

Marginalization and the In/authentic Workplace Experiences of Engineers

Gretchen A. Dietz, University of Florida

Gretchen A. Dietz is a PhD candidate within Environmental Engineering Sciences at the University of Florida. Her research interests are cultures of inclusion in engineering and engineering identity development, specifically for underrepresented engineers.

Dr. Elliot P. Douglas, University of Florida

Elliot P. Douglas is Professor of Environmental Engineering Sciences and Engineering Education, and Distinguished Teaching Scholar at the University of Florida. His research interests are in the areas of problem-solving, cultures of inclusion in engineering, engineering ethics, and environmental justice.

Erica D. McCray, University of Florida

Dr. Erica D. McCray is an Associate Professor of Special Education at the University of Florida. Prior to joining the faculty, she served as a special educator for students with behavioral and learning disabilities in Title I elementary and middle school settings. Dr. McCray has been recognized on multiple levels for her teaching and research, which focuses on diversity issues.

The slide features a blue background with a faint grid of images showing diverse people in professional settings. On the left, there is a vertical orange bar. The text is white and includes the University of Florida logo, the title of the presentation, the grant number, and the names of the presenters with their affiliations. A small tagline is at the bottom right.

UF Herbert Wertheim
College of Engineering
UNIVERSITY of FLORIDA

Marginalization and the In/Authentic Workplace Experiences of Engineers

NSF grant EEC-1827377

Gretchen A. Dietz ¹ (Presenter)
Dr. Elliot P. Douglas^{1, 2}
Dr. Erica D. McCray³

1. Department of Environmental Engineering Sciences
2. Department of Engineering Education
3. School of Special Education, School Psychology, and Early Childhood Studies

POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

This presentation is a narrative exploration of how three women in engineering with marginalized identities navigate their workplace cultures, specifically looking at how they can authentically be themselves. The data shown within this presentation were collected as part of a larger NSF-funded study qualitatively assessing the manifestation of racism within the technology industry.

From literature, we know that Black engineers leave their workplaces at a higher rate than White engineers. This is largely due to the toxic workplace environments defined by White men that are unwelcoming for minoritized people [1], [2]. With this work, we intend to understand their experiences and combat racism in tech. The narratives shared by the participants will provide a depiction of what is occurring in tech. The intention of this is to push cultural change and going beyond changing diversity numbers within workplaces.

Background

Barriers faced by women and Black professionals

- Bias in hiring practices
- Salary inequity
- Unfairly negative performance evaluations
- Fewer advancement opportunities
- Token hiring
- Placement into positions not associated with core company activities (e.g. human resources)
- Perceptions of incompetence

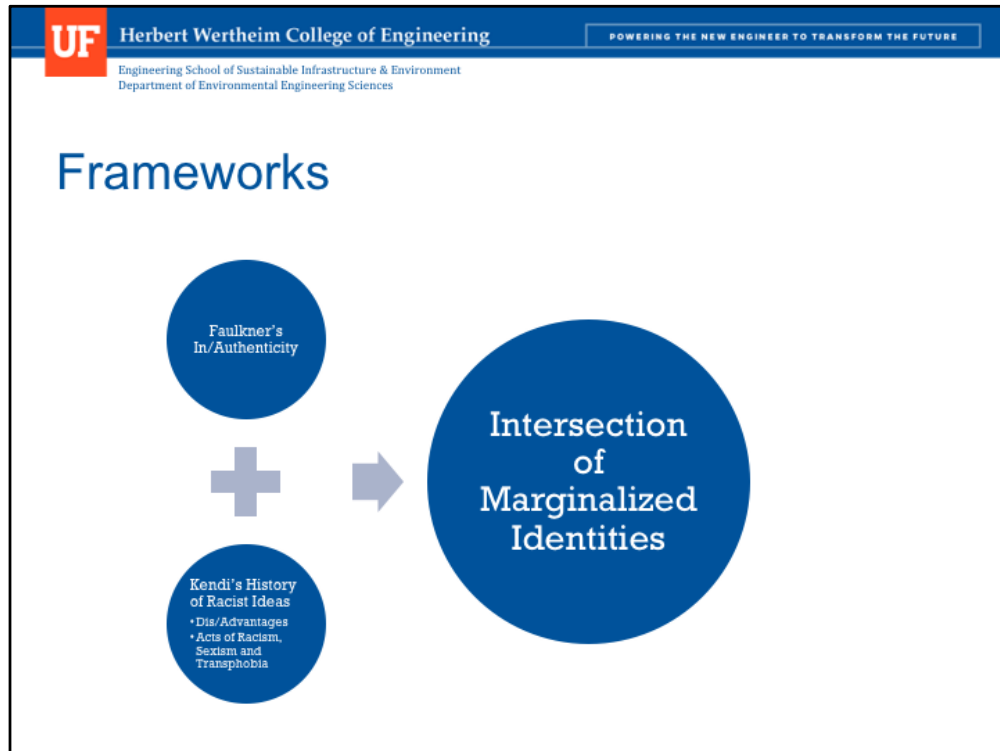
White individuals hold nearly 70% of the full time employment within the engineering and scientist positions, where Black individuals hold almost 8% [3]. This does not compare favorably with the US demographic averages. As for gender, about 44% of full time employees are women and 56% men [3]. Although the gender gap is closing, barriers still exist for marginalized people. This includes issues such as salary inequity, bias in hiring practices, token hiring, perceptions of incompetence, and fewer advancement opportunities.

Background

Barriers found in engineering

- Similar barriers as women and Black professionals
- Black engineers expressed the need to outperform White engineers by 3-5 times to be considered equally qualified
- People of Color and women have lower perception of inclusion
- Perception of inclusion is strongest predictor of workplace satisfaction and wellbeing
- Engineering culture defined by White men

Unfortunately, little research has been conducted to understand the professional experiences of Black engineers. Specifically for engineers, it has been found that Black engineers expressed the need to outperform White engineers by 3-5 times to be considered equally qualified, that Black and Indigenous People of Color and women have lower perception of inclusion, and this perception of inclusion is the strongest predictor of workplace satisfaction and wellbeing [4]-[8]. There has been found to be a dominant culture of engineering defined by White men, and 30% of women who leave engineering cited the climate as being the reason they left [9].

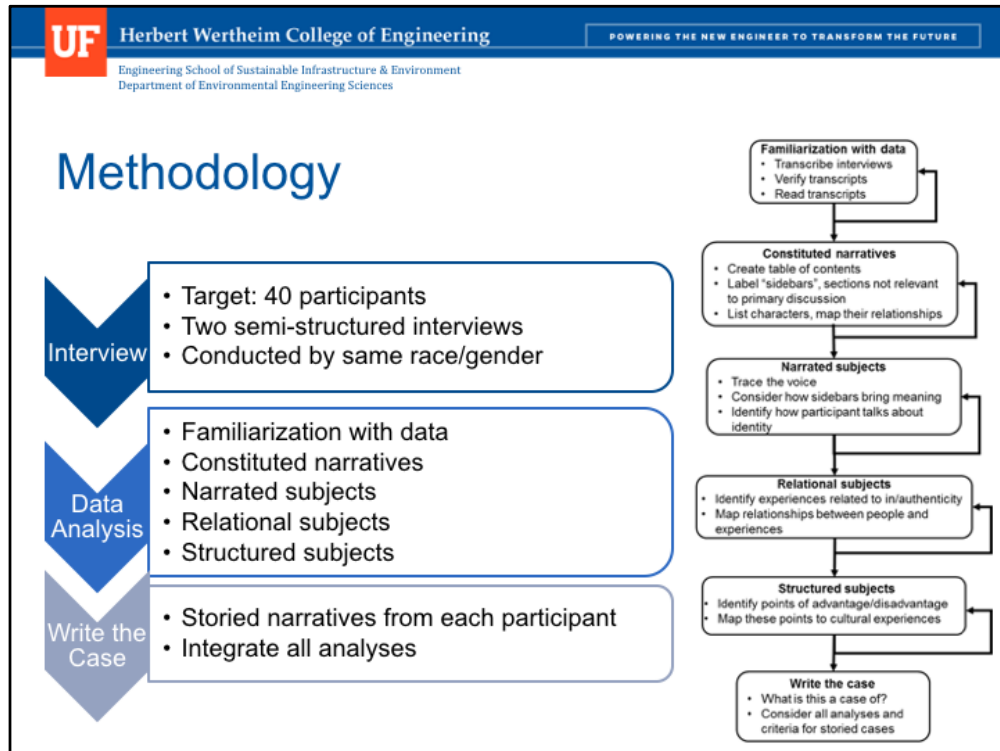


Three frameworks were used for this analysis of in/authentic experiences of marginalized women in engineering. For the first framework, we used Faulkner’s [10] concept of in/authenticity, which describes how women in engineering may have experiences that are either authentic or inauthentic to their personal identities. We broadened this lens to encompass marginalized identities in addition to gendered experiences.

The second framework utilized was derived from Ibram X. Kendi’s [11] “History of Racist Ideas in the U.S.” Specifically, we used Kendi’s structural analysis of racism within the workplace and expanded it to include other forms of discrimination such as sexism and homophobia. Another concept derived from Kendi’s work was the explication of moments of advantage and disadvantage taken by individuals. Kendi describes the roots of racism in the desire for advantage. Therefore, we looked for moments of advantage and disadvantages taken, as well as acts of racism, sexism and homophobia within the participants’ narratives.

Lastly, we used Crenshaw’s [12] intersectionality to understand the relationships between dimensions of society and subject formations, specifically focused on social oppression and power as experienced by Black women. Identity is not static, it fluctuates. Black women are subject to multiplicities of discriminatory experiences

due to their intersectional identities. Likewise, we focused on the experiences related to multiple marginalized identities for all three participants.



As mentioned, this presentation is part of a larger NSF funded study assessing the in/authentic experiences of engineers in tech. We are interviewing 40 engineers, 10 each of Black men, Black women, White men, and White women. Data is currently being collected for the study. The three participants for this presentation were chosen due to their unique stories centered around their self-identified intersecting marginalized identities. At the time of writing, there were only five women interviewed. Four White women working in the tech industry and one Black woman working outside of tech.

Two semi-structured interviews were conducted with each participant using Zoom. Each interview was conducted by interviewers of the same race and gender as the participant. In the first interview, we solicited narratives about their early experiences that led them into engineering including: grade school experiences, influential people, and other factors that molded them. The second interview explored their workplace experiences, probing topics such as professional identity, workplace climate, and diversity.

The data analysis process can be seen in the figure on the right. Looking at the figure, we began our analysis by transcribing and checking the interview recordings for accuracy. Transcripts were read through multiple times for familiarization.

In the next step of the analysis process, we read through identifying relational and reflexively constituted narratives. A table of contents from the narrative was created to identify the storylines and map the overall structure of the stories. "Sidebar" conversations that do not contribute to the primary story were identified. We also created a list of characters and mapped the relationships between them.

The next step included tracing the narrated subjects by following how the participant talks about themselves and others. This involved identifying instances of the words "I", "you", "they", etc. These were examined for identities the participant talks about.

In the following step, relational subjects, the transcript was read specifically through the lens of in/authenticity [10]. We highlighted and documented moments of cultural match or mismatch along with the participants' responses to them. We attended to the participants' language used as a means to understand how in/authenticity affected them and their intersecting identities.

The next reading employed the lens of Kendi's [11] concept of racist ideas to frame the structured subjects. Instances of discriminatory actions that stem from efforts of one group to maintain an advantage over another were identified. These points of dis/advantage were examined to see how they were connected to racist ideas.

The final step in the data analysis phase was to write the cases and storied narratives of what was presented from each participant.



In this section, I will present a shortened narrative and analysis of each participant. For the sake of time, a summarized version of their narrative highlighting major story lines will be presented. Within the narratives, we used narrative smoothing to make the participants' stories coherent.

UF Herbert Wertheim College of Engineering POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE
 Engineering School of Sustainable Infrastructure & Environment
 Department of Environmental Engineering Sciences

Leanne Narrative

■ Identities: Black woman in engineering

"You always feel like there's a boogie man over your shoulder."
 "I'm going to check you."
 Workplace experiences being a Black woman
 "You've got to turn on that switch"

“You always feel like there’s a boogie man over your shoulder.”

“I am a mechanical engineer. I actually got into engineering [because] I was a mechanic first so used to fix cars at a garage and stuff. Working at the shops, I definitely” was “the only female but I was around Black people though. That was different but yeah, I’ve heard all kinds of stuff. You name it I probably have heard it.”

“Because of my upbringing I was blessed to have a general idea that [engineering]’s what I wanted.” College had challenges, “being the only Black chick in certain classes I would feel kind of like pressured that the fact that I was having a hard time with stuff. You always feel like there’s a boogie man over your shoulder. Whether it’s real or not it’s always there.”

“I’m going to check you”

Getting a co-op was difficult. “They give you like counselors and stuff but I always felt like I didn’t have the support where I needed. And you know, some of my peers they had connections because their uncle worked at this company or that, you know, so I always felt like I had to do more to get to the same place in that regard.”

I got my first job through “a job fair at my school and they were recruiting but it was

kind of tough finding work.” I have never had a job where I felt as though there was a proportionate number of Black or women engineers. My “first corporate job out of school had a good group of women and men and there were a couple of Asian folks so there was some kind of something. But it’s actually funny because at that job, we were doing training and the very first day, our supervisor, part of his introductory stuff, he plays this old clip from the ‘30s. In it they showed these destitute Indians in the background, and the narrator commented on them and said ‘something-something-something,’ and here are the [pejorative]. I was like did he just say [pejorative] in the video? I was like oh no, and that is a derogatory term.”

“I’m looking around to see if anybody else is reacting and nobody else is reacting then I was like shit, I got to be the one to bring up about the race and of course I’m the only Black chick so it’s going to sound like I’m like, you know, fucking around with it. But I was like oh, I got to do this— on the first day. I was like I’ll wait until after this is all done and I’ll talk to him privately.” My parents raised me to speak up, “I gotta, I’m going to be diplomatic but I’m going to check you.”

Working after that “was okay. Being new in the corporate world, I had a little bit of etiquette to learn. One of the things is they’re always watching you. Even when you think they’re not. And it’s not like I was trying to purposely be devious or anything.”

“I think there was like a generational difference there in like the way that he was because from where he comes from, you know, you hunker down, you adapt. ”

Workplace experiences being a Black woman

The last engineering workplace I had worked in was “a small company” in which “I had known the owner previously from some other work I had done for a different company. He offered me work and the software he wanted me to use I was rusty on, so I told him that.” He said it was “‘no problem’ I thought there was an understanding there.” Shortly after, “I learned that I wasn’t going to report to him, I was going to report to somebody else like his engineer lead. That guy and I were having a hard time communicating. He would edit a lot of my stuff with a lot of scrutiny to the point where he would almost, he would double-back on things he told me not to do previously or vice-versa.” I thought to myself, “that’s weird like what’s going on?”

“By the time I started full time the owner was very upset with me and I was like ‘well, listen, if the supervisor doesn’t like these second set of drawings I’m doing I will leave but let me at least finish this because I started it. So let me at least finish it.’ And he

ended up liking them so I ended up staying, but after that the energy changed because the owner kept complaining about you know, 'why are you taking so long?'" I tried "to tell him it's because of the communication between supervisor and I but all he sees is 'oh, well, look what she did.' It became worse as the months went by to the point where he started doing that doubling back thing more and on top of that he started getting backed up on his designs. So I started to not have work to do."

Eventually I caught on to "what the supervisor was doing so I started making him write down his edits that he wanted me to do so that I could eventually show the owner the hypocrisy that was going on. The owner goes, 'oh yeah, yeah, I know... he's totally covering his ass because I'm putting pressure on him because I need these drawings so he's just upset.' And then he goes, 'you know, we're from you know, such-and-such country, so in our culture you know, he doesn't know how to talk to women.' My mouth dropped."

"If this is an issue about my gender how am I supposed to know that? And then he's not communicating to me what he's telling you so how am I to know to fix something that I don't know is a problem, right? So I was already in shock that that was going on but I was even more in shock that he admitted such a thing in such blunt language. And so he was like 'so don't worry about it, you know I love you, you always have a job here and if you ever feel like there's an issue you just come back to me.' And I was like wow! Maybe a week and a half later and we were having a group meeting and they're emphasizing about how they need it done quickly and this and that and then the owner turns to me while in front of the supervisor and my coworker, he turns to me and waving his finger he goes, 'and you, especially you, need to be careful of all the mistakes you've been making because you've been costing me money making all these mistakes,' doing this the whole time, reprimanding me like I'm a child. I snapped at that point because (laugh) no. There is levels to that, you can't, but I did stop him and I said, 'excuse me, I don't understand why we're having this conversation after I just came to you about this two weeks ago.' I wanted to go off. I mean I felt heat in my chest."


"I just left [the] company and it was actually not a great experience. It was one of the first times I had encountered an issue with the owner and didn't feel looked after in the way I thought I was. Being like the only girl in this industry you're going to hear everything under the sun whether it be from coworkers or customers, they're constantly challenging you and it can be, for lack of a better word, demeaning. So if you're not strong in yourself and trust your character you can take it to heart. But I had great supervisors who championed me and rooted for me like some of the best cheerleaders so that negative stuff I encountered didn't feel so bad because I had

their love and their support.”

“This was one of the first times where I realized it wasn’t that way even though I thought it was and that really hurt me because I really felt betrayed and confused. It’s funny, I told, when I was lamenting about it, you know, my mom, I was like ‘I don’t handle being a female well like that.’ I just realized this, like I’m not that good at doing this. What I meant by that was like this is what women go through all the time. When I told my friends about it, they were surprised I hadn’t had more experiences like this because they had had bosses who treated them similarly and it’s like really shitty that it’s so common.”

“You’ve got to turn on that switch”

Between my professional and personal identities, “I feel like I don’t feel separate. I feel like it’s a part of me. I’m also very like brash and raw in general, like I’m very direct. I feel like that’s who I am whether I’m working with you or just hanging out with you, like that’s me. So I don’t really feel like they’re separate things. The thing you have to separate is when you’re around like a room of White people and you’ve got to turn on that switch so I can get paid. So there’s that but to me that’s not foreign because I’ve learned about it from the time I was five, six, so to me that’s not foreign. It’s just like putting on a suit vs. you know, your weekend clothes, same thing. Depending on the crowd I’m going to be around, you’ve got to put on a suit with it. But my innermost soul still will penetrate through and I still may say something off-cuff. It usually gets a smile out of people so that’s kind of like me, too. So I can kind of like get away with it sometimes.”


Herbert Wertheim College of Engineering
POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

Engineering School of Sustainable Infrastructure & Environment
 Department of Environmental Engineering Sciences

Leanne Analysis

Dis/Advantages	In/Authenticity	Marginalized Identities
<ul style="list-style-type: none"> ▪ Difficulty getting co-op. Lack of “support where I needed. My peers they had connections.” ▪ Coworkers didn’t “know how to talk to women.” 	<ul style="list-style-type: none"> ▪ “I got to be the one to bring up about the race and of course I’m the only Black chick. I’m going to be diplomatic but I’m going to check you.” ▪ “I had a little bit of etiquette to learn.” ▪ Codeswitching 	<ul style="list-style-type: none"> ▪ Must speak up to racism and sexism ▪ “By the time I got to college I was the only Black person and the only female in my particular class.”

For Leanne, intersectionality of being Black and a woman created a dual oppression that she felt throughout her engineering experience. Unlike the other participants, she had experienced discrimination from her gender, and discrimination from her race, as the framework of intersectionality describes.


The intersection of race and gender identities caused both disadvantages and inauthenticity. Leanne felt that she was authentic because she didn’t separate her personal life from work, but she continued to describe instances of code switching, or inauthenticity, stating “the thing you have to separate is when you’re around a room of White people and you’ve got to turn on that switch so I can get paid.”

Although she expresses authenticity in speaking up to racism and injustice, her need to speak up in the first place is the byproduct of systems of racism in place that create injustices and inauthenticity for Black and Indigenous People of Color. Leanne’s codeswitching is an example of the disadvantages of operating in a workplace defined by Whiteness. The advantage of power and privilege held by White coworkers causes her to fear racial bias and racism that may come from her being her authentic self and not turning on “that switch.”

Likewise, the same disadvantageous oppressive systems are in place causing her to

witness and call out misogyny. Her first workplace was a toxic environment that disadvantaged her because her coworkers did not know how to talk to women. She had to be the one to speak out and call out racism and sexism because she was the only one experiencing it.

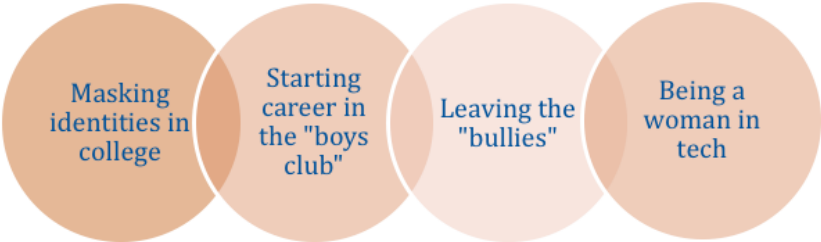
Even at the start of her career, Leanne was placed at a disadvantage because the homogeneity of engineering has failed to provide her a network to obtain jobs. It was difficult for her to get a position, yet easy for her peers who had connections within the industry. This shows the connectedness of racism within engineering and its effects on opportunity.


Herbert Wertheim College of Engineering
POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

Engineering School of Sustainable Infrastructure & Environment
Department of Environmental Engineering Sciences

Heather Narrative

■ Identities: White transgender woman in engineering



Masking identities in college

“I was not the ideal [electrical engineering] candidate.” Engineering “feels like a meat grinder almost, you know, and being one of the lower performing students, I definitely felt constantly out of place. And that may be for a lot of other reasons, you know. I couldn’t really be myself. Constantly stretched too thin. I’m also trans, I’m transgender so it was like add that to the mix of stress.”

Starting her career in the “boys club”

When I started my career, “I literally am, I’m a woman except it was so early on I was in the closet at work so no one knew and I’m living my life, you know, I have an apartment in my actual name, I have a roommate and I have to change my clothes like put on a sweater and a beanie to go into the apartment because I didn’t want people to know that I was going to work as a guy. And I interviewed once at this [company] and I was so uncomfortable in general and this guy is just like ‘you’re going to love it here. You know, it’s just a boys club and we all just get along so well, and there’s no women here because you know, women get pregnant and like you know, you lose all the experience you give them and then they disappear.’ And I was just like, oh, my God, please shoot me. And I’ve got all this student debt and I’m pretty sure I’m going to get this job. Do I report this or do I just take the job and pay off my debt and survive because I don’t know if I’m going to have money for rent next

month. So I made a decision to take that job but I never forgot about that, right? But that's the kind of thing that I would hear all the time. That's what I heard especially when they thought they were talking to a boy. And I can't help but never forget that so I always wonder what people say, you know, when women aren't in the room. And I wonder about that now more than ever."

While at this company, I transitioned. "I went the safe conservative route, I didn't do it until I already had a really good reputation. Even though it was very early on, I had already worked on some big customers and made a name for myself. So I basically worked with HR and we basically said to anyone, this is it, deal with it, if you don't like it, goodbye. Yeah, so it was great to get that level of support and that's something that I think was something I couldn't have gotten at a smaller company at least at that time."

Leaving the "bullies"

"Coming out of school, I just don't know anything, right? Especially about industry and about office politics and so my personal experience was to learn as much as I can and then kind of eventually have the respect to lead by example and then eventually lead by specifically calling out things and calling out behaviors and trying to do the right thing. And so I'm not saying that everyone I worked with in the beginning was a bully but there were a lot of bullies and I've even dealt with bullies even since."

Eventually I left because "I wanted a different culture. I already had a good reputation. I wanted to not have to fight every year and a half, tooth and nail, for every change. It just got to be too much for me, more than I could handle doing that. I had to fight tooth and nail for every battle. Where here, I haven't had to yet."

Being a woman in tech

At my current workplace, "I'm a lot more comfortable. As far as that goes, working with more people who are like me, it's, it is a lot more comfortable. I'm less likely to hear in the background, people talking about women in what really is sexual harassment. I used to see that a lot more often. I haven't seen that in years. And it was just generally accepted."

"I think it's very much like that where I would hear a lot more of it because people just saw me as you know, she's just one of us, right. Wait, you know, there's other people with diverse backgrounds and I'm not going to single them out. I think people are more cognizant of not making people feel uncomfortable, right? I think the more

diversity you have the more people are also going to go out of their way to be respectful and not feel like they can just get away with anything.”

“I have [had] to use different words than guys do. Countless times I’ve seen a guy say something and then I say something and I’m just accused of being a bitch. And it made me not use those words and it’s like, you know, ‘you’re really harsh on that person.’ It’s like ‘no I wasn’t, I just said what we needed to do.’ It’s not just men saying that to women, like women say it to other women, too. I can’t even tell you enough given my experience the culture shock, you know, of being a woman in the workplace, I couldn’t have anticipated it given my background either so it’s been interesting. But I think it’s getting better. I work with a product manager and a debt manager and they’re even more direct than I am and it’s just refreshing that we all just understand that we’re not being bitches, right, we’re just saying what we need just like a guy would.”

When I first started working, “the amount of student debt that I had even with working and how hard it was for me to get the job, you know, it’s just some fights aren’t worth it like when I got to be more senior and I knew what I was talking about and people respected me, it became a lot easier to call out things like that. There’s good policies about it now and I wouldn’t be afraid to do it the right way. I think that things have changed so much even in the last, at least in my sphere of anecdotal experience, it’s changed a lot.”

Here, they’re “really accepting” of different cultures. “I think everyone just keeps an open mind to what the right thing is for again, the customer and the people doing the work. In the past, it was mostly not the cultures I had a problem with, it was just, in my opinion, it was other people not being willing to see my perspective, right, whereas I felt for sure that I listened to other folks but then some people are very stuck in their ways and won’t even try. The biggest lesson I have taken is I think everyone is trying to do the right thing. More often than not I should say. More often than not people and stakeholders and partners, everyone’s trying to do the right thing.” My company gives me enjoyment by “having my back. Supporting me when I call out things if I think that we’re wasting our time on something or if we’re doing something that isn’t good for our customers I feel like I’m listened to.”


My professional and personal identity diverge “a lot. Work is work and I used to pour my life into it. [Now] I work for a paycheck and have hobbies outside of work.” I can “mostly” be myself at work. “It just depends on how long I’ve been somewhere. For the most part I can. There’s just personal stuff” I don’t discuss. For example,

“someone made a comment the other day and it was about, my fiancé and I are both bisexual, right? He’s a guy but it doesn’t change the fact that that’s who we are. And my fiancé, he’s gender queer, too, and so he doesn’t always do things that are very masculine, so someone made a comment about ‘oh, well, he’s not gay or anything,’ and I was like ‘well, he kind of is a little bit and that’s okay.’ People are weird about that stuff still. But it’s not a big deal. I mean I just didn’t say anything because it’s like, if I was really being myself, I’d be like ‘you know, he really totally is and it’s not a big deal,’ right, but sometimes you just don’t talk about personal stuff at work and you just kind of let it roll off and you’re like whatever.” I temper that piece of me “because it is scary because you don’t know what people, what people think, right, so they may even be polite in front of you. I haven’t come out to anyone as trans at this company. There’s so much transphobia in the world that scares me. I am afraid that would impact how people interact with me so I don’t really talk about that.”

The diversity of this company has “changed dramatically over the last few years. I used to be the only woman on any team. There might be like token one or two of us and even at my old company it started off that way.”

“I’ve had a lot of trouble with certain cultures who aren’t as accepting towards women. I definitely felt more like I had to, you know, become a whisky drinker and I like whisky now but I literally set out to discover whisky because I knew that would help me be part of that boys club, right.”

“You don’t know every time that you’re passed up for something because of that so these micro-aggressions. I can also say for sure that micro-aggressions are there and they’re real and sometimes they’re more than micro-aggressions.” Sometimes they’re “straight up active aggression.”

 Herbert Wertheim College of Engineering POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE		
Engineering School of Sustainable Infrastructure & Environment Department of Environmental Engineering Sciences		
<h2>Heather Analysis</h2>		
Dis/Advantages	In/Authenticity	Marginalized Identities
<ul style="list-style-type: none"> ▪ “She’s just one of us” ▪ Fear of transphobia ▪ Student debt forced her into “boys club” job 	<ul style="list-style-type: none"> ▪ “Going to work as a guy” ▪ Current workplace, “Working with more people like me, it’s a lot more comfortable.” ▪ Weighed her words ▪ She can “mostly” be herself at work ▪ Blended into “boys club” for different cultures 	<ul style="list-style-type: none"> ▪ Sexuality, gender identity ▪ “My fiancé and I are both bisexual. Someone made a comment about ‘oh, well, he’s not gay or anything,’ and I was like ‘well, he kind of is a little bit and that’s okay.’ People are weird about that stuff still.”


Heather experienced discrimination because of her multiple marginalized identities. Heather’s transgender identity initially created disadvantages and inauthenticity in the workplace. She began her career in a company that prided themselves on being a “boys club.” She had to take any job she could get after school because of student debt. She attributed the challenge of getting a job to her low GPA and the recession. Her first job was prior to her transition, causing an internal battle of inauthenticity as she went to work in the “boys club.”

There were instances of sexual discrimination which made her uncomfortable within her initial workplace. She would hear sexual harassment in the background because they saw her as “she’s just one of us.” She described her experience, saying “everyone I worked with in the beginning was a bully.” She didn’t stand up to discrimination because she was young and afraid of losing her position because of the power the “boys club” held. Eventually she was able to transition into herself, and she left her first workplace.

Her current workplace allows her to be authentic because they are “really accepting” of diverse people. Now that she is more senior within her career, she calls discrimination out because she has the advantage of her own currency. She knows her worth and is able to be her authentic self. She can be authentic because her

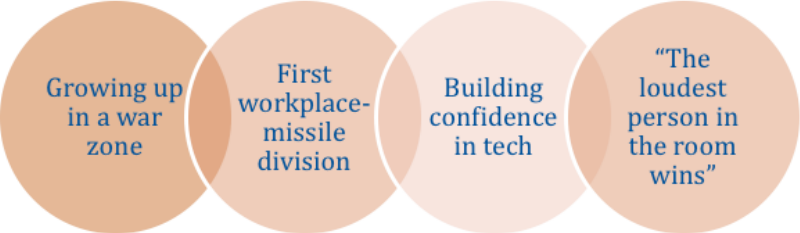
company has a supportive culture.

Contrary to this, when working with clients of different cultures that aren't as accepting of women, Heather tried to become a part of the "boys club," pushing her to be inauthentic. Heather also hints at fear of homophobic prejudice, specifically when one coworker called out her fiancé. She mentioned that "people are weird about that stuff still." Although she wanted to call her coworker out, she didn't because she keeps her personal life out of the workplace. She continued to explain that she hid her marginalized identities stating, "it is scary because you don't know what people think." Although she is comfortable inside and outside of the workplace, she keeps these two experiences separated.


Herbert Wertheim College of Engineering
POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE
Engineering School of Sustainable Infrastructure & Environment
 Department of Environmental Engineering Sciences

Hana Narrative

- Identities: White Middle Eastern woman in engineering



Growing up in a war zone

“I’m Middle Eastern. You don’t grow up being an engineer as a Middle Eastern woman.” As a child, “I didn’t dream about becoming anything. I dreamed about survival because I grew up in a war zone so it wasn’t really until I came to the U.S., we moved here in the early ‘80s and I was in high school, that I actually started thinking about what is it that I want to do with my life. I literally grew up in a civil war, people were dying all around me so it wasn’t like we had a lot of opportunities. A dream about being engineers, it was more about dreaming about getting out of the hell hole you’re in.”

“I was in high school” when we moved to the U.S. “My mom was terrified of American culture because it was so different than what we grew up in and she wanted to keep us in the house. So went to school and came home and that’s what we did. It influenced me to not think big enough. It influenced me how to figuring out also, understanding American culture, understanding how business is run in the U.S., understanding how to communicate and deal with people. I was sheltered and not in a great way.”

“I was very perplexed when a lot of the girls in my classes were complaining about math and science and saying that they hated it, you know, because they’re girls. I

think that's a lot of the American influence in terms of girls aren't as good in math. Growing up that was never a subject that was discussed anywhere. It was a big change in high school." This continued into college. "I never even thought about girls in engineering actually until I went into engineering that I recognized there aren't a lot of girls in engineering."

First workplace- missile division

During college, I had an internship and "I was terrified in the beginning. But I liked it better than the school work so I was excited and thrilled." I was terrified because "I felt, of course, you know, do I really know what I'm doing? What if I fuck up? What if they find out I know less than what I know? Again, insecurity, lack of confidence." I was in their "missile division, which I did not want to be any part of because, I was in a war zone and I definitely did not want to work on missiles. I was the youngest by many, many, many years. So it was intimidating and difficult." After two and a half years, my family and I moved to the southeast and I got a new job at my second tech company.

Building confidence in tech

Within this company, "it was a much younger group of people, many that are my age so it felt more natural. I had a good team that I worked with and I think that's when I started gaining more confidence." Eventually, I moved to the west for my current job. My company now is "very transparent. Collaborative. They give the employees a lot of autonomy to do their work. They empower teams to make big decisions. Not very top heavy, it's really bottoms up. A lot of it is organic."

My professional identity has "never diverged, well, it diverged most recently from the way I see myself. I've always felt as an engineer and that was who I was. I mean, kind of my profession is a big part of who I am. So I'm a mother. I'm a wife. But I'm also an engineer. That's how I identify myself. So it's very much part of who I am I would say. I have recently switched from being engineering to what we call technical program management and that's been a very difficult transition for me because I don't identify as a program manager."

When I moved out west for my current position, "I actually had to change quite a bit to fit within the environment that I was in because although they want authenticity, they want people to be themselves at work and in the home, that's just a lot of talk and not a lot of action because if I come in and I'm passionate about something I'll get too emotional. 'You're not reasonable. Why do you push so hard? Why are you not in agreement?' So it's like wait, you want me to be my authentic self but you

actually don't want me to be my authentic self. You want me to speak softer, you want me to agree and not show my emotions. You want me to just nod vertically even when I disagree? So that goes against my grain. So you really don't want me to be my authentic self. You want me to bring authentic self that you like, not the authentic self that's authentic. So I've had to change quite a bit to fit the mold here." I feel that this is the case because "I think it is the culture. There's no confrontation in big meetings. There's like no open, open dissent that would make people feel bad about what they've done so it's very civil from that perspective. It's very homogenous and then you lose awareness of the other side. If you're not talking about the other side then you don't understand what's happening and then you become more and more less aware of things that you should think about."

"The loudest person in the room wins"


"It's predominantly a very male environment. They have big egos, lots of big egos. They're men in position of power with big egos so you have a pretty big battle ahead of you. Sometimes it's just easier not to argue. The culture, I mean, everybody (laugh), everybody wants to be open and transparent and you know, different perspectives. We don't always succeed at doing that, that's for sure. There's a culture of the loudest person in the room wins."

"With my current position," there is some "stickiness." There is "maybe unconscious bias that happens in the workplace or whether it's conscious or unconscious, I don't know. The word minorities in general, there's some stickiness there in terms of, for me as a woman, right, stickiness in terms of what you can and cannot say and how you say it and who chooses to listen and not listen and kind of it's not wonderful. For women, I mean we kind of fit the statistics for sure, in terms of number of women in the room and when the woman speaks up how she speaks up and how many times she gets interrupted and how many times somebody else says the same thing a woman just said, then they get heard but she doesn't get heard. So all of these things in terms of woman alone that are pretty evident and we see them day in and day out in most of our meetings. The company had put some initiatives. They call it 'Be the Ally' and essentially in the room they usually have people that are trained to notice these things and speak up when they do happen and it does actually work to a certain extent. We train people to also notice it for themselves like when it happens to you how should you react. We have unconscious bias training. We have conscious bias training. We have a lot of feedback, it's a very feedback culture, so if people do it all the time it definitely shows up on their performance."

Personally, "I can't say I handle it the way I would like to say I handle it. Sometimes,

I'm so taken off guard that I don't know what to say, I'm at a loss so I just kind of freeze or not speak up for myself. It's much easier for me to stick up for someone else than it is to stick up for me. Sometimes I get a perception like you're in a room with a bunch of other men and you don't want to sound like you're bringing up [bias]. As a woman, too, when you're a minority, the minute you speak up they'll be like 'oh, here she goes again bringing up all these biases' like so what, we all interrupt each other. So there's a level of you want to fit in, you don't want to be rocking the boat every single time, you want to be cautious about how many things you bring up and how you say it and so just kind of be selective. It's effective actually and the person who did the interruption as an example or the talk-over, is usually pretty embarrassed by the situation."

Men get leadership positions because "they've had the training to go do it and they've had the network and they've had mentors and they had people up top pulling them whereas women, they're still just struggling to get that mentor who's going to believe in them in the first place. I think also men in general do a better job at identifying mentors and reaching out to them. So like a young male coming into the workplace kind of goes okay, who do I want to be my mentor? And there's also usually a lot more males to choose from so they can always find somebody at the high-end level who's also a male that they can reach out to. For a woman that comes in, she looks to the top and she may see one woman that she can ask to be her mentor and then that woman probably has 20 other women she's mentoring because she's the only one. A lot of women aren't even aware" that they should get a mentor.


Herbert Wertheim College of Engineering
Engineering School of Sustainable Infrastructure & Environment
 Department of Environmental Engineering Sciences

POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

Hana Analysis

Dis/Advantages	In/Authenticity	Marginalized Identities
<ul style="list-style-type: none"> ▪ Initial workplace of older white men seen as “intimidating” and “difficult” ▪ Talked over in meetings ▪ “Predominantly a very male environment. They’re men in position of power with big egos.” 	<ul style="list-style-type: none"> ▪ Company moved her from engineering to management ▪ Chooses when to speak up and what she says ▪ Tones down emotions 	<ul style="list-style-type: none"> ▪ Not exposed to US culture growing up ▪ “I never even thought about girls in engineering actually until I went into engineering that I recognized there aren’t a lot of girls in engineering.”

A large part of Hana’s identity growing up was getting out of the warzone she lived in. When her family came to the U.S., she was unaware of American culture because her mother sheltered her. She felt that this was a disadvantage because it hindered her development of communication and people skills. Although this lack of exposure disadvantaged her in that sense, it also had advantages because she didn’t recognize gender norms of engineering. It wasn’t until she got to college that she realized women didn’t seem to do engineering in the U.S.

Hana’s warzone upbringing was reawakened when she began working. Hana had disadvantages of fear from working in a missile department and being surrounded by White older men with “big egos.” This culture was “intimidating” and “difficult” for her, and did not feel authentic to what she wanted an engineering workplace to be.


Hana recognized that companies strive for authenticity, but only if you match the culture that they define. In her experience, she was seen as “too emotional,” “in disagreement”, and had to be inauthentic to fit their mold.

In her career, men have defined the workplaces and have the advantage of power positions. They also have “big egos” that are disadvantageous to her. She experienced being talked over in meetings and forced to watch her words because of her gender.

There was a “culture of the loudest person in the room wins,” and women didn’t get to speak up as authentically as men did.

At the time of her interview, Hana was experiencing inauthenticity when it came to her position within the workplace. Her experience directly aligned with Faulkner’s realms of technical and management positions. She was placed into a management position, even though it was not authentic to her.

Shared Experiences


Herbert Wertheim College of Engineering
POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

Engineering School of Sustainable Infrastructure & Environment
Department of Environmental Engineering Sciences

Shared Experiences

Building the overall narrative

Dis/Advantages	In/Authenticity	Marginalized Identities
<ul style="list-style-type: none"> ▪ Discrimination <ul style="list-style-type: none"> ▪ Sexism ▪ Racism ▪ Tokenism and isolation 	<ul style="list-style-type: none"> ▪ Learn “workplace etiquette” ▪ Masking identities ▪ Weighing words ▪ Speaking up 	<ul style="list-style-type: none"> ▪ Gender

Within this section, I am going to present the shared findings between each of the participants. Each participant shared gendered workplace experiences and discrimination due to their marginalized identities.

I will build from their inauthenticity at the start of their careers, where they had to “learn” how to fit into the male dominant workplace culture. Their inauthenticity persisted through masking identities and weighing their words throughout their narratives.

Furthermore, the workplace cultures disadvantaged the participants through sexism, racism, tokenism and isolation. Thus the cycle of inauthenticity continued. As the participants progressed in their careers, they did become authentic in the sense that they spoke up to injustices.

Inauthenticity

Boys club etiquette

- “Being new in the corporate world, I had a little bit of etiquette to learn. One of the things is they’re always watching you. Even when you think they’re not.” - Leanne
- “Coming out of school, I just don’t know anything, right? Especially about industry and about office politics.” - Heather
- “It was very much like a boys club.” -Heather

Each of the participants acknowledged a lack of understanding of workplace culture when they began their careers. Leanne and Heather mentioned their perceived lack of preparation for office etiquette and politics, whereas Hana had fear of lack of knowledge. Incorporating our frameworks, we can see that because the workplace culture is defined by men, the women felt as though they had to learn how to fit into this mold, or that they are not enough, creating inauthenticity.

Thus far in the larger study, male participants did not enter the workplaces with lack of confidence. They were not intimidated, rather they described their initial workplaces as “fun”, “positive”, “open”, “flexible” and “free” to do what they wanted.

UF Herbert Wertheim College of Engineering
Engineering School of Sustainable Infrastructure & Environment
Department of Environmental Engineering Sciences

POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

Inauthenticity

Marginalization

- “It’s pretty predominantly a very male environment. They’re men in position of power with big egos so you have a pretty big battle ahead of you. Sometimes it’s just easier not to argue.” -Hana
- I can “mostly” be myself at work. “I haven’t come out to anyone as trans at this company. There’s so much transphobia in the world that scares me. I am afraid that would impact how people interact with me.” -Heather
- “The thing you have to separate is when you’re around like a room of White people and you’ve got to turn on that switch so I can get paid.” -Leanne

For each of the marginalized participants, there was inauthenticity stemming from fear and power. The majoritarian caused the participants to interact cautiously within the workplace, for fear of hate and job loss. Like Hana described, men are in a position of power, leading to a “big battle ahead.” Therefore sometimes it is easier not to argue and the disadvantages persist.

Although Heather was her authentic self, meaning she did not have to acknowledge her trans identity, she was inauthentic in the sense that she had to fear if people outed her.

Leanne’s intersectionalities of race and gender were impactful in her workplaces. She recognized the existence of racism, causing her to code switch into an inauthentic form of herself. The ubiquitous racist society that does not accept non-majoritarian cultures has forced her into inauthenticity from a young age. She described that White people hold the advantage of her livelihood through pay, therefore she must act inauthentically to ensure her position. In addition to racism, she also experienced sexism through her intersectionality. As Crenshaw [12] described, Leanne lives a double bind of race and gender.

Inauthenticity

Weighing words

- “I’ve seen a guy say something and then I say something and I’m just accused of being a bitch.” -Heather
- “I actually had to change quite a bit to fit within the environment that I was in because although they want authenticity, that’s just a lot of talk and not a lot of action because if I come in and I’m passionate about something I’ll get too emotional. ‘You’re not reasonable.’” –Hana

The participants mentioned how they chose their words and when they spoke up. Heather and Hana described how they had to tone down their emotions and responses to fit into the White male dominant workplace culture. As described by Heather, men can get away with saying things within their culture, but when women speak up it is seen as harsh. Likewise, Hana described how men dismiss when women bring up biases. She chose when to “rock the boat” and weighed her words. Because of the White male majoritarian culture, a level of inauthenticity was felt by each participant.

UF Herbert Wertheim College of Engineering
Engineering School of Sustainable Infrastructure & Environment
Department of Environmental Engineering Sciences

POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

Authenticity

Speaking up

- “I work with a product manager and a debt manager and they’re even more direct than I am and it’s just refreshing that we all just understand that we’re not being bitches, right, we’re just saying what we need just like a guy would.” -Heather
- My company is good at “supporting me when I call out things.” -Heather
- “I’m going to be diplomatic but I’m going to check you though but I’m going to be diplomatic.” -Leanne

In terms of authenticity, the three participants described authentic experiences when the workplace culture allowed it, meaning when they were comfortable with who they were around. They each explained that they could be authentic and speak up when they were surrounded by people of similar backgrounds and interests.

In her quote, Heather was comfortable when the people around her allowed a direct and open dialogue.

Leanne was authentic in standing up against racism and discrimination just as her parents had taught her growing up. In her narrative, she had displayed various examples of how she was authentic in using her voice to combat the majoritarian. This was authentically who she was; she will “be diplomatic” but she will “check you.”

Hana found comfort in being surrounded by people of similar ages. She described that earlier in her career it was “intimidating” and “difficult” because she was surrounded by older white men. As each participant progressed through their careers, they became authentic in speaking up.

UF Herbert Wertheim College of Engineering
Engineering School of Sustainable Infrastructure & Environment
Department of Environmental Engineering Sciences

POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

Disadvantages

Sexism

- “This guy is just like ‘you’re going to love it here. It’s just a boys club and we all just get along so well, and there’s no women here because you know, women get pregnant and like you know, you lose all the experience you give them and then they disappear.” –Heather
- “For women, we kind of fit the statistics for sure, in terms of number of women in the room and when the woman speaks up how she speaks up and how many times she gets interrupted and how many times somebody else says the same thing. Then they get heard but she doesn’t get heard. So all of these things in terms of woman alone that are pretty evident and we see them day in and day out in most of our meetings.” -Hana

Each of the participants witnessed and was disadvantaged by sexism. Within Heather’s first workplace, coworkers blatantly told her their sexist reason as to why they don’t have women, and they were proud of their “boys club.”

Hana and Heather both mentioned that women were talked over, and the manner that they speak up is an issue within the workplace. They were cautious in what and how they said things.

Leanne and Heather mentioned that certain cultures who aren’t as accepting of women gave them issues, specifically with communication. For Heather this disadvantaged her because she had to go out of her comfort to learn how to bond with their culture. She gave an example of how she learned to drink whisky to fit in. Whereas Leanne continued authentically and put the onus on her coworkers to fix their prejudice.

Disadvantages

Tokenism

- “You learn how to code-switch early. That’s what it is. I was always one of maybe five or 10 in the whole grade. We’re numbered. And then by the time I got to college I was the only Black person and the only female in my particular class.” -Leanne
- “For a woman that comes in, she looks to the top and she may see one woman that she can ask to be her mentor and then that woman probably has 20 other women she’s mentoring because she’s the only one.” -Hana
- “I used to be the only woman on any team. There might be like token like one or two of us and even at my old company.” -Heather

Examples of disadvantages from tokenism were present in each of the participants’ narratives. For Leanne, she explicitly stated her intersectionality of being a Black woman in engineering. Systems of racism in place have forced her to code switch from an early age. Due to “being numbered” or marginalized, she was inauthentic in turning on the switch to fit into the majoritarian culture. She recognized her marginalization.

Both Hana and Heather pointed out their marginalized gender statuses, stating that there aren't a lot of women in engineering. Disadvantages from this included being treated like a token, not having women to foster mentorship relationships, and placing a burden on the few women in leadership roles to be a mentor for all women in the company.

UF Herbert Wertheim College of Engineering
Engineering School of Sustainable Infrastructure & Environment
Department of Environmental Engineering Sciences

POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

Conclusions

- “Engineering workplace cultures have to become much more welcoming, comfortable and supportive places... for groups who are currently in a minority or marginalized in the profession – if they are to avoid losing or underutilizing their talent” (Faulkner, 2009a, p. 16)
- “Love, education, and activists will not end racism. We must dismantle the policies in place to begin to eradicate it” (Kendi cited in O’Neal, 2017)

Findings demonstrated that all three participants experienced disadvantages, feelings of isolation, and inauthenticity due to their gender minority status. Each participant noticed a lack of diversity in their workplaces, and they described the workplaces as mostly older White men.

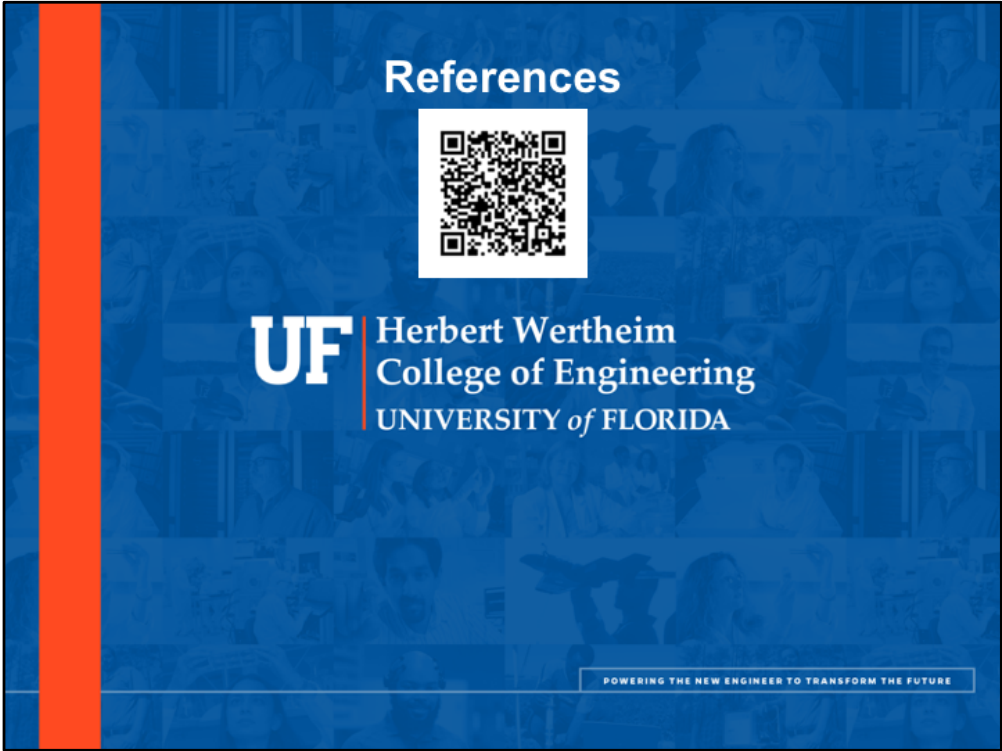
In terms of authenticity, the three participants described authentic experiences when the workplace culture allowed it, meaning when they were comfortable with who they were around. They each explained that they could be authentic when they were surrounded by people of similar backgrounds and interests. Each participant described instances where their marginalized identities were masked or toned down depending on the situation that they were in.

In conclusion, we have found that workplaces are still defined by White male culture, creating disadvantages, feelings of isolation and inauthenticity for women. As Wendy Faulkner stated, “Engineering workplace cultures have to become much more welcoming, comfortable and supportive places... for groups who are currently in a minority or marginalized in the profession – if they are to avoid losing or underutilizing their talent” [13, p. 16].


As for structural racism, transphobia and sexism, instances of injustice still pervade

workplaces. This creates fear for marginalized individuals to comfortably speak up which allows disadvantages to persist. As Kendi [14] states, “Love, education, and activists will not end racism. We must dismantle the policies in place to begin to eradicate it.”

In order to combat racism in tech, we intend to present the narratives gathered to various computer and information technology stakeholders. We intend to provide resources for companies in their advancement of justice and equity and the advocacy for a shift in attitudes, behaviors, and policies.



References



UF Herbert Wertheim
College of Engineering
UNIVERSITY of FLORIDA

POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE

The slide features a blue background with a collage of student photos. A vertical orange bar is on the left. The text 'References' is at the top center. A QR code is in the upper middle. The University of Florida logo and 'Herbert Wertheim College of Engineering' are in the center. The tagline 'POWERING THE NEW ENGINEER TO TRANSFORM THE FUTURE' is in a small box at the bottom right.

For our list of references, please scan the QR code.