



# Manifestations of Racism in the Engineering Workplace

EMPIRICAL RESEARCH

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## ABSTRACT

**Background:** This paper focuses on the manifestation of racism within the computer and information technology (IT) sector of engineering. The IT sector lacks diversity and a welcoming environment, particularly for women and People of Color. Thus, this paper serves as a case study to interrogate the culture of engineering workplaces. This paper focuses on the narrative of Ben, a Black engineer, as he navigates his engineering workplaces.

**Purpose:** This paper contributes to the literature on justice and equity in engineering, specifically the experiences of a Black engineer. We examine how workplace cultures affect the extent to which Ben can authentically be himself as both a Black man and an engineer and how racism manifests within the workplace. We also aim to provide guidance to other researchers on qualitative data analysis through our detailed presentation of the results.

**Method:** This paper presents a narrative analysis of experiences shared by Ben, a Black engineer. Specifically, he was interviewed about his workplace experiences. Interviews were read through the lenses of racial and vocational identity development, in/authenticity, and the manifestation of racist ideas.

**Results:** We explicitly identified how racism manifested throughout engineering workplaces through Ben's narrative. Early in his career, Ben was inauthentic to his personal identity and conformed to the normalized workplace culture, but he established his authenticity and racial identity as he matured as a professional.

**Conclusions:** Ben's experiences illuminate how pathways through engineering and engineering workplaces are built on white normative expectations.

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The current racial climate has resulted in increased recognition that the United States cannot achieve greater diversity unless the institutional structures that reinforce racism are dismantled. Within engineering, there are several ways in which dominant white<sup>1</sup> narratives are reinforced, such as the structures of educational institutions (Slaton, 2010) and workplace climates that privilege white, male ways of being (Dotson, 2008; Faulkner, 2009a, 2009b; Gibbs, 2008). For example, scholars in engineering education have described racially hostile climates of engineering and power dynamics between faculty and students that privilege white individuals (McGee, 2020; McGee et al., 2019; Strayhorn et al., 2013). Furthermore, within engineering education, Black scholars have shown the ways that textbooks, syllabi, and curricula minimize Black intellectual contributions, giving power and privilege to white contributions (Bradley, 2019; Long & Mejia, 2016; McGee, 2020; Provenzo et al., 2011 as cited in Long, 2021).

This paper focuses specifically on the computer and information technology sector of engineering. Underrepresentation and marginalization are not confined to the computer and information technology sector, but their apparent persistence makes them a good case study for our work. There are differences between the cultures of IT and engineering. For example, IT is known for aggressive demands for extended work hours and use of technology during nonwork hours, use of exclusive technical jargon, and attitudes of superiority over users of the systems they support (Guzman & Stanton, 2009), whereas engineering's culture is typically not described as such. Nevertheless, the lessons learned from this study can provide insight into the engineering workplace, especially since the engineer we report on in this paper, Ben, works in the IT department of a large engineering firm.

In recent years, there has been increasing scrutiny on diversity within the computer and information technology industry. Popular press articles about the toxic climate at some companies (Kohlhatkar, 2017; Levin, 2017) and data on demographics (Information is beautiful, 2017) have portrayed an industry that is not welcoming of a diverse workforce. Issues faced by women and People of Color include biased hiring practices, the need to prove themselves competent to an extent not required by their white colleagues, and even overt acts of sexism and racism. As a result, these companies are attempting to increase efforts to diversify their workforce. However, the Tech Leaver Study showed significant attrition from these companies due to unfairness or mistreatment (Scott et al., 2017). Without attention to the culture of these companies, efforts toward increasing diversity are likely to fail.

We have two primary objectives for this paper. The first is contributing to the literature on diversity and inclusion in engineering. As will be described in the literature review, surprisingly little research has been conducted on Black engineers' experiences in the workplace. In addition, there is a lack of research that focuses on systemic, organizational aspects of racism in engineering. To address these gaps, we seek to answer the research questions:

1. How is the racial identity of Ben, a Black software engineer working in an engineering company, manifested in the workplace?
2. How does Ben respond to racialized situations in the workplace?

This paper addresses these questions through a narrative case study of a single participant, a Black man working in a large engineering firm's computer and information technology department. Literature has shown that the experiences of engineers are similar across many engineering disciplines. Therefore, this work applies to various contexts.

Our second objective is to make our analysis process transparent in a way that goes beyond typical reporting for publication. We follow the Q<sup>3</sup> framework for quality considerations in qualitative research (Walther et al., 2013, 2017). Our data presentation supports the Q<sup>3</sup> framework, especially in process reliability and communicative validation. Through our presentation of the data, we also hope to provide guidance to other researchers on qualitative data analysis.

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<sup>1</sup> We are intentional in not capitalizing white throughout the paper in an effort to decenter whiteness and white dominance in the US.

As discussed below, although there has been considerable research conducted on Black individuals' experiences in various workplaces, there has been little research specific to Black engineers. We explored literature that focused on the individual experiences of Black engineers in the workplace since our focus in this paper is on Ben's experiences of racialized situations as a Black engineer.

### EXPERIENCES OF BLACK INDIVIDUALS IN THE WORKPLACE

Significant research has been conducted on Black individuals' experiences in the workplace (Feagin & Sikes, 1994; Jackson et al., 1995; Johnson & Eby, 2011; Thomas & Gabarro, 1999; Bell, 1990). Within their careers, Black individuals described biculturalism, or the need to exist between two cultures: their Black culture and the normative white workplace culture (Bell, 1990; Feagin & Sikes, 1994; Jackson et al., 1995). This white workplace culture ignores cultural norms and values of People of Color broadly, and Black people specifically. Instead, Black workers are expected to assimilate to white expectations (Feagin & Sikes, 1994). The unjust task of navigating between two cultures can result in identity loss and psychological stress (Bell, 1990; Jackson et al., 1995).

The studies described above focus on individual experiences. These individual experiences are situated within organizational structures that define and dis/allow acceptable roles and behaviors. However, as noted by Acker (1990) and Ray (2019), there is a disconnect between organizational studies and studies on gender and race, resulting in a lack of understanding of how organizations create and perpetuate gendered and racialized hierarchies. For example, Acker (1990) discussed how even the seemingly simple concept of "a job" is gendered.

### EXPERIENCES OF BLACK ENGINEERS IN THE WORKPLACE

Although much has been written about race in engineering education settings, particularly students, comparatively less research has examined race in the engineering workplace. The few studies that have been conducted noted some important themes, such as cultural mismatch impacting Black engineers (Dotson, 2008; Gibbs, 2008; Ross, 2016; Ross & Godwin, 2016). The dominant white culture of the workplace presents barriers for Black engineers that can result in social isolation and/or a distinct separation between social and work lives and personas (Dotson, 2008; Gibbs, 2008; Rice, 2011). Perhaps most alarming, Black engineers must outperform white engineers by 3–5 times to be considered equally qualified (Gibbs, 2008). In a study by Mor Barak and Levin (2002), race and gender were the strongest predictors of inclusion, while perceptions of inclusion were predictive of job satisfaction and well-being. Therefore, racialized barriers can negatively impact the experiences of Black engineers.

One way in which Black engineers have overcome these barriers is through enacting personal agency (Ross, 2016; Ross & Godwin, 2016; Ross et al., 2021). Some studies documented how Black women engineers overcame their feelings of isolation by actively seeking opportunities that fulfilled their personal needs and forming networks. Being both Black and women, they had dual aspects of isolation not experienced by Black men or white women. In general, a lack of connection between individual needs and the workplace can lead to isolation and constant awareness of race (Buzzanell et al., 2015).

In addition to the literature cited above, there is work on the gendered and racialized cultures of engineering and engineering education (e.g., Buse et al., 2013; Huynh & Buswell, 2019; Lichtenstein et al., 2009; Martin, 2015; Martin & Garza, 2020; Moore et al., 2003; Morelock, 2017; Mozahem et al., 2019; Reyes, 2011; Samuelson & Litzer, 2013; Schar et al., 2017). Broadly speaking, these studies describe how underrepresented minoritized engineers are expected to adapt to current engineering cultures, instead of engineering adapting to support their needs. However, there is a dearth of research examining these cultures through the lens of organizational theory (Acker, 1990; Smith, 1990, 2005; Ray, 2019). Pawley (2019) used Smith's (1990, 2005) concept of ruling relations to examine the gendered nature of engineering education institutions. She found that

educational institutions have developed a picture of the “ideal” student. Students who do not fit this ideal experience tension due to the mismatch between their everyday experiences and the ruling relations of the institution. It is safe to assume that the experiences of engineering students follow them into the workplace.

THEORETICAL FRAMEWORKS

Our project follows specific tenets of Critical Race Theory (CRT; Bell, 1976). We recognize the permanence of racism in US society, whiteness as property that endows white people with advantages, and that counter-storytelling amplifies the voices of marginalized people in order to expose normalized racial experiences. While these tenets form a foundation for our understanding of the role of race in the engineering workplace, our analysis uses three specific frameworks.

In this paper, we are examining the individual experiences of Ben, a Black software engineer working in a large engineering company. Table 1 shows the way we have conceptualized these experiences. We are interested in three aspects of Ben’s experiences: how his racial identity is manifested in the workplace, how he responds to racialized situations internally, and how he responds to them externally. For each of these aspects, we contrast two opposing ways that Ben responds. The following sections discuss each of our frameworks in detail.

Table 1 Overall conceptualization of the theoretical frameworks.

RESPONSES TO RACIALIZED SITUATIONS		
Racial identity (Helms & Piper, 1994)	Conformity	Internalization
Internal response (Faulkner, 2000a, 2000b, 2007, 2009a, 2009b)	Inauthenticity	Authenticity
External response (Kendi, 2016)	Assimilation Segregation	Antiracism

RACIAL IDENTITY

We conceptualize racial identity through Helms and Piper’s (1994) theory of racial and vocational identity development. Ben’s racial identity in the workplace impacts how he responds to racialized situations. With a conformity status, he accepts the status quo, while with an internalization status, he can be agentic in responding.

Helms (1994) identified race as conceptualized in three ways: nominally, culturally, and socio-politically. Helms and Piper (1994) theorized the coupling of racial identity development and career maturation. For greater explanatory power, they suggested socio-political conceptualizations of race to examine work and career experiences. They base this on racial power differentials in the United States, where historically, white people have “defined and controlled access to work, and all other racial groups and cultural groups have had to function in a societal work environment which they have had comparatively little control over or influence in shaping” (Helms & Piper, 1994, p. 125). A socio-political framing emphasizes how individuals and groups react to racialized experiences in the workplace. Helms and Piper (1994) outlined different statuses for individuals as they develop their racial identity and career maturity. Early career and racial identity stages typically align with conformity<sup>2</sup> status, meaning that individuals conform to the status quo due to racialized experiences. They cannot be agentic for themselves because of their early career status. In the latter parts of development, when there is career maturity, racial identity is internalized, and individuals can act as agents for themselves and other People of Color. Although there are multiple stages in the timeline of career and racial identity development, we focused on conformity and internalization status as two conflicting ways in which Ben’s awareness of racialized situations was manifested.

2 We use the term “conformity” throughout this paper as a label for the “silencing” of People of Color. We recognize that it expresses an aspect of deficit-based terminology, but we utilize the language to stay consistent with the underlying framework by Helms and Piper (1994).

We conceptualize Ben's internal response, that is, the way he positions himself as a Black engineer, through Faulkner's (2000a, 2000b, 2007, 2009a, 2009b) concept of in/authenticity. This theory describes how experiences in the workplace can feel "authentic" or "inauthentic" based on culturally-derived expectations (Dietz et al., 2022). Ben feels inauthentic when he feels the need to mask his personal identity as a Black man or when his identity as an engineer is called into question. He feels authentic when he can express his personal identity as both a Black man and an engineer.

Wendy Faulkner developed her theory of in/authenticity through a study of gender roles in the workplace. She first used the term "gender inauthenticity" in the context of software engineering as part of her discussion of engineering dualities (Faulkner, 2000b, 2000a). She discussed the division of engineering into the "technical" and "social" realms, with the technical serving as "real" engineering. Stereotypically men are expected to engage with the material world, while women are expected to engage with the social world. She used this duality to explain why some girls may reject computer science as being too "nerdy" – too technical with insufficient engagement with the social world. She later expanded her concept of in/authenticity to describe how certain engineering roles are stereotypically masculine (e.g., technical work) and others are stereotypically feminine (e.g., personal interactions). A woman doing stereotypically masculine work may feel that this work is "inauthentic" due to these gendered expectations. Cech et al. (2011) found a similar phenomenon among women engineering students. The women in their study had lower professional role confidence concerning engineering careers than men, resulting in lower persistence in the degree program and lower intention to pursue an engineering career.

We have adapted in/authenticity to race, using it to identify instances of racially "inauthentic" experiences due to cultural mismatch, or biculturalism (Bell, 1990), in the workplace and instances of "authenticity" when People of Color are their true selves in the workplace. We chose Faulkner's concept of in/authenticity because it was developed within an engineering context, and the oppressive structures of sexism have parallels to racism, especially in engineering. Engineering education specifically has ruling relations structured in white and male-dominated ways (Pawley, 2019). Although the experiences of gender and race are not analogous, this shift in in/authenticity towards race illuminates the experiences of People of Color within engineering and its workplace climates that privilege white males (Dotson, 2008; Faulkner, 2009a, 2009b; Gibbs, 2008). Various authors have noted the tensions created when People of Color are forced to function in a cultural setting created by whiteness (Bell, 1990; Dietz, 2022; Dotson, 2008; Feagin & Sikes, 1994; Gibbs, 2008; P. B. Jackson et al., 1995; Ladson-Billings, 1995, 2014; Ross, 2016; Ross & Godwin, 2016). Thus, People of Color mask their cultural identity to ease tensions (Anzaldúa, 1990; Fanon, 1952). Furthermore, Anzaldúa (1990) described how People of Color experience putting on and taking off masks as needed to un/cover their authentic selves to survive the culture of their workplaces. Shifting in/authenticity to consider race allowed us to investigate how Ben experienced un/masking due to the culture created within the workplace.

## SEGREGATION, ASSIMILATION, AND ANTIRACISM

We conceptualize Ben's external response to others' racist acts through Kendi's (2016) historical analysis of the development of racist policies in the US. While not written as a theoretical framework for social science research, its overarching thesis and framing of racist behaviors as an outcome of racist ideas provided a useful analytical tool for our work. Kendi's descriptors of responses to racism provide a means of understanding how Ben reacts to racialized experiences in the workplace. He acts as an assimilationist when his actions indicate acquiescence to the status quo. He acts as an antiracist when he rejects the status quo and advocates for change.

Kendi (2016) defined a *racist idea* as "any concept that regards one racial group as inferior or superior to another racial group in any way" (p. 5). He then described three ways that people can respond to racist ideas. We have adapted these descriptions as a framework for identifying how Ben (and others he interacts with) respond to racialized situations. The different types of responses are:

- Segregationist: A response that points to Black people themselves as responsible for racial disparities, for example, that Black people “choose” to live in segregated neighborhoods or “choose” not to attend college (Bonilla-Silva, 2018). We did not see any evidence of segregationist responses in Ben’s narrative.
- Assimilationist: Kendi (2016) described assimilationists as people who say that “Black people *and* racial discrimination were to blame for racial disparities” (p. 2, italics in original). They advocate for Black people to conform to societal norms to “fit in” to normative expectations. Similarly, Ben acts as an assimilationist when he accepts the status quo or actively works to “fit in” to espoused or implicit expectations.
- Antiracist: Antiracists explicitly call out racial discrimination and act against it. These acts can be advocating for large policy changes (e.g., the Black Lives Matter movement) or individual acts of disruption (e.g., when a Black employee questions why she has not received a promotion when her similarly positioned white colleagues have). Ben acts as an antiracist when he questions policies or practices as being racialized.

## METHODOLOGY

### PARTICIPANT INFORMATION AND DATA COLLECTION

This paper presents the findings from a single participant interviewed as part of a more extensive qualitative study investigating the manifestation of racism in the workplace experienced by Black engineers in the IT sector (Douglas et al., 2019). In this paper, we present Ben (a pseudonym), a Black male engineer who works in the information technology department of a large consumer-facing company.<sup>3</sup> This company’s business has complicated logistical requirements, requiring a department dedicated to developing and implementing software solutions to support its primary business. Ben received a Bachelor’s degree in engineering (see footnote 3) approximately 15–20 years prior to the interview.

Ben was recruited through industry contacts and completed two semi-structured interviews conducted by an interviewer that self-identified as the same race and gender. The interviews were conducted and recorded via Zoom. In the first interview, narratives were solicited about the early experiences that led him into engineering. We asked questions such as “What experiences growing up shaped your academic identity and your identity in becoming an engineer?” and “How did your grade school experiences influence your success in college and your major?”. The second interview delved into his workplace experiences, probing around professional identity, workplace climate, and diversity. This interview began with the statement, “Tell me what it is like to work in your company,” to elicit stories about his work experience. Consistent with Reissman’s (2008) recommendations for narrative interviews, the interview was approached as a conversation between the interviewer and Ben, resulting in Ben naturally telling stories about his experiences (Polkinghorne, 1995). The interviewer allowed Ben to direct the conversation, probing him as needed to elicit additional details or the meaning of his experiences. Probing questions in this interview included:

- In what ways does your professional identity overlap or diverge from how you view yourself as a whole person? What aspects are amplified or tempered at work? Why?
- What is the climate like for you in your job now? How has it changed over the years?
- How did you deal with the climate when you were first working? How do you deal with it now? How has your approach changed over time?

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<sup>3</sup> Because of the small number of Black engineers in the workforce, we are deliberately obscuring his identity and background. If we were, for example, to name his industry sector we would potentially compromise his anonymity more than we would like.



- Why have you chosen this approach?
- How effective has this approach been for you? What, if any, have been responses to this approach?

While these probing questions were pre-planned, the interviewer was careful not to treat them as a rigid set of questions but used them to open up the conversation as needed. A professional transcriptionist transcribed the interview recordings. This paper reports data exclusively from the second interview.

## DATA ANALYSIS

Data analysis was conducted primarily by the first and second authors (Dietz and Brown). Our analytical process followed what Polkinghorne (1995) described as a “paradigmatic analysis of narrative data” (p. 12). Ben presented his stories in a nonchronological fashion, as is typical in conversation (Reissman, 2008), and thus we reconstructed his stories using Doucet and Mauthner’s (2008) Listening Guide. The Listening Guide uses multiple readings of the transcript to “listen” to the narrative differently each time. The multiple readings are then combined to create the final narrative. Analytic memos were created, documenting the process during all stages of analysis.

Data analysis began with thoroughly reading and checking the transcriptions for accuracy (Pawley & Phillips, 2014). The transcript was pseudonymized, redacting names, locations, ages, organizations, school affiliations, nationalities, languages, and religions, and this information was replaced with broader categories (Pawley, 2019). Two members of the research team, Dietz and Brown (a white woman and a Black man), independently read the transcript multiple times for familiarization.

Next, the transcript was read to identify the constituted narratives or different chapters. With this, we looked for overarching stories of what Ben was sharing. In his interview, we identified important moments where there was a personal shift or change in his storytelling. Each of these stories was labeled as a chapter in his narrative. A table of contents from the narrative was created to identify the storylines and map the overall structure of the stories. Sidebar conversations that did not contribute to the primary narrative were identified and labeled as such. For example, we did not include a story from Ben about how he considered becoming a nurse until he shadowed his aunt in a hospital, and “it was like all this chaos,” so he decided, “okay, let’s just try this computer thing.” We also created a list of characters and mapped the relationships between them.

The following reading traced the narrated subjects by following how Ben talked about himself and others. This process involved identifying instances of words such as “I,” “you,” and “they.” These instances were examined for identities described by Ben.

In the following step, relational subjects (other characters with influence), we identified how others played a role in Ben’s narrative. Specifically, we looked at how others fostered cultures that created moments of authenticity and inauthenticity. The transcripts were explicitly read through the lenses of in/authenticity (Faulkner, 2009b) and vocational and racial identity development (Helms & Piper, 1994). As we read the transcript, we looked for instances of the concepts comprising those frameworks (e.g., when Ben acted inauthentic to his true self). This process was iterative; concepts were operationalized, and Ben’s statements were notated using *a priori* codes, which in turn helped to identify additional instances of the concepts. The codes used can be found in Table 2 below. We highlighted and documented moments of cultural match or mismatch along with Ben’s responses. “Authenticity” is used to recognize moments when Ben could express his personal identity as both a Black man and an engineer. “Inauthenticity” is represented when Ben masked a part of himself or his identity as an engineer was called into question because of the environment or other actors in the environment.

Throughout this reading, we also attended to the language Ben used to understand his racial and cultural identities (Helms & Piper, 1994). Racial identity development and career maturation developed by Helms and Piper (1994) brought to the forefront how Ben’s racial identity changed due to racialized experiences in the workplace. In the early stages of racial and career development, individuals conform due to racialized experiences–conformity status (Helms & Piper, 1994).

In the latter parts of development, racial identity is internalized–internalization status (Helms & Piper, 1994). Therefore, moments of conformity and internalization were labeled throughout Ben’s narrative as he described progressing through his career.

The next reading was to identify structural subjects. We looked for acts of segregation, assimilation, racism, and antiracism (Kendi, 2016). “Segregation” was used to describe instances when relational subjects blamed Black people for racial disparities through actions such as threats, devaluing People of Color, and advocating whiteness rather than blaming the systems of racism in place. “Assimilation” describes moments where characters described white culture or expectations as “normal,” resulting in People of Color assimilating or masking identity. “Racism” describes moments of oppression or injustice. Lastly, “antiracism” is used to label moments where characters challenged racism and recognized racial discrimination.

The final step in data analysis was to write Ben’s narrative. First, each chapter created in the analyses was pulled together to create an overall narrative of Ben’s experiences. This was an overarching narrative that combined all of Ben’s information relative to the research questions; sidebar conversations that did not relate to the research questions were left out. Within the narrative, we employed narrative smoothing to allow an easier reading flow of what Ben was saying (Kim, 2016). To do this, we took out instances of repeated words, and added words to make the narrative flow or gain meaning. For example, within the first sentence of Ben’s narrative presented in the findings, to give context to what Ben described based on the interview prompt and to help with the flow of the narrative, we added a leading sentence: I work for a “global” company, Company Z, “so we can’t cater to whites or Blacks, or just one particular person because you wouldn’t be in business very long.”

To identify our words versus Ben’s, we kept his words in quotation marks. Next, we used the overall narrative to create a shortened narrative presented in this paper. The shortened narrative was written by compiling the chapters of Ben’s life that articulated his personal story in terms of our theoretical frameworks. Within each chapter, we drew from the stories that outlined his racial identity, internal responses, and external responses, as framed by vocational and racial identity development (Helms & Piper, 1994), in/authenticity (Faulkner, 2009b), and responses to racism (Kendi, 2016). In constructing the narrative, we took into account sections that were explicitly analyzed with our theoretical frameworks while considering the need to include excerpts that did not connect directly to the analyses or research questions. In the analysis, we used a slash (/) to indicate simultaneous moments of both authenticity and inauthenticity (i.e., in/authenticity) or acts of racism and acts of antiracism (i.e., anti/racism). The final narrative was deliberately written in the first person with direct quotes to make Ben’s emotional responses apparent (Walther et al., 2017). These steps were taken to represent the social reality experienced by Ben credibly. Weekly meetings were held between the two primary analysts (Dietz and Brown) to establish consensus on interpretations and the content of the narrative. Each member of the entire research group reviewed the narrative and final interpretations until a final consensus was achieved. The final narrative and analysis was sent to Ben for his feedback.

**Table 2** Codebook and example segments of text.

BEN’S RESPONSE	CODE	DEFINITION	EXAMPLE CODE SEGMENTS
Racial identity (Helms & Piper, 1994)	Conformity	People of Color’s experiences in early stages of career thus they feel they cannot be agentic for fear of job loss, conform to the status quo and don’t speak up to racism  (e.g. fear, unawareness, toning down cultural norms, hiding/masking parts of identity, low career maturity)	“I used to be more just conform... I bought like \$400 headphones to make sure, those are noise cancellation, to make sure the sound doesn’t leak out...”  “Would I feel comfortable doing that? No. So my level of comfort and like, I guess, expressing myself, hasn’t gotten like to the point where I feel like I can do that with no consequence and that’s like quote/unquote in my head.”  “I didn’t call them out on [the racist picture]. I just let it go...”



BEN'S RESPONSE	CODE	DEFINITION	EXAMPLE CODE SEGMENTS
Internal response (Faulkner, 2000a, 2000b, 2007, 2009a, 2009b)	Internalization	People of Color's experiences in latter stages of career, thus they feel they have leverage in order to be agentic in recognizing race and racialized systems and acting to dismantle them for self and others in racialized workplaces (e.g. combats racism, values cultural and racial identity, contests white normativity, embraces and supports cultural capital, career maturity)	"I didn't call them out on that. I just let it go, and I should have... I'm not going to do that anymore, when stuff happens like that."  "I used to be more just conform, but now as I've gotten older I'm like, no, I've earned my right to be here, too..."
	Authenticity	Ben is able to recognize himself as both a Black man and an engineer. (e.g. self-definition of worth, bringing cultural capital, confidence, cultural and racial identities embraced, self-agency)	"When I'm coding or in my zone over there working on code, I like to listen to rap music... it just kind of just keeps me in the zone, just keeps me, make the job fun and just kind of into my work."  "And so basically my manager was stuck in a situation, so I went to him and said, 'you know what, I'm confident I could finish this project and bring it home.'"
External response (Kendi, 2016)	Inauthenticity	Ben is unable to fully recognize himself as a Black man or an engineer. (e.g. masking parts of identity, downplaying cultural capital, devaluing Blackness, cultural mismatch, lack of confidence)	"Would I feel comfortable doing that? No. So my level of comfort and like, I guess, expressing myself, hasn't gotten like to the point where I feel like I can do that with no consequence and that's like quote/unquote in my head."
	Racism	Situations that devalue People of Color (e.g. Racialized situations, manifestations of structural and individual acts of racism, bias, systems of oppression, dis/advantages of one race over another, normalization of whiteness, diminished agency, disregard of cultural capital, unequal distribution of resources)	"So he passed the phone to me and I look at it and there's a picture of a snowman being hung on a noose in a tree."
	Segregation	Situations in which Ben or others blame Black people for the struggles they face (e.g. threats, devalue contributions of People of Color, advocate whiteness, "othering")	Not observed
	Assimilation	Conforming to societal norms in order to 'fit in' to normative expectations (e.g. accepting white normative values/standards, masking identity, recognizing racism but not calling it out, changing to fit the mold, act in accordance to white acceptability)	"I don't even have to be disrespectful but at least say something."
	Antiracism	Recognizes injustices and actively works to combat them (e.g. combats racism, embracing cultural capital, flouting whiteness, advocates for diversity, inclusion, justice and equity)	"I ended up leaving early and so later on that day he called me and he was just like, 'I see you feel, the decision I made affected you.' And I told him 'yes it did' ...So I told him, 'well, I'm going to tell you now I'm not quitting but I'm telling you I'm not going to work a second over 40 hours for you ever again. I'm telling you now, when there's an issue I'm going to come up with every excuse in the world why it can't be done knowing it can be..."

## Quality Considerations

Quality was monitored through Walther et al.'s (2013) Qualifying Qualitative Research Quality (Q<sup>3</sup>) framework. The Q<sup>3</sup> framework considers two aspects of the research: making data and handling data. The quality areas of the framework are process reliability and five aspects of

validation: theoretical, procedural, communicative, pragmatic, and ethical. The Q<sup>3</sup> framework was used as a set of flexible, guiding questions throughout the research process. The framework provided engaging and guiding questions that allowed us to see what Ben was portraying, ground interpretations in his social reality, and provide relevant and meaningful findings beyond the study setting. For example, as Dietz and Brown were “handling the data” by analyzing the interviews, the Q<sup>3</sup> framework posed the guiding question for procedural validation of “What features can we design into our process of interpretation to mitigate the risk of mis-constructing the social reality of our participants?” (Walther et al., 2017, p. 401).

As we reflected on this question, we shifted our process to incorporate more frequent and iterative member checks with the other authors, Douglas, McCray, and Richardson, to mitigate against a narrow perspective of Ben’s experiences. We also included several steps to ensure communicative validation. The narrative and corresponding analyses were primarily written by Dietz and Brown and then checked by Douglas, McCray, and Richardson, adding more depth when needed. A draft version of this manuscript was provided to Ben. He provided feedback to ensure that we were “authentically co-construct[ing] meaning of participants’ social realities on their terms” (Walther et al., 2017, p. 401). Finally, we note that the choice to present the narrative in the first person supports pragmatic and ethical validation. We originally wrote the narrative in the third person. When we presented the third person narrative to our project advisory board (which includes expertise in narrative analysis), we were strongly encouraged to rewrite it in first person in order to present not only what Ben said but how he said it, in order to not lose the emotional impact of his story (Walther et al., 2017).

## POSITIONALITY STATEMENTS

Our positionalities impacted the entire research process, especially given the different ways that race can be understood (Secules et al., 2021). The authors of this paper hold diverse experiences and viewpoints. The overall team includes a white female who was a Ph.D. student at the time of the research and is now an assistant teaching professor; a Black male research assistant, a Black female professor, a white male professor, and a Black male industry partner and Ph.D. student. We all recognize the permanence of racism within the United States and the importance of critical and anti-deficit studies to challenge structural racism. We each have motivation and commitment to understanding and combatting social inequities, especially within engineering. We deliberately created a diverse team in order to include different perspectives. The white researchers hold both insider and outsider perspectives. They have training and experiences as engineers but do not have experiences as racially minoritized people. Two of the Black members of the research team have racialized lived experiences, but lack engineering work experience. Finally, the last research team member is a Black man with extensive industry experience in engineering. Through this combination of insider/outsider perspectives, we can better ensure the trustworthiness of our findings in reflecting Ben’s experiences. One important impact of our positionalities was the choice of who on our research team would interview Ben. We deliberately selected one of the Black men on our team to interview Ben to mitigate any power imbalances (Au, 2019) and to empower Ben to speak about racialized experiences in a way he may not have with a white interviewer.

In terms of this manuscript, our positionalities also impacted how we disseminated our findings. We went through several rounds of peer debriefing and member checking in order to develop and revise the manuscript. Our diverse team had many conversations and rounds of edits to discuss manuscript development. We took into consideration and discussed pieces of our positionalities, such as insider/outsider, industry/academia, engineering/outside of engineering, and how this impacted the piece. For example, Dietz (white female), initially interpreted the following quote as authenticity: “When I’m coding or in my zone over there working on code, I like to listen to rap music. That bothers people. Even though I got headphones on, it’s like why does that bother you what I’m listening to?...” Brown (Black male) interpreted it as assimilation. Because of our different understandings of race and racism, we brought varying perspectives on the situation. Dietz interpreted the quote as Ben being true to himself and getting himself in the zone for his work despite a workplace that is not supportive. Brown pushed back, stating,

I think assimilation is a better descriptor for this section. The company recognizes that discrimination exists in theory but approaches Ben's music as an issue of him rather than what is their goal at work and how does this impede on others' work? (internal documentation)

This was a pivot point for the team, where we recognized that we needed to frame our analysis either from Ben's perspective or the workplace's. As a result, this passage was coded as authenticity. As illustrated through this example, the team discussed each decision made throughout the narrative creation and analysis. After much discussion and review, we believe our positionalities strengthened this work, tying in various identities, experiences, and positionalities that may be reflective of our readers.

## FINDINGS

In this section, we present an in-depth analysis of Ben's story, which provides a powerful example of how racism manifests in the engineering workplace. Ben is a Black man who has worked in technology roles for over 10 years. Growing up, he did not feel like an intellectual, but he had a work ethic he says was instilled by his father. Ben had familial capital that helped him persist (Moore et al., 2003). At age 17, he became a father. Ben's family supported his career aspirations by sharing parental responsibilities as he completed school. Throughout college, he worked hard and earned his bachelor's degree. He had a gift for his discipline and recognized his potential.

We chose to highlight Ben's unique experiences because they make the racism in his engineering workplace explicit. His narrative captured rich stories across the frameworks we used in the analysis. Below we display Ben's narrative and our analysis of his story. The left-hand column presents the narrative, while the right-hand column provides the observational analysis corresponding to that narrative section. This format illuminates the study's theoretical frameworks through Ben's narrative. We also present the data in this way to be transparent about our analytical process and to provide guidance to other researchers who might employ similar analyses.

In a typical research paper, findings are presented in the aggregate (e.g., themes) with selected quotes to illustrate those themes. However, St. Pierre and Jackson (2014) described the limitations of traditional coding as decontextualization of the coded interview segments and that since people tend to identify patterns in the world around them, "if you think you have to find a theme, you probably will" (p. 716). In addition, coding can provide a veneer of "objectivity" by making it appear that the codes reside "inside" the data. St. Pierre and Jackson expose this fallacy, pointing out that our positionalities as researchers impact the patterns we see. Instead, "thinking with theory" has been presented as an alternate approach to qualitative analysis (Douglas, 2017; A. Y. Jackson & Mazzei, 2012; St. Pierre & Jackson, 2014). Thinking with theory involves reading through the lens of a theoretical framework such that "knowledge is opened up and proliferated rather than foreclosed and simplified" (Jackson & Mazzei, 2012, p. vii). In our study, we read the data through multiple lenses, each providing a different perspective on Ben's narrative. Take, for example, this excerpt from Ben's narrative:

There's plenty of people that's way smarter than me. I'm doing this with just sheer work ethic, you know, if I actually had, you know, a lot of this given to me earlier, ain't no telling where I would be.

Using a traditional approach, we might code this excerpt as "working hard." However, this code limits our understanding of his performance to the American ethos that you can accomplish anything by working hard. It ignores the structural racism that limits opportunities for minoritized groups. When considered in the context of Ben's entire narrative and Kendi's (2016) framing, we can see it as an act of antiracism. Ben has deliberately worked to accomplish his goals as an act of defiance against the structural barriers he faced and a means of empowering others.

Presenting our findings in this way serves two additional purposes. First, we hope to provide guidance to other researchers. While textbooks offer detailed examples of coding (Charmaz, 2014; Corbin & Strauss, 1998), existing examples of thinking with theory are limited. Researchers interested in thinking with theory can examine how we analyzed our data and use it as an example for their research.

Second, our presentation supports the Q<sup>3</sup> model of research quality. The format of our findings is intended to support process reliability and communicative validation. Specifically, we seek to provide evidence to allow readers to consider the following questions: “How can we construct our findings within the meaning conventions of the relevant research community?... How can we document and authentically demonstrate the dependability of our entire research investigation?” (Walther et al., 2017, p. 401). Accordingly, our Findings section is presented to connect Ben’s words to theoretical understandings explicitly. Readers can compare the data to our interpretations and answer those questions themselves.

NARRATIVE STORY	OBSERVATIONS
<b>Current Workplace: Do Black Lives Matter at Work?</b>	
<p>I work for a “global” company, Company Z, “so we can’t cater to whites or Blacks, or just one particular person because you wouldn’t be in business very long. From a culture and company standpoint, even with like the current climate we’re in now, our company was pretty explicit when you talk about Black Lives Matter. And our CEO sent several emails talking about just trying to promote that. So from a company culture perspective, I can appreciate that.</p> <p>“I think another challenge when you don’t have diversity, it’s like I have to work really hard to, either you conform to them, or like you have to fight for change or fight to like push yourself out there. So I’ll give you an example, some recent. When I’m coding or in my zone over there working on code, I like to listen to rap music. That bothers people. Even though I got headphones on, it’s like why does that bother you what I’m listening to? And not only that when I’m listening, usually I like to be at my desk so I’m not bothering nobody, I have headphones on and I like to like dance while I’m coding, it just kind of just keeps me in the zone, just keeps me, make the job fun and just kind of into my work. Well, people have reported me because of that and it’s like it’s disturbing to them and it’s like come on, now, it’s not like I’m out breakdancing on the floor, merely just rocking, but it’s things like that to where like if you diverse, it’s like you learn those are just things that, from my culture, those are the things we do to excite us and motivate us to like keep going. But if you’re not used to that, then it’s like you’re doing something wrong.</p>	<p><b>Authenticity</b> – Ben authentically uses motivational tools such as rap music and dancing while he works. In this moment, he sees his Blackness as an integral part of who he is as an engineer. Although he is productive and nobody can hear it, he still receives complaints.</p> <p><b>Racism</b> – Some of Ben’s coworkers reported him for his dancing and music, which was a form of intimidation. Ben explains how the lack of diversity affects how his culture and motivation techniques are silenced because they differ from white normative values.</p>
<p>“And believe me, I got several different examples of things like that. And I used to be more just conform, but now as I’ve gotten older I’m like, no, I’ve earned my right to be here, too, I put in work just as much if not more. If you have a problem with this, that’s not my problem. I’m not disturbing anybody. I mean, I bought like \$400 headphones to make sure, those are noise cancellation, to make sure the sound doesn’t leak out, but so it’s not my problem to cater to your, to your, I’ll just say to your bias. So it’s like, I mean, I’m going to do it. And I’m glad I started to take that stance.”</p>	<p><b>Authenticity, Conformity shifted to Internalization</b> – With experience and growing self-assuredness, Ben began to assert himself-resisting conformity-in the workplace. He does not “cater to [their] bias.” He knows what supports his identity as a Black engineer and authentically uses these methods. Ben’s racial identity shifts from conformity at the time of the complaint to internalization as he speaks during the interview. He recognizes that music supports his productivity and will not conform by stopping this method.</p>
<p>“I have a coworker that sits with me, a white coworker, this is another great example. He literally comes to work, puts both his feet on his desk, and lays back in his chair and plays on his phone all day. Comfortably. It’s just like, it’s just regular, he’s known for doing that all the time. Would I feel comfortable doing that? No. So my level of comfort and like, I guess, expressing myself, hasn’t gotten like to the point where I feel like I can do that with no consequence and that’s like quote/unquote in my head. But there are definitely levels of relaxation that I’ve been able to say, okay, it’s not that bad, I can do this and still things will be okay.”</p>	<p><b>Inauthenticity and Conformity</b> – Ben is guarded due to fear of racial bias. Because he is guarded, he cannot fully be his authentic self and feels the need to conform to expectations. Conversely, a white coworker relaxes without fear at work, comfortably unaware.</p>
<b>I Should Have Spoken Up</b>	
<p>“...It shows basically in what I’m about to tell you, to be comfortable enough to do what I’m about to tell you, shows that like, you know, you don’t even feel nervous about doing this.”</p>	<p><b>Conformity and Racism</b> – Ben’s preamble describes a company culture that supported his white co-worker’s comfort in sharing the racist imagery of a snowperson with a noose around its neck. For such imagery to be openly</p>

(Contd.)

At Company X “there was no diversity there. It’s 99% white and then 1% Black. There’s no diversity.” One day, “we’re in a team meeting at [Company X], there’s about 10 of us on the team. There were just two Black men and then everybody else was white. So while we’re waiting for this meeting to start, we’re kind of in this huddle, one of my team members is laughing at this picture she’s looking at and so she looks at the picture, she laughs, and she passes it around. We’re kind of around this round table. So she passes it to her friend and she looks at it and laughs and then she passes it down and down and so and it ended up coming to my African American coworker, who was new. He just graduated so he’s already just fresh from, he’s just now joining the workforce so he looks at it and all he could do is drop his head. So he passed the phone to me and I look at it and there’s a picture of a snowman being hung on a noose in a tree. And I just remember looking at that, and it was just like, okay, and I just gave it to her and didn’t say nothing about it.

“The lesson I learned, and it still haunts me to this day, is that I didn’t call them out on that. I just let it go, and I should [not] have. Especially, my coworker was Black, I almost felt like, and we never talked about this but it almost felt like he was almost hoping and relying on me to say something because I had a voice, I had been there for some years, so I was accomplished, I was doing a good job there so I had a voice to say something and I didn’t and it was like, again kind of that ties in as well where it was like I’m not going to do that anymore, when stuff happens like that. Because that haunts you.

“I know it does for me and it was just like one of those things if I could go back I definitely would have called them out on that. I don’t even have to be disrespectful but at least say something.

“So now that I’m older and I have more success and been doing this for a while and have a certain level of, I don’t really want to call it privilege because I don’t think I’m there yet but seniority. We’ll just call it that. I’m in a position now where I can speak and not be afraid to. And then, too, not just not be afraid to, but have the confidence to where like if they did let me go, okay, fine, I’ll just find another job. I’ve got 15 years’ experience at this point so finding a job won’t be hard so now that I have that I just feel like I have this almost responsibility to say something now.”

My final straw with this company was when “I was the team lead on the project and we ended up finishing the project successfully. And so that project as big, as visible as it was, the only thing I got from that project was a pin that my manager literally got from a gumball machine that said, ‘good job.’ That was it, no raise, no extra money, nothing. Literally, I’m watching other people around me get promoted for way less. So anyway, I made a point, when this happened I kind of knew okay, it’s time for me to go. So that was kind of my last straw and I decided to go ahead and, as LeBron says, take my talents elsewhere...

“That feeling of pushing yourself and going and working that hard to just get a pin, a pin that they can put on your, a good job pin that you get out of a 25-cent gumball machine, that feeling, it was a horrible feeling. Especially when you see people around you that are doing way less get promoted and get all these opportunities for advancement, and I just was like, I’m not going to let that happen to me again. I’d rather quit a job, a good job than to have to have that feeling again.”

#### **Say What You Mean, Mean What You Say**

“So I ended up going to this company called [Company Y]. So when I got there, they had hired a third party to write an app for them but that person quit. And so basically my manager was stuck in a situation, so I went to him and said, ‘you know what, I’m confident I could finish this project and bring it home.’ So my manager was like ‘man, if you do that I’m going to get you some [NBA] tickets, I’m going to give you a raise and all this and this’ so that of course doing that motivated me even more.

“I worked hard and it was challenging but I ended up getting it done. So we celebrated and they took us, as a team, they took us all out to like an [NBA] game. I think they like had a lunch for us or something. So anyway, once the celebration and the smoke cleared, I went to him and I was like, ‘okay,

*shared as a joke and not seen as problematic is an explicit act of racism. He felt uncomfortable calling out the racism expressed in the picture and office. His discomfort reflects an unnamed fear of the oppressor and racist retaliation. At the time of the racist event, Ben’s racial identity aligned with conformity status because he obeyed white culture.*

**Conformity shifted to Internalization** – In the incident shared, Ben did not call out racism but wishes he could go back and change the situation. He had seniority, but did not use it to combat racism. At the time, his fear of how his white coworkers would respond led him to conformity. Now he recognizes and will use his seniority to call out racism. He feels he can speak up against racism without fear of consequences. Thus, his racial identity shifts to internalization status with a commitment to his racial group.

**Assimilation** – Ben offers that he would not “have to be disrespectful but at least say something.” Even if he does say something, he wants to stay within expected norms. In contrast, his white counterparts in Company X were unconcerned as the picture was shared with the group.

**Antiracism, Authenticity and Internalization** – Ben has the confidence to call out racism and will do so from a place of authenticity if placed in the position again. He is willing to put his job on the line to be an antiracist and combat racism because he knows his value as both a Black man and an engineer—a Black male engineer—and will not suffer in silence. Thus, his racial identity has developed into an internalization status within the workplace.

**Racism/Authenticity** – Ben was not rewarded for his hard work like he was promised. In the face of this racist behavior by his supervisors, Ben felt authentic by recognizing his talents and giving himself the agency to take action and leave the company altogether. He was in search of a company that would reward his talents.

**Authenticity** – Ben understands his worth as an engineer. He sees his talent and recognizes that others will value him, even if this company does not.

**Authenticity** – Ben felt authentic in his stance against the lack of promotion in his workplace. He states that he’d “rather quit a job, a good job, than to have that feeling again,” the feeling of working hard and not being rewarded. He recognizes his worth and will not let himself be treated unfairly again.

**Authenticity** – Ben feels authentic as an engineer. He knows his abilities and has the confidence that he can complete the project.

**Racism** – Ben sees the supervisor’s refusal to give him the promised raise as an act of racism. When the supervisor says he would have to give the raise to everyone, he devalues the contribution Ben made to this important project.



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so what's with my raise?" His response was, 'I'm sorry, it's not in the budget. If I have to do it for you, I have to do it for everybody.' And I got pissed, man, I was just like, 'no, that ain't what you said. You promised, you dangle a carrot under my nose saying you going to take care of me if I took lead, now you going back on your word.' He was like 'I'm sorry.'

"I ended up leaving early and so later on that day he called me and he was just like, 'I see you feel, the decision I made affected you.' And I told him 'yes it did' and I explained that, what happened at [Company X] and how that made me feel and I said 'like you're doing the same thing even though I explained it to you before.' So long story short he was like 'well, I'm sorry you feel that way.' So I told him, 'well, I'm going to tell you now I'm not quitting but I'm telling you I'm not going to work a second over 40 hours for you ever again. I'm telling you now, when there's an issue I'm going to come up with every excuse in the world why it can't be done knowing it can be, and tell you now that I'm not going to dedicate myself at all, to overwork in anything and put any extra effort in the job that I do...' So he asked me, he said, 'well, are you putting in your resignation?' I said, 'no, I'm not quitting. No, I'm not putting in my resignation at all, I'm just letting you know now that from now on, this is what you're going to get out of me.' He said 'okay.'

"Well, the next day, I woke up and I don't know what came over me but I was just like, I knew we had, the product that we had just built, we had some bigwigs coming in to look at it, and he had some stuff he wanted me to do, a couple of changes he wanted to make. And I told him 'I was sick I couldn't do it.' And he was 'okay, when do you plan on coming back?' I was like, 'I don't know. I got two weeks sick time, whenever I feel better, I'll be back. I don't know when that could be. It may be tomorrow; it may be two weeks. Whenever I feel better, I'll call you and let you know. In the meantime, just wait until I call you to tell you that I'm better.' And keep in mind, these are very strong words and very assertive words that I'm using. I definitely could've lost my job over it, for saying it. But in my mind, I had just had enough and I was just like, if I lose my job, fine, but I just won't, I don't have to do that and I'm not going to work for nobody like that ever again. I'm not going to ever feel like that at no other job ever, like what they did for me at [Company X] and how that made me feel. And I was just confident. And believe me, again, I knew full well that he could've easily like said, well, I'm going to let you go but I just didn't care. I was just confident in myself I guess. So anyway he said, 'okay, well, I hope you feel better.' That was about 9 o'clock...he called me about 11 am and said, 'I got to tell, I went and I talked to the CFO and we're able to get you a \$5,000 bonus'. And I was like, 'cool, we can work with that, that's good...'

"...So then he was like 'I know you're sick, when will you be able to come back?' My exact words was, 'Shit, I'll be back tomorrow.'"

### **Gotta Represent**

"If I can do it anybody can and that was one of the other reasons that drove me to get a degree was just so I can be a voice to say, man, like this is something we can do, too. There's plenty of people that's way smarter than me. I'm doing this with just sheer work ethic, you know, if I actually had, you know, a lot of this given to me earlier, ain't no telling where I would be, but I would just say if I can do it anybody can. We don't see from a media standpoint or from a perception standpoint, when you see [my discipline] it's hard to imagine Black men especially doing it. But we are, we here and we can and we definitely got the toolset. I'm telling you, a lot of people I work with, a lot of people of different races. I have been [outperforming] and then I'm just me so I can imagine like, you know, other guys doing the same. All these athletes, they literally just say I'm going to use my mental toughness and mental abilities in the same kind of approach that I take towards athletics. Let me take that same drive and put it in academics—we'll run the world.

So we[re] already superheroes, just look what we've accomplished. I think for us to be able to like endure slavery and the day slavery is over with, there's no reparation check, no—okay, here's a path you all can start going, 40 acres and a mule—nothing. Slavery's over figure it out. And we figured it out. Got Jim Crow and all this—figure it out. Just to always be able to, always make something out of nothing, always having to over-prove yourself, always having to do way more."

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**Antiracism** – With confidence, Ben stands up to his boss about the injustices in his workplace. He stopped putting in extra time and effort that goes unrewarded as a means of protest.

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**Antiracism and Internalization** – Ben's stance against his mistreatment in the workplace is shown through his confident protest against coming to work. His actions were antiracist in that he took action to protest against injustice. Although he knew he could lose his job over this, he did not care and internalized his identity and stance. He knew his value and that he could go somewhere that supported him.

**Authenticity** – Ben is unwilling to ever again not stand up for himself. He is confident in his identity as a Black man to protest against future injustices. He is also confident in his identity as an engineer, knowing he could be fired but willing to take his chances. Left unsaid is that, like the situation with his previous company, he knows he can get a job somewhere else.

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**Antiracism** – Ben is successful in his efforts to call out his unfair treatment and receive the compensation he felt he deserved.

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**Anti/racism and Internalization** – Ben is an antiracist, role model, and advocate for Black engineers to keep pursuing their careers. He sees his cultural capital and internalizes his identity to help other Black engineers. He recognizes that the media is biased based on race and does not portray engineers as diverse, which hinders underrepresented people's ability to see themselves in that position.

**Authenticity/Internalization** – Ben's identities as a Black man and as an engineer are inseparable. By outperforming other engineers, he affirms his worth as a Black engineer. He also recognizes that the struggle is not just his alone but is a consequence of racism in the workplace.

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## DISCUSSION

The Findings section illustrates how Ben's individual experiences are connected to the frameworks of in/authenticity, racial and vocational identity development, and racist ideas. Here we address the research questions in terms of each of the components of our analysis: Ben's racial identity, his internal responses to racism, and his external responses.

### RACIAL IDENTITY

Helms and Piper (1994) described racial identity development as it occurred simultaneously with career maturity. Ben's racial identity development is seen throughout his narrative. Early on, he stayed silent to maintain his position in the company. These actions aligned with conformity status by assimilating white standards (Helms & Piper, 1994). As he progressed in his career, he recognized his value and would not let whiteness diminish it. He described his career maturity, stating,

So now that I'm older and I have more success and [have] been doing this for a while and have a certain level of, I don't really want to call it privilege because I don't think I'm there yet but seniority. We'll just call it that. I'm in a position now where I can speak and not be afraid to.

Thus, as he grew in his career, his approach to racism shifted towards antiracist actions with internalization and commitment to his race and culture. This was mainly seen in his story at Company Y when he was not fairly compensated for his hard work. He approached this situation by explaining to his boss what had happened at Company X and how he would not let that happen again. He described his interaction saying,

...keep in mind, these are very strong words and very assertive words that I'm using. I definitely could've lost my job over it, for saying it. But in my mind, I had just had enough and I was just like, if I lose my job, fine, but I just won't, I don't have to do that and I'm not going to work for nobody like that ever again.

Ben's internalization status allowed him to recognize the injustice and develop responses (see following sections) to combat racism.

### INTERNAL RESPONSE

We can see how Ben positions himself as a Black engineer using Faulkner's (2000a, 2000b, 2007, 2009a, 2009b) concept of in/authenticity. For the most part, Ben's story is one in which he feels authentic as a Black man and an engineer. There is only one instance of inauthenticity that we coded when he says that he would not be comfortable sitting at his desk playing on his phone all day, as his white co-worker does. Despite this being the only time Ben describes inauthenticity in the workplace, it is significant because it tells us about the relative power between white and Black workers. Ben's discomfort stems from the workplace as a white space that devalues Blackness. He cannot assert the same power as his white colleague in playing games all day. Ben's experience aligns with the CRT tenet of whiteness as property, providing advantages for white people that are denied to People of Color.

While most of Ben's internal responses are of authenticity, these responses still come from a place of struggle and are thus different from the authenticity that a white engineer would feel. Ben's strongest sense of authenticity comes when he talks about using headphones to listen to rap music while he codes. In this incident, his Blackness is fully present with his engineering self, with each reinforcing and supporting the other. Another positive instance of authenticity comes when he asserts to his new supervisor that he can complete a difficult project. He knows who he is as an engineer and what he can accomplish.

Other instances of authenticity come when Ben recognizes his worth in the face of struggle. On three separate occasions, he is willing to put his job on the line, knowing that he can get another job if needed: when he leaves his first company when he tells his new supervisor that he is sick

in response to not getting the promised raise, and when he says that now he would speak up if a racist incident like the picture of the snowperson happened again. However, even though Ben feels authentic as a Black engineer, his experiences reveal the underlying racism of the workplace. He feels authentic *despite* that racism. Unlike his white co-workers, for whom we presume authenticity comes naturally without any thought, Ben must consciously assert his authenticity.

## EXTERNAL RESPONSE

Ben faces multiple instances of racism, from highly explicit (the picture of the snowperson) to borderline explicit (receiving a “good job” pin, not getting promised raises). These “everyday” occurrences of racism show how whiteness and anti-Blackness pervade engineering, paralleling the CRT tenet of the permanence of racism as an underlying aspect of US society. As a component of US society, engineering is primed for racism to be woven into its existence.

For the most part, Ben intentionally weighs the costs of resisting racism in the workplace; his weighing of those costs shifts with greater maturity and professional capital in the later stages of his career. While he did not speak up when the picture of the snowperson was shown, now he would. In two cases, he put his job on the line (in one case, actually leaving) to protest injustice. Ben is not part of an organized movement for antiracism; nevertheless, his actions are in service to antiracism as he stands up to injustice. In one case, he was able to change the outcome, although we do not know if his actions resulted in long-term changes to policy.

## LIMITATIONS

The primary limitation of this work is that the narrative was a co-construction between Ben and the authors (Reissman, 2008). The interview was a conversation in which Ben and the interviewer negotiated the direction of that conversation. In constructing the narrative from the interview, as a research team, we made choices as to how to structure Ben’s story, which inevitably resulted in some aspects being emphasized over others. Our positionalities as authors unavoidably impacted this construction (see Positionality section). As described in the Quality Considerations section, we used the Q<sup>3</sup> framework to mitigate this issue.

Another limitation is that the experiences that Ben described are temporal. As a result, our interpretations are based on past experiences that may include recall bias on Ben’s part. Nonetheless, Ben’s experiences are valid to his lived reality. We recognize that he has lived through these experiences and trauma; therefore, they are a reality to him. His subjective interpretation is true to his memory of the experience (Seidman, 2019; Polkinghorne, 2007).

## CONCLUSIONS

In this paper, we have presented our data in a unique way. Publications generally only provide selected quotations that illustrate the primary findings, often presented as themes. Instead, we have presented an entire narrative to show how the analysis connects to the participant’s words. Rather than relying on our interpretation, we invite readers to examine the narrative and consider how their interpretations may differ. We also hope our data presentation may serve as an example, guiding others interested in conducting similar analyses.

Throughout this paper, we have focused on Ben’s individual experiences and the racism he encountered in the workplace. We also recognize that these practices are supported by structural racism at the societal level. Thus, we briefly turn to CRT to connect our work to its tenets.

With CRT, we recognize the permanence of racism, whiteness as property, and counter-storytelling. We provided Ben’s perspective as a counter-narrative to the perception that underrepresentation in engineering is simply the result of a “leaky pipeline” rather than a manifestation of the permanence of racism in engineering more broadly. Additionally, the interactions Ben described in engineering workplaces as white and male-dominated illustrates the maintenance of whiteness as property. Thus, we have learned that there has been an inadequate effort to reshape engineering towards

antiracist and asset-based approaches and that demographically engineering has remained homogeneous. As engineering educators, we must learn from this and educate future engineers to combat racism in engineering workplaces.

Substantively, we have documented the challenges one Black engineer faced in the workplace. The presentation of a single narrative allows a deep understanding of the everyday experiences of a Black engineer in a way that other approaches cannot. Beyond a lack of representation, our particular subject and others in our larger study have provided a view into work environments that range from mildly biased to overwhelmingly racist. Some of these organizations have asserted that Black employees have fallen short in their efforts to assimilate into the dominant culture, a view that has been described as racist (Kendi, 2016). Our research notes the coping strategies Ben and other participants have developed to navigate their environments. These conditions should not be surprising as these organizations exist in a larger culture of bias and prejudice directed at Black Americans. Like other professional organizations, these entities assert that merit and hard work are sufficient for upward mobility. At best, organizations that recognize challenges regarding race remedy these conditions without examining existing systems and structures. Changing systems and structures is a long-term endeavor; however, it is necessary if the environments Black engineers endure are to become more supportive and equitable for them.

We would like to caution readers not to essentialize one Black man's experiences as representative of the entire population. Ben gave a detailed glimpse into his lived experiences that might resonate with others. Ben's interview was just one of 23 interviews we have conducted with Black/white female/male engineers. In our ongoing project, we are analyzing the entire set of interviews. Future papers will consider the range of experiences of our participants from both individual and structural/organizational points of view. We also plan to develop recommendations for individuals and organizations to combat racism in the workplace.

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The authors have no competing interests to declare.

## AUTHOR CONTRIBUTIONS

All five authors participated in data collection, data analysis, writing, and checking the results reported in this study. Within the methodology section, we identify specific roles that each author took throughout the research process.

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