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Patrice M. Buzzanell
University of South Florida, pmbuzzanell@usf.edu

Colleen Arendt
Concordia University

Rebecca L. Dohrman
Washington University

Carla B. Zoltowski
Purdue University

Prashant Rajan
Research & Insights, Salesforce, Seattle

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Article

Engineering Emotion Sustainably: Affective Gendered Organizing of Engineering Identities and Third Space

Patrice M. Buzzanell ^{1,*}, Colleen Arendt ², Rebecca L. Dohrman ³, Carla B. Zoltowski ⁴ and Prashant Rajan ⁵¹ Department of Communication, University of South Florida, Tampa, FL 33620, USA² Department of Communication Studies, Concordia University, St. Paul, MN 55104, USA³ Department of Management Communication, Washington University, St. Louis, MO 63130, USA⁴ Elmore Family School of Electrical and Computer Engineering, Purdue University, West Lafayette, IN 47907, USA⁵ Research & Insights, Salesforce, Seattle, WA 98103, USA; rajan.prashant@gmail.com

* Correspondence: pmbuzzanell@usf.edu; Tel.: +1-765-414-0353

Abstract: The questions of why there are so few women in engineering and how to change engineering cultures to be more inclusive have garnered much social scientific research and considerable funding. Despite numerous findings and interventions, no studies to our knowledge have analyzed how difference is constituted discursively, materially, and affectively in ways that are deeply embedded in engineering occupational and societal cultures. This study takes an affective gendered organizing approach to analyze how affect is constituted through emotions/talk, interactions, and materialities. Using constructivist grounded theory, we explored our interview data of 69 engineers (45 women and 24 men) to find three themes. The first describes women's sensate experiences that underlie their expressions of (un)belongingness and (in)visibility. The second depicts men's emotional labor to voice inclusion while enacting exclusion. The third pulls these feelings forward as the impetus for women's constitution of feminist third spaces/places that operate as sites of collective emotional labor and resilience. Throughout we display the contradictory and essential embodiment of affect within individuals' identities and as a sensemaking force that continues to constitute organizing systems of inequity. Taking an affective gendered organizing approach enables researchers and practitioners to respond more fully to the question of why inclusion is so difficult to achieve and to develop sustainable interventions for women's career success in STEM.

Keywords: affective gendered organizing; career identity; emotional labor; resilience; high-tech careers



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1. Introduction

Women remain underrepresented in Computer Science, Engineering, and Mathematics despite billions of dollars spent annually on equity initiatives. Globally, women's participation continues to grow in STEM (science, technology, engineering, and math), yet they make up only 29% of the research and development workforce [1] and 14.5% of all engineers in the labor force [2]. The National Science Board [3] reported that women represented 34% of all STEM workers in 2019 with variations based on engineering specialization and social identity groupings such as race/ethnicity. Prior to the COVID-19 pandemic, women numbered 24% and 28% of undergraduate and graduate engineering majors [4]. We look at the ways that men and women engineering students talk about the emotions associated with disciplinary professionalization to learn why there are so few women in the majority-male STEM disciplines and professions [5].

Our work extends communication research that provides in-depth and nuanced descriptions of how gender-related social norms, that is, Discourses are dynamically reproduced during everyday conversations and interactions [5–7]. Such work has shown both d- and D-discourses repeatedly position women as not belonging and as (un)intentionally

excluded from engineering majors, work, and careers. In other words, talk and interactions among people (discourses) tend to reinforce societal understandings (Discourses) that engineering is masculine and dominated by men. The emotional outcomes of STEM participation have typically been studied in relation to the experience and performance of emotions in the classroom and the workplace. Academic emotions such as student anxiety and workplace performances of emotional labor aside [8–11], less understood are the ways in which discourses, indeed all utterances, reflect and constitute the fluctuating feelings or pre-/non-verbal affective states [12] associated with them. As Eddington et al. [13] point out, affect is necessary for the sensemaking and interpretation of events, identities, and organizational membership.

We use the affective gendered organizing approach [13] to demonstrate a novel insight regarding how affect is constituted through emotion in d/Discourses that construct and are constructed by contradictory organizational and disciplinary identities. Our analyses probe what lies beneath the economic rationale for diversity and inclusion (D&I) to consider how affect, or fluctuating feelings and/or ranges of emotional changes that often go unnoticed [12], drives organizing and inequity. Our account for the role that affect plays in the gendered organizing of STEM participation juxtaposes men and women participants' descriptions of the feelings associated with their choice to study and work as engineers. These descriptions contest binary stereotypes of women's exclusion and invisibility in STEM by documenting the heterogeneity of ways in which the affective experience of D&I is manifest discursively for women and men. Thus, our study contributes a contradiction- and emotion-centered approach to understanding why and how the rational interventions constructed to foster greater D&I cannot attack the core issues of gender inequity, sexism, and discrimination because they do not address the feelings that underlie people's actions.

1.1. Literature Review

In this section, we first discuss women in engineering, then argue for an affective gendered organizing approach to STEM participation.

1.1.1. Women in Engineering

The National Academies [14] reported that there are no biological or aptitude differences between women and men that can account for representation in STEM disciplines. Yet, the experiences and careers of women and men in STEM remain notably different.

To understand gender disparities in engineering and its subdisciplines, scholars have used different theoretical lenses (for overviews, see [15,16]). Researchers have studied how engineers experience career socialization [17], how engineering schools' masculine and authoritarian mission statements and culture explain difficulties in recruiting and retaining women [9,18,19], and how math-, science-, and occupational-related stereotypes and other forms of sexism can undermine women's interest in STEM majors and careers [16,20,21]. Among factors linked to women's retention, self-efficacy (beliefs in abilities to accomplish goals) and other cognitive areas emerge as predictors of persistence and membership [22,23] along with motivational and sociocultural factors [16]. Missing is how d/Discourses shape and are shaped by gendered organizing, often in ironic ways.

For instance, Jorgensen [24] found that women engineers often adopt male interaction rituals to achieve a sense of belongingness in their field. When asked directly, women adamantly protested gender differences in their engineering experiences, yet provided countless reports of differential treatment based on gender. For women engineers of color, the intersections of gender, race, class, and workplace experiences affect and are affected by people, structures, and materialities within their fields during their undergraduate through postgraduate years such that they often feel disillusioned, ambivalent, and/or suspicious [25]. Although seemingly innocuous, materialities such as rooms filled with photos of only men as institutional leaders or groups of men working on design projects or presenting prototypes in design reviews can form impressions that women are unwelcome. Other investigations also have examined women engineers' experiences of vulnerability,

perceived need to construct resilience strategies to focus on the positive, and ambivalence at being labeled as marginalized [26–28]. Furthermore, the lack of support for women’s STEM participation invalidates their sense of belonging in engineering [29] and includes engineering faculty’s discouragement of women students and postdocs from expressing even potential interest in motherhood and work–family balancing [30,31]. Women engage in emotional labor to navigate the social-technical dualisms that form “intractable professional and organizational dynamics” [9] (p. 333) built into the gendered organizing of engineering.

1.1.2. Emotions and Affective Gendered Organizing

Miller et al. [32] provide an essential typology of emotion in the workplace. These include emotional labor (“the display of emotion that is in some way defined and controlled by management”), emotional work (“emotion that, like emotional labor, is a part of the job itself but which is a natural outgrowth of job-related communication”), emotion with work (“emotion that emerges through relationships and interaction with other employees in the workplace”), emotion at work (“emotion that has its genesis outside of the workplace (e.g., worries from home, grief, excitement about a sports team) but is experienced in the workplace”), and “emotion toward work as the emotional experience in which the work or job is the target of the emotion” (pp. 232–233). They concluded that emotion is “multifaceted and complex” (p. 255) noting that distinctions between emotional work and emotional labor are “not mutually exclusive” (p. 257). This typology serves as a foundation of how we understand and articulate emotion and affective gendered organizing in our study.

In the more than 15 years since Miller et al.’s publication, the study of emotion has grown. Much of this research has focused on work itself, particular professions, well-being, and sustainability, and representing Miller et al.’s workplace emotion types in overlapping ways. Riforgiate et al. [33] defined emotional labor as the “management of emotions as part of one’s job performance” (p. 392) and explored its links to daily communication, physical health, and psychological well-being through a two-week-long diary study. They found that different forms of emotional labor might prove detrimental to workers’ well-being. Additionally, they found that “internal tensions resulting from organizational expectations” in conjunction with normative expectations that workers themselves use (p. 393) might prove unsustainable. Similarly, Kim and Williams [34] uncovered how human service professionals engaged in emotional work to handle career challenges that could lead to burnout and/or fulfillment. They offered pragmatic applications for ways to develop selective communication networks for sustainable careers, especially in South Korea. Powers et al. [35] also sought remedies to work-related emotional communication that can exacerbate or lessen burnout among attorneys. In examining vulnerabilities and stressors associated with essential workers’ burnout, Villamil and D’Enbeau [36] concluded that a tension-centered approach depicted employees’ attempts to construct workplace dignity and sustainability during the COVID-19 pandemic. Similarly, Wang [37] described emotional labor as tensional “controlled empathy” or emotional disinvestment-investment that enabled the U.S. 911 emergency center dispatchers to perform amidst conflicting positive feelings, resentments about status inequalities, and identity changes. These different studies indicate multiple and often contradictory embodiments of professional identity and of emotion in workplaces as members strive to organize for well-being and career sustainability.

Emotion and affect are intertwined. Affect is “not reducible to clearly expressible human emotion . . . but arises before and beyond any linguistic denotation” [38] (p. 718; see also [39]). Only [38] insisted that affect is the intensity of feeling that drives communication and organizing. Since affect is the sensory capabilities or embodiment of feelings underlying discourse, affect aids in sensemaking and forms the means by which inclusion-exclusion boundaries are constituted. Moreover, in the ongoing discussion about distinctions between emotion and affect, Mease and Branton [40] noted that some scholars consider emotion as a specific state of affect that is momentarily captured. Because relationships between

affect and emotion are unsettled [40], “emotional labour and affective labour are used more or less interchangeably as variations on the broader theme of immaterial labour; labour that produces feelings rather than things” [38] (p. 720). Eddington et al. [13] used both emotion and affect to show how affective organizing constituted gendered identities around men’s rights issues in online spaces. They displayed how affect legitimized and promoted hegemonic masculinity and practices through language and its materialization in embodied action (and artifacts; see simulations of affect control theory, [41]). In other words, Eddington et al. showed how affect drove boundary- and world-making through the senses and expressed feelings, or emotions, about men’s identities and status in society that formed their online organization, The Red Pill.

We build on this literature by examining affective gendered organizing among women and men in an offline setting, exploring the feelings simmering within and among d/Discourses, materialities, and affect. We utilize an affective gendered organizing approach to consider how affect and emotion are constituted in d/Discourses that simultaneously construct and are constructed by contradictory gendered and professional identities within a single organization. Therefore, our study asks:

RQ: How does affective organizing constitute gendered identities and structures in engineering?

2. Materials and Methods

2.1. Participants

Because the various disciplines within the field of engineering have different ratios of men to women, we collected a purposive sample of 69 engineers (45 women and 24 men) who represented most of the disciplines available in the College of Engineering at a large public Midwestern U.S. university. We utilized a purposive method of recruitment because it allowed us to diversify the pool of participants in relation to their specific disciplines within the engineering field as a whole. We attempted to recruit participants from all of the engineering subdisciplines to ensure that we covered the broad range of subcultures within the larger engineering culture. As such, participants represented 10 disciplines, including aerospace, agricultural and biological, chemical, civil, electrical, industrial, materials, mechanical engineering, and engineering education. The average age of participants was 23 years. Most (64%) identified as Caucasian with the remainder (36%) self-identifying as Indian, African American, and Asian. Of these 45 women, 52% were undergraduate students, 41% were graduate students, and the remaining 7% were working in the industry. All were current members or alums of a single College of Engineering. All the men were undergraduate students.

2.2. Procedures

In this section, we discuss our interview protocol, our recruitment, and our analytic techniques. First, our semi-structured interview guide included 15 questions split into four categories: career decision-making (e.g., How did you decide on your major?); career experiences (e.g., What is the nature of the work you do?); gender, work, and career (e.g., How do you think more women can be recruited into engineering?); and demographic information. The interview protocol also included several probes that interviewers could use as appropriate (e.g., Why did you choose your major? What is something meaningful that you have done?). The same interview protocol was used for both women and men participants. Graduate students with training and experience with qualitative research methods interviewed participants, with women interviewing women engineers and men interviewing men engineers. No questions were asked that specifically related to emotion or feelings.

Second, following Institutional Review Board approval, we recruited our 69 participants via emails sent to members of this university’s Women in Engineering (WIE) program and to an engineering design class. Interested participants responded to the email, at which time we scheduled an interview at a time convenient for them. The average length of

interviews was 39 min (range: 17–90), and they were transcribed by the authors as well as professional transcriptionists. After checking transcriptions against the audio recordings for accuracy, we changed names to pseudonyms and masked identifying details. We referred to all participants—current students and professional engineers—as “engineers” throughout because this designation is used from day one at the college.

To analyze our data, we used constructivist grounded theory, a critical constant comparison technique that admits researchers’ knowledge into the interpretation of data from the initial phases of the project through its write-up and member checks [42]. We reflected upon our past and present involvements, understandings of power and resistance in this and other academic settings, and interactions with the people, places, and missions of the College of Engineering and the university in general. In exploring affect, our insider–outsider relationships as researchers, instructors, and investigators in funded engineering education and D&I projects in this university and College of Engineering enabled us to interpret participants’ sensemaking, identity construction, and emotion about their engineering work and experiences.

The first stage of data analysis involved open coding, or identifying phenomena in the data and creating categories that represented these phenomena. We developed over 60 codes in the open coding stage by individually analyzing our transcripts and constructing short phrases or single words to represent the semantic patterns and emotional expressions in our participants’ talk. Once all the authors developed their own codes, we met to ensure that we covered all the interview content and to eliminate duplications of codes. After we were satisfied with our open coding discussions and results, we then collapsed the 60 codes into 27 codes. In the second stage, axial coding, we used NVivo software to organize our data and to capture our discussions about the associations among concepts.

All the authors generated the open and axial coding. Axial coding involved linking the initial categories to create subcategories such as the advice participants have been given, discussion of their skills or aptitudes, and positive or negative experiences. We continued our discussions until we all expressed agreement about our axial coding. Then, we moved to the final stage of generating themes or semantic patterns and emotional expressions or affect that were evident within and throughout our interviews. Once we felt that we finalized our themes, we returned to our data and looked for negative cases. At this point, we found that our themes represented our data. We began writing our results to depict what was said and unsaid regarding feelings and embodied experiences. We did member checks by describing our findings and representative quotes and analyses with engineering education experts during STEM conferences and through conversations with professors and student engineers.

3. Results

In examining how affective organizing constituted gendered identities and structures in engineering, we found three themes. First, we describe women’s feelings of (un)belongingness and (in)visibility then discuss men’s emotional labor to portray support for D&I while feeling as though women do not and should not belong. We contend that these sensate experiences and emotional labor promote agency in our third theme: feminist third spaces/places for collective emotional labor and resilience.

3.1. Women’s Feelings of (Un)Belongingness and (In)Visibility

In this section, we detail the feelings of difference and exclusion, as well as the feelings of being both invisible and visible simultaneously that emerged from the data.

3.1.1. Feelings of Difference-Exclusion

Discourses and materialities colluded to construct a dominant sense of difference and exclusion that made women confront feelings that they did not belong in engineering (for unbelongingness and exclusion, see [27]). Participants shared many examples of negative experiences as engineers. As Megan put it, “there are some people out there

that don't think that females should be engineers . . . it's an earth-shattering experience to have people actually tell you". Megan's use of "earth-shattering" conveyed the depth and despair associated with her realization that people do not envision women as engineers. Jo expressed frustration even as she tried to rationalize exclusion: "guys either don't think of you as an equal . . . [or] aren't mature enough to understand you, how to work with you".

Women shared that they were very aware of their minority status in classes and at work, conveying senses associated with vigilance and threat. Greta's phrasing of "I usually notice" indicated that the feeling of unbelonging re-occurred repeatedly over time and place for her and other women engineers: "I usually notice it [in] at least the first two days, like sometimes I'll even go so far as to count like 'I am one of 5 girls in the class out of 70'". Elizabeth affirmed this awareness of low numbers of women and her feelings of relief at having other women around her: "it was really nice to have someone to talk to because you feel like a minority, (pauses) which I guess you are". Taking a slightly different perspective, Shelly thought that her mechanical engineering classes were "a better spread" at "probably 80% men, 20% women". She expressed satisfaction at 20%, ironically neglecting the point that women are half of the world's population.

While some of the women spoke about the low percentage of women, others reflected on the effects of feeling unwelcome as one of few women in classes, groups, and at work. Ashley said that being the lone woman was often pointed out: "the guy'll turn to me and be like 'oh, you're the only chick in here.' I'll be like, 'Oh yeah I guess I am' (laugh)". Her laughter seemed to indicate discomfort and her felt need to diffuse, through emotional work, a contradictory and incongruous power-laden situation [43]. Stacy also felt discomfort at her isolation: "you notice it . . . it's kinda like, wow, this is weird, I feel like they're all staring at me".

In addition to the uncomfortable feelings of being singled out and focused on, women also spoke about other instances as exclusionary. Mary remembered a professor who wanted to make sure the only woman in his class knew the material and was not going to have an "easy" time: "I was like the only girl in the class, and he kept picking on me because he wanted to make sure that I wasn't going to get let off the hook easy because I was the only girl". Jessica recalled a professor's inappropriate comments: "he definitely made some comments about women in the workforce". Sandy remembered men being nervous about her arriving at her first co-op (internship). She acknowledged that it felt "traumatic" for her but was "more traumatic" for the men who had constructed their workplace as a masculine, men-only, place:

"It was more traumatic for the people I worked for than for me . . . I walk into the lab and they're like 'What do we do with you?' (laugh) They're like 'We can't talk about the same things we talk about 'cause you're here.'"

Sandy's laughter seemed to indicate her feelings of incredulity that the men could not figure out how to talk to each other with her around. At another co-op, Megan seemed stunned to learn from co-workers what her supervisor told everyone:

"Actually this past summer I had a supervisor that, right before I got there, had actually, he'd been in a group of people and they were all males but, he just happened to talk about how he didn't think females should be engineers. And he was my supervisor all summer."

This hostility was matched by exclusionary sites and artifacts. Shelly noted that facilities lacking sufficient women's restrooms sent a "subtle but hostile message": "so it's like, wow it's like you're not wanted there (whisper/laugh) . . . Sends a subtle but hostile message." Shelly's whispered remarks and laughter drew out the boundaries of and tensions in (il)legitimized memberships in engineering [27,43]. Every woman described discursive and embodied experiences that reinforced women-do-not-belong-in-engineering, that "actively or passively made them feel out of place, doubt their abilities and be alienated" [44] (p. 7).

3.1.2. Feelings of Being Invisible and Visible

Women felt stuck in double binds of invisibility and visibility (for gendered invisibility-visibility in engineering, see [18]). They described feeling invisible when they were ignored or talked over and very visible when they encountered stereotypes about women, namely, that they were not smart enough, were emotional, were only in engineering to land a man, or when their actions were interpreted as “slutty”. This section presents the broader, enduring systems of Discourses and materialities that shaped and were shaped by how some men interacted with our women participants.

With regard to feelings of being invisible, many women spoke about being repeatedly ignored or talked over with a sense of frustration. Isabella reported having trouble getting men to include her and listen to her ideas: “when I’m the only girl in my group and all the guys are like, okay yeah we’re gonna do this and we’ll do this and la la la la, like ‘Hello! (laugh) I’m part of the group too!’” Her laughter signaled contradictory feelings about being upset and about her need to resist exclusion and men’s presumed authority to determine membership along with her feelings that she had to do so without seeming hostile [43]. Rose was exasperated at being ignored: “You get that every day, you know? Like when we work in groups things like a guy will turn to the guy before he turns to you to ask a question”. Jessica’s experiences were similar: “they’re like brainstorming . . . and I would, you know, continually be getting talked over”.

Sophia expressed frustration and anger (“fuming”) when she took over a project for a male coworker who had to take a leave of absence. She worked overtime to save the project. Yet when the project was presented, her supervisor attributed her contributions to the absent coworker: “Every question . . . and every comment, he was just directing it to this guy and I would try to jump in and be like, ‘remember this is why we made this decision’ or ‘this is why we set it up this way’”. Despite her interjections, the boss “deflect(ed) it back toward this guy and it was killing me, I was fuming”. Kim shared another common power move by “macho guys”: “when guys wanted to dominate, you know, what was going on and they would kind of neglect what you would say until they said it and then they would take credit for it”.

With regard to feelings of being too visible, all our women participants expressed frustrations with the multiple gendered stereotypes they constantly found being enacted in their classes and workplaces. In addition to being ignored by her male classmates, Rose also recognized that when they would talk to her, they would be very condescending: “the way people talk, you know, it’s like, ‘I KNOW that’ (laugh), you don’t have to spell it out for me. Like I’m right there with you.” Jessica fought against stereotypes that attractive women cannot be smart and competent when “guys . . . didn’t really take you seriously, you know, kinda thought you were just there as a pretty face and didn’t really have a whole lot upstairs, you know.” For Suzy, the stereotype of women not being competent meant that she was physically removed from sites of learning:

“I started asking him [professor] my first question . . . but evidently my question wasn’t profound enough and so he kicked me out of his office hours and didn’t give me any help . . . He’s like ‘We’re done here’ and he got up, he ushered me out of his office.”

Not only were women not considered smart, but they also faced stereotypes that women were too emotional to be engineers. Jessica said that these beliefs were definitely on her “radar” as she protested people’s ignorance: “I think they think ‘Oh, she’s gonna cry’ in a meeting or something, you know what I mean, and I’m like ‘no I’m not.’” Ashley expressed frustration in trying to avoid any embodiment tied to being female, emotional, weak, and slutty:

“It’s really frustrating . . . people look at, you know, being the slutty female as such a negative thing to show your female figure your, you know, female characteristics about maybe being sensitive or being emotional or being passionate

about something and, and at the same, you know, you just don't wanna show those aspects that are tied to being female and weak."

Sophia also had to deal with her boss who thought she was too weak to be an engineer: "He would always [talk to me] . . . about needing to toughen up."

Just as the women engaged in strategies to not be perceived as emotional, incompetent, and slutty, Jo mentioned that many women constantly combated stereotypes that they were in engineering to get boyfriends: "I had some guys that . . . thought that I was . . . interested in finding a boyfriend, which wasn't the case . . . I'm not the only person that has had that kind of situation." Jaime remarked, "some guys . . . hit on you and think it's okay". Participants described these incidents of gendered stereotype enactments and sexualized environments as uncomfortable and prompting emotional labor and impression management to project a professional engineering image. Their experiences also required that they be, and feel constantly, on guard and cautious:

"The relationship with those guys [in class] is kind of weird . . . if you try to be their friend or partner, they would always in the end take it as you want them . . . I think I didn't have that group of guys to work with, I think it really hurt me for that class, whereas I knew they were working together, but I never felt a part of it. Whenever I went to talk to them, they just decided I was stupid or I didn't know what was going on enough to help me out." (Suzy)

Not only did Suzy experience harassment, but her exclusion by others impacted her ability to succeed in classes where students relied on each other for help.

3.2. Men's Emotional Labor to Voice Inclusion but Enact Exclusion

In this theme, men's ambivalence, or contradictory feelings, about D&I efforts to pull women into engineering and retain them surfaced in comments for which men exert emotional labor to portray themselves as honoring inclusion. In talking to their men interviewers, the men engineers exerted effort to construct identities that made them appear reasonable and caring about women in engineering, but resentment seemed to underlie their talk. These feelings seemed to be sensate, below conscious feelings [39]—not necessarily intentional or deliberate and probably rooted in homophily, or people's tendency to be attracted to similar others. These discourses were not as blatant as the antifeminist discourses [13] where men tried to (re)structure their online and offline worlds as male. Although their emotional labor was designed to create impressions of political correctness and support, their interviews revealed underlying biases. These biases were reflected in ways that expressed men's feelings of elitism and exclusion by constructing women as "other", maintaining there was no need for more women, and viewing recruiting as problematic.

3.2.1. Men's Feelings of Elitism and Exclusion

Many of the men argued that engineering is such an elite field that people should not have to be recruited into it, even if it would mean improving representational diversity numbers. Their responses signaled both a lack of understanding about why more diversity in engineering would be beneficial and the reality that engineering was losing many highly skilled women to fields similar to engineering. These responses resulted from when men were asked how more women could be recruited into engineering (although women did not respond this way to the same question). Whereas a few men offered solutions to what they said was a serious issue facing engineering, most men's feelings surfaced in elitist and exclusionary discourses that questioned whether it was in engineering's best interest to recruit more women. This theme reinforced (a) the belief of women as "other", and therefore (b) recruiting more women was problematic because it led to forcing unnatural and dispassionate women into their elite profession.

Men's discourses about women as "other" often centered on the idea that men and women are simply different and therefore have divergent career interests. Albert expressed his idea that one of the ways to increase recruitment of women would be to have women

on the recruitment team “because women think differently”. Peter’s response was “I can’t really tell you about girls because I have no clue how they think.” Although Dinar said that he believed in a gender-neutral environment, his phrasing suggested gender differences: “See I think, again, myself, I’m not very gender-biased. I mean there are certain things which women are better at, but I think still, I would like [there] to be a gender-neutral environment.” Ken added his belief in gender differences as leading to men being “just a better engineer to start with”:

“I think that the son going out and doing firewood, or maybe he’s working on the car with his dad, is going to develop more engineering skills, and I think he’s going to be a natural like, just a better engineer to start with, and I think he’s going to be more driven to that kind of goal; where maybe the girl isn’t going to be as naturally driven towards engineering.”

Despite saying that he did not know how girls think, Peter’s linguistic choices indicate a belief that women have a different “mindset” and “drive” from men, saying that engineering is “geared toward the male mindset. I mean, I just don’t think women have the same mentality and the same drive for that type of work that men do . . . inherently it is not something that appeals to that many women”. He continued:

“I’m going to sound really sexist, I’m sure, but I think that in general, they’re more concerned with more tangible things, you know, relationships and more visual and aesthetics, so I think that engineering fields where they can kind of put that into use, I think there’s definitely room to kind of market those more for women engineers.”

Whereas Peter suggested that women were not interested in certain subfields of engineering but might be more interested in others, Rajit posited that women might be avoiding engineering because they view it as too hard and that they want an easier major:

“I think it is a fact that women don’t realize that there are lot of things that they want to do that they can do going into engineering disciplines. They just feel they want to take the easier way to get to their goal. Maybe because they feel engineering is harder, you know.”

Some men discussed gender differences as being innate, but others acknowledged that society plays a role in directing men toward engineering and women toward other fields.

Whereas women participants acknowledged society’s role in socializing women and men toward different careers, only a few men acknowledged society’s impact versus innate biological differences as keeping women from engineering. Albert acknowledged the role society plays in the lack of women engineers: “I mean, society forces them (women) to go to liberal arts or just pharmacy, but sometimes they really want to do something that they like, but they choose to do something that society asks them to or their parents (ask them to do).” Ken also described society’s role: “I think society has kind of been more of like—like there’s a reason that there’s way more men in engineering; it’s the way society puts it”. Emilio likewise thought that the strategies for recruiting women should be different “mainly because of the way society has been for the past hundred years.”

In no need for more women, when asked how more women could be recruited into engineering, some men questioned whether it was really a problem worth fixing. Peter asked whether people were confusing the lack of women with a lack of interest: “I think that inherently they’re not going to be able to draw a lot of women engineers. But are they confusing a lack of women currently, with women in general just aren’t drawn to those fields?” Some participants, like Tim and Ken, thought that people needed to learn to live with the idea of fewer women engineers. Ken argued:

“I think that we have to embrace that there are less women in engineering and that’s fine. It’s not to say that women can’t be engineers or they’re going to be inferior engineers; I just think we need to be honest with them and say ‘Hey, there

are less of you guys, but you have all the opportunities in the world. There are all kinds of programs for you.”

Likewise, Tim did not want to keep interested women out of engineering, but simultaneously indicated that he did not see the lack of women as an issue:

“I think it may be possible that you need to get the idea of saying that engineering is an option to women, but I don’t think we need more women. I think it’s just more like if a woman is interested, they should have every equal opportunity to join.”

This idea that a lack of women was not a problem, and certainly not a problem that needed to be fixed, connects to the next theme, namely, that some participants actually felt that trying to increase the number of women engineers was harmful to engineering.

3.2.2. Feelings That Increasing the Number of Women Engineers Is Harmful to Engineering

This subtheme provided men’s understandings of (a) recruiting as problematic and (b) recruiting as confused with force.

In recruiting as problematic, men felt that trying to bring more women to engineering was harmful because they perceived that the profession was too elite and therefore recruiting should not be needed. Men likened recruiting women to forcing them into the field and to gaining less qualified, dispassionate colleagues. Some participants, like Randy, believed that if one had a passion for a field, recruiting should be unnecessary. When asked how more women could be recruited into engineering, Randy said,

“Ohhh. I don’t know that that should be the interest of engineering. I think everyone should find out what their passion is, and pursue that . . . That’s the kind of people you want in jobs. If they have a passion for the work they’re gonna do good. They don’t really need too much other incentive. I don’t need this bonus that’s going to come about. I don’t need, I don’t know, it’s just if you love doing it, you’ll do it.”

Similarly, Rudra reported that he would have liked to see people enter the field who did not need to be recruited because recruitment was akin to forcing women into these careers:

“I don’t think they need to really recruit more. I think it’s fine. I mean, they always say that there should be more women in engineering or chemical engineering, but I honestly think that actually there are starting to become more women in there, and I don’t know if they recruited or not, so . . . But honestly, I don’t think so because a lot of people I’m in class with, women and men, they all have a natural, like wanting to learn these things. There isn’t necessarily like a woman was forced here because there weren’t many women here to start with. I think they all naturally do it themselves.”

Regarding strategies for increasing the number of women engineers, Ken argued that this special recruitment fundamentally went against the idea of equality:

“That’s kind of an interesting point just because like do they want to be treated equally or do they not want to be treated equally? That’s the big thing I’ve always kind of struggled with because it seems like sometimes they’re always, you know, fighting for equal rights, but at the same time, I don’t think they should have equal rights. That’s a personal thing, but I think that we should maybe embrace that they are different, you know?”

These quotes are directly linked to beliefs that women and men were different. Therefore to “push” women into a field was not in anyone’s best interests. This claim also connected to previous quotes that perhaps everyone needed to learn to live with fewer women engineers.

In recruiting as confused with force, some men positioned recruiting like various outreach events as harmful to the field because women should not have to be forced to enter engineering. The idea that women lose their agency by entering a field or particular program based on extra recruitment did not align with sports recruitment or with empirical findings about retaining women engineers that suggest that women have no problems exiting fields or selecting specific engineering disciplines, such as biomedical engineering.

When asked if more women needed to be recruited, Rudra envisioned an optimal strategy of enrolling women and men who “all have a natural-like wanting to learn these things (engineering)”. Rudra continued: “Yeah. I’d like for them (women) to choose for themselves and not have a real big external influence on moving towards any direction, rather they should do it themselves.” Tarrin said something similar about not wanting people to be forced to join engineering:

“I mean I think outreach events are great, but I guess there’s a line where you start trying to make, really convince people to become engineers instead of just present them information about what engineers do and get them interested in it.”

Walter felt that the move to increase women was harmful because he believed that the criteria have been adjusted, or lowered, for women to be accepted:

“Right now my personal experiences are, from undergrad, there are a lot of people that I saw in these STEM technologies that probably shouldn’t have been . . . you know, in the university, usually the criteria for women is a little lower than men, to help get more women into the field; but I feel like they’ve already gone past that and they need to bring it back up so it’s [the criteria] about even.”

Similarly, Tarrin perceived the issue of recruiting women as one of quality over quantity:

“Do you really want those people who are not really, otherwise, going to be best suited for this kind of field to be in the field? Because, sure you can have a lot of people, but I think quality is more important than quantity. So if they’re [women] not interested, maybe they shouldn’t be in it in the first place.”

Tarrin felt that recruiting women was not a good use of resources: “But my point is that maybe you—we should focus the effort on something else. Into like trying to make our curriculum better instead of spend [sic] money and try to make woman more interested in the field.” The irony is that the men do not see how they were encouraged to go into engineering. They felt that their major and career choice was made freely based on what felt meaningful and appealing, even as they also talked about how their fathers and uncles mentored them and influenced their career choices.

In summary, throughout this theme men engaged in emotional labor to signal support for women, given their required D&I training, while maintaining that women should not be forced into engineering. In this way, the men played the role of protector and supporter of women’s choice and agency in career decisions. The men “attempt[ed] to demonstrate authenticity through affect by making it rational” ([13], p. 133). This tension seemed to be just one step away from saying that women were taking men’s rightful place in college and in the labor force. This tension also conveyed how men’s organizing “coalesces around oppression but not self-victimhood; however, they (men) continually deplore external institutions that serve to protect women over men” (p. 129).

3.3. *Feminist Third Spaces/Places for Collective Emotional Labor and Resilience*

Women engineers’ discourses exposed their recognition that they were constantly dealing with unjust, harassing, de-legitimizing, and gender-stereotypical experiences, which men’s discourses (un)intentionally corroborated. Women’s experiences formed the context in which they felt frustration, vulnerability, isolation, or lack of belonging even as they also were fully admitted members of the College of Engineering with rights to space, learning, and interaction. These experiences and feelings were often cited as barriers to women’s inclusion and success in engineering. We reframed their individual and collective

feelings of (un)belongingness and (in)visibility as the impetus for agency through surfacing the underlying sensate experiences in their current engineering world, much as Eddington et al. [13] explored men's feelings as the drivers for their anti-feminist virtual world-making. Unlike Eddington et al.'s study, our women participants were not talking about collective online experience, but rather physical spaces and face-to-face organizing.

Taken together, women's emotional labor, affect, sensemaking, and identity formations became the impetus for their own and other women's constitution of third spaces [45]. These third spaces/places were feminist insofar as they were sites of advocacy for women and other vulnerable members [46]. We begin this section of our findings by documenting the need for a site of collective emotional labor [47] and belongingness. As this collective coping is both adaptive to their circumstances and transformational on the individual college program and engineering levels, we draw upon the communication theory of resilience's (CTR's) processes and adaptative-transformative tensions [26,28,48–50]. We contend that sustainable gendered affective organizing is constituted in and by the cultivation of resilience within feminist third spaces/places for women in engineering. This organizing is similar both to how Eddington et al. [13] demonstrated the ways affect, sensemaking, and identity constructed online antifeminist organizing and to how our men constructed their contradictory inclusionary–exclusionary d/Discourses of engineering.

Feminist third spaces offer spaces and/or physical places or sites in which problematic issues can be challenged, framed as possibilities, and organized for “reconciliation between dualities which enables sustainability” [46] (pp. 4–5). Pauly noted that the feminist third space/place she studied, called NETWORK, did not transcend tensions or move outside of the paradoxes that existed in the male-dominated, masculine organizing of the Roman Catholic Church but created a new space within it based on the felt need and the complexities inherent in the context and relational interactions. Third spaces/places generally are spaces that are open for community-building that are not an individual's primary home or work, but that are spaces where people can become “regulars” and feel a sense of ownership over the space. These spaces were historically more numerous in many American communities and have been reducing in number over the past half-century. These spaces operate as “great, good places” [45] in which conversation, mutual respect, and feelings of belonging and inclusion happen despite disagreement [45,51]. Such spaces/places are key to women's cultivation of resilience and to sustainable organizational and occupational change for gender justice [50,52,53]. This theme contrasts women's feelings and enactment of their (a) individual strategies and instead focuses on their (b) collective, intentional design of feminist third spaces/places that provide space for community-building within a male-dominated discipline.

3.3.1. Women's Individual Strategies

Our analysis noted how participants leveraged individual strategies by (a) relaying evidence of competence, (b) enacting alternative logics such as taking the high road, and (c) focusing on positive moments and productive action.

In relaying evidence of competence, women engineers reported early and sustained senses of joy, belongingness, affirmation, and feelings of normalcy, accomplishment, and talent not only from family members' comments rooted in childhood but also from their abilities to do the material labor of engineering. Their stories depicted supportive networks and engineering self-efficacy development that were essential for women's entry into and continuation of engineering majors and careers [26,28,44]. Of interest is that none of the men mentioned poignant memories of these types despite being asked the same interview questions as women participants.

Participants detailed early positive support from parents and grandparents. For example, Jessica was heartened by her father's enthusiasm: “my dad really encouraged me to, he's like you've got the skills for it, you might as well at least try engineering” (see also Dawn). When Allison expressed so much frustration that she wanted to quit, her mother's response felt soothing: “it's ultimately up to you but you know you can do it.”

Suzy's parents lifted her spirits: "my mom always told me I could be anything I wanted to be, both my parents did since they think like the sky's my limit." Indeed, almost all of the women described salient memories from when they were young that indicated an early aptitude for the skills needed in engineering and their feelings of accomplishment, such as Shelly's story about putting together a tricycle at age three:

"There was a natural aptitude that I showed early on. Subsequent to my third birthday, a couple of months thereafter, I had gotten a tricycle as a holiday gift . . . I put it together and took it to the neighbors to tighten the bolts. So I was able to effectively assemble my tricycle correctly at slightly over three years old . . . as I aged, I was the girl who played with the trucks and took the bikes apart. It wasn't weird to me. It was just how I was."

Similarly, Grace said that her mother likes to tell the story of Grace's first ballet recital:

"I was three. I knew the routines from class, but I didn't dance a step, but when it was over I told her (my mother) how the curtain worked! I was all excited about the pulleys and the rope. She knew I would be an engineer."

As they aged, the women discovered other talents that enabled them to sustain their interests in engineering despite challenges. Sandy explained that "I've always been really good at math and science" which is one of the reasons she chose engineering as her major. Some women thought that their brains were oriented toward STEM. Jessica remarked, "I was really just looking for something that allowed me to use the math side of my brain because that's where I'm definitely stronger, much more than English or anything like that". Similarly, Kathy credited her "physics" brain as her reason for choosing engineering: "I'm really like physics-based in my thinking. I like machines. I like movement and working with forces and that kind of thing. That's my forte, I guess, so mechanical [engineering] seemed the most logical progression for that".

Overall, our women participants recounted their excitement and feelings of competence and pride when working with material artifacts and doing engineering, while also receiving encouragement from family, friends, and others over their lifespans. This subtheme shows how affect and sensemaking were organized into engineering identity anchors that cultivated resilience about belongingness, support, and experiences of joy and enthusiasm that counteracted challenges (see also [26,28,50]). In contrast, none of the men told stories about showing an early aptitude for engineering. A few of the men mentioned they played with Legos™ (Tarrin) or liked to take apart old technologies (Tristan). Whereas women engineers frequently mentioned that they were "good" at math and science as major reasons they chose to enter engineering (talent), the men rarely made such statements, saying that they "liked" (interest) more so than that they were "good" at math and science.

In enacting alternative logics such as taking the high road, besides providing evidence of competence, the women often minimized their negative experiences such as Jessica who dismissed her professor's prejudiced thoughts about women and minorities in the workforce by attributing such comments to age and personality:

"He's very old school. . . . He's just kind of a goofball I guess, and so I don't take it that seriously, I think there's some females in the classes that were definitely offended by it. I just kind of brushed it off and took a "prove him wrong later" type of attitude."

Jessica also used this "prove him wrong later" strategy when her group members would ignore her. Indeed, other women mentioned that they used this attitude as a response to negative experiences. When being stared at in class, Stacy shrugged it off saying, "you just get over it and whatever they wanna think of you, that's fine." After mentioning that guys hit on women and think it is acceptable behavior, Jamie simply said: "you know, you deal with it."

Women also minimized the situation by suggesting that it was not so bad. Sophia had been warned about one man's reputation but downplayed his behavior: "He had never ever

expressed any of that toward me. Maybe jokingly but never in front of others and never in a meeting or a serious situation.” In one breath she said he was not inappropriate and in the next said that he was, but it was acceptable because he did so “jokingly”. Ironically, she later recalled when this same person credited her male coworker for the project she saved. She minimized this second situation by focusing on the “high road” and how getting credit for her work was not her goal:

“I’d done it as a favor kind of out of the goodness of my heart to help them, and it was infuriating. I was fuming for like three days . . . the way that I was able to just let that go is . . . I knew I’d done a good job. I knew I had helped them meet their goal. That was the important part, you know, not who got credit.”

Sophia tried to handle the situation with dignity, but she clearly felt anger at the unjust interaction. Perhaps she “let go” because she knew of no other strategy to make a difference (see also [26,27]) or perhaps she recognized that asserting her expertise and accomplishments might be perceived as “engineering arrogance” which Dayna warned would further a man’s career but not a woman’s:

“If a woman has that engineering arrogance, she’s seen as not a nice person, and that holds her back but if she’s a nice person and a team player she’s not recognized for her efforts.”

Similarly, Shelly mentioned that she learned to “become highly tolerant of all sorts of things that you wouldn’t be tolerant of in a diverse environment because there’s only one of me . . . you take a fair amount of unpleasant things and just deal with it.” These comments constitute the marginalizing communication often found in STEM cultures [33].

In focusing on positive moments and productive action, not only did the women recall instances of “taking the high road”, but they also engaged in emotions and behaviors that helped them pursue their overarching goals [48,49]. Examples of backgrounding negative feelings while foregrounding productive action included dressing more casually because of unwanted attention and establishing professional images to avoid problems with male classmates, bosses, and colleagues. Jessica mentioned that men’s perceptions of women as too emotional were “on her radar” so she enacted emotional labor by putting “that barrier up front like, I’m very professional, this is what I can do.” She said she learned to “get that professional relationship established from the very beginning” to protect her from “credibility issues and that sort of thing”. But Sandy used the opposite strategy at her co-op. Because the men in her lab expressed nervousness about what topics they could discuss around her, she jumped right into the conversations by the end of her first week: “I caught them talking about something and I jumped right into the conversation because I’m a giant tomboy”.

Though not a “tomboy” like Sandy, Ashley felt she needed to assume more of a masculine personality while socializing with male classmates: “You kinda get into this whole thing of, you know I’m hanging with the guys, I’m doing the ‘guy thing in engineering’ . . . you’re trying to keep your femininity at the same time . . . taking on this kind of macho personality.” She (see also Emily) said she did not want to stand out or appear weak. Because of these concerns, she felt conflicted: “I do lose myself a lot through interactions with just hanging out with guys”. Ironically these individual strategies helped the women deal with experiences of sexism, injustices, and “unpleasant things”, but did not and could not operate as a collective strategy for adaptation and systemic change.

3.3.2. Collective Design of a Feminist Third Space/Place

In this section, we move from women’s orientation of handling challenges themselves to communal agency strategies such as the (a) collective focus on the positive, and the (b) being there for and with other women.

For their collective focus on the positive, while the women noted affirming messages they received that led them to and kept them in engineering, many also focused on other positive aspects of being a woman engineer [26]. Because they might be “a little different

from the rest”, supportive elements like the highly active Society of Women Engineers (SWE) chapter at this university and the Women in Engineering (WIE) program played a critical role for our participants as third spaces/places for collective emotional labor or coping and for transformation. These practices entangled the materializations of affective intensities, in identity and possibilities for transformation [40]. Laura summarized SWE’s supportive and confidence-building functions for many of our participants:

“(Members would say) ‘I’ve done this,’ ‘We’re going to do this,’ ‘I’ve had this experience,’ ‘I’ve had that experience,’ ‘Don’t worry about it, I’m going to come with you.’ ‘Let’s go talk to this person.’ ‘This is how you should phrase your email. If this is what you want to ask, this is what you really want to know.’ . . . so that’s what SWE was about for me, that was my professional support system.”

Likewise, the WIE Director boosted members’ confidence. Kim said,

“The [retired] Women in Engineering director was just exactly what a girl in engineering needs. You walk into the office and she goes “Keep going! You’re doing great.” She’ll just tell you what you want to hear to keep you motivated.”

Megan said WIE “is such a strong thing to have, especially the way we have it laid out where you can live with the people and you get to interact with them outside of school.”

The women flipped the emotional challenges by focusing on the positive aspects of being a woman in an in-demand field, as Kathy argued,

“In all reality, being a woman engineer is an advantage because there is such a strong network with the Women in Engineering program and with SWE. The guys are left to their own devices to figure it out whereas we’ve got that little extra support.”

Allison concurred, “If I wasn’t in SWE I wouldn’t have gotten a job, because of the things that I’ve learned like what to expect in an interview, different interview questions . . . SWE was the most beneficial thing for me to ever get into”. Rose used alternative logics when she remarked that being a woman engineer was fun: “you get more attention and . . . I get job offers a little quicker, you know because companies are trying to up that ratio and I’m all for that (laugh) you know?” She said that she planned to “prove to you that I’m just as good as somebody else.” Jessica reflected on the extra positive attention from companies at job fairs: “A lot of times it is change of scenery from a sea of guys so I think it’s refreshing sometimes to see an intelligent woman stepping up that knows what she wants and is willing to go out there and get it, so I think that’s good”.

In being there for and with other women, role models build self-efficacy insofar as women can watch other women engineers perform different tasks and imagine that they, too, can succeed [22]. Almost all women reported that seeing different women in engineering whom they met through college initiatives such as SWE and WIE or through their classes and work experiences was helpful because they could envision themselves as also surviving and thriving in rigorous, male-dominated environments.

Role modeling and opportunities for conversation and support combined into feminist third spaces/places. In addition to SWE and WIE, participants described an engineering sorority and a course on women in engineering that participants, like Jessica, affirmed as helpful for showing how “successful woman engineer speaker[s]” were using their degree after graduation: “it was so cool to hear what they’ve done, you know, like whether they went to law school, some went to med school, whatever they’re doing, some are doing very traditional manufacturing roles.” In discussing her role models, Jamie mentioned both a professor with whom she worked and the WIE course specifically: “there’s a class, Women in Engineering . . . They bring in women engineers from all over to . . . talk about their experiences and know that ‘hey, it might be tough right now but you’ll be glad that you did it’”. In addition to the WIE course, there was a dormitory floor reserved for women engineering majors. Megan described how this living arrangement helped her meet others similarly exasperated by their challenges in engineering:

“(We) were all going through the same thing so when you’re sitting there and you’re literally getting ready to put your foot through your computer screen, you know, there’s someone next door who’s getting ready to put their foot through their computer screen. So you can help each other.”

Megan expressed both frustration and relief in knowing that she was not the only one struggling with engineering courses. Likewise, the women largely reported that seeing other women in engineering whom they met through different initiatives reinforced that they, too, could enact resilience. Women like Megan described how reassuring it felt to have other women going through the same issues such as difficult homework so that they did not feel alone in their struggles. Bethany claimed that having more women faculty members in engineering would have made an impact on her: “Seeing women in engineering, seeing women in faculty positions. I don’t think I’ve ever had a woman teach me . . . outside of my electives”. A recent graduate and professional engineer, Sarah, asserted that programs like career day in elementary schools are opportunities to either reinforce stereotypes or introduce children to the idea of women engineers:

“And maybe if someone brings in their dad that’s an engineer it’s like “alright, a guy’s doing that”. But girls really don’t think about it until it’s somebody’s mom that’s an engineer [who] comes in or [is] a math teacher or science teacher.”

In quotes such as Sarah’s, the glimpses of transformation on individual and occupational levels can be envisioned through concrete D&I examples.

4. Discussion

Through analyzing the affective gendered organizing in a College of Engineering at one institution of higher education, our study offers a contradiction- and emotion-centered approach to understanding why and how the rational interventions constructed to foster greater D&I cannot attack the core issues of gender inequity, sexism, and discrimination because they do not address feelings. In other words, without delving into what underlies the manifestations of gender inequalities, D&I initiatives for women and for minoritized groups are bound to fail.

Women make sense of their experiences in engineering by expressing how their sense experiences bubble up into feelings of (un)belonging and (in)visibility with associated senses of vulnerability, ambivalence, frustration, anger, and so on that often emerge in response to men’s (un)intentional discourses and the masculine Discourses in engineering. These men have taken mandatory training in, and show that they know how to espouse, D&I. However, their feelings and interactions present tensional exclusionary spaces that become manifest in the many examples that the women explicitly, and the men inadvertently, described. These examples not only form exclusionary spaces but also instances of often subtle, nuanced, and discounted gender-based harassment [53] for which the National Academies of Science, Engineering, and Medicine have reported and called for further research and interventions [54].

Even with these obstacles, women find strength and persistence through their sense of accomplishment and self-efficacy, much as Tian and Bush [55] noted how their Chinese political leaders constructed resilience through their transformative achievements. Our women participants proudly expressed their accomplishments regarding their work with material artifacts; their confidence that they have done and can do the theoretical bases of engineering, such as math and science; and their networks of support that affirm their engineering identity anchors and the normalcy of women in engineering. Their emotional labor to be seen as credible professionals and as included required collective coping and resilience, thus encouraging them to form and sustain feminist third spaces/places as ongoing affective gendered organizing. These feminist third spaces/places offered sustainable contexts in which women could adapt to the challenges they faced and work toward transforming women’s membership in, and the very nature of, engineering.

To this end, we encourage more research into paradox, emotion, and affect in gendered engineering organizing. In affective gendered organizing, scholarship often is conducted online with spillover into offline contexts [13]. In our study, participants described interactions that occurred offline but could have easily occurred online. We encourage investigations into women's and men's affective gendered organizing in engineering virtual spaces and with an intersectional lens to understand more fully the complex ways sense experiences, diverse social identities, and power relations become manifest in engineering. In particular, we acknowledge the need for research that privileges the experiences of BIPOC (Black, Indigenous, People of Color) men and women in engineering. Such accounts remain largely missing in the literature despite evidence pointing to the systemic exclusion of BIPOC individuals from participating as STEM students and faculty [56,57].

Additionally, we encourage the study of engineering communities outside the United States to better understand how these affective gendered organizing and resilience phenomena operate differently in other cultures or other parts of the world. Furthermore, our study included only 7% of participants who were working in the industry, with our focus being on students or novice engineers. Although privileging early career perspectives is useful for retaining engineers in higher education and other industries, we might have inadvertently excluded some aspects of women's and men's engineering careers that become more salient as people age or advance in their careers. We encourage future research that incorporates greater diversity in participants.

With regard to pragmatic implications, creating training that focuses on d/Discourses and materialities would provide opportunities to learn, reflect upon, and role-play corrective behaviors such as allyship for lessening microaggressions [58] and perhaps getting at the affect that runs below conscious expression [39]. Our women participants expressed contradictory feelings of (un)belonging and (in)visibility yet we note that their very presence functioned as a resistance to normative understandings of engineering and engineers, some of which were expressed by our male participants. As Tracy and Rivera [59] found, enduring gender scripts are played out through talk and interaction, but there are likely some flickers of transformation worth pursuing. Ongoing training and conversations about these issues based on the understanding of the feelings and gendered organizing dynamics can help people design prototypes useful in the moment and then revise them for sustainable interventions that address systemic causes for the underrepresentation of women [8,18,60]. In these ways, we offer communication-centered implications that can change STEM conversations in sustainable ways [61].

In conclusion, without considering the paradoxical nature of affect in gendered organizing, interventions designed to lessen women's underrepresentation in engineering cannot be sustainable. We utilized the same interview protocol for collecting data from women and men engineers about D&I. We contribute how women's feelings of (un)belongingness and (in)visibility and men's emotional labor to voice inclusion while enacting exclusion energize and sustain organizing to construct feminist third spaces/places as sites for collective emotional labor and resilience as both adaptive and transformative (communication theory of resilience, CTR) [48–50]. In doing so, we answer calls to expand CTR's processes to incorporate voice, resistance, and context-specific strategies such as in engineering [26]. Furthermore, D&I complexities in engineering demand more than simplified solutions. We leverage our paradoxical gendered affective approach to disrupt linear thinking and organizing and infuse agency-power inequalities [62–64] for reimagining engineering.

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