Perceptions About the Role of Race in the Job Acquisition Process: At the Nexus of Attributional Ambiguity and Aversive Racism in Technology and Engineering Education

Abstract

This study explored the role of race in the negative job acquisition outcomes of African American graduates of a federally funded multi-institution doctoral training program. Because the credentials of African American graduates were similar, equal to, and/or, in some cases, exceeded those of their white peers, qualifications were ruled out as contributing to negative job outcomes. Further examination indicated that among the likely factors accounting for job acquisition outcomes were: tokenism; aversive racism; microaggressions; and inadequate professional development for graduates entering a White-male-dominated field. Recommendations for practice suggest amending graduate programming to include anticipatory socialization relative to being a member of a historically underrepresented group in the field, and mentorship that can help diffuse the impacts of tokenism and facilitate career success in academia.

Keywords: Race, Gender, Tokenism, Professional Development

Twelve individuals—three African American, one non-U.S.-resident African, and eight White—completed the National Technology and Engineering Education Program (NTEEP, a pseudonym), a prestigious federally funded multi-institution doctoral training program. Two years post-graduation, the three African American program fellows were the only graduates who had not obtained permanently funded academic positions. Did the program fail these students in some way? Were they less prepared or less accomplished than their White colleagues? Was the outcome the result of racial bias in the field of technology and engineering education? In this paper, we explore answers to these complex questions through the perceptional lens of the program faculty and fellows and through the theoretical lens of tokenism.

Tokenism is a psychological state imposed upon persons from demographic groups that are rare within a work context (Kanter, 1977a; Niemann, 2003). More than numbers, tokenism is fueled and moderated by antecedents, including subordinated gender status within the context, placement of the demographic group on the social hierarchy, and perception of gender and race appropriateness

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for the occupation (Yoder, 1994; King, Hebl, George, & Matusik, 2009; Stichman, Hassell, & Archbold, 2010; Torchia, Calabro, & Huse, 2011). Consequences of tokenism are behavioral and perceptual and include feelings of isolation and loneliness, visibility and chronic distinctiveness (Pollak & Niemann, 1998), representativeness and role encapsulation, stereotyping and stereotype threat, racism, and attributional ambiguity (Niemann & Dovidio, 1998; Niemann, 2003; 2011).

Tokenism results from the context, not from the qualifications, accomplishments, or character of the tokenized person and not necessarily from intentional prejudices of persons in the workplace, whose biases may be unconscious. These contexts afford exaggeration of differences between tokens and persons who are members of dominant demographic groups within the environment (Kanter, 1977a). Observers in these contexts may: assimilate tokens to their preconceived notions about their group (Sekaquaptewa & Thompson, 2003); question their goodness of fit for a given environment, role, or occupation (Hewstone, Cairns, Voci, Hamberger, & Niens, 2006); or encapsulate group members into particular roles and occupations (King et al., 2009; Yoder, 1994). In addition, tokens may be evaluated under different, and more stringent, criteria than their dominant colleagues (Jones, Dovidio, & Vietze, 2014). For a non-dominant group member, tokenized contexts may trigger feelings of inadequacy (Kanter, 1977b), stigma (Niemann, 2003; 2012), inequity, and intensified attributional ambiguity (i.e., not knowing the intentions of the feedback or actions toward or against them). That is, the individuals perceived do not know if feedback and outcomes are grounded in a fair and equitable evaluation or based on racist or sexist biases.

Tokens may also experience the fear of proving true the stereotypes about one's group, also known as *stereotype threat* (Steele, 1997), which is more pervasive among members of historically underrepresented racial or ethnic groups than gender groups (Thompson & Sekaquaptewa, 2002). For instance, an individual's visibility may create more pressure to take or not take certain actions (Kanter, 1977b). Students and faculty from these groups identify feelings of isolation, expectations to conform, and negative stereotypes (Austin, 2010; Niemann & Dovidio, 1998; Niemann 2003, 2012). They often perceive an overall lack of academic fit (Schmitt, Oswald, Friede, Imus, & Merritt, 2008) and lack of support systems (Poirier, Tanenbaum, Storey, Kirshstein, & Rodriguez, 2009). The lack of critical mass impacts their willingness to speak up, which can be deemed risky for persons in non-dominant groups (Crosby, King, & Savitsky, 2014; Niemann, 2012). Further complicating the issue, research suggests individuals in the numerical minority may feel like imposters, which leads them to discount their achievement and ability and attribute successes to external factors, such as luck or charm (Sekaquaptewa, 2011).

Hiring decisions create tokenized contexts. Due to *aversive racism*, which refers to largely unconscious racial biases and preferences for the in-group

(Gaertner & Dovidio, 2014), it is likely that some of the hiring or decision-making faculty and leaders do not understand the role of race in their perceptions and ultimate decisions. However, there is strong empirical evidence that White persons judge Black persons using different standards than when judging other White persons in employment and other everyday situations. For instance, when Black persons are evaluated for hiring, annual reviews, or promotion, if their profile is short of perfect, inherent biases work against them. In contrast, White decision makers weigh the strongest credentials of White men most heavily in their decision making. That is, White men systematically shift their decision-making standards, depending upon the race of the candidate. For Black men, as well as for White women in White male-dominated professions, decision makers focus on the weakest aspects of their profiles. When they evaluate White men, the same decision makers focus on the strongest aspects of the profile. This process may be largely unconscious, leaving these decision makers to strongly deny that racism or sexism played any role in their evaluation of a candidate (Gaertner & Dovidio, 2014). Dismissal of candidates' credentials and downplaying of their potential contributions may result from decision makers' biases rather than from an objective evaluation of the individual (Niemann, 2012).

About the Study

At the time of this study, NTEEP was a multi-university collaborative network developed to "build research capacity within technology education through development of doctoral programs and students, to build capacity in K-12 technology education to teach engineering design and apply engineering design processes to solve technological problems, and increase diversity and leadership capacity in the field," according to one of the program's principal investigators (PIs). NTEEP doctoral fellows received formal training at their primary base university. The cohort model also brought the fellows together for various courses at one of the partner institutions as well as for conferences, symposia, and travel.

Upon realizing that none of the three African American fellows had obtained a full-time academic position two years after graduation, the NTEEP PIs engaged a consultant, the first author of this paper, to gain insight into these outcomes. Specifically, the consultant was to explore perceptions about whether experiences related to the fellows' membership in historically underrepresented groups within their field led to the unexpected job outcomes. In this qualitative study, the job acquisition process is understood through participants' experiential lens.

All 12 NTEEP fellows as well as program faculty were invited to participate in the assessment. Of the three female and nine male fellows, eight fellows self-identified as White, three as African American or Black, and one as African (non-U.S.-born). Interviews were designed to ascertain participants'

perceptions of demographic factors in the program experience and job acquisition outcomes. Of the faculty members, five were White males, one was a White female who became part of the program after the program's conception and development, and one was a foreign-born African male who retired before the program ended.

Semi-structured, open-ended interviews were utilized to maximize flexibility and create room for the discussion of sensitive topics (Merriam, 2009). Interviews were conducted with nine of the 12 fellows. Two fellows elected not to participate, and one did not respond. All program faculty members participated in the interviews. To maintain the confidentiality of the small number of study participants, respondent quotes are only identified as either fellows or faculty.

An initial 30-minute interview was conducted with each of the nine fellows to begin relationship development between the consultant and fellows. During this interview, the consultant described the purpose of the assessment: to gain further knowledge about fellows' perceptions of socio-demographic factors in the job acquisition experiences. The initial questions verified program participation and completion, current job situations, and racial or ethnic identity. A 1-hour follow-up phone interview probed into fellows' individual experiences and perceptions about the program structure, faculty mentoring, and the perceived role of race, gender, and socioeconomic status in their experiences.

For member checking (Merriam, 2009) and to provide an additional feedback loop, the consultant developed an executive summary of the interview themes and disseminated it to participating fellows. All fellows concurred with the report content. The summary was then reviewed with program faculty via 1-hour semi-structured interviews to increase perception reliability and layered insights about the program and job outcomes. Further, the fellows' scholarly productivity that was publically posted on the NTEEP website was disaggregated according to one of three types: publication, presentation, or grant.

Perceptions About the Role of NTEEP in the Job Acquisition Process

As with most graduate training (Austin, 2010; Hailey, Erekson, Becker, & Thomas, 2005; Griffith, 2010; MacLachlan, 2006; Litzler, Lange, & Brainard, 2005; Malcom & Dowd, 2012), NTEEP's focus was on building students' capacity to conduct original research in their field. Program structure included significant exposure to funding agencies, small seed grants, and paper presentations at program-sponsored symposia, university site visits, and networking with established scholars in the field. All faculty members expressed satisfaction that the program goals had been fulfilled. Fellows also expressed gratitude for the opportunities afforded them by the program:

- "I knew it was important to understand how meaningful research is conducted; [NTEEP] did that well. It gave us the DNA of the research process."
- "I am so grateful for [NTEEP], and the taxpayer who made this possible, and for the faculty and support staff. I don't think I'd have a job without [NTEEP]."

The program's cohort model afforded networking, peer collaboration, and the potential for developing mentoring relationships with faculty members from various universities. Consistent with research indicating that mentoring expectations depend on multiple variables, including faculty or student role, age, experience, and cultural differences, the extent to which fellows availed themselves to networking opportunities varied (Crisp & Cruz, 2009; Savage, Carp, & Logue, 2004). Some fellows believed that respect for and deference to the faculty required that the faculty take the initiative for extending professional relationships beyond the formal requirements of the classroom. Other fellows believed that the success of networking and professional relationship building was their responsibility and incumbent upon their own initiative.

- "[The program] faculty were very professional. They were all concerned with our well-being, but not about collegiality. They made it clear they were the faculty and we were the students."
- "It's each man or woman for him or herself, but the men seem to more naturally form networks and friendship groups that women are left out of."
- "The vehicle was [NTEEP] but I was the engine. I got to drive the sports car but it requires someone to take initiative."

Although faculty members agreed with the importance of networking for success in the field, the development of those skills was not specifically addressed in the curriculum, nor was there an assumption that it should have been a formal part of the program.

- "I'll respond when they come into my office under stress, I'll listen, but it's not my job to be buddy-buddy with them."
- "Some in the [NTEEP] network were narrow minded. About half of the faculty were open minded about working with minorities outside of those they advised, others were content with the status quo."
- "Networking has to do with maturity and personality. It's available to everyone."
- "The area of technology education is that way. Professors are called 'doctor.'"

Fellows across demographic groups, including White males, indicated that a discussion of the impact of race or gender in the workplace and in their careers and how to navigate these challenges when they are experienced might have served them well as researchers and as future leaders in their field. The program's structure has proven particularly disadvantageous for persons from

historically underrepresented groups, who may face additional obstacles in fitting in at institutions that lack diversity (Gaffe & Pruitt-Logan, 1998; Smith 2000). This research-based model often fails to address many of the nuances that entail success in academia (Gaffe & Pruitt-Logan, 1998; Poirier, Tanenbaum, Storey, Kirshstein, & Rodriguez, 2009; Smith, 2000).

- "My major Faculty was honest about the difficulties I would encounter, but it was never brought up in class or during conferences or seminars."

Faculty members expressed varying levels of concern that a lack of discussion on race or ethnicity and gender seemed to have such a negative impact on some fellows' experiences. Race concerns were simply not part of their awareness. A few expressed hesitancy and discomfort with the idea that race might matter in the job acquisition process.

- "Two years ago, they had a research symposium at [a partner campus]. One panel dealt with diversity issues; all three African American [fellows] were on that panel. It became uncomfortable. Panel members got into the issues and got no response."
- "I guess we could have done better but it's a challenge with the state of the field, mostly White male, and with lack of knowledge of faculty in this area."
- "Race/gender was not a factor in jobs. There were issues in getting a job but they were related to the economy, not race or gender. It was very competitive."
- "I wouldn't know how to give female or minority guidance but I agree that it's difficult for minorities and women to survive in that world."

The Perceived Role of Biases in the Job Acquisition Process

All respondents were directly asked to speculate about what role, if any, race may have played in the job acquisition outcome. They suspected that race may have been a factor in the lack of success in the job search process, but one that was subtle, covert, difficult to document, and very difficult to know how to navigate.

- "I don't know if race or gender mattered, but my department is mostly White male and there's lots of talk around the university of needing to improve diversity."
- "It would be naïve to say that being a White male didn't make a difference in getting my job and my success in my environment, but it's hard to articulate and prove."

Fellows' quantity and quality of scholarly productivity was not sufficient to account for different job acquisition outcomes. As indicated in Table 1, scholarship outcomes, indicated by publications, presentations, and grants, varied within each racial group. Table 1 shows scholarly activity aggregated according to type—publications, presentations, or grants—with each item being awarded 3, 2, and 1 points, respectively. These points were awarded in order to

take into account the importance of each activity type in the competitive application process for tenure-track positions.

Table 1
Fellows' Scholarly Productivity Scores

Race	Research Interest	Score	Position at Time of Study
White	Professional Development	74	Tenure Track
African American	Mentoring, HS, Race, Gender	34	Research Consultant
African	Metacognition	26	Tenure Track
White	HS, Systems Thinking	15	Tenure Track
White	Creativity	14	Tenure Track
African American	Meta-cognition	10	Adjunct Faculty
African American	HS, Self Efficacy, Race	6	Post-Doctoral Fellowship
White	Student Learning	5	Community College Director
White	HS, Engineering	0	Tenure Track

As reflected in the range of productivity scores, some fellows structured their scholarly activity in ways that maximized perceptions on productivity. A closer examination of the publications, especially those who had an exceptionally high number, revealed that some were very short (1–2 pages) essays or articles, theme papers that were divided into multiple publications, and some were in non-peer-reviewed venues. However, it is important to also note that perhaps some of these fellows were not consistent with making the full spectrum of their scholarly activity publically available through the NTEEP website.

Overall, fellows did not definitely know, nor could they prove or disprove, the role of biases in the decision compared to the role of their demonstrated competencies. They were left with lingering suspicions and attributional ambiguity that race mattered in the decision or evaluation (Crocker, Voekl, Testa, & Major, 1991; Niemann, 2003, 2012).

- "Racism is still an issue, but I don't know if it affected my job search. Race matters in society but not for me personally."
- "I don't know if race/gender matter, but I've been in much more diverse universities. Experience plays a more important role than gender. I don't know about race."
- "I don't think race mattered; some of the adjuncts are Asian and African American, but all my colleagues [tenure-track professors] are male, so gender might matter."

Faculty members had varying theories about the job acquisition outcomes. Some speculated that African American males and females across race or ethnicity, due to their paucity in the field, may have a higher bar than White peers to prove their qualifications and fit for an academic position. They conjectured that African American students might have to go out of their way to demonstrate their good personality, "team player" attitudes, and collegiality

before they could get an interview. Tacit in their comments was the idea that these attributes may be taken for granted for White males but unknown or questioned about students of color. Other faculty members speculated that African American fellows might have to apply for more positions than their White male colleagues to have a chance for an interview. They would then need to engage in more interviews than their White male colleagues to eventually be perceived as a good fit for the hiring department.

- "Being minority in the field is not a barrier as long as they're productive and visible at national conferences and writing. They'll be okay."
- "Being Black was a factor for those who didn't get jobs; they were just as qualified and motivated as those who did get jobs. The field is White-male dominated with people who are only comfortable around people who look and think like them."
- "Race plays no role; people don't care about background. In fact, people might look more kindly upon Blacks/Hispanics/women due to lack of their groups in the field."
- "Students were given all the skills they need to get a job; and it's up to them to put those skills to use. If they don't get a job it's because of their lack of skill and/or motivation, and not about bias in the workplace."

Fellows were also asked to indicate what, if any, role they believe gender played in this process. Again, responses reflected the complexity of the question and subjective perceptions.

- "I don't believe that race has any impact on the work environment, though gender might matter because all of my colleagues are male and the department has been talking about the need to hire females to be role models."
- "Snide comments are made. It's a systemic issue. It's a very political culture."
- "I think my experience played more of a role than being male (in getting a job). I was told I was a very good fit for the job."

Other fellows noticed *microaggressions* in the workplace and program. "Racial microaggressions are the brief and commonplace daily verbal, behavioral, and environmental indignities, whether intentional or unintentional, that communicate hostile, derogatory, or negative racial, gender, sexual-orientation, and religious slights and insults to the target person or group" (Sue et al., 2007, p. 273). For instance, one program faculty member reportedly told students, "We're supposed to address gender, so for this project, the motorcycle will be pink." Faculty members were disturbed but not necessarily surprised by the occurrence of insensitive remarks.

- "The pink motorcycle comment doesn't surprise me, because it's a group [the Faculty] that hasn't thought much about race or gender."

- "I'm disgusted by the pink motorcycle comment. It makes me sick that they said that."

Recommendations for Practice

When it comes to entry into the academic job market for faculty of color, race matters (Law, Phillips & Turney, 2004; Rai & Critzer, 2000; Stanley, 2006; Turner & Myers, 2000). Although the numbers of White women and people of color in the field are growing, they are still entering a White-male-dominated field. As such, even the most well regarded programs can be unprepared to address the challenges of students from underrepresented groups. The perceptions and suspicions of some program students and faculty cannot disregard the student demographics, especially in a field dominated by White male faculty. In many ways, perception is reality (Bem, 1972). Superficial attention to and silences about matters of race or ethnicity and gender are inconsistent with recommendations from research literature (Tochluk, 2010). For example, in a study on tokenism, researchers found that the perceptions of the field can influence perceptions of climate (King et al., 2009). When students make comments such as "I didn't want to have the burden or responsibility of speaking for all females" or "snide comments are made. It's a systemic issue," it is an indicator about the need to change.

For the field of technology and engineering education, and even generally for STEM fields, to be accessible to members of historically underrepresented groups, graduate education will benefit from restructuring professional development curricula and programming (Austin, 2010) to include meaningful mentoring with anticipatory socialization that will better prepare persons entering a White-male-dominated field by helping them navigate the politics of racism and sexism (Heilman, Block & Stathatos, 1997; Stanley, 2006; Sue, 2010; Vargas, 2002).

NTEEP faculty, however well intentioned, may not have understood the unique preparatory needs of White women or of men and women of color. The proactive engagement of faculty with these topics can instill confidence in students and, if done knowledgeably, can prepare students to engage environments in which they will have solo or token status. Mentoring and professional development may be especially critical to persons who are underrepresented within a field. As visible minorities in their field, they need confidence that they will fit and be respected and welcomed in these environments. Such comments, when spoken by a faculty member, can impact the climate and feelings of belonging in the field. Specific recommendations for practice include the following.

First, discuss the possibility of experiencing the collective psychological effects of tokenism, including how to navigate the situation. Students need to know that tokenized situations exist in the workplace and that consequences are a function of the context not their competence. Faculty need to rankly discuss

issues of racial and gender biases in the field. For instance, faculty might discuss conscious and unconscious biases in the field that may impact the perception of students' fit for a position, which is oftentimes synonymous with hiring committees preferring candidates with similar ethnic, racial, cultural, and gender backgrounds (Heilman, Block, & Stathatos, 1997; Rai & Critzer, 2000; Niemann, 2012; Sue, 2010; Vargas, 2002).

Second, faculty should seek to develop trusting relationships that can diffuse issues of attributional ambiguity. Not knowing whether feedback is genuine or is related to prejudice makes it difficult to gauge one's skills and abilities and what actions one needs to take to improve. It can stop professional development, halt career trajectories, and undermine self-confidence (Crocker et al., 1989; Niemann & Dovidio, 1998; Niemann, 2011). Knowing can help diffuse the impact of conscious and unconscious bias and stereotypical beliefs (Steele, 1997, 2010).

Third, address stereotype threat, which is defined as the fear of proving true the stereotype about one's group (Steele, 1997, 2010). Strategies that can diffuse this identity threat include becoming "alert to how the features of a setting affect people and change them so that they don't disadvantage certain groups" (Steele, 2010, p. 183–184) and helping people understand the safety that they do have in a given setting (Steele, 2010).

Fourth, prepare students for the possibility that they will experience daily microaggressions based on their race or gender. Such discussions may facilitate anticipatory socialization, which refers to the ways that student's academic and career aspirations can be influenced by institutional policies and practices (Hurtado, Newman, Tran, & Chang, 2010). Such socialization may also anticipate best interview strategies and presentation of qualifications of members of historically underrepresented groups in the field, thereby increasing the likelihood of success in the job acquisition process.

Conclusion

The job acquisition outcomes for the African American candidates was not inevitable. To be sure, responsibility for ensuring equitable opportunity during the job acquisition process is to be shared amongst program faculty, hiring faculty, and the fellows themselves. Nevertheless, the case of NTEEP can be interpreted as a story of successful recruitment and retention of members of historically underrepresented groups within the technology and engineering education fields but as a failure of adequate professional development for graduates entering a White-male-dominated field. The findings and recommendations in this paper are consistent with those in the National Research Council (2013) report, *Research Universities and the Future of America: Ten Breakthrough Actions Vital to Our Nation's Prosperity and Security*. The report states that increasing the numbers of historically underrepresented groups in STEM fields is especially urgent for the United

States to remain globally competitive in the economic market. The future of STEM fields, including technology and engineering education, may depend upon the interest and success of persons who have been historically underrepresented in these fields (White, Altschuld, & Lee, 2006). Both may be facilitated by enhanced professional development within graduate programs. Graduate programming that includes professional development will benefit all students. Clear expectations and mission statements about the role of race or gender in the program may increase sensitivity and awareness.

In many ways, men and women of color may be canaries in the academic coal mine warning us of the toxic academic environment for members of historically underrepresented groups within the field (Torres & Guinier, 2003). We need to engage in meaningful, yet difficult, conversations and anticipatory socialization about the likelihood that White women and men and women of color may be working in White male-dominated academic contexts. As one faculty member stated, the African American fellows not getting permanent positions "is an indictment of [NTEEP]. In hindsight, we should have provided [professional development]. This could be a weakness of graduate preparation in other disciplines, as well." Conversations about tokenism, attributional ambiguity, and aversive racism can encourage trusting, mentoring relationships and prepare students to navigate the political and psychological consequences of tokenized academic contexts. When leaders consider the role that White male dominance has played, everyone, but especially those most vulnerable, can benefit.

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