental period for the study of identity of individuals who have achieved success.

What is the utility of narrative theories of personality for research on the identity construction of African American adolescents who have achieved success in science and mathematics?

From a biopsychological and cultural historical perspective of race, the identity construction of African Americans who have achieved success in science and mathematics is particularly complex. Because of this complexity, narrative theories of personality provide a valuable theoretical tool for further understanding, not only because of their focus on identity construction, function, and complexity but also because they recognize that “narratives are intelligible within a particular cultural frame, and yet they differentiate one person from the next” (McAdams, 2001, p. 101). Narrative theories are thus valuable guides to understanding and examining how race, from a biopsychological and cultural historical perspective, is represented

in an individual's internalized narrative of self, something not easily accessible because of its complexity.

Self-defining memory, for example, is one narrative theory of personality that provides a useful theoretical framework for developing new understanding of the identity of African American adolescents who have achieved success in science and mathematics. This theory seeks to explain how an individual confronts the challenge of evaluating, categorizing, and ordering all the competing demands of internal and external stimuli such that he or she "fixes" a perception into consciousness (Singer, 1995; Singer & Salovey, 1993). In constructing an understanding of self, how does Malcolm attend to the internal stimuli of understanding a group of which he is a member as "strong minded, intelligent, um hard working people" (see chapter-opening quotation), while simultaneously encountering competing and pervasive external stimuli of persistent racial stereotypes of his group as weak minded, dumb, and lazy (Bobo & Kluegel, 1997)?

Does Malcolm's construction of group-defining traits that are directly opposite those most often associated with his group in society serve a particular adaptive function? Are Malcolm's evaluation and categorization of the external stimuli of racial intellectual stereotypes of African Americans serving not only as a mechanism for him to define himself in the opposite way but also as a motive for his own academic success? Are intellectual stereotypes of African Americans a pronounced and meaningful part of the external stimuli that Malcolm integrates into the construction of his identity?

An individual relies on narrative as a perceptual aid or means of internal sight (Singer, 1995). This internal sight is not just automatic, but is the emergent product of what Singer describes as three hierarchical principles of the I-Self, as well as action on the part of the Me-Self. Singer suggests that the self as subject or knower (I-Self) employs three hierarchical principles of organization—evaluation, categorization, and subsidiation—that facilitate greater and greater distinctions in the I-Self's world of internal and external demands. According to Singer, these principles guide the development of the cognitive, affective, motivational, behavioral, and psychophysiological systems of personality. In turn, the interaction of these systems creates multiple Me-Selves that are composed of the different roles and contexts of the personality. Within each of these Me-Selves are evaluations (valenced responses to self and others), categories (self- and other representations) and sequences in time (the self and others in the past, present, and future). In the context of discussing her academic achievement and success, Karen, for example, defines herself as an active agent in demonstrating having to "prove" her ability to others in ways that were not required of her when she was younger. In constructing her identity, she uses sequences in developmental time that are repeated in the same pattern.

"Well when I was younger, I feel I didn't have to prove myself, but as I got older found that it. . . that you have to. . . kind of do have to prove yourself, so. More when I got older I found that out, but not when I was younger."

Does this repetitive developmental sequence of time and “proof” serve an adaptive function in Karen’s internalized narrative of self? What is the nature of the external and internal stimuli that Karen is evaluating and categorizing in her integrative narrative of what she “found” about having to demonstrate a particular quality or worth or ability in order to “prove” herself?

Like Karen’s segment of identity construction represented here, LaToya’s raises many theoretical questions about the interplay of race, cognition, emotion, and motives for success that are further complicated by a different type of developmental and temporal sequence. In LaToya’s identity construction, what is the psychological meaning of her decision to use the language of emotion? Is there a psychic tax or is ego depletion (Baumeister, Bratslavsky, Muraven, & Tice, 1998) occurring as LaToya tells the researcher about her emotions of having an “attitude. . . . always [being] mad” and feeling “like you always have to get back at everybody else for all the years of oppression and stuff like that”? Is there an interplay among LaToya’s race-related emotion, achievement motives, and understanding of why success is important to her as an African American? Is it possible that racism or “all of the years of oppression and stuff like that” and what her “ancestors went through with slavery” serve as one, of many, motives for her success in science and mathematics? Could understanding the psychological function of this racism help us better understand the type of motives LaToya has for high science and mathematics achievement? Does LaToya’s disposition with respect to racism of the past serve the psychological function of facilitating a belief in her abilities to succeed without ego depletion? In situations and contexts in which she perceives racism, does an understanding of race from a cultural historical perspective actually increase her capacity or willingness to engage in achievement-related behavior?

Race Self Complexity and New Directions for Research on Science Success

In our opinion, Malcolm, Karen, and LaToya reveal in fewer than thirteen sentences the complexity of race in the identity construction of African American adolescents who have achieved success in science and mathematics. What theoretical frameworks exist to explain that for some adolescents, creating an internalized story of self is bound by competing internal and external stimuli, some of which (but not certainly not all) are related to the psychological significance of race? We believe that narrative theories of personality provide a theoretical guide for the development of such a framework. These sentences also illustrate that understanding the self and social processes related to the science achievement of at least these three students would be distorted without a theoretical framework that explains how race, from a biopsychological and cultural historical perspective, is represented in their self system and identity construction.

Although there are many theorists who have contributed understanding to this psychological issue, there has not been an explicit personality theoretical framework developed to guide research on how race is represented in the self system of African Americans at its most complex level and that focuses on individuality, function, and complexity. We believe that such a theoretical framework of race self complexity needs to be developed. We recommend that one new direction for research on the identity of successful African American adolescents is to conduct research to understand systematically how race, from a biopsychological and cultural historical perspective, adds another layer of complexity to the self system and psychologically complicates identity construction.

Such a theoretical framework of race self complexity can be developed through careful, strategic, and complex research design. Emerging from this type of focused research design would be numerous studies conducted specifically to build a theory of race self complexity. In this beginning articulation of race self complexity, we contend that a theory of race self complexity would explain how race, from a biopsychological and cultural historical perspective, is represented within the self system of African Americans and adds complexity to this system. It also would explain how the self system, because of its well-established intricate structure, dynamics, motives, and functions, also creates complexity as to how race is understood, experienced, and socialized by African Americans. This two-way complexity is important to capture in a theory because it has implications for the socialization and personality development of African Americans who live in a society in which the psychological meaning of race at the institutional, individual, and cultural levels requires various patterns of adaptation. For the reasons we have articulated in this chapter, we contend that studying the lives of African Americans who are successful, especially in subjects that are thought to be based on innate ability, would be particularly useful for developing a theory of race self complexity. Race self complexity is proposed as a way to theoretically integrate research on the self (for example, Baumeister et al., 1998; Beach & Tesser, 1995; Krueger, 1998; Robins, Norem & Cheek, 1999) and research on the psychological significance of race (for example, Bowman & Howard, 1985; Boykin & Ellison, 1995; Cross, 1991; Cunningham & Spencer, 2000; Franklin & Boyd-Franklin, 2000; Harrell, 1999; Sellers, Rowley, Chavous, Shelton, & Smith, 1997; Stevenson, 2002; Way, 1998) to capture critical issues of individuality, complexity, and psychological function.

In summary, it is clear from the arguments in this chapter that there are many theoretical issues and questions that require further systematic inquiry to understand how race is represented in the identity construction of successful African American adolescents. As African American high achievers in science construct their academic identity, what is the interplay of cognitive, social, and emotional representations of race? In subjects such as science and mathematics, where success is perceived by many adolescents

to be based on innate ability, are intellectual stereotypes of African Americans a pronounced and meaningful part of the academic identity African American adolescents construct? Does this always have to be a psychological liability, or are there situations in which intellectual stereotypes are part of their motives for academic success?

Conclusion

The purpose of this chapter was to make several theoretical arguments about new directions for research on the identity of African American adolescents who have succeeded in science and mathematics. We have argued that the way that race is represented in African American adolescents' identity construction is theoretically important in understanding their success in science and mathematics. We suggested that race from a biopsychological and cultural historical perspective is a *psychological* context for personality development. Therefore, race should be included in analyses of the human development of African American adolescents. In addition, we argued that narrative theories of personality offer opportunities to answer important theoretical questions about how race, from a biopsychological and cultural historical perspective, is represented in the identity construction of African American adolescents who have achieved success in science. We have approached the question of what new directions are necessary for research on the science and mathematics achievement of African Americans by using the discourse of three adolescents who are high achievers in science to posit a set of theoretical arguments about the complexity of identity of African American adolescents.

We believe that there is a need for scholars of human development to move the study of the identity of African American adolescents from an isolated context—where research on African American adolescents is thought of as contributing to the field knowledge exclusively about African Americans—to an integral context. African American adolescents are human, and therefore some of the discoveries about their identity and success have the potential to contribute to increasing understanding of human development. For example, research on African American adolescents can raise questions about knowledge of human development that has been developed created largely from research with white middle-class participants (Graham, 1994; McLoyd, 1991). In other words, if we are able to develop a theoretical framework to explain how race adds another layer of complexity to the self system of African Americans, it is likely that advances in understanding the function and motives of the self for all humans will be made as well.

In conclusion, it is important to consider the significance of the historical moment in which this chapter is written. Three related Supreme Court cases about race and educational equity have significance in defining the historical moment and the importance of how race is considered in research on science success. In spring 2003, the Supreme Court heard two

cases challenging the constitutionality of the use of race in education, *Gratz v. University of Michigan* (2003) and *Grutter v. University of Michigan* (2003). The court determined that race can be used in educational decision making without offending the Constitution. These decisions suggest that the court recognizes that there continue to be unequal educational opportunities to learn. In other words, the premise of these decisions was that this racial inequity persists in the nation's public education system and should be considered when judging the high school achievement and performance of non-White students for university admission. At the same historical moment, national organizations and institutions throughout the country are celebrating the fifty-year anniversary of the historic Supreme Court case *Brown v. Board of Education* (1954), a case that has been described as the most significant Supreme Court decision about equal educational opportunity in the history of American jurisprudence (Winston, 2003).

Although African Americans have made considerable progress in educational opportunities and attainment in the fifty years since *Brown v. Board of Education* (Nettles, Perna, & Freeman, 1999), the nation has failed to reach *full* excellence and equity in educating all its citizens. This inequity is no more apparent than in science and mathematics. Moreover, this inequity in educational opportunity is occurring at a time when the report by the American Association for the Advancement of Science, *Science for All Americans* (1989, p. 1), asserts the following: "What the future holds in store for individual human beings, the nation and the world largely depends on the wisdom with which humans use science, math, and technology. And that, in turn depends on the character, distribution, and effectiveness of the education that people receive."

This is a historical moment in which psychologists have a critical role to play in research on the self and social processes related to the success of African American adolescents in science. We believe that the research of personality psychologists is critical because of our focus on understanding the person. The new directions proposed for research on the identity of African American adolescents who are high science achievers represent a recycling of history of sorts. In *Brown v. Board of Education* (1954), the psychological research of Kenneth Clark on identity and success of African Americans was integral to the argument advanced in this case that African American students' self-interpretations based on race were negative and self-hating and shaped their educational success. The Supreme Court's decision stated that "a sense of inferiority affects the motivation of a child to learn." Fifty years later, we too suggest that the self processes related to race, from a cultural historical and biopsychological perspective, are important for understanding success of African American students in science and therefore cannot be neglected in research on their academic development. We also contend that how race is represented in the self system of African American students is much more complex than the social science research could have reflected in

1954 because of the limited theoretical and methodological knowledge about race in social science at that time.

As only a few phrases constructed by three adolescents, Malcolm, Karen, and LaToya, reveal, race may be a psychological context for personality development and therefore for understanding success in science. Although understanding this piece of the identity puzzle will not magically create widespread success in science, it will add one of the more vital pieces that has been largely ignored in psychological research, as well as in discourse on national policy, program, and practice. Malcolm's, Karen's, and LaToya's words challenge all researchers who are invested in the future of the nation. Those interested in the success of all students will need to consider race self complexity as an important new direction for research. If it is our hope that fifty years from now, scholars of human development will be able to write the story of the science success of African American adolescents as a population, we cannot afford to silence the profound internal voices of society's Malcolms, Karens, and LaToyas.

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