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Intersecting Identities of Women in Engineering

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Dr. Cross completed her doctoral program in the Engineering Education department at Virginia Tech in 2015 and worked as a post-doctoral researcher with the Illinois Foundry for Innovation in Engineering Education at the University of Illinois at Urbana-Champaign. At UIUC she has collaborated with multiple teams of engineering faculty on implementing and assessing instructional innovation. Dr. Cross is currently a Research Scientist in the Department of Bioengineering working to redesign the curriculum through the NSF funded Revolutionizing Engineering Departments (RED) grant. She is a member of the ASEE Leadership Virtual Community of Practice that organizes and facilitates Safe Zone Training workshops. Dr. Cross has conducted multiple workshops on managing personal bias in STEM, both online and in-person. Dr. Cross' scholarship investigates student teams in engineering, faculty communities of practice, and the intersectionality of multiple identity dimensions. Her research interests include diversity and inclusion in STEM, intersectionality, teamwork and communication skills, assessment, and identity construction. Her teaching philosophy focuses on student centered approaches such as problem-based learning and culturally relevant pedagogy. Dr. Cross' complimentary professional activities promote inclusive excellence through collaboration.

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The Intersecting Identities of Women in Engineering

Introduction

The inequities that plague our society are mirrored in higher education and arguably exacerbated in STEM fields. Giving a voice to marginalized groups and understanding the double bind of race and gender on university campuses is critical, especially after the Charlottesville, VA protests, white supremacist efforts to bring in Nazi sympathizing speakers, and rampant sexual misconduct towards undergraduates documented across the country. The result of this discourse and uncivil behavior, as well as more subtle beliefs about white superiority, are interpersonal and institutional barriers that lead to limited participation of women, particularly women of color, and thus the loss of their presence and expertise within the field of engineering and STEM, more broadly.

The "chilly climate" is often cited as an explanation for the loss of women from STEM. The "chilly climate" is defined as women in the male dominated STEM fields feeling unwelcome [1] [2] [3] or people of color experiencing a diminished sense of belonging within engineering profession [4] [5] [6] based upon daily social interactions that threaten the identity of females in STEM [7], men in STEM settings who treat women in subtle sexist ways [8]. However, interactions that allow the "chilly climate" to persist have yet to be characterized. This lack of understanding can inhibit the professional engineering identity construction of women. Additionally, postsecondary education research typically focuses on a single identity dimension such as gender [9], which ultimately excludes assessment or understanding of the lived experiences of those with multiple marginalities, such as women of color (WOC). These studies connect single identity dimensions to student outcomes and few studies clarify how the intersection of identities are situated within the social context of the engineering culture. Consequently, a need exists to examine how the engineering culture impacts multiple components of identity and the intersection of identities within women. To address this gap, our study illuminates the intersections of identity of women in engineering and how WOC perceive the double bind of race and gender within the context of their engineering education.

The data reported here are a part of a larger, sequential mixed-methods study (N=276) of undergraduate female engineering students at a large Midwestern research university. This project applies the framework of intersectionality with the following scales: Engineering Identity, Ethnic Identity, Womanist Identity, Microaggressions, and Depressive Symptoms. We use intersectionality to investigate the interaction between intersecting social identities and educational conditions. The Womanist Identity Attitude scale (WIAS) provides an efficient way to understand gender, racial, and intersecting identity development of WOC. We utilize the microaggressions scale, in order to develop quantitative measures of gender-racial discrimination in STEM. We also included the Patient Health Questionnaire (PHQ-9), an instrument for measuring depressive symptoms, to assess health outcomes of respondents' experiences of gender-racial microaggressions.

Our three emergent findings suggest instrument accuracy and provide insight into the identity and depression subscales. Factor analysis established a basis to refine our quantitative survey instruments, and indicated that 23 items could offer greater accuracy than the original 54 items of the WIAS instrument. Second, the majority of participants report a high level of identification with engineering. This result rebuffs the long-held stereotypes that females are less interested in engineering. Third, a significant portion of female respondents self-reported PHQ-9 scores in the 15-19 range, which corresponds with a “major depression, moderately severe” provisional diagnosis, the second-highest in severity in the PHQ-9 provisional diagnosis scale. Women with elevated levels of depressive symptoms were significantly more likely to also report frequent instances of microaggressions. These preliminary findings are providing never-before seen insight into the experiences of women in engineering. Our results suggest a path to accurately describe the experiences of women and WOC in engineering, while revealing options for improving inclusion efforts.

Method

A sequential mixed methods study is employed to allow us to best answer the research questions [10]. The first phase is a quantitative survey followed by interviews to allow participants to further explicate their survey answers and their perceptions as a woman of color in engineering. The qualitative and quantitative data will have equal priority and will be connected through data analysis to triangulate the results. The survey was administered in the Fall semester of 2016 and the opened-ended questions were coded using qualitative analytical techniques (e.g. thematic coding). The response rate for our survey was roughly 20% of the female population within the college. The mixed methodology provides flexibility to analyze the data, provides more complete answers to research questions, and is aligned with our intersectionality framework and theoretical perspective [11] [12] [13]. However, the focus of this paper summarizes our evaluation process of our survey instrument. The survey instrument was piloted before data collection began and we consulted intersectionality expert researchers for face validation.

Theoretical Framework

Intersectionality provides the overall framework for the study. While the concepts of intersectionality are established in social science research, the use of an intersectionality is a novel approach for STEM scholarship and it is rarely considered in STEM education studies on marginalized groups. Thus, most studies of underrepresented minorities in STEM ignore the interrelated relationship of race and gender on the lived experiences of women and men of color [14]. Moreover, intersectionality approaches are necessary because the dynamics of gender plays out differently across racial groups in STEM settings when researchers acknowledge the interrelatedness of identities and take a holistic approach [15]. In the larger study, we intentionally focus on and highlight the intersection of race and gender or the “double bind” of WOC in STEM from an intersectionality approach. Indeed, it is the primary analysis approach, a key component to the research design, and part of the development of the research questions. The current study applies intersectionality as an analysis process with a methodology consistent with fundamental feminist principle through which intersectionality was created. Specifically, we follow an analysis process recommended by intersectionality research experts [16] and situate our study in the larger conversation of intersectionality beyond the two dimension of race and gender. The dearth of intersectionality research in engineering education can mask challenges that impact women with multiple oppressed identities. **In this paper, we describe the results of our factor analysis to evaluate our survey instrument to capture the intersecting identities of women in the college of engineering. The analysis is part of the first phase of this mixed methods study and our two guiding research questions (RQs) are:**

RQ1: Are the subscales selected for the Women in Engineering survey valid and reliable for the population sample?
RQ2: Are there statistically significant relationships between the Women in Engineering subscales and evidence of intersecting identities?

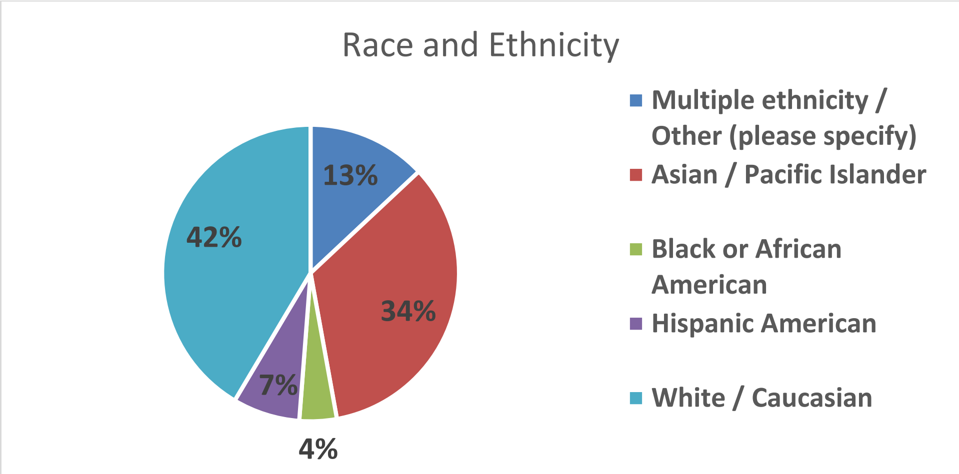
Table 1: Scale Abbreviations, Descriptions, Number of Items and Cronbach Alpha Values

Abbreviation	Scale Description	No. Items	Reliability
ENG_IDTY	Identification with Engineering (IE) [17]	5	0.70
EI_EXP	Ethnic Identity subscale exploration [5]	3	0.82
EI_COM	Ethnic Identity subscale commitment [5]	3	0.75
WIAS_PRE	Womanist Identity Attitude Scale (WIAS) subscale PRE-encounter [6]	8	0.53
WIAS_ENC	Womanist Identity Attitude Scale (WIAS) subscale ENCounter [6]	7	0.51
WIAS_IMEM	Womanist Identity Attitude Scale (WIAS) subscale Immersion/Emersion [6]	10	0.79
WIAS_INT	Womanist Identity Attitude Scale (WIAS) subscale Internalization [6]	7	0.57
PHQ_WK	Patient Health Questionnaire 2 weeks [8]	9	0.90
RMA_SEM	Racial Microaggressions 2 Semester [7]	9	0.86

Participants

A combination of sampling approaches were used in order to study the sample who identified as a female student currently enrolled in the college of engineering (N = 267). In the larger population, 13% of participants self-identified as first generation and 86% indicated their socioeconomic status as middle to upper class. All participants were initially contacted by email and provided a link to the survey containing participation requirements and consent information.

Figure 1: Self-Selected Racial and Ethnic Identity Percentages



The inclusion criteria for the first phase of the data collection included all undergraduate female students currently enrolled in the college of engineering. In addition to being enrolled full-time in engineering, the participants were 18 years of age or older. The participants were on average 20 years of age. The participant pool represented 11 different majors within the college of engineering. The participants' identity and consent were maintained according to IRB requirements and no compensation was offered for completing the survey. The percentages of participant demographics are shown in Figures 1 and 2 which are summarized in Table 2 along with frequency count (Appendix).

Table 2: Self-Reported 1st Generation Status

		Frequency	Percent	Cumulative Percent
	Yes	35	13.9	13.9
	No	216	86.1	100.0
	Total	251	100.0	

Figure 2: Self-Selected Socioeconomic Status (SES) Percentages

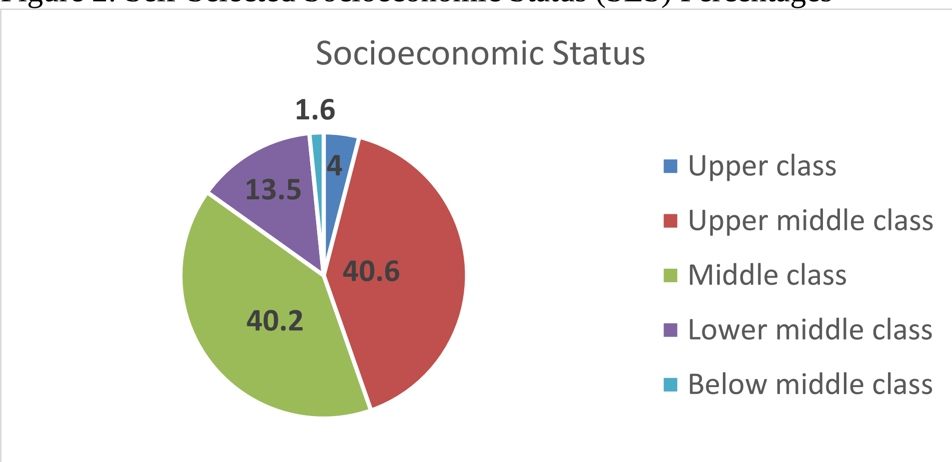


Table 3: Demographics Summary

Race/Ethnicity	Frequency		**SES**	Frequency
Multiple ethnicity / Other (please specify)	32 (13%)		Upper class	10 (4%)
Asian / Pacific Islander	84 (34%)		Upper middle class	102 (41%)
Black or African American	10 (4%)		Middle class	101 (40%)
Hispanic American	18 (7%)		Lower middle class	34 (13%)
White / Caucasian	102 (42%)		Below middle class	4 (2%)
Total	246		Total	251

Data Collection

In the first phase of the study, data collection consisted of a quantitative survey data that was managed through Survey Monkey, which is an online secured data management system. Students accessed the online survey instrument with the link provided in the recruitment email. The survey instrument used established methods including required consenting methods [18] and provided participation criteria. The survey instrument included the aforementioned published and previously validated measurement scales. The measurement scales included the following: 1) identification with engineering [17] to measure engineering identity; 2) ethnic identity scale [19] to measure the level of identification with racial or ethnic identity; 3) Womanist Identity Attitude scale (WIAS) [20] to measure attitudes reflective of the four stages of womanist identity development (i.e., Pre-encounter, Encounter, Immersion–Emersion, Internalization); the Racial Microaggressions Scale (RMAS) [21] to measure students perceptions of racial microaggressions; and 4) the Patients Health Questionnaire [22] is a self-report measure of symptoms of depression. Each scale include Likert type questions with items rated on a 5-point scale that ranges from strongly disagree (1) to strongly agree (5). Sample items from the WIAS include: “I would have accomplished more in this life if I had been born a man” and “I am comfortable wherever I am”. The survey instrument concluded with a two open-ended responses to indicate the participant’s willingness to be interviewed and demographic information. Demographics included age, gender, gender identity, major, race, SES, and 1st generation status. The participants were asked to provide an email address if they would consider an individual interview as part of the primary data collection for the second phase of the study. The survey completion time typically lasted between 20-35 minutes and the research team will report summative data to maintain anonymity of the participants and only use identifying information to solicit further participation in the research study.

Reliability and validity are important to establish an instrument to accurately characterize complex relationships such as intersecting identities. We compared our Cronbach alpha values to published studies in our previous work [23]. Although, the data as analyzed is insightful, the low Cronbach’s alpha for the original 50-item scale suggested a need to employ additional statistical analysis to evaluate the reliability of the subscales for our participant population. We used Hayes’ ALPHAMAX procedure [24] to determine whether a smaller subset of items could be identified that show high internal consistency with this sample. A subset of 22 items (Section 1, questions 1, 5, 7, 9, 12 - 14; Section 3, questions 2, 10, and 14; and Section 3, questions 3, 4, 7, 13 – 16, 18 – 20, and 23 – 25) showed good reliability, suggesting a unidimensional factor structure.

Data Analysis

Data analysis consisted of classic statistical testing including 1) the internal consistency to measure data reliability and compare with published results; 2) Pearson correlations among constructs to measure the strength of relationship between the various subscales; and 3) analysis of variance to determine if there is a (statistically) significant difference among the population means. The statistics were calculated using the SPSS statistical software. The general descriptive statistics for each subscale were also calculated for the data set. We used Latent Class Analysis (the Structural Equation Modeling equivalent of cluster analysis) to identify latent classes with distinct combinations of scores on engineering, ethnic, and womanist identity, microaggressions, and PHQ-9 depression. Because LCA—like cluster analysis—is sensitive to outliers, we screened for values > 2 SD above the mean on each variable. This resulted in excluding 4 participants were scored very low on engineering identity and also happened to be missing data on all other variables. All variables were z-scored and were then entered into the LCA; using Mplus software, we were able to include all participants, regardless of missing data (via Full Information Maximum Likelihood estimation). A 1-class solution did not converge, and 2-class, 3-class, and 4-class solutions showed progressively better fit (see Table 4; a smaller Bayesian Information Criterion (BIC) and a larger entropy indicate better fit). Based on these fit statistics as well as the size of the latent classes and their interpretability, we selected the 4-class solution as the best solution.

Table 4: Latent Class Characteristics Summary

Number of Latent Classes	BIC	Entropy (0-1.00)
1	8360.090	N/A
2	8352.789	0.472
3	8368.822	0.507
4	8288.711	0.719

Results

The descriptive statistics including minimum, maximum, mean, standard deviation, and Kurtosis (i.e. a measure of distribution normality) for each scale and sub-scale are displayed below in Table 5.

Table 5: Descriptive Statistics Summary of the Women in Engineering Scales and Sub-scales

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ENG_IDTY	276	1.80	5.00	**4.4990**	.42992	-1.275	.147	4.808	.292
EI_Exp	275	1.00	5.00	**3.7891**	1.12191	-.826	.147	-.441	.293
EI_Com	275	1.00	5.00	**3.9745**	.99214	-1.073	.147	.251	.293
WIAS_Pre	276	1.13	4.00	**2.0611**	.43594	.569	.147	1.136	.292
WIAS_Enc	275	1.57	4.29	**3.0067**	.48212	-.187	.147	.173	.293
WIAS_ImEm	276	1.00	4.00	**2.5533**	.56124	-.088	.147	.060	.292
WIAS_Int	276	2.00	5.00	**4.1598**	.38440	-.772	.147	3.159	.292

RMA_Sem	254	2.00	43.00	**22.8425**	8.39718	.139	.153	-.514	.304
PHQ_2WK	254	.00	36.00	**16.4528**	8.70576	.179	.153	-.760	.304

The mean of engineering identity shows high levels of identification with engineering which is consistent with previous research [17]. Also, more than 95% of sample reported high levels of identification with engineering which resulted in a skewed distribution of responses and a leptokurtic or peaked distribution as indicated by the high Kurtosis statistic (K = 4.930 > 0). Also, generally the participants reported high levels racial or ethnic identity (Avg. = 3.8/5), but African-Americans and Asians reported higher levels than other racial groups. The elevated scores on the PHQ-9 (Average > 15) corresponds with a "major depression, moderately severe" provisional diagnosis, the second-highest in severity in the PHQ-9 provisional diagnosis scale. Alarmingly, more than **70%** of female student sample **(N=276)** self-reported moderate to severe levels of depression and anxiety **(e.g. >10)**. Based on this result we are providing participants with information on campus resources for mental health support. As we take an intersectional approach in the study, we were also interested in the social dimensions of identity that intersect for our participants. In the Appendix is a table of cross tabulations breakdown of participant demographics by race*SES and race* 1st generation status are displayed below in Tables 8. The correlations for all the sub-scales are listed in the simple correlation table (Table 6).

Table 6: Simple Correlations of Subscales

	ENG_ IDTY1	EI_ EXP	EI_ COM	WIAS_ PRE	WIAS_ ENC	WIAS_ IMEM	WIAS_ INT	RMA_ SEM	PHQ_ WK
ENG_ IDTY	1								
EI_ EXP	0.051	1							
EI_COM	0.037	**.589****	1						
WIAS_ PRE	-0.005	**-.170****	**-.166****	1					
WIAS_ ENC	-0.043	**.189****	0.078	0.098	1				
WIAS_ IMEM	0.013	0.110	0.010	**.131***	**.613****	1			
WIAS_ INT	**.142***	0.034	-0.010	**-.240****	-0.055	**-.234****	1		
RMA_ SEM	0.019	**.164****	**.142***	0.050	**.130***	**.232****	0.036	1	
PHQ_ WK	-0.094	-0.050	0.021	0.046	**.189****	**.350****	**-.169****	**.220****	1

*. Correlation is significant at the 0.05 level. **. Correlation is significant at the 0.01 level.

The statistically significant relationships are bolded. The only significant difference between racial groups observed by cross tabulation were the reported frequency of perceptions of racial microaggressions. We concluded that the self-reported RMA varied by race based on the analysis results displayed in Table 10 in the appendix. The Chi-Test value = 212.621 > critical value (9.49), therefore we REJECT H_0. We reject the null hypothesis that reported levels RMA are the same for all races. The self-reported frequency of racial microaggressions significantly differ by race, $X2(4, N = 246) = 0.000$, $p > .05$ and we accept the H_1 hypothesis as true that 'the reported levels of RMA are different for women of color and other females' studying engineering. Also, were calculated the correlations for all the scales and sub-scales. Interestingly, the elevated PHQ scores were correlated with microaggressions [r (243) = .22, p < .01]. This relationship will be further explored in the individual interviews.

Based on the correlations, engineering identity was related to the internalization sub-scale of the WIAS. The internalization level is an indication that a women has integrated a personally defined positive view of womanhood into their identity despite cultural norms or the antithetical positions of the women [20]. The results suggest that the participants were able to integrate a positive womanist identity into their engineering identity. Also, the exploration subscale of ethnic identity measure correlated with multiple scales (4: commitment subscale of ethnic identity, pre-encounter and encounter phases of the WIAS, and the racial microaggressions measure). The racial ethnic subscale of exploration is defined as seeking information and experiences relevant to one's ethnicity (e.g. learning cultural practices), but it supports the commitment to one's ethnic racial identity and critical to the process of ethnic identity formation [19]. The combinations of the multiple correlated identity scales suggest the presence of intersecting identities of the participants, but more importantly the variations in the intersecting identities, which is consistent with previous research [25]. That is to say, the intersection of race and gender or gender and engineering identities varies between and within racial groups.

Other evidence that suggests the differences between and among racial groups is found in our Analysis of Variance (ANOVA) calculations. We created One-way ANOVA tables to identify which social classification (e.g. major, race, SES, or 1st Gen) varied between WOC and other females for each sub-scale. A one way analysis of variance showed that the effect of commitment subscales of ethnic identity was significant, $F(4,241) = 3.129$, $p = .016$. Comparing the Fstatistics to the critical value 2.37 indicates significant differences in racial microaggressions, both ethnic identity subscales, and the immersion-emersion subscale of the WIAS. Table 7 summarizes the ANOVA calculations for each subscale. The overall trend was for higher ethnic identity among African-American and Asian students, and higher engineering identity among White students. White students showed low levels of microaggressions and depression, whereas students in other groups had more mixed patterns. Some Black and Hispanic students self-reported high levels of microaggressions and depression, whereas others reported low levels of both. Asian students showed the same patterns, but not in general low on engineering identity.

Table 7: ANOVA by Race (Fcrit= 2.37, p <.05)

ANOVA Summary	Sum of Squares	df	Mean Square	F	Sig.
ENG_IDTY	0.823	241	0.189	1.089	0.363

EI_EXP	268.664	241	1.115	**6.725**	0.000
EI_COM	235.107	241	0.976	**3.129**	0.016
WIAS_PRE	41.963	241	0.174	1.513	0.199
WIAS_ENC	55.610	241	0.231	1.328	0.260
WIAS_IMEM	72.055	241	0.299	**2.866**	0.024
WIAS_INT	32.279	241	0.133	0.437	0.782
RMA_2SEM	13021.911	241	54.033	**17.041**	0.000
PHQ_2WK	18386.470	241	76.292	0.781	0.538

Discussion

Understanding the intersection of identities for women studying engineering is an important topic to understand as we strive to broaden their participation. In this paper, we highlight our process to develop a valid and reliable process to characterize the experiences of women in engineering and how those experiences can impact their multiple identities, including developing an engineering identity. In answering our first research question, all the subscale generated similar reliability values as other studies, but we identified a subset of items within the WIAS subscales that significantly increased the accuracy of the response scores. The answer to our second research question is the results of a combination of multiple statistics. Through multiple calculations, our results indicate significant relationships between the construct within the Women in Engineering survey instruments and also suggest intersecting identities of female participants in the study. For example, engineering identity was correlated to the internalization sub-scale of the WIAS. This result is important to demonstrate examples of an integrated and coherent (e.g. non-conflicting) gender and professional identity formation is possible for female students in engineering. Also, the racial/ethnic identity correlated to several construct, which suggest race still impacts female students' identity development and experiences in engineering. Furthermore, ethnic identity is key to the current study as the ANOVA results identified variation between races experiencing racial microaggressions. Finally, higher levels of experiencing RMA's also correlated to higher self-reported levels of depressive symptoms. This finding is consistent with previous work on RMA, in the broader context of higher education, but we are excited to initiate the conversation about mental health in the context of engineering education.

Conclusion

In conclusion, we report a few key findings. First, we identified a basis to modify the original survey to a more accurate measurement of womanist identity. Next, the females in our study generally have a strong engineering identity and a significant portion of those female reported elevated levels of anxiety and depression. The elevated levels of depressive symptoms correlated to more racial microaggressions. Which leads to our last finding, that we found evidence of intersecting identities among the participants and variation of intersections within each racial group. Therefore, understanding why the variation emerged within racial groups is a next step in our project.

Additional future work and the limitations of our study should be considered in reflecting on the results of our study. One limitation that is related to future work is the collection of quantitative survey responses only in the current analysis. We are currently conducting in-depth interviews to discuss survey responses with participants. The interviews will help us understand how the intersecting identities of race and gender can impact the education of women in engineering, especially WOC. Also, the interview will allow participants to describe the intersection of their identities, as explicit intersecting identity items were not included in the survey. Another limitation of our study is the data collected is from a single research intensive university. In our future work we also plan to collaborate with other institutions to administer the survey instrument to compare results across institutions. Despite these limitations, the results our current study is initiating dialogue about the importance of targeted approaches to developing positive identity development process for women in engineering, especially WOC.

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Appendix

Additional Tables of Statistical Calculations to Support Conclusions

Table 8: Cross Tabulation Economic Group (SES) and 1st Generation by Race

Socioeconomic Status	Multiple ethnicity	Asian / Pacific Islander	Black or African American	Hispanic American	White / Caucasian	
Upper class	1	3	0	3	2	9
Upper middle class	13	39	1	2	47	102
Middle class	14	36	5	4	38	97
Lower middle class	4	5	4	7	14	34
Below middle class	0	1	0	2	1	4
Total	**32**	**84**	**10**	**18**	**102**	**246**
1st Generation Status	Multiple ethnicity	Asian / Pacific Islander	Black or African American	Hispanic American	White / Caucasian	
Yes	1	10	2	10	12	35
No	31	74	8	8	90	211
Total	**32**	**84**	**10**	**18**	**102**	**246**

Table 9: Cross Tabulations of Race*RMA (racial microaggressions scores)

		Multiple ethnicity / Other (please specify)	Asian / Pacific Islander	Black or African American	Hispanic American	White / Caucasian	Total
RMA_Sem	9.00	2	0	0	0	9	11
	10.00	0	0	0	0	4	4
	11.00	1	1	0	0	5	7
	12.00	1	1	0	1	4	7
	13.00	0	2	0	0	9	11
	14.00	3	1	0	0	2	6
	15.00	0	3	1	1	3	8
	16.00	1	2	0	0	5	8
	17.00	2	1	0	0	6	9
	18.00	0	2	1	0	6	9
	19.00	1	6	0	1	0	8
	20.00	0	4	0	0	4	8
	21.00	0	4	0	1	7	12
	22.00	2	6	0	0	4	12

	23.00	2	1	0	1	6	10
	24.00	2	5	0	0	5	12
	25.00	3	4	1	0	3	11
	26.00	3	1	1	0	3	8
	27.00	1	3	1	0	5	10
	28.00	1	3	0	1	5	10
	29.00	2	8	0	0	2	12
	30.00	0	4	1	0	2	7
	31.00	2	8	0	0	1	11
	32.00	0	4	1	1	0	6
	33.00	0	1	0	2	0	3
	34.00	0	2	0	1	1	4
	35.00	0	2	0	1	0	3
	36.00	1	2	0	1	0	4
	37.00	0	2	1	1	0	4
	39.00	0	0	0	1	0	1
	40.00	0	0	1	2	0	3
	41.00	0	0	1	2	1	4
	42.00	1	1	0	0	0	2
	43.00	1	0	0	0	0	1
Total		32	84	10	18	102	246

Table 10: Chi-Square Tests (Crosstab Race*RMA)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	212.621[a]	132	.000
Likelihood Ratio	204.480	132	.000
Linear-by-Linear Association	14.600	1	.000
N of Valid Cases	246		
a. 170 cells (100.0%) have expected count less than 5. The minimum expected count is .04.			