Factors promoting persistence of African American students in undergraduate engineering
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Rationale for Study:
• Certain ethnic and racial minorities are still underrepresented in science, technology, engineering, and mathematics (STEM) majors due to low persistence rates.
• Need to focus on sub-fields of STEM and specific racial ethnic or racial groups to fully understand the complex situation.

Research Question: How do African American engineering students’ experiences in their academic, social, and institutional environments, as well as their individual characteristics, influence their persistence toward degree completion?

Research Design:
• To identify positive outcomes (i.e., persistence) rather than negative outcomes, such as attrition
• Two semi-structured interviews with African American engineering upperclassmen (i.e., juniors and seniors)
  ➢ Interview I – to understand participant’s relevant life experiences (i.e., family, pre-college experiences, salient social identities)
  ➢ Interview II – to understand participant’s academic and social experiences as they relate to his/her pursuit of an engineering degree and how they influence him/her
• Two observations to provide context about the eng. community
  ➢ Upperclassmen meeting of a STEM enrichment program
  ➢ National Society of Black Engineer’s student chapter meeting

Participants:
• African American juniors and seniors at a top-ranked research-based engineering school

Data Analysis:
• Open-coding to identify themes and categories
• Summative memos on data collection
• Constant comparative analysis and analytical memos

Preliminary Findings:
Centrality of Race in Student’s Experiences of Engineering School
• Students felt the visibility of their race on campus, both in academic and social situations and often experienced feelings of isolation
  There was a group of three or four black girls, we are all in [the same major]...we had these office hours review sessions and we were the first people there, we started a list so our names are on top of it. And then when the professor finally got there, there was a whole other list that we were just not included on... It was really upsetting, like, I didn’t—we didn’t know what to do. I shouldn’t have to assert myself, no one else asserted themselves. (Chayla)

Factors Influencing Persistence – “Why” Persist
• Expectations and sense of responsibility
  I just feel like I can’t fail. Because like people expect you to fail, so it’s like I can’t really fail...I’m the only black engineer from [community]. The team is on my back in a sense—it’s really not, but it is...By the team I mean your race. Black engineers—like that’s what I mean by the team. Like putting them on my back and making sure that you look good so that everyone else looks good. (Anthony)
• Utility of engineering degree
  When I looked into what I wanted for college, it wasn’t to go to college because that’s what you did after high school, you go because you don’t have any money and you need a degree to make money. So it was really, very much so, what degree do I need to get to make as much money as possible. So I don’t have to go through [living in poverty] again. (Chayla)

Factors Influencing Persistence – “How” to Persist
• Self-organized communities increase academic and social support
  ...I guess the most positive thing that I’ve experienced would be the groups that I’ve built...I have never made a schedule or signed up for classes having not talked to [the other black students my major]. We take all our classes together, purposely, ...we take classes together, we study together, it kind of makes it easier. It’s really been a strong sense of community between all of us. Because we look out for each other... the sense of community is really what kept me [in engineering]. (Chayla)
• Find and learn from informal mentors
  ...my involvement in the National Society of Black Engineers...it allowed me to know get to know upper-classmen and they helped me with my classes, choosing the right professors, feeling out campus in a way that you wouldn’t get on a guided tour in was way that a professor wouldn’t tell you, you would, kinda be mentors, and even as far as helping me with my homework or telling who to go to for help with my homework. (Danielle)
• Reframing negative experiences
  ...It was really discouraging when I entered college, it was kind of I had to prove myself even more just to be on the same level as my peers. ...It taught me a lesson that I had to speak up for myself and had to assert myself so my opinions... it helped me in my internships and it helped me have leadership positions in my organizations it was a tough lesson and it can be seen as a negative but reflecting back on it, it was probably a positive because it helped me grow as a person. (Danielle)

Emerging Conceptual Framework:
Based on the Brofenbrenner model which describes individuals as embedded within a series of systems; individuals are shaped by their environments
• The African American students in the pilot study had a strong sense of community that shaped their lives and helped them to navigate their engineering campus and their institution

Conclusions:
• Students feel that race is an extremely salient identity in both academic and social situations.
• Students leverage each other by building communities and establishing mentoring relationships to aid in persistence toward degree completion

Future Work:
• Expand pilot study into full-scale study with particular focus on students’ experiences
  ➢ Juniors or senior status
  ➢ Variety of engineering disciplines
  ➢ Leaders and non-leaders
• Continue with multiple interviews and observations of relevant engineering activities

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