

## **Board 136: An Intersectional Perspective to Studying Microaggressions in Engineering Programs**

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## **An Intersectional Perspective to Studying Microaggressions: An Overview of the Current Scholarship**

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### **Abstract**

Microaggressions are widespread in engineering but have received limited attention from engineering education scholars. This research presents the current state of literature on microaggressions and emphasizes the need to adopt an intersectionality perspective to studying microaggressions. The research presents a review of the literature including the (1) study context, (2) study methods, (3) study objectives, (4) microaggressions outcomes and (5) microaggressions types using data from 45 journal articles. Data analysis included coding of the journal articles to identify major themes representing different forms of microaggressions. The current results show that the research studying microaggressions using an intersectional lens is limited. This research contributes to improved understanding regarding microaggressions by identifying the gaps within existing literature on microaggressions. Practically, this research increases the visibility of subtle negative behaviors that engineering minority groups experience and their importance for students' success and persistence.

### **Introduction**

Engineering programs continue to be underrepresented in terms of gender and racial minorities. Previous scholarship on minority retention in engineering primarily focuses on institutional factors or direct forms of discrimination in the field (Glass, Sessler, Levitte, & Michelmore, 2013; May & Chubin, 2003; Pawley, 2013). While these policies are important to minorities' experiences in engineering education, they only partially account for minorities' desires to exit the engineering profession (Glass et al., 2013). The norms and behaviors that operate outside of the direct forms of discrimination are wholly understudied. Around 61% of minorities mention that they experience subtle negative behaviors, or microaggressions, in engineering (Williams, Li, Rincon, & Finn, 2016). While these behaviors are frequent in engineering (Forrest-Bank & Jenson, 2015; Fouad, Chang, Wan, & Singh, 2017), their nature in engineering programs are not well studied especially across diverse gender and race groups. This research brings attention to an understudied topic in engineering – microaggressions. Microaggressions represent the subtle and stunning assaults people encounter based on their membership in social groups such as race, gender, and sexual orientation. discriminatory experiences based on a person's

membership to a group. For example, labeling a woman as “bossy” is a microaggression and sends the message that women need to be passive and that assertive behavior is not welcomed.

While microaggressions in engineering are widespread, the research on microaggressions in engineering is scarce with a few notable exceptions (Camacho and Lord 2011; Burth et al. 2016). Camacho and Lord (2011) have shown that microaggressions in engineering occur at the institutional level, at the interpersonal level and as everyday norms (e.g. jokes). Burt et al (2016) have emphasized the diverse microaggressions that Black students experience in engineering during their advising experiences. This literature collectively has shown that microaggressions are more frequent among certain gender and race groups than others and underscored the importance of intersectionality as lens to study microaggressions. The intersectional paradigm holds that race, class, and gender cannot be understood as discrete categories of analysis but are instead mutually constituted (McCall 2005; Shields 2008). Kimberle Crenshaw (1989) coined the term intersectionality, which underscores the multidimensionality of marginalized subjects’ lived experiences. Intersectionality seeks to demonstrate the racial variation within gender and the gendered variation with race through its attention to subjects whose identities contest race-or-gender categorizations (Nash, 2008). In explaining the importance of intersectionality, Pat Hill Collins (2002) refers to it as “the matrix of domination”. Collins (2015) asserts that race, class, gender, sexuality, ethnicity, nation, ability and age operate not as unitary, mutually exclusive entities, but as reciprocally constructing phenomena that in turn shape complex social inequalities. According to Burham (2001), Black women’s experience as women is invisible from their experiences as African American, so they are always “both/and”. Consequently, analyses that claim to examine gender while neglecting a critical stance towards race and class inevitably do so at the expense of African American women’s experience. Based on a study by Wilkins (2008), the complex intersections of race and gender, and the contradictions among them, also constrain white women in their efforts to recreate their gendered identities. Moreover, Wilkins (2012) maintains that identities are organized at the complex intersection of multiple categories of membership and meaning. According to McBride, Hebson and Holgate (2015), intersectionality forces researchers to recognize that there is diversity in any category of worker, and that individuals “within an intersectional space (i.e., of two overlapping categories) may be experiencing something completely different to those occupying one of the categories (p.335). For example, Elliott and Smith (2004) found that men and women of various races and ethnicities experience increasing inequality in workplace power, relative to white men, but they experience it to different degrees and via different mechanisms. Moreover, intersectional approaches might focus on groups, on systems, or on processes (Cho, Crenshaw, and McCall,2013).

This research uses theory of intersectionality as lenses to studying microaggressions and identifies the experiences that diverse gender and race groups experience using previous literature on microaggressions.

## **Methods**

This review of the sub-field intends to identify the current state of research on microaggressions. Specifically, this research identifies the (1) study context, (2) study methods, (3) study objectives, (4) study outcomes and (5) microaggressions types. To identify the literature on microaggressions, two databases (JSTOR and Google Scholar) were used employing key word searches, including “microaggressions” and “microaggression”, and cross-references. A total of 57 articles were identified across 20 refereed journals. The final list was narrowed down to 45 journal articles which included articles based on gender and race microaggressions only. For example, some of the articles excluded discussed microaggressions based on sexuality (Galupo & Resnick, 2016) and religion (Nadal, Griffin, Hamit, Leon, & Tobio, 2015.) Then, the articles were imported into NVivo, a qualitative analysis software which helps with the coding management process.

Five macro codes were used to categorize the articles: (1) study context, (2) study methods, (3) study objectives, (4) study effects from microaggressions, (5) microaggressions type. For each macro code category, we identified several sub-codes, or sub-categories describing the macro code. The “*study context*” macro code refers to the environment of the studies on microaggressions. The code included four micro codes: (1) Graduate education, (2) Undergraduate education, (3) High school, (4) Workplace, and (5) Therapy. The “*study methods*” macro-code refers to the methods used in previous literature including data collection and analysis. The code included two micro-codes: (1) data collection and (2) data analysis. Interviews, survey, and previous literature were used as data collection methods. Narrative analysis and statistical analysis were the two forms of data analysis methods that we identified. The “*study objective*” macro-code refers to the objective of the existing studies on microaggressions. The code included five micro-codes: (1) increasing awareness about microaggressions, (2) description of microaggressions, (3) effect of microaggressions on a range of outcomes, and (4) analysis of past results. It was pertinent that we explore the different reasons why researchers were studying microaggressions so that we were aware if our research was redundant or not. The “*microaggressions outcomes*” macro-code refers to the examined effect of experienced microaggressions and was split into six micro-codes: (1) mental health, (2) physical health, (3) social performance, (4) academic performance, (5) work performance, and (6) self-performance. For example, academic performance outcomes may include research that examines how experienced microaggressions affect how well individuals do in their classes or on assignments. Finally, the “*microaggressions type*” macro-code refers to the different forms of microaggressions experiences by diverse gender and race groups mentioned in the literature. A comprehensive list of microaggressions type is presented in the results section. Additionally, because our study focuses on gender and race microaggressions, we present our results based on the most studied gender and race groups including: (1) Asian, (2) Asian men, (3) Asian women, (4) Black, (5) Black men, (6) Black women, (7) Latinx, (8) Latinx men, (9) Latinx women, and (10) Women.

## **Results**

### ***Study context***

The first set of results (Table 1) shows that 13% of the literature was studied in the context of graduate education, 58% in the context of undergraduate education, 11% in the workplace and 13% in the therapy. The most studied context for microaggressions included undergraduate education (Harper, 2013; Nadal et al., 2015; Torres-Harding, Andrade, & Romero Diaz, 2012; Yosso, Smith, Ceja, & Solórzano, 2009) while the least studied context included graduate education (Owen, Tao, Imel, Wampold, & Rodolfa, 2014).

Table 1: Overview of the context of study in previous literature

| <b>Study context</b>    | <b>Relative Frequency</b> |
|-------------------------|---------------------------|
| Graduate education      | 13%                       |
| Undergraduate education | 58%                       |
| Workplace               | 11%                       |
| Therapy                 | 13%                       |
| Other                   | 4%                        |
|                         | N=45                      |

### ***Study methods***

The second set of results (Table 2 and 3) presents the type of methods, including data collection and data analysis methods used by the literature on microaggressions. Table 2 shows that 51% of the literature on microaggressions used interviews while 33% of the literature used surveys as data collections methods. A small portion of the literature (2%) used data from previous literature. Table 3 shows that 46% of the literature on microaggressions used narrative analysis while 37% of the literature used statistical analysis. The results show that current literature has used both qualitative and quantitative methods with a slight preference for qualitative methods.

Table 2: Overview of the data collection in current literature

| <b>Data Collection Methods</b> | <b>Frequency</b> |
|--------------------------------|------------------|
| Interviews                     | 51%              |
| Surveys                        | 33%              |
| Previous literature            | 2%               |
|                                | N=45             |

Table 3: Overview of the data analysis in current literature

| <b>Data Analysis Method</b> | <b>Frequency</b> |
|-----------------------------|------------------|
| Narrative                   | 46%              |
| Statistical                 | 37%              |
|                             | N=45             |

### ***Study objective***

The third set of results (Table 4) presents the objectives of the current literature on microaggressions. Table 4 shows that 80% focused on studying the effect of microaggressions on a range of outcomes, 51% focused on describing microaggressions, 4% of the literature on microaggressions focused on increasing awareness of microaggressions, and 2% analyzed past results. Based on these results, the most studied objective included the effect of microaggressions on a range of outcomes (Constantine & Sue, 2007; Nadal, Griffin, Wong, Hamit, & Rasmus, 2014; Okazaki, 2009) while the least studied objective included analysis of past results (Nadal et al., 2015).

Table 4: Overview of the study objectives in current literature

| <b>Objective</b>                                  | <b>Frequency</b> |
|---|------------------|
| Effect of microaggressions on a range of outcomes | 80%              |
| Description of microaggressions                   | 51%              |
| Increasing awareness about microaggressions       | 4%               |
| Analysis of past results                          | 2%               |
|   | N=45             |

### ***Microaggressions Outcomes***

The fifth set of results (Table 5) presents the microaggressions outcomes identified by current literature. Table 5 shows that 75% of the literature focused on the effects of microaggressions on mental health, 28% focused on the effects of microaggressions on physical health, 28% focused on the effects of microaggressions on social performance, 22% focused on the effects of microaggressions on academic performance, 8% focused on the effects of microaggressions on self-performance, and 13% focused on the effects of microaggressions on work performance. Based on these results, the most studied outcomes from microaggressions included mental health (Constantine & Sue, 2007; Ong, Burrow, Fuller-Rowell, Ja, & Sue, 2013) while the least studied outcomes from microaggressions included self-performance (Mercer, Zeigler-Hill, Wallace, & Hayes, 2011)

Table 5: Overview of the microaggressions outcomes in previous literature

| <b>Outcome</b>       | <b>Frequency</b> |
|----------------------|------------------|
| Mental health        | 75%              |
| Physical health      | 28%              |
| Social performance   | 28%              |
| Academic performance | 22%              |

|                  |     |
|------------------|-----|
| Work performance | 13% |
| Self-performance | 8%  |
| N=36             |     |

### ***Types of Microaggressions by Gender and Race Groups***

The sixth set of results (Tables 6-9) shows a range of microaggressions experiences by diverse gender and race groups. We first define the microaggressions in this section and then discuss the types of microaggressions experienced by each gender and race groups. *Alien in one's own land* represents the assumption that a group does not belong in the country they are in due to their group membership. *Ascription of intelligence* represents the assumption of one's intelligence or lack of intelligence (e.g. being smart) based on their group membership. *Assumed universality of experiences* is the assumption that all individuals of a certain race have the same exact experiences and the experiences are interchangeable. *Assumption of threat/criminality* represents the assumption that a person is violent, can cause harm to someone or has some criminal record and tendencies because of their group membership. *Assumptions about style and beauty* represents the assumption that their physical appearance is associated to their group membership. *Characteristics of speech* includes stereotypes about a person's speech or style of speech because of their group membership. *Colorblindness* represents denial of an individual's racial identity and structural forms of racism. *Dehumanization* represents making a person feel less than human or assumption that a person has no humanity because of their group membership. *Denial of racial identity* represents denial of a person's racial identity. *Emasculation* represents the situation when people have been emasculated based on stereotypes about their race. *Exoticism* represents sexualized images or speeches based on stereotypes surrounding a person's race. *Invalidation of experience* represents disregarding a person's experiences. *Invalidation of interethnic identities* represents the assumption that all ethnic groups within a race are the same. For example, this can include the assumption that Japanese culture is the same and is interchangeable with the Chinese culture. *Invisibility* includes making a person feel invisible or doubting their contribution. *Myth of meritocracy* implied that race only has a minor role in determining life outcomes and that a person's status results from their effort. In other words, it means that race/racism has nothing to do with a person's life situation. *Pathologizing culture* includes assumptions that aspects of a person's culture is a nonfactor compared to the white standard. *Projected stereotypes* represents situations when a person is reduced to caricatures or stereotypes surrounding their identity. *Second class citizenship* represents the belief that a group needs to be treated as inferior and deserve a lower quality of lie. *Sexist humor and jokes* are comments that reinforce gender-roles and stereotypes by making demeaning comments about a person's gender. *Sexual objectification* represents situations when a person is reduced to the sexualization of their body in verbal or nonverbal ways. *Silence and marginalization* includes situations when a person experiences are made invisible and marginalized in their efforts. *Undeveloped incidents* are experiences that cannot be categorized under the definitions of microaggressions.

Asian, Asian Men and Asian Women Group.

This group included a set of 15 papers. Previous literature discussing microaggressions has identified that Asians were likely to experience feeling like an alien in their own land, ascription of intelligence, denial of racial identity, invalidation of interethnic differences, invisibility, pathologized culture, and second-class citizenship. *Alien in one's own land* was mentioned in 60% of the papers, *ascription of intelligence* was mentioned in 33% of the papers, *denial of racial identity* was mentioned in 13% of the papers, invalidation of interethnic differences was mentioned as well in 13% of the papers, invisibility was mentioned in 13% of the papers, pathologizing culture was mentioned in 13% of the papers, and second-class citizen was mentioned in 20% of the papers. The results suggest that alien in one's own land is the most frequently experienced microaggression by Asians.

In addition to these racial microaggressions, previous literature has identified microaggressions which were specific to Asian women and Asian Men. *Exoticism* was mentioned in 33% of the papers and *projected stereotypes* was mentioned in 7% of the papers describing microaggressions experienced by Asian women. *Emasculation* was mentioned in 13% of the papers describing microaggressions experienced by Asian women. Finally, *underdeveloped incidents* describes microaggressions that do not fit into any of the categories previously described and still need further research to develop a description for these microaggressions and were mentioned in 33% of the papers. The results suggest that exoticism is the most frequently experienced microaggression by Asian women while emasculation is the most frequently experienced microaggressions by Asian men. Nevertheless, exoticism is much more prevalent for Asian women.

Table 6: Microaggressions types experiences by Asians, Asian Men and Asian Women

| <b>Microaggressions Type</b>            | <b>Asian</b> | <b>Asian Men</b> | <b>Asian Women</b> |
|---|--------------|------------------|--------------------|
| Alien in own land                       | <b>60%</b>   |                  |                    |
| Ascription of intelligence              | 33%          |                  |                    |
| Denial of racial identity               | 13%          |                  |                    |
| Invalidation of interethnic differences | 13%          |                  |                    |
| Invisibility                            | 13%          |                  |                    |
| Pathologizing culture                   | 20%          |                  |                    |
| Second class citizen                    | 20%          |                  |                    |
| Emasculation                            |              | <b>13%</b>       |                    |
| Exoticism                               |              |                  | <b>33%</b>         |
| Projected stereotypes                   |              |                  | 7%                 |
| Underdeveloped incidents                | 33%          |                  |                    |
| <b>N=15</b>                             |              |                  |                    |

Black, Black men, and Black women Group.



This group included a set of 25 papers. Previous literature discussing microaggressions has identified that Blacks were likely to experience feeling like an alien in their own land, assumed universality of experiences, ascription of intelligence, assumption of criminality, colorblindness, assumed universality of experiences, invisibility, pathologizing culture, second-class citizenship, and myth of meritocracy. *Alien in one's own land* was mentioned in 8% of the papers, *assumed universality of experiences* was mentioned in 16% of papers, *colorblindness* was mentioned in 12% of the papers, *invalidation of experience* was mentioned in 4% of the papers, *pathologizing culture* was mentioned in 16% of the papers, and *second-class citizen* was mentioned in 24% of the papers, *ascription of intelligence* was mentioned in 44% of the papers, *assumption of criminality* was mentioned in 60% of papers, and *myth of meritocracy* was mentioned in 20% of the papers. The results suggest that assumption of criminality is the most frequently experienced microaggression by Blacks followed by ascription of intelligence.

In addition to these racial microaggressions, there are specific experiences that were attributed to Black men and women. Specifically, for Black men, *invisibility* was mentioned in 16% of the papers, *ascription of intelligence* was mentioned in 13% of the papers, *assumption of criminality* was mentioned in 32% of papers, *dehumanization* was mentioned in 8% of the papers and *myth of meritocracy* was mentioned in 20% of the papers. For Black women, *projected stereotypes* was mentioned in 16% of the papers, *assumptions about style and beauty* was mentioned in 28% of the literature, and *silence and marginalization* was mentioned in 16% of the literature and *myth of meritocracy* was mentioned in 7% of the papers. The results suggest that assumption of criminality is the most frequently experienced microaggression by Black men and assumption about style and beauty is the most frequently experienced microaggression by Black women.

Table 6: Microaggressions types experiences by Blacks, Black Men and Black Women

| <b>Microaggression Type</b>         | <b>Black</b> | <b>Black Men</b> | <b>Black Women</b> |
|-------------------------------------|--------------|------------------|--------------------|
| Alien in own land                   | 8%           |                  |                    |
| Assumed universality of experiences | 16%          |                  |                    |
| Ascription of intelligence          | 44%          | 13%              |                    |
| Assumption of criminality           | <b>60%</b>   | <b>32%</b>       |                    |
| Colorblindness                      | 12%          |                  |                    |
| Invalidation of experience          | 4%           |                  |                    |
| Invisibility                        |              | 16%              |                    |
| Pathologizing culture               | 16%          |                  |                    |
| Second class citizen                | 24%          |                  |                    |
| Myth of meritocracy                 | 20%          |                  | 7%                 |
| Dehumanization                      |              | 8%               |                    |
| Projected stereotypes               |              |                  | 16%                |

|                                    |     |            |
|------------------------------------|-----|------------|
| Assumptions about style and beauty |     | <b>28%</b> |
| Silence and marginalization        |     | 16%        |
| Underdeveloped incidents           | 52% |            |
| <b>N=25</b>                        |     |            |

Latinx, Latino, and Latina Group

This group included a set of 13 papers. Previous literature discussing microaggressions has identified that Latinx were likely to experience feeling like an alien in their own land, ascription of intelligence, characteristics of speech, assumption of criminality, exoticism, invalidation of experience, pathologizing culture, second-class citizenship, and projected stereotypes. *Alien in one's own land* was mentioned in 62% of the papers, *ascription of intelligence* was mentioned in 23% of the papers, *characteristics of speech* was mentioned in 15% of the papers, *invalidation of experience* was mentioned in 4% of the papers, *pathologizing culture* was mentioned in 23% of the papers, *assumption of criminality* was mentioned in 31% of the papers, *exoticism* was mentioned in 8% of the papers and *second-class citizen* was mentioned in 23% of the papers. The results suggest that alien in own land is the most frequently experienced microaggression by Latinx, followed by ascription of intelligence Blacks.

In addition to these racial microaggressions, there were specific experiences that were specific to Latinas. Specifically, for Latinas, *projected stereotypes* was mentioned in 8% of the papers and exoticism was mentioned in 15% of the papers. There were also microaggressions reported in the papers that attributed to Latinos specifically. For example, *assumption of criminality* was mentioned in 8% of the papers. The results suggest that assumption of criminality is the most frequently experienced microaggression by Latino and exoticism is the most frequently experienced microaggression by Latina. However, Latina experienced projected stereotypes with the same frequency that Latino experienced assumption of criminality (8% each).

Table 6: Microaggressions types experiences by Latinx, Latinos and Latinas

| <b>Microaggression</b>     | <b>Latinx</b> | <b>Latino</b> | <b>Latina</b> |
|----------------------------|---------------|---------------|---------------|
| Alien in own land          | <b>62%</b>    |               |               |
| Ascription of intelligence | 23%           |               |               |
| Characteristics of speech  | 15%           |               |               |
| Assumption of criminality  | 31%           | <b>8%</b>     |               |
| Exoticism                  | 8%            |               | <b>15%</b>    |
| Pathologizing culture      | 23%           |               |               |
| Invalidation of experience | 15%           |               |               |
| Second class citizen       | 23%           |               |               |
| Projected stereotypes      |               |               | 8%            |
| Underdeveloped incidents   | 38%           |               |               |

### Women

This group included 5 papers. Previous literature has identified four main microaggressions that affect women: invisibility, sexist jokes/humor, sexual objectification, and underdeveloped incidents. *Invisibility* was mentioned in 60% of the papers, *sexist humor/jokes* was mentioned in 20% of the papers, sexual objectification was mentioned in 60% of the papers. It is noteworthy that invisibility and sexual objectification each was mentioned 60% for women.

Table 7: Microaggressions types experiences by Women

| <b>Microaggression</b> | <b>Frequency</b> |
|------------------------|------------------|
| Invisibility           | 60%              |
| Sexist humor and jokes | 20%              |
| Sexual objectification | 60%              |
| <b>N=5</b>             |                  |

### Comparison of intersectional papers and non-intersectional papers

The final analysis in this paper presents an overview of the papers which have adopted an intersectional perspective to microaggressions and those which have discussed microaggressions using gender and race dimensions separately.

Table 8: Microaggressions types using intersectional and non-intersectional perspective

| <b>Intersectionality of paper</b> | <b>Frequency</b> |
|-----------------------------------|------------------|
| Intersectional                    | 33%              |
| Non-intersectional                | 67%              |
| <b>N=45</b>                       |                  |

### **Discussions**

Underrepresentation of minority groups in engineering. Previous work on the everyday “small” discriminatory behaviors have been understudied in engineering. Researchers propose that gender and racial microaggressions are important for minorities’ experiences in engineering programs and their capacity to succeed in these programs. Nevertheless, research on microaggressions in engineering is scarce. This paper presents an overview of the literature on microaggressions using previous work from engineering and non-engineering scholarship. The research contributes to understanding of the diverse forms of microaggressions that are experienced by gender and race groups and also points to gaps in the literature. First, the results show a focus on undergraduate education and less on other contexts such as graduate education.

Second, the literature on microaggressions adopting an intersectional perspective is scarce. Adopting a perspective that considers gender and race groups is important as it provides a more refined understanding based on people's unique experiences with microaggressions, and, as a result it has potential to contribute to more suited policies. Third, the research shows that the microaggressions experienced by the Latinax group have received less attention compared to the microaggressions experienced by other minority groups. Fourth, academic and work performance is an understudied outcome, likely diminishing the perception that microaggressions are of direct concern to the administrators and company leaders.

The primary impact from this research is addressing the negative behaviors that exist toward minority engineering students (Fouad et al. 2017) which act as barriers to broadening participation in engineering. This is timely as engineering programs continue to struggle to retain minority groups (Fouad and Singh 2009). Engineering programs can use the results from this research and broaden participation in engineering by increasing the visibility of the negative subtle behaviors and implementing policies to address them. This research brings attention to the much needed piece in broadening participation by focusing on the everyday micro behaviors that are frequently normalized as the status quo.

## **Conclusions**

This research presents an overview of the current literature on microaggressions in engineering and non-engineering contexts. The analysis in this paper is based on 45 journal articles and focuses on presenting the current state of the literature on the following items: (1) study context, (2) study methods, (3) study objectives, (4) study outcomes and (5) microaggressions types. The overview presents a few gaps in the literature including the need to adopt an intersectional perspective to microaggressions, expanding the literature to other minority groups (e.g. Latinax), extending the literature to graduate education and academic and work performance.

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