WIP: An Exploration of the In/Authentic Experiences of Engineers

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Abstract

This paper is a work in progress (WIP) assessing how engineers view aspects of the workplace culture affecting the extent to which they can authentically be themselves. Our conceptual framework includes Faulkner's [1] concept of in/authenticity and Kendi's [2] history of racist ideas in the U.S. In this paper we present experiences of three engineers working at the same company, which were collected as pilot data for an NSF-funded study. We found that the two White engineers saw no distinction between their personal and work identities. They saw the company's values aligning with their personal values, and the workplace as being open and comfortable. In contrast, the Black engineer described taking on different identities in business settings and one-on-one interactions. Several instances of structural racism were identified including lack of attention to racial diversity while hiring, lack of diversity in the workplace, and colorblind attitudes. All participants saw the advantage of diversity, yet little action was taken to improve diversity in their company. With this project we intend to illuminate the experiences of Black engineers, and to make industry stakeholders more explicitly aware of diversity issues.

Introduction and Background

Although efforts have been made to diversify engineering, actual progress has been limited [3]. In 2016, 47.6% of engineering degrees were awarded to graduates who were White yet only 3.32% were awarded to those who were Black [4]. Although increasing numbers in the workplace is important, this effort alone is insufficient. Diversity is "an asset, an enabler that makes teams more creative, solutions more feasible, products more usable, and citizens more knowledgeable. Diversity arguably makes any profession, but especially science and engineering, more competent" [5, p. 73-74]. The history of engineering shows that its culture has been defined and dominated by White engineers [6]. As a result, Black engineers experience putting on and taking off masks [7], [8] as needed to un/cover their authentic selves to survive the culture of their workplace. Unfortunately, little research has been conducted to understand the professional experiences of Black engineers. Generally, it has been found that people of color face significant barriers in the workplace [9]–[14].

One critical aspect missing from prior investigations is the explicit examination of Black engineers' experiences with racism. Engineering education research has not typically addressed racism directly, yet it is the root of all racial barriers and negative experiences. With this project, we aim to add depth to workplace research through narrative analysis of both the structural and individual acts of racism affecting the experiences of Black engineers.

Methodology

This work in progress is part of a larger narrative analysis project aimed at investigating the workplace experiences of Black engineers in the technology industry [15]. For this paper, we focus on initial data that were collected within the pilot phase of the project. The study was framed by complementary conceptual and theoretical frameworks. At an individual level, we

used Faulkner's [1] concept of in/authenticity to understand how the workplace culture affects an engineer's ability to be their authentic self. At a structural level, we used concepts from Kendi's [2] history of racist ideas in America to explore racism, specifically his categorization of approaches to racism (segregationist, assimilationist, and anti-racist) and his description of the roots of racism in the desire for advantage.

The data presented were collected from three participants; one self-identifies as a Black male and two as White males, working as engineers within the same company. Two semi-structured interviews were conducted with each participant using Zoom. Each interview was conducted by interviewers of the same race and gender as the participant. The first interview was structured to solicit narratives about their early experiences that led them into engineering including grade school experiences, influential people, and other factors that molded them. The second interview explored their workplace experiences, probing topics such as professional identity, workplace climate, and diversity.

Data were analyzed using a multi-step process that integrated Polkinghorne's [16] criteria for narratives and Doucet and Mauthner's [17] Listening Guide as outlined by Pawley and Phillips [18]. This process included transcriptions and multiple readings through the different lenses of our frameworks [15]. The last step in data analysis involved creating a storied narrative for each participant.

Selected Findings

Interviews were conducted with three male engineers who all work at the same company. William is Black, while John and Frank are White. Both William and Frank were raised in the US. John was raised in France and lived there his entire life until joining his current company 12 years ago. All three are in leadership positions. Due to space limitations we present a summarized narrative of just one of the engineers, William. In the Discussion we compare the experiences of the three in light of our theoretical frameworks.

William

At a young age, William was faced with a teacher who led him to have a prove-them-wrong mindset. She said he had "dumb luck" when he got better grades than a fellow White student, which stuck with him. He worked hard and ahead of his peers in order to "prove her wrong" and to "prove to [himself] that it wasn't luck." This led William to the top of his class, which guided him to engineering in college. He grew up surrounded by a Black community. Upon arrival to a large predominantly White university, he felt isolated. There were tensions and racial division at his university. During this time, he met his girlfriend who became his wife. William's father-in-law became an influential figure because of his advice that "there's going to come a point in time where you're going to need to be around people who are like you that may not look like you." William has carried and applied this advice throughout his life. William stated that "because from a socioeconomic status and…I want to provide for my family, these are people that are like me, but they don't necessarily look like me."

William graduated college and worked at a large company where he previously interned. Twelve years ago, he left that company in order to begin his time at his current place of employment. During the time of the interview, William was in a leadership role and recognized that the company gave him opportunities to define a career path that did not exist before he began working there, but he questioned the rate of his advancement. He "has not been shy" to have conversations about his "desire to advance", but when the time came "it was always this kind of pause or reason." He has seen a varying length of time (2-10 years or more) for others to be promoted into his desired position. William described the company as diverse, but diverse "in pockets." He has very few peers on his level that he can relate to. He felt that the percentage of Black employees was only about 2-3%, but he blamed this on a national issue because the US population was only 14% Black. The company's main hiring source for new employees was a large local university, and they hire based on experience, not diversity. Recruiters searched for candidates with one to three years of job experience, often through internships, and invest in training them for positions that typically require more years of experience. Despite this, he recognized that his company has an "affirmative action program" and conversations to start a more serious effort in diversifying the workplace. He stated that the company must be willing to "bring [individuals] on as a promotion based on their potential…not necessarily what they demonstrated as their performance."

William recognized that he needed to conduct himself differently depending on the situation he was in. In meetings or when he took charge of initiatives, he portrayed himself as a "commanding force." His personal, emotional self appears when he engages in one-on-one conversations. During the development of his team, he did "not project and give [his] perspective, [his] opinion" in order to "let things evolve." William has had meetings where he was the most senior person present, yet his counterparts directed the conversation towards his subordinate. He always brought his "A-game" and kept his personal life at home. He said that he did this "based on race." William felt that because of "that social element and people not having the opportunity to know [him] outside of [the workplace], it has hurt [his] progression… relationships matter." William lived with the mindset that he was in control of his destiny. He believed that his position was "non-negotiable." Every year, he needed to feel as though he was "growing in [his] influence, in ability to get things done, and in [his] voice." If that was not happening, he needed "to somewhere else to be."

Discussion

The two White participants described shared values and authentic experiences within the workplace. They had little to no personal divide between work and social life leading to authenticity. Work was personal and they had solid relationships within the company. They both held leadership positions that were obtained at a reasonable progression. The Black male participant described a bifurcated experience within the workplace. William portrayed having to switch between being inauthentic and authentic. William was authentic in asking for what he wanted and recognized that if his voice was not being heard or he was not getting what he deserved, then he had control of his destiny and had the power to be somewhere else. Related to inauthenticity, William consciously shifted personas between work and home. He left his emotional side at home and was a commanding force at work. He identified as an "extreme professional." William described that he deliberately did not bring his family to work events,

attend happy hours, or befriend coworkers. Because he described this separation as being "based on race," we interpreted his experience as inauthentic in comparison to the White participants. William also experienced isolation because of the lack of peers on his level in the workplace.

Structural racism was reflected in various forms throughout the interviews. All three participants described the hiring process as based on merit. This can prove to be disadvantageous to minoritized individuals, given they often don't have the same opportunities to get the same experiences as White candidates. Hiring was frequently done at a local predominantly White university. All participants blamed the lack of diversity on pipeline issues, meaning there are not many applicants from diverse backgrounds. Their best approach to hiring was to hire interns while they are completing graduate school at the local university. One issue with using just this avenue for engineering interns is that across all of engineering at that university, master's students are less than 1.5% Black, and PhD students are less than 5.5% Black. Thus, the unequal representation within the structure of engineering education at the local university trickles into the workplace of this company. There was talk, but no action to improve diversity. Efforts to diversify while hiring could simply include seeking candidates from other universities.

The participants hired "folks that you feel have the stamina, that have the drive" to "go the extra mile." Specifically, they searched for interns that possessed and proved these qualities throughout their internship with the company. One of the White participants, John, gave an example of an ideal intern for hire, describing the intern as staying late on Fridays "to fulfill the needs of customers." In essence, the participant described the culture of the company as you must work hard, and if you don't, you aren't a team player. You must prove that you are "willing to go the extra mile." Your work ethic isn't defined by your position or expectations, rather it is defined based on a comparison to other employees. This becomes an issue with race because of the pressures felt by Black engineers to outperform White engineers 3-5 times in order to be considered equally qualified [10]. The heightened pressure to "go the extra mile" may be unattainable for those who already push past this point to reach equal consideration.

Applicants and employees were described as needing to fit into the company values. These values were integrity, compassion, teamwork, excellence and stamina. Although these company values are common within various workplaces, they are often set and defined by White normativity. One participant described the company as "Everybody [is in] the same boat rowing in the same direction." Essentially, this is a colorblind approach where employees must blend or conform to the culture of the workplace in order to succeed [19]. With this atmosphere, the workplace is not very welcoming of different approaches towards solutions. This means that employees should conform to White normativity, causing some to hide their unique assets.

None of the participants described instances of blatant racism within the workplace. No segregationist acts were identified, yet no instances of antiracism were found either. Each participant displayed multiple assimilationist actions, including William, the Black engineer. For the most part the participants displayed a colorblind, liberalistic approach to race [19], meaning that they saw no differences or discrimination. William persisted with the advice of his father-in-law and is now at a point where he has fit into the culture of his workplace. To him this feels authentic, although it also represents an assimilationist act because he blends into the workplace culture rather than expressing antiracist acts such as calling out the need to depend on diversity.

The participants and other characters within the narratives believed that people should just blend to fit into White normative ways that defined the workplace.

Future Work

The project that the pilot data were collected from is now in the data collection phase. The pilot data allowed us to tailor the interview protocol in order to elicit more detailed responses from participants. Currently, we are interviewing engineers to hear their workplace experiences related to inauthenticity and the history of racism. We intend to use the narratives in order to raise awareness of conditions in workplaces, promote attitudes of cultural change, and move further than simply adding more numbers for diversity within engineering. With these efforts, we hope to increase support and action towards more diverse and inclusive environments.

Acknowledgement

References

[1]   W. Faulkner, "Doing gender in engineering workplace cultures. II. Gender in/authenticity and the in/visibility paradox," *Eng. Stud.*, vol. 1, no. 3, pp. 169–189, Nov. 2009, doi: 10.1080/19378620903225059.

[2]   I. X. Kendi, *Stamped from the beginning: The definitive history of racist ideas in America*. New York: Nation Books, 2016.

[3]   A. L. Pawley, J. A. Meija, and R. A. Revelo, "Translating Theory on Color-blind Racism to an Engineering Education Context: Illustrations from the Field of Engineering Education," presented at the ASEE Annual Conference, Salt Lake City, UT, 2018.

[4]   Data USA, "Engineering | Data USA," 2019. [Online]. Available: https://datausa.io/profile/cip/engineering#employment. [Accessed: 13-Dec-2019].

[5]   D. E. Chubin, G. S. May, and E. L. Babco, "Diversifying the Engineering Workforce," *J. Eng. Educ.*, vol. 94, no. 1, pp. 73–86, Jan. 2005, doi: 10.1002/j.2168-9830.2005.tb00830.x.

[6]   A. E. Slaton, *Race, Rigor, and Selectivity in U. S. Engineering: The History of an Occupational Color Line*. Harvard University Press, 2010.

[7]   G. E. Anzaldúa, *Making Face, Making Soul - Haciendo Caras: Creative and Critical Perspectives by Feminists of Color*. San Francisco: Aunt Lute Books, 1990.

[8]   P. L. Dunbar, *The Complete Poems of Paul Laurence Dunbar: With the Introduction to "Lyrics of Lowly Life,."* Dodd, Mead, 1913.

[9]   S. A. Hofacker, "Career Self-Efficacy as a Means of Understanding the Gap Between Career Attainment and Opportunity for the U.S. Government Black Engineer," Ed.D., The George Washington University, United States -- District of Columbia, 2014.

[10] T. S. Gibbs, "From retention to detention: A phenomenological study of the African - American engineer experience," Ph.D., Walden University, United States -- Minnesota, 2008.

[11] D. Rice, "The Career Experiences of African American Female Engineers," presented at the Adult Education Research Conference, Toronto, ON, Canada, 2011.

[12] M. S. Ross, "A unicorn's tale: Examining the experiences of Black women in engineering industry," *Purdue Univ.*, p. 376, 2016.

[13] G. A. Dotson, "No employee left behind: The lived workplace experiences of inclusion /exclusion of African American engineering professionals within the semiconductor industry," Ph.D., Capella University, United States -- Minnesota, 2008.

[14] E. P. Douglas, P. G. Richardson, and F. Dupuy, "WIP: Racialized experiences of Black engineers.," in *Paper presented at the ASEE Annual Conference, Columbus, OH.*, 2017.

[15] E. P. Douglas, E. D. McCray, and G. A. Dietz, "The In/Authentic Experiences of Black Engineers," in *Proceedings, ASEE Annual Conference*, Tampa, FL, 2019.

[16] D. E. Polkinghorne, "Narrative configuration in qualitative analysis," *Int. J. Qual. Stud. Educ.*, vol. 8, no. 1, pp. 5–23, Jan. 1995, doi: 10.1080/0951839950080103.

[17] A. Doucet and N. S. Mauthner, "What can be known and how? Narrated subjects and the Listening Guide," *Qual. Res.*, vol. 8, no. 3, pp. 399–409, Jul. 2008, doi: 10.1177/1468794106093636.

[18] A. L. Pawley and C. M. L. Phillips, "From the mouths of students: Two illustrations of narrative analysis to understand engineering education's ruling relations as gendered and raced.," presented at the ASEE Annual Conference, Indianapolis, IN, 2014.

[19] E. Bonilla-Silva, *Racism without Racists: Color-Blind Racism and the Persistence of Racial Inequality in the United States*. Rowman & Littlefield Publishers, 2006.