Racial Microaggressions within the Advisor-advisee Relationship: Implications for Engineering Research, Policy, and Practice

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The underrepresentation of Black men in engineering highlights a missing segment of the population who could contribute to the knowledge economy.[1] An increase in Black men in engineering could lead to an increase in Black faculty members – and in general, role models – who could teach and inspire future generations of students in science, technology, engineering, and mathematics (STEM). To address this national concern, stakeholders must first identify prevailing issues such as racial microaggressions, which threaten the long-term participation of Black men in science and engineering.

In this paper, we define "racial mircoaggressions," illustrate how and in what ways they manifest within an important engineering educational context, the advisor-advisee relationship, and highlight the deleterious effects they have on Black men graduate students in engineering. Finally, we offer implications for research, policy, and practice that can improve the teaching and learning environment for Black men students who regularly face racial microaggressions in engineering. By addressing the practices and activities that have the potential to deter students from sustained participation in engineering, we may be able to increase the number of Black men who enroll, remain in, and complete engineering graduate programs.

Literature on Graduate Advising Relationships and Racial Microaggressions

The nature of the advising relationship impacts a number of student outcomes; the most commonly cited in higher education research are time-to-degree, productivity, academic sense of self, and completion rates.[2,3,4] Because of these potential outcomes, the advising relationship is often considered a mentoring relationship where the advisor helps the advisee learn about – and become socialized to – the academic field of study, the university, research, ethics, and many other important aspects related to being a graduate student.[5] Advisors can display a caring interest in students' welfare, helping students navigate anxiety and culture shock that may accompany undertaking a new endeavor in an unfamiliar place. Additionally, the advisor can help students network by making new contacts and gaining exposure to other faculty, advanced students, and members of their broader professional community.[6,7]

The advisor-advisee relationship is complex and life-changing; one's advisor can help to generate ideas about and support for postgraduate career choices, and help influence students' professional identity.[8] In fields like engineering, where the academic advisor may also serve as a student's research supervisor,[8] the advisor-advisee relationship includes myriad power dynamics. As a result, the advising relationship could have positive and/or negative effects on graduate students,[9] including but not limited to feelings of accomplishment and progression, or disappointment and failure.[2]

The extant literature on advising tends to talk about these relationships across fields of study (for example, including samples from social sciences, humanities, and, natural sciences; see Barnes & Austin, 2009 for example). A more nuanced approach that focuses specifically on students within engineering would provide detailed examples of how engineering advising relationships impact students.

One element of advising relationships that may have negative effects on graduate students is "racial microaggressions." The construct "racial microaggressions" is gaining a considerable amount of attention in higher education and psychology literatures, and even in news outlets. This increased attention highlights a growing discourse around the experiences of individuals from underrepresented groups. To capture the broad conversation, we begin by explaining what racial microaggressions are, how they are sometimes displayed, and their effects on individuals. We also share recent scholarship on how racial microaggressions impact college students.

Racial microaggressions are typically described in the literature as subtle (or not so subtle) comments or behaviors, unfair treatment, stigmatization, hyper surveillance, and personal threats or attacks on one's well being.[11] Racial microaggressions can be brief or reoccurring. They tend to surface through daily verbal communication, as well as behavioral and environmental policies and practices, whether intentional or unintentional. Whether brief or ongoing, the message remains the same; racial microaggressions denote "otherness" and are interpreted by recipients as insulting. The consequences of racial microaggressions are still being explored, but existing scholarship acknowledges the psychological stress experienced by victims of microaggressions.[11]

Racial microaggressions exist in a variety of contexts (e.g., academic and non-academic), which indicates that no matter where people of color go, they are inundated with messages that they are different. However, this paper focuses on how racial microaggressions take place on college campuses. Within existing scholarship on underrepresented students of color attending predominantly White institutions, students overwhelmingly describe the campus climate as being hostile, isolating, and unwelcoming.[12, 13] For example, Black students on these campuses routinely report confronting negative comments and stereotypes from White instructors and peers.[14] As a result of these confrontations, students feel obligated to validate their intellectual competence in the classroom and affirm their rightful position at their institution.[15,16] In other words, students feel obligated – and as a result, attempt – to disprove implicit and explicit assumptions made about them.[17] In colleges and universities, students of color are not only striving to complete academic work, they are simultaneously managing psychological feelings of inadequacy brought on by racial microaggressions.

Several studies find that some perpetrators of racial microaggressions are unaware that they engage in such communication and behaviors when they interact with people of color.[18, 19] This lack of familiarity with how one's own actions impact other individuals poses some challenges to eradicating these behaviors. Detailed scholarship on how racial microaggressions present themselves in domain-specific contexts, like engineering education, remains absent from the higher education literature. Identifying these harmful behaviors is important because racial

microaggressions are likely to impact student retention, achievement, sense-of-self, and identity as an engineer. Highlighting the voices of students who experience racial microaggressions within engineering may provide helpful illustrations of the messages and behaviors some students perceive as being detrimental to their academic achievement in engineering.

Theoretical Framework

In engineering fields, students' experience with research, and their relationships with their faculty advisor and peers, appear to be most germane to shaping students' learning, their professional identity, and graduate experiences.[8] To more fully understand how individuals learn – and how their identities develop – through interactions and participation with others, this paper draws on sociocultural perspectives on learning as a theoretical framework. From a sociocultural perspective, learning occurs through the co-construction of knowledge and interactions with others within a given community.[20, 21, 22, 23] This theoretical framework suggests that what students learn and who they will become (e.g., professional and personal identity) is related in large part to their various contexts, their interactions with others in their community, and how they participate in their community.[22] Sociocultural perspectives on learning allow a holistic view of the factors that shape students' teaching and learning environment, and the impact they have on students' learning and identity development.

Drawing on sociocultural learning perspectives, the following research questions guide this study: 1) What do racial microaggressions look like within the engineering advising relationship? 2) What effects do racial microaggressions have on Black men in engineering graduate programs?

Methods

Data includes interviews from 11 Black men engineering graduate students from a large Midwestern research institution. Interviews were chosen to highlight students lived-experiences through their often unheard voices.[24] Students were interviewed using a semi-structured interview protocol,[24] where a standard set of questions guided interviews and the principal investigator had the flexibility to ask follow-up questions where necessary. Interviews ranged between one and approximately two hours. Participants were asked questions about their collegiate background, doctoral experiences, and identification with and intentions to remain in engineering. Some sample questions from the interview protocol include: What influenced your decision to go to graduate school; What were your expectations of [Midwestern Research University] prior to enrolling; How have your actual experiences differed from or aligned from the experiences you were expecting to have here; Did you ever consider leaving graduate school; and What programs or resources do you wish were offered to keep Black men enrolled in graduate school? After data were collected, audio recordings were transcribed verbatim to capture participants' meanings in their own words.

Because this study focused on the construct of "racial microaggressions," the researchers needed to establish a baseline understanding of the nature of racial microaggressions and how they might be represented in the transcript data. The team of five researchers read articles to become familiar with the concept of "racial microaggressions" and to help them think about how racial microaggressions are represented in textual data in the higher education literature (see for example Smith, Allen, & Danley[2]). After reading the articles, the researchers discussed what they believed racial microaggressions were, and how they might be presented in this study's data, yet agreed to remain open to new representations of racial microaggressions described by study participants.

Both deductive and inductive analytical approaches were used to analyze the data. For the first round of analysis, transcripts were divided among researchers so that each transcript was reviewed by two researchers. Thematic analysis was used to analyze the interview data. Thematic analysis helps to identify patterns in text data.[25,26] This analytical method was selected because the preliminary data was to be reviewed among multiple researchers. The flexibility of this method allowed for the discovery of patterns, discussion among reviewers, and explicit connections to existing literature.[25] The first review of the data used a deductive approach, searching for evidence based on existing, a priori knowledge. Each reviewer read through the transcripts and identified areas that captured how students experienced racial microaggressions within the engineering context. Additionally, reviewers noted the ways in which microaggressions impacted the students who were interviewed. After highlighting potential areas that addressed the research questions, the researchers met as a team to discuss their initial thoughts. At this point, an inductive approach to data analysis was used. The researchers focused on instances of racial microaggressions between students and their advisors. They considered how students' interpretations were similar and different, and where different, discussed the nuanced dimensions. For example, considerations were noted pertaining to how interactions between students and advisors exemplified racial microaggressions, participants' feelings after being microaggressed, and other outcomes that resulted from offenses. Finally, the findings were organized into themes.

Several steps were taken to ensure the quality of the findings. First, after the transcriptions were produced, the audio recordings were checked against the transcripts to verify the accuracy of the data. Second, transcripts were sent to participants to verify the accuracy of content and meaning; no participants responded with changes to their transcriptions. Finally, because five researchers analyzed the data, and the five had various backgrounds and perspectives, the researchers reflected on their positionalities and subjectivities. This process of being reflective helped them acknowledge who they were – and the biases they held – relative to the data. By engaging in these practices, the researchers were able to acknowledge – and to the extent that it was possible – separate their biases from the data they analyzed. Afterwards, the researchers compiled their findings, and came to consensus with regards to this study's findings.

Findings

Findings from this study illustrate that Black men in engineering graduate programs engage with their faculty advisors in various educational spaces, including communication in one-on-one meetings, interactions in the laboratory, and occasional casual conversations. Through these interactions with faculty advisors, students described encountering both positive and negative experiences that shaped how they valued the advisor-advisee relationship. Equally important, students revealed how they processed, coped with, and addressed subtle and overt racial microaggressions within the situational and engineering context.

Racial Microaggressions within the Advisor-Advisee Relationship

In our study, the participants defined their perceptions of the role of an advisor and the advisor's importance in shaping the graduate school experience. For example, Jackson, a mechanical engineering doctoral student, compared the advisor-advisee relationship to a marriage:

> Well some people liken the advisor, advisor-advisee relationship to a marriage and that you know you are likely to be together four/five/six/seven years, depending on how long you are here and so. Being able to come in and kinda foster that relationship is important.

Jackson's interpretation of the advisor-advisee relationship acknowledges the potential extended time that an advisor and advisee could be "together" and the importance of "fostering" their relationship for the duration of the academic experience. In addition, Jackson's quotation sets the tone for how most participants described their expectations of their relationship with their advisors. They described having – or wanting – a supportive relationship, one where they learned and received encouragement from an expert in their field. Jackson's quotation also represents how students entered into their relationships with their faculty advisors, with respect and an understanding of the power dynamic between student and faculty advisor; this relationship suggested, at least to some of the participants in this study, that one should not do anything that could jeopardize the "marriage," as Jackson called it. The participants in this study stressed the importance of the connection between engineering student and advisor in terms of the mediating roles faculty played in students' academic careers, or at least students' perceptions of the role faculty would play in their academic careers in the future.

When graduate students reached out to potential advisors, their first interactions were crucial to their relationship, which made microaggressions that occurred during these interactions particularly problematic. In the cases where prospective advisors did not respond, or did so abruptly, some students developed early negative perceptions of themselves, which impacted their perception of how the advisor-advisee relationship might continue. Jaden, an electrical engineering doctoral student, described his first interaction with his advisor:

When I did my initial grad search I only found a few advisers who I considered working with. Um. A lot of them wouldn't respond to email and I thought, "this won't go well." The one who did, I went to his office and he gave me this bizarre look. I'm not sure if he expected me to be Black honestly, that's what I think it was.

As described by Jaden in the quotation above, some students' initial interactions with their advisors produced subtle feelings that caused internal dissonance, and made them question themselves -— "Is my advisor not talking to me because I am Black?" In this case, Jaden interpreted his initial meeting with his advisor as being a racial microaggression based on a quizzical look from his advisor. As explained by Solaranzo, Ceja, and Yosso,[27] racial microaggressions can be subtle, but because they also tend to be cumulative over time, they nonetheless trigger feelings of inadequacy in those who experience them. Jackson's experience with his advisor is similar in that he was uncertain about how well the "marriage" was going. Because of the infrequency of interactions with his advisor, and their different personality styles, Jackson had concerns about the relationship:

At the same time, I had reservations about my advisor. At the time I had only met with him once. I was unsure as to whether or not our styles would mesh, whether we would get along for you know the extended period of the Ph.D., whether he would provide the right type of support and interaction that I thought would be beneficial.

As students progressed through graduate school, however, they described both positive and negative interactions with faculty advisors. What was perhaps most enlightening was how some students' early perceptions of the advisor-advisee relationship set the foundation for their future interactions. Jackson explained, "I slowly started to realize that the advisor who I was kind of unsure about became more and more solid in my mind…From my first half an hour interaction with him, of course it's difficult to tell how he is going to be for the next five years." If the early interactions were uncomfortable, it took more time – and perhaps more mental energy – for students to trust their advisors. This might suggest that students were fearful that their assumptions about mismatches between advisor and advisee may have been accurate.

Threatening Effects of Experiencing Racial Microaggressions within the Advisor-Advisee Relationship

Findings from this study illustrate that some Black men students deal with racial microaggressions in various ways that threaten their understandings of their professional identity as engineers and – in part – influence their decisions regarding whether or not to persist in engineering. One finding suggests that students' perceptions of racial microaggressions were primarily related to oral communication exchanges with their faculty advisors. For example, James, a biomedical engineering doctoral student explained that his advisor communicated with

him in ways that appeared to belittle his intelligence and level of academic preparedness:

> Um -- so like…it's like when he tells you stuff it's kind of…if you approach him, and he asks you questions and it was like some fundamentals you don't know, or you were never taught it as far as software stuff, he just -- I don't want to say he belittles you, but he'll kind of be like "yea, you learned this as a junior in undergrad, and the sophomores here are doing it, blah, blah, blah", and I'm like, "ok" (laughter). It would go in one ear out the other, but yeah, you know you don't really feel good afterwards. But then I guess talking to other students in the lab that's been there longer than I have, supposedly that's how he is, and that's the way he approaches, I guess approach you when you have "x, y, or z" lack of knowledge.

While one could argue that the advisor was assessing James' pre-existing knowledge and skills, James' quotation suggests that this conversation and communication style was not an isolated incident, but rather that his advisor routinely enacted microaggressions against him by asking questions to verify whether or not he was qualified to engage in the work of their discipline; the messages the advisor sent to James caused him to question his ability to successfully engage the engineering material.

Another facet of dealing with the racial microaggressions that Black men students are subjected to is internalizing what they hear, rationalizing it, and as a result taking ownership of the harassment as a means to cope. This was apparent when Jackson commented on feedback he received from his advisor: "And, I guess my feeling is that that maybe I'm subject to other judgments that if I were in the majority I wouldn't be necessarily be subject to." Jackson's comment suggests he believed that he was being judged and subjected to different levels of scrutiny from his advisor because he was part of an underrepresented ethnic group rather than being in the majority (i.e., White and Asian students). Equally important to acknowledge, Jackson does not just recognize what he perceives as unequal treatment, he appears to rationalize – and possibly normalize – the treatment he receives to cope with receiving microaggressions. Similarly, James explained how he dealt with microaggressions and persevered: in order to make progress, he, too, developed and rationalized the bad experiences he endured and minimized them as "bumps along the road." By doing so, he nonchalantly deemphasized the uphill struggle he faced in order to move past the negative experiences.

While this paper primarily focuses on racial microaggressions from academic advisors, some students described receiving racial microaggressions across the College of Engineering context (e.g., in classrooms). In some cases, a student's advisor was also his professor in certain courses. The outcomes of receiving racial microaggressions, across the engineering context, from the same and different people, made students feel less comfortable in the field of engineering. Alarmingly, some students expressed exhaustion due to having to navigate and negotiate what they perceived as an unwelcoming academic space. Chris, a chemical engineering doctoral student, explains his exhaustion:

Now, when those get uncomfortable for the Black male, and especially the advisor relationship might get uncomfortable coupled with the prejudice people may have with you being a minority male, in a field dominated by white men, the pressures can get to you and can see the fact that you can't do it.

Chris addressed the fact that he did not feel supported as a "minority male" and as a result was uncertain of completing the doctoral program. Similarly, Paul, an electrical engineering doctoral student, described interactions with his advisor that challenged his sense of academic self and professional engineering identity. Paul explained, "I don't know why, I still don't know why he, he basically said, you know, 'why don't you go out and work first for a few years,' that was his opinion." Some individuals who encounter racial microaggressions may not be immediately aware of the offense, and might overlook such behavior and comments in the moment.[28] In this particular case, Paul had difficulty understanding whether his advisor was trying to be helpful or offensive, causing Paul to rationalize the nature of their interaction. Paul attempted to make sense of his advisor's recommendations. To work in the field, rather than continue with his education, seemingly challenged what he had believed about himself as an emerging scholar and an engineer. Taking the two quotations together, these findings reveal why interactions with one's advisor and professors are such critical factors for Black men completing their doctoral program; interactions within the College of Engineering mediates students' learning, influencing their decisions about whether or not to persist in the graduate program, and perhaps whether or not to remain in the field of engineering.

Discussion and Implications

Racial microaggressions happen in myriad contexts throughout a student's academic journey. However, this paper provides a focused view of racial microaggressions between Black men doctoral students in engineering at one "very high research" institution and their academic advisors. The research focused on this relationship because existing scholarship acknowledges the vast roles and impacts advisors have on students' graduate and postgraduate experiences. The extensive, direct contact that faculty advisors have with students across multiple contexts (e.g., classroom, research experiences, academic meetings) raises concern about the number and severity of racial microaggressions Black men experience over the cycle of their graduate education. The findings from this study point to several psychological and health-related effects that students described experiencing as a direct result of being "othered" by their faculty advisor.

Some limitations should be considered. First, the sample size of 11 is not representative of all Black men engineers at the institution involved in this study, nor of all Black men in graduate programs in engineering in the United States. However, the goal of this study was not to generalize to Black men writ large, but rather to gain a deeper understanding of the lived-experiences of a small population nested within a particular educational culture (i.e., Black men graduate students in engineering at one, very high research institution). Second, drawing on

sociocultural cultural perspectives provided a useful framework to help analyze the data used in this study. The framework's concept of "context" informed how students' experiences are bounded by – at least in part – the social, political, economical, and historical contexts in which they lived at the time of data collection. Their experiences must be considered in concert with the period during which data were collected (e.g., the presidency of Barack Obama; attacks on affirmative action). Additionally, sociocultural perspectives on learning provided the utility of considering the effects of contexts and interactions on students' learning and professional identity development. However, because the focus of this study is on students who are both Black and male, additional theoretical frameworks (e.g., critical race theory and men and masculinity) would better capture these intersectional identities to illuminate the experiences of students.

Despite these limitations, this paper identifies several opportunities for future research and implications for future professional practice. First, faculty advisors were identified as being perpetrators of racial microaggressions against Black men students. However, evidence suggests that there are other individuals within engineering contexts that also cause harm to Black men through racial microaggressions. More research and analysis is needed to identify who these individuals are, their relationships with Black men, and the contexts in which these racialized incidents occur. Such an examination would provide a more expansive picture of how some Black students experience engineering, including how their retention in the STEM field is threatened. Another area for future research would interrogate the campus or college climate. A study that explores the environmental factors – from a campus climate perspective – might provide clues to the systems and structures that give rise to racial microaggressions within a College of Engineering.

Addressing racial microaggressions through professional practice needs to be a priority. Findings in this study indicate that after experiencing racial microaggressions, some students express a diminished sense self as related to their academic ability, which has the potential to threaten their retention in the STEM field. Additionally, it appears that some students struggle to develop an identity consistent with engineering after facing racial microaggressions. These findings suggest that there might be a relationship between one's educational experiences (including one's negative interactions with a faculty advisor) and one's engineering self-concept and identity as an engineer. To address this concern, faculty, staff, and administrators need to be more aware of their Black men students, and understand that while many graduate students struggle at times, Black men (and other underrepresented students of color) may face additional challenges caused by the engineering context. Besides helping to eradicate racial microaggressions, those in positions of power should create more intentional support structures that strengthen students' academic sense of self and help to buffer, at least in part, the negative impact of experiencing racial microaggressions. One such strategy could be to create an affinity-based program – or student organization – where students can meet and support one another. Finally, faculty advisors need to become more culturally competent in the ways they behave and interact with students from underrepresented groups. Addressing racially charged behaviors and

comments – whether those are intentional or not – is a small, yet important, step in the direction of increasing and sustaining participation in engineering for Black men.

Conclusion

The findings in this paper provide a clearer understanding of racial microaggressions from an engineering perspective. The domain-specific focus illuminates what is taking place in engineering, and explicitly highlights the racial microaggressions students experience within advisor-advisee relationships. Due to the sensitivity of this paper's topic, it is likely that some readers will instantly argue that students are being "too sensitive," or even "playing the race card." Although these explanations seem possible when examining incidents in isolation, they are less likely to be valid when there is a shared pattern of experiences between students and across a body of research on the experiences of students from underrepresented groups. The value of qualitative interviews is the power of students' voices as they describe their "lived experiences." The engineering education community can no longer continue to explain away students' racialized experiences, no matter how challenging these experiences may be to face. This call-to-action provides an opportunity for engineering educators – and other members of the engineering community – to interrogate various actions and behaviors; for example: "how might my actions be perceived as unwelcoming to students from underrepresented groups"? If this field is serious about broadening participation, it must investigate the [systematic] practices and activities that threaten to push students from underrepresented groups out of engineering.

While this paper focuses on racial microaggressions between Black men graduate students and their advisors, there are other contexts within colleges of engineering where racial microaggressions occur (e.g., between peers, with staff and administrators, through systematic policies). Scholars should continue examining what racial microaggressions look like within the field of engineering. Domain-specific investigations provide greater nuance to engineering educators' understandings of racial microaggressions. Equally important, more scholarship on this topic might serve to affirm students who have historically endured unwelcoming and isolating experiences in engineering, but never had the language – or evidence – to "prove" that their experiences were valid.

As previously mentioned, a challenge with racial microaggressions is the possibility that perpetrators are unaware that they are harming other individuals through their words and actions. If used with the intent of changing and improving professional practices, the findings in this paper have the potential to better inform those who interact with students from underrepresented groups. Improving the nature of interactions by being more mindful of how Black men are racially microaggressed against, and by addressing the systems and structures that allow these behaviors to continue, engineering educators can help to create the supportive educational spaces needed for academic achievement; engineering can then become a more welcoming field of study for Black men.

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