The background features a complex network of blue lines and arrows. Some lines are solid, while others are dashed. The arrows point in various directions, creating a sense of movement and interconnectedness. The lines and arrows are primarily located on the right side of the slide, with some extending towards the center.

WORK IN PROGRESS: EXPERIENCES JEOPARDIZING UNDERGRADUATE WOMEN MENTAL HEALTH IN ENGINEERING

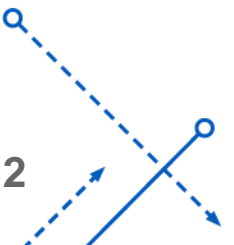
Matilde Sánchez-Pena, Ph.D. – University at Buffalo

Anne M. McAlister, Ph.D. – University of Virginia

Nichole Ramirez, Ph.D. – The University of Texas at El Paso

Plan

- Context & Motivation
- Research approach
- Results
- Discussion & Future Work



Context & Motivation

Longitudinal explanatory sequential mixed methods study sponsored by NSF

Studying:

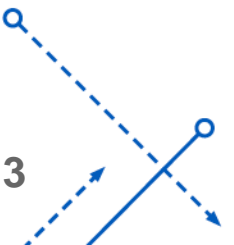
- The relationship between **stigma of MHCs** and help-seeking attitudes of engineering students and early professionals.
 - How it is moderated by student's characteristics

Quantitative → Qualitative (interviews)

Multi-institutional



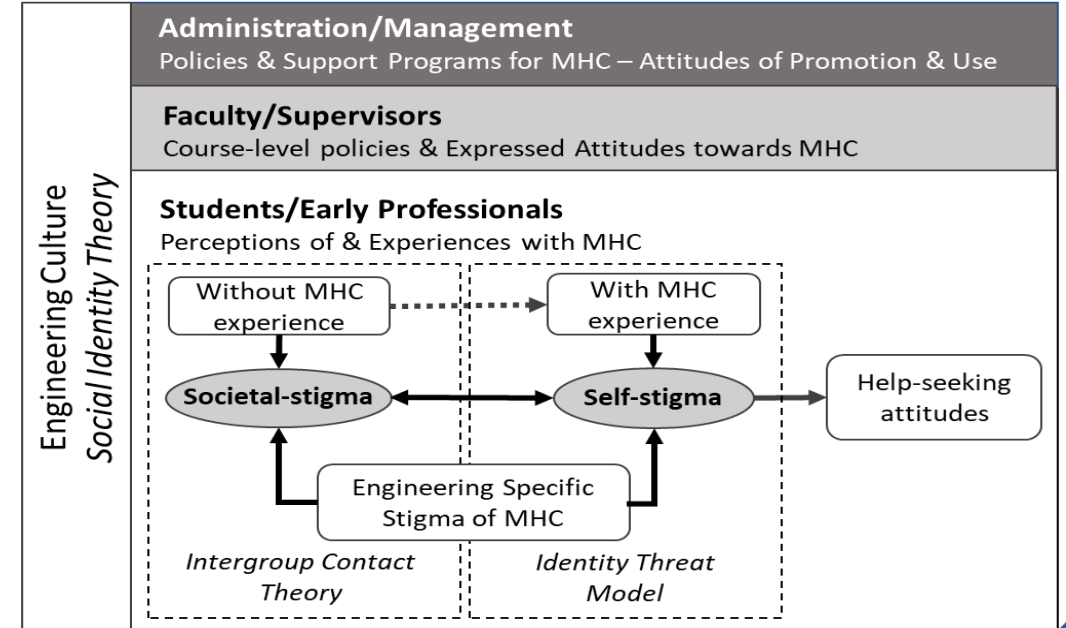
US Northeast ($N_{\text{quant}} = 211$, $N_{\text{qual}} = 34$) US Midwest ($N_{\text{quant}} = 940$, $N_{\text{qual}} = 27$)



Context & Motivation cont'

Qualitative exploration of:

- Which elements of engineering identity and other identities influence help-seeking attitudes of undergraduate and early professionals?



Context & Motivation cont'

Our early quantitative results showed evidence of:

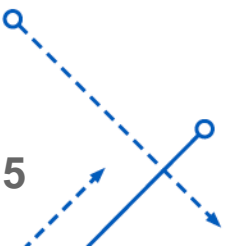
- Women and other gender minorities having higher prevalence of MHCs and also higher help-seeking attitudes

Our early qualitative results have shown that:

- Masculinity in engineering deterred women from help-seeking

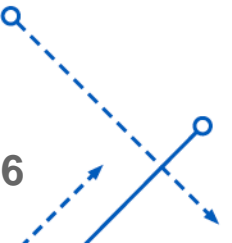
Research Question:

What are the gendered experiences that women engineering students describe as directly affecting their mental health and help-seeking attitudes?



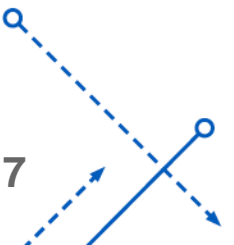
Research Approach

- Thematic analysis of women identifying participants during Year 1 of the study (n=25)
- Performed by one of the team members
- Interrater reliability was secured



Results

- Being the only woman exacerbates MHCs, deters help-seeking, and limits ability to build networks of support
- Gendered perceptions can hide MHCs and deter help-seeking
- Sexist comments limit women ability to create reliable networks of support in engineering for their MH.

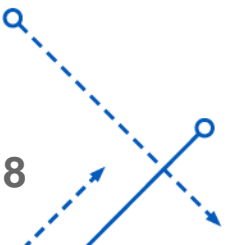


Being the only woman exacerbates MHCs

I really believe that engineering played a big role in, I don't know, exasperating is the right word. I might have faced these challenges later on but quickly pushing me to a different level of mental health challenge was probably played a big part by feeling like an imposter in engineering. And being a woman in engineering too, I think, played a role in not feeling I belonged in a lot of the classes and was really struggling...

I remember I would walk in [an engineering class] and I just felt like I just did not belong. I felt so sad that I had worked so hard and yet I couldn't escape this fear and this feeling like I didn't belong there.

And it was frustrating because I feel as though my male counterparts would never experience. They didn't... Feeling they didn't belong in the room was an experience that I felt like I shouldn't be subject to. I had worked so hard, I knew I belonged there, I was doing fine in the class. But I just couldn't deal with it. (Lily)



Being the only woman exacerbates MHCs

Lily (cont')

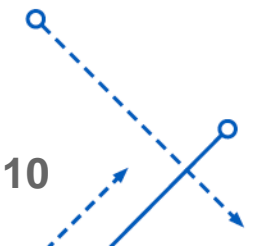
And it actually manifested in physical symptoms as well. So much that I had to go get checked out by a doctor because I was just so ill every time I walk into class, I felt so ill. And that was just a symptom of anxiety and all that kind of stuff

So and actually got to the point, not specifically because of that class, but that was definitely part of it. Was feeling suicidal thoughts and really being concerned for my own life and safety. So I ended up going to a... Being partially hospitalized. So I would go to the hospital during the day and get treatment and care for my OCD and anxiety conditions. And then come back during the day. So my peers knew nothing, they just didn't see me in class for a month. (Lily)



Being the only woman deters help-seeking

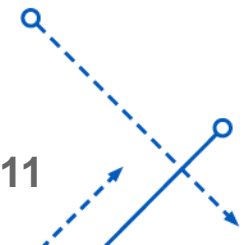
I do think that in engineering specifically that you have more stress to do better as a female in engineering just because it is such a male dominated industry. And I do think that seeking help might be more difficult for some girls because it's like, "I'm already struggling at this and I don't want other people to see that I'm struggling with my mental health." (Nicole)



Being the only woman limits ability to build support networks and forces to find alternatives

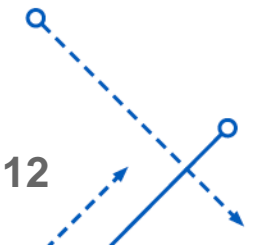
I feel kind of isolated sometimes with my schoolwork but not from a social aspect but just like, “oh, I actually don't have any females that I talked to about questions or anything like that” and I don't know if anybody else feels like that. (Nicole)

it is helpful to have friends in engineering to talk to, but some things that I stress about I don't feel comfortable talking to them about so I'll go to my roommates about, like the struggles of being a woman in engineering. All my friends are men so they don't really get it and it can be kind of weird talking to them about it, but my roommates are all women in STEM as well. Even though they're not in engineering it's still helpful to relate to them about things like that (Sandra)



Gendered perceptions can hide MHCs and deter help-seeking

It's really hard to identify yourself because you think you're fine, you think you're okay. You're just like, say for a girl, "Oh, my period is about to come. I feel hormonal," whatever. Let's say a guy perspective, I can't really give you a guy perspective, but a girl would say that. A girl would be like, "It's just my hormones," or whatever. (Amy)



Sexist comments & attitudes limit women ability to create reliable networks of support in engineering for their MH.

some of the some of the guys will talk to others around me rather than me. But it has been- It was a lot better than I expected it to be, coming into it hearing other horror stories (Tina)

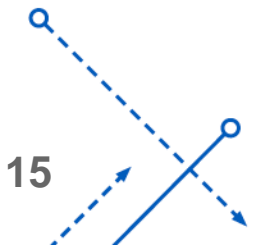
I don't know if it has implications on my academic success because at the end of the day we're all taking the same test. Mental health it definitely does a little bit. But when my friends talk over me or repeat the same exact thing I just did, I'll call them out for it and I'll say, "I literally just said that. You're just ignoring me." (Sandra)

Sexist comments & attitudes limit women ability to create reliable networks of support in engineering for their MH.

*So that's one of the things that I can't really talk to my engineering friends about because **they have expressed that I'll automatically get a job because I'm a woman.** I do think it does give me an advantage, not because I'm just a woman, but because diverse minds bring diverse ideas to solutions. And that's something that companies want, they want people with different mindsets. And I have that because I am a woman in a male dominated field. But despite getting a job, I have the added stress of worrying about will they treat me equally? Will they talk about me differently? And obviously it's scary to think about sexual assault, sexual harassment in the workplace, but it's not really something like my engineering friends have to worry about, I guess. (Sandra)*

Discussion

- Gendered experiences in engineering can exacerbate MHC
- Women themselves hold gendered views that could hide the presence of MHCs leading to poor help-seeking
- Such experiences and views as well as the overt and covert sexism experienced in day-to-day interactions affect women ability to create reliable networks of support that are necessary for help-seeking.
- Women specific spaces and programming in engineering are essential for counteracting such experiences and enhance help-seeking.



Implications

- Women specific spaces and programming in engineering are essential for counteracting such experiences and enhance help-seeking.
- Overt and hidden messages conveyed in engineering classes should be revisited, such as those promoting fierce competition, lack of collaboration, and fierce comparison.
- Alternatives could include infusion of growth mindset discussions, and scaffolding of collaborative endeavors.
- Similarly, men engineering students should be more intentionally exposed to equity oriented narratives to identify their role as perpetrators of harm.

Future work

- The longitudinal analysis of interviews will allow the capturing of changes through time, new/different challenges, and how previous experiences inform the participants actions.
- This will offer a unique opportunity to capture first professional experiences of women engineers.

