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Creating Inclusive Department Climates in STEM Fields: Multiple Faculty Perspectives on the Same Departments

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ABSTRACT

Climate studies that measure equity and inclusion among faculty reveal widespread gender and race disparities in higher education. The chilly departmental climate that women and faculty of color experience is typically measured through university-wide surveys. Although inclusion plays out at the department level, research rarely focuses on departments. Drawing from 57 interviews with faculty in fourteen STEM departments, we compare experiences with inclusion among faculty in the same departments and rank who differ by race and gender. Drawing from theoretical frameworks of diverse learning environments and organizational sociology allows us to analyze the department as an organizational context. Analyzing multiple perspectives on the same departments reveals three types: inclusive, improving, and marginalizing. Department types vary on perceptions of representation, collegiality, and democratic leadership. Faculty across race and gender largely agree when they are in inclusive or marginalizing departments. In improving departments, there is greater disagreement. By focusing on faculty who share the same department and rank, but differ by race and gender, we identify key approaches leaders can take to create more inclusive departments. Our focus on the department level helps develop new insights about how inclusion operates in university settings.

Keywords: faculty; higher education; race; gender; inclusion; diversity; leadership; mentoring; representation; collegiality

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Creating Inclusive Department Climates in STEM Fields: Multiple Faculty Perspectives on the Same Departments

Through national and institutional efforts, universities aim to become more diverse by hiring and promoting women and faculty of color. Yet, even where recruitment succeeds, retention of women and faculty of color has been weaker. Many STEM departments thus remain predominantly composed of white and Asian men (Stewart & Valian, 2018). Lack of *inclusion* helps explain the persistence of these issues. We define inclusion to mean faculty members feel connected, valued, respected, and heard. Less inclusive departments are less likely to attract and retain a diverse faculty, with resulting effects on lower student diversity. It is, thus, critical to understand how to make departments more inclusive.

Many researchers recognize that STEM departments are less inclusive to women, particularly, Black, Indigenous and Latinx women (Ong, 2005; Turner, González, & Wong, 2011; Zambrana, 2018). These findings are regularly borne out in climate surveys, including COACHE surveys, which are often multi-institution or institution-wide (Benson & Mathews, 2014; Cech, Blair-Loy, & Rogers, 2018; Mamiseishvili & Lee, 2018; O'Meara, Lounder, & Campbell, 2014; Riffle et al., 2013). Climate studies often highlight aggregate findings about respondents' perceptions, for example by race, gender, nationality or rank across the university, rather than how the experiences of colleagues in the same department compare (Benson & Mathews, 2014).

Disciplinary cultures also vary, with life sciences usually identified as more inclusive and physical sciences as less inclusive (Barthelemy, McCormick, & Henderson, 2016; Cain & Leahey, 2014; Ecklund & Lincoln, 2016; Ong, 2005; Ridgeway, 2011). These studies focus on how particular disciplinary cultures may be more resistant to incorporating women and faculty of color, in part due to stereotyping, as well as lower levels of representation. Analyses of disciplines highlight how broad disciplinary cultures may devalue members of underrepresented groups (Ecklund & Lincoln, 2016).

While understanding inclusion at the level of the university or discipline is important, we focus our attention at the level of the department. Departments are a space where institutional and disciplinary norms intersect – and where specific organizational practices can contribute to the exclusion or inclusion of STEM faculty members (Etkowitz, Kemelgor, & Uzzi, 2000; Maranto & Griffin, 2011). We focus on the organizational level of the department, to understand how inclusion plays out at the local level, analyzing specific department-level mechanisms that shape inclusion. Conceptually, we rely on a framework developed by Hurtado, Alvarez, Guillermo-Wann, Cuellar, & Arellano (2012) to take an organizational approach to departments, which have internal logics reflecting their practices, as well as broader influences, such as university and disciplinary context.

By examining how inclusion operates in departments, we move the focus from the individual to the structural level. Our study design is unique, because it allows us to understand how faculty members who are in the same department and share the same rank, but differ by race and gender, view inclusion similarly or differently. This method allows us to triangulate our understandings of departmental inclusion, enabling us to identify how faculty in the *same* department understand their departmental climates, as well as the factors associated with inclusion. Importantly, our data allow us to see how local work climate matters for all faculty.

Literature Review

Research regularly reports that women feel less valued, connected, and respected in STEM departments and fields (Belle, Smith-Doerr, & O'Brien, 2014; Benson & Mathews, 2014; Britton, 2017; Cain & Leahey, 2014; Maranto & Griffin, 2011; Ong, 2005; Riffle et al., 2013). Members of institutions or disciplines may engage in explicit discrimination and exclusionary practices, as well as more subtly creating "chilly" climates that marginalize women faculty and faculty of color, making them feel that they do not belong (Britton, 2017; Cain & Leahey, 2014; Cech et al., 2018; Maranto & Griffin, 2011; Smith & Calasanti, 2005). Among STEM faculty members, women and people of color are less likely to view their departments as supportive (Cech et al., 2018; Maranto & Griffin, 2011; Riffle et al., 2013; Smith & Calasanti, 2005).

The literature suggests three ways that departments may become inclusive independent of disciplinary norms. First, with greater representation in their departments, women and faculty of color may feel less marginalized. Secondly, departments can create more collegial climates intentionally, through practices such as faculty mentoring. Thirdly, formal decision-making processes and leaders such as department chairs can reinforce inclusion, by unambiguously supporting diversity, giving voice to all colleagues, and addressing conflicts explicitly.

Representation

Women and faculty of color are more likely to feel included in departments that are more diverse. For example, where women faculty are in departments with a higher proportion of women faculty, they may be more productive, and more satisfied with their jobs (Porter, 2007). Departments in more diverse disciplines are more likely to be diverse; yet there is substantial variation in department diversity within any given discipline (Wingfield, 2020).

Broad stereotypes about women's suitability in certain fields shape their interactions at work; colleagues may see women as more legitimate when they are more highly represented (Ridgeway, 2011). For example, in fields with more women, such as Biology or Psychology, faculty may be less likely to stereotype women as lacking competence (Ridgeway, 2011). When women are rarer, they may be tokenized and have fewer connections to colleagues (Maranto & Griffin, 2011; Stewart & Valian, 2018). These same processes play out for faculty of color, often exacerbated for women of color. In STEM departments, white women and women of color expend substantial effort and energy counteracting stereotypes and assumptions (Settles, Cortina, Stewart, & Malley, 2007; Smith & Calasanti, 2005; Wingfield, 2020). Being a member of a minority group is related to marginalization (Maranto & Griffin, 2011; Settles, Buchanan, & Dotson, 2019; Stewart & Valian, 2018). Social exclusion includes being both isolated and hyper-visible professionally and socially (Settles et al., 2019).

Collegial Practices

Existing research suggests that women feel less valued, respected, informed, and visible in their departments, which contributes to lower levels of job satisfaction and higher levels of isolation and intent to leave (O'Meara et al., 2014). Yet colleagues can work to create more inclusive and supportive climates. Lack of department "collegiality" is a primary explanation for why faculty leave (O'Meara et al., 2014).

Faculty members find their jobs significantly more satisfying with access to internal relational supports and mentoring (Bilimoria et al., 2006). Many universities support faculty through formal mentoring programs, including programs aimed at women and faculty of color (Dill & Zambrana, 2016; Fleming et al., 2016). Mentoring programs can create greater transparency, making a department feel more inclusive. Yet the presence of informal mentoring also matters, as formal mentoring is not always as effective as more informal forms of mentoring (Inzer & Crawford, 2005). Mutual mentoring models that bring groups of faculty together within departments may create more collegial connections than one-to-one mentoring models (Yun & Sorcinelli, 2009).

Another component of an inclusive culture is workload equity. Women faculty, on average, spend more time on service, teaching, and mentoring, while men, on average, spend more time on research (Bird, 2011; Guarino & Borden, 2017; Misra, Lundquist, Holmes, & Agiomavritis, 2011; O'Meara, 2016). This gap is exacerbated for faculty from underrepresented minority groups, with women of color shouldering high workload burdens (Espino & Zambrana, 2019; Harley, 2008; Hirshfield & Joseph, 2012; Turner et al., 2011). Inequities in workload are linked to greater career dissatisfaction, lower retention, and longer time to promotion, making workload equity essential for inclusion (Bird, 2011; Britton, 2017; Hanasono et al., 2019).

Decision-making and Leadership

Decision-making processes also play a role in how included faculty members feel in their departments. Inclusive leadership requires connecting with faculty members, and working toward creating more democratic governance. Women and faculty from underrepresented groups are less likely to feel they have a voice in their departments; voice can improve their experiences (Belle et al., 2014; Settles et al., 2007). Where department chairs seek the input of all faculty members, work environments become more inclusive (Fleming et al., 2016; Settles et al., 2007).

University leaders, including department chairs, should actively emphasize equity and acknowledge the need for inclusion. Where leaders see diversifying the institution as someone else's responsibility, inclusion is less successful (McClelland & Holland, 2015). Campus leaders can devote resources to hiring and retaining diverse faculty (Wingfield, 2020). Yet, departmental leaders also play an important role in creating inclusive department cultures (Fleming et al., 2016; Stewart, Malley, & Herzog, 2016; Yen et al., 2019). Despite increased attention to training leaders, leadership strategies for effective inclusion are often vague (Bilimoria & Singer, 2019; Yen et al., 2019).

Another component of leadership is managing conflict among the faculty, including acknowledging and working through issues rather than avoiding them (Gmelch & Carroll, 1991; López Yáñez & Sánchez Moreno, 2008). While department members will have differing perspectives on any given question, how conflict is managed has long lasting effects. Where chairs and heads recognize not only the substantive goal (solving the specific issue) but also the goal of maintaining good relationships (Gmelch & Carroll, 1991), they can create more inclusive environments.

Theoretical Framework

Our work is built on a theoretical framework about “diverse learning environments” from Hurtado et al. (2012), as well as from organizational sociology. Because we are working on the topic of faculty inclusion, we explore diverse working environments, rather

than diverse learning environments, but build from the model Hurtado et al. (2012) develop on learning climates. A multi-contextual campus climate model recognizes not only the experiences of faculty at the level of interaction, but also the institutional, policy, and historical contexts, linking micro and macro. Campus climate does not only reflect, then, psychological perceptions of individuals or interactions among individuals, but also a historical legacy of inclusion or exclusion, compositional diversity, and institutional policies and processes (Hurtado et al., 2012). As Hurtado et al. (2012, p. 103) note, the addition of an organizational approach reflects the importance of “developing strategic activity for institutional transformation,” yet as they argue, “much more research on identifying processes and organizational structures that continue to reproduce inequalities within institutions is necessary to round out the picture.” Our work aims to identify processes and structures that reproduce inequalities for faculty members, particularly by gender and race.

The model centers the social identity of faculty members who experience both inclusion and exclusion. Yet the model argues that actors are continually creating and recreating climates through curricular and co-curricular spaces for students. We extend this approach by focusing on *formal* and *informal* spaces for faculty members. For faculty, this model might suggest the importance of exploring formal interactions, such as how departments make decisions together in areas such as hiring or develop formal mentoring programs, as well as informal interactions, such as how departments more generally engage around mentoring and social activities.

Organizationally, the diverse working environment model “identifies structures and processes that embed group-based privilege and oppression or confer resources that often go unquestioned, such as tenure processes, decision-making processes regarding recruitment and hiring, budget allocations, curriculum, and other institutional practices and policies” (Hurtado et al., 2012, p. 60). Rather than assuming such structural processes are neutral, the model emphasizes the potential for racial inequities to be built into these contexts. This approach aligns with how organizational theory focuses on structure. Rather than simply identifying how faculty and their interactions with one another need to change, it calls attention to how policies and practices also need to change, given how racial and gendered inequalities are embedded in those structures. As organizational sociologist Victor Ray argues, racism (or sexism) is not “an ahistorical constant lodged in individual minds, or as a singular ideology, but rather as a variable, adaptive to organizational niches” (2019, p. 33). This shift in focus helps identify how departments can create more supportive contexts, what Susan Sturm (2006) refers to as “the architecture of inclusion.” Just as curricular and co-curricular experiences are central to students’ experiences, informal and formal experiences in departments are central to how faculty members receive resources and support and make decisions to stay or leave the institution (Britton, 2017; Fleming et al., 2016; O’Meara et al., 2014).

Yet, only a couple studies of faculty inclusion focus on the department as an organizational context. For example, Maranto & Griffin (2011) find that women are less likely to feel excluded in departments with more women faculty, and all faculty feel less excluded where they perceive the department as having greater procedural justice and gender equity. Etkowitz et al. (2000) identify instrumental departments, with low levels of morale and high levels of isolation, and relational departments, with more collegial and cooperative environments. We build on their work.

Hurtado et al.’s model (2012) suggests attending to numerical representation, formal and informal interactions, and individual perceptions of the climate, including perceptions of targeted social groups. Analytically, we consider how these factors play out at the departmental level.

A typical climate study reports how faculty across the university view their departmental climate, exploring whether, for example, women of color at the university generally see their departments as less inclusive, but not analyzing how faculty members working in the same department view that department. We analyze tetrads of white women, women of color, men of color and white men who are departmental colleagues, because we believe this gives us better insight on departmental processes of inclusion and exclusion.

The factors that shape inclusion and exclusion play out in individual perceptions and interactions, but are embedded in the organization of the department and university, which is further embedded in policy and historical contexts (Hurtado et al., 2012; Yen et al., 2019). As Sturm (2006, p. 249) argues, departments organize faculty member's activities and relationships, "mediating how norms and policies are translated into practice. . . [thus] an important location for cultural meaning-making and for producing sustainable change." Yet, departmental policies, practices, and cultures are often based on assumptions that reproduce gendered and racialized inequalities (Acker, 2006; Ray, 2019). Sturm (2006) suggests that full institutional citizenship (inclusion) requires removing barriers that thwart the participation of women and people of color.

Research Questions

We focus explicitly on departmental contexts, considering multiple and diverse faculty perspectives on the same department through a unique research design. Rather than comparing faculty understandings of inclusion by race and gender across the university, we compare how faculty who vary by race and gender but are located in the *same departments and at the same rank* understand inclusion in their department. This design allows us to answer the following questions:

RQ1: How do faculty members in the same department understand their departmental context? For faculty at the same rank and in the same department, does race and gender drive their feelings of inclusion?

RQ2: What are the factors in departments that shape faculty perceptions of their context as inclusive or marginalizing? Do representation, formal and informal interactions, decision-making processes, and leadership, shape individual perceptions of the climate?

Method

The method used by this research team is qualitative and interpretivist, relying on an inductive approach to identifying how faculty members make sense of their experiences in their departments. As discussed below, we used a purposive sampling technique, in order to ensure a diverse sample, and analyzed the data inductively, examining the patterns that arose from the respondents' accounts to allow us to better understand both how faculty members in the same departments made meaning from their experiences, and which factors they saw as important to their departmental cultures.

In 2019 and 2020, the lead author conducted semi-structured interviews with 62 faculty members in STEM departments, defined as math and computer science, engineering, physical sciences, earth sciences, biological sciences, and social sciences. Because this paper focuses on perceptions within departments, we focus on interviews in

departments with three or more respondents.² Thus, our final sample is based on 57 interviews.

Context and Positionality

Research U is a research intensive publicly funded university in the Northeastern U.S. The institution has both historically and currently served a predominantly white population, and the diversity of the faculty, particularly among STEM departments, has shifted slowly, primarily through incorporating Asian men and white women, although recent hiring has included more men and women from underrepresented groups. Approximately 35% and 25% of faculty in the STEM colleges at the university are women and faculty of color, respectively, with 8% from underrepresented minority groups. While the university is only somewhat diverse overall, there are more variations among STEM departments and colleges, with some being more or less diverse.

The interviewer is a U.S. born Asian woman social scientist, which helped build rapport, though she also is an “outsider” for many participants depending on their race, gender, and field. Our positionality as a team shaped our analysis of the data. As two Asian American and two white women social scientists, we experience substantial privilege; we were alert to differences in experience by race, gender, and discipline in our analysis of the data.

Data Collection

Sampling was purposive and focused on identifying four faculty members from the same department and around the same rank; a woman of color, a man of color, a white woman, and a white man (also including nonbinary faculty where possible). The interviews occurred in four waves beginning in April 2019 and concluding in May 2020; interviewing women of color first, then men of color, white women, and finally white men. We centered the data collection on women of color because women of color belong, in many ways, to the most vulnerable group and most underrepresented group in STEM departments. We wanted to ensure that we had a robust sample of women of color, and then match them to men of color, white women, and white men – all groups that are more likely to be represented in STEM departments – in the same departments holding the same rank. This allows us to understand whether and how women of color’s experiences differ from other groups at the same rank. Interview participants were also chosen based on seniority in the department, with a preference towards faculty who have less power, such as assistant professors or lecturers. Depending on the rank of the most junior women of color who agreed to an interview, we then matched the remaining interviews to her rank. All contact information was collected from publicly accessible faculty lists located on department websites.

We approached the most junior woman of color (for example, an Assistant Professor or Lecturer), prioritizing Black and Latinx scholars, because we were interested in understanding the experiences of faculty members who might be understood as more vulnerable, and also wanted to understand the *current* challenges rather than historical departmental issues. Comparing faculty in the same departments and rank allowed us to understand how gender and race shape the faculty members’ accounts of their experiences. We sent one follow-up email if we did not receive a response, and then contacted the next

² Faculty members may be less likely to agree to an interview if they feel excluded. Thus, the sample may not represent the least inclusive settings.

most junior woman of color in the department. We matched men of color, white women, and white men in each department to the woman of color's rank. Our response rate was 61%; women of color were most responsive (over 90% agreed to an interview), which may reflect a greater sense of connection with the woman of color who requested and conducted the interviews.

The initial interviews with women of color, and most men of color and white women, were conducted in the respondents' offices on campus at Research U, or another comfortable campus location suggested by the respondent. For two men of color, four white women, and all white men, the interviews were conducted via video call, given the COVID-19 pandemic. Most interviews took between 40-75 minutes, with most averaging one hour in length, including video calls. White men were more likely to digress, which may be related to the interview mode, but may also reflect attempts to deflect from issues in the department in ways that might work to reinscribe privilege. In all but three instances, interviews were audiotaped with the respondents' permission and later transcribed for analysis. When not audiotaped, the researcher took detailed notes, completing the transcription the same day as the interview. We use pseudonyms and exclude identifying details to protect respondent confidentiality.

Data Analysis

The interview schedule addressed a number of different questions, including opportunities to collaborate with colleagues, how decisions were generally made in their departments and whether they felt their voice was heard in those decisions, who they might connect with if they have questions about their research, teaching, mentoring, or service, whether they see any colleagues as mentors, and how accessible mentors are, what things might make their departments feel more inclusive, their perceptions of how diverse their departments were, and whether they thought that specific groups, including women, faculty of color, and foreign born faculty, feel included in their departments.³ Faculty were also asked to describe times when they felt a lack of inclusion, or when they were surprised by either a decision, or how a decision was made in their department.

While conducting and transcribing the interviews, we kept notes about how inclusion was discussed in response to these questions. We developed a codebook initially primarily focused around the central questions, as well as some themes that cropped up as we discussed the interviews. We discussed these themes weekly for about six months, and worked together to develop codes that represented a number of themes and subthemes. For example, one theme, on mentoring, had subthemes about check-ins, advocacy, formal mentoring, informal mentoring, mutual mentoring among peers, developing relationships, comfort approaching mentors, and university recognition of mentoring. On inclusion, we coded feeling included or not, perceptions of how different groups feel included, and suggestions for practices that promote inclusion. As we began coding the data, using NVivo software, we followed semi-open coding techniques to identify how respondents spoke about inclusion in their departments. As we continued these coding discussions, we were alert to any counter-examples. For example, we found some women of color describing their environments as unexpectedly collegial and inclusive, and noticed that in those departments, men of color, white women, and white men similarly characterized their departments as inclusive. Similarly, we began noticing that, white men might point out ways

³ We also asked questions about inclusion for sexual/gender minorities; many did not know. A few respondents identify as queer and one as nonbinary; these faculty generally express inclusion.

that either they felt marginalized, or how others in their department feel marginalized, which differs from “campus climate” analyses that tend to emphasize that white men see their settings as inclusive. These findings led us to our research questions about how faculty in the same department, but who differ by race and gender, understand their departmental environment as inclusive.

At this stage, we were particularly concerned with any potential differences in how we, as a team, had coded the data, wanting to ensure that we were treating the data as systematically as possible. To validate that we were systematically coding, we recoded the data on inclusion, creating new codes for inclusivity based on the responses of each respondent to each question about inclusion for women, faculty of color, and foreign-born faculty as either “included,” “somewhat included,” or “marginalized.” At this stage, the first author, who had also carried out all of the interviews, did the recoding, but we discussed the findings at length in our meetings, to ensure that this recoding matched our perceptions of the processes at play. This approach confirmed our initial observations that, rather than some departments being inclusive on gender but not on race, or on race and gender but not nationality, a number of departments appeared to be consistently *inclusive* or consistently *marginalizing* more broadly. Faculty, regardless of their race and gender, in what we term inclusive and marginalizing departments appeared to agree about the departmental culture. There was more variation by race and gender among the faculty in departments we term “improving.”

At the same time, we were coding other themes that were coming up in the interview, such as their perceptions of representation by race and gender, how departments handled conflict (which often came up in response to the question about “surprises” in decisions or how decisions were made), and access to mentorship. When we ran queries, we realized that these themes intersected with the themes around inclusion in interesting ways, helping us identify the factors that are most associated with inclusive (or marginalizing) departments. This led us to our research question about the factors in departments that appear associated with faculty perceptions of their departments as either inclusive or marginalizing, and which link to the theoretical model developed by Hurtado and colleagues (2012). In the final stage of analysis, the first author discussed the emerging findings with other faculty on campus, including some who had taken part in the interview, exploring whether our findings about inclusion rang true with them or not. This member validation gave us even greater confidence in the trustworthiness of the data.

Participants

Table 1 summarizes the sample. The research design ensured a diverse sample: about half of the sample are women, non-white, and foreign-born. Developing a matched sample, by department and rank, allows us to understand how faculty race and gender shape experiences. While in the larger project, companion papers focus on differences by race and gender, this paper focuses more on *how colleagues in the same department see their department*. We primarily interviewed Assistant Professors, with some Associate Professors, usually recently tenured. We interviewed a few Professors and non-tenure-track faculty members. Occasionally, we interviewed one person of a different rank, but at a similar professional stage to other faculty members interviewed for that department (e.g., a recently promoted Associate Professor with advanced Assistant Professors). We do not present a detailed table listing each participant to avoid making respondents identifiable. When we quote a faculty respondent, we include their race, gender, and nativity.

Table 1: Demographic Characteristics of Respondents Included in This Study (N=57).

Characteristic	Description	Number	Percentage
Gender	Women	29	51%
	Men	27	47%
	Non-binary	1	2%
Race	Black	5	9%
	Latinx	5	9%
	Asian	18	32%
	White	29	50%
Country of Birth	Born outside U.S.	29	51%
	U.S. born	28	49%
Rank	Lecturer/Sr Lecturer	6	10%
	Assistant	25	44%
	Associate	17	30%
	Full	9	16%

Findings

Identifying Departmental Contexts

Women of color, followed by white women, were the least likely to read their departments as inclusive, while men of color (almost entirely foreign-born) were the most likely to see their departments as inclusive. We analyze the departmental context of inclusion, identifying organizational factors contributing to the local climate. Following Hurtado et al. (2012), we focus our attention on factors of representation, formal and informal interactions, and individual perceptions of the climate, to facilitate understanding differences between diverse working environments. These factors help us to identify three different kinds of departments, *Inclusive*, *Improving*, and *Marginalizing*, as shown in Table Two. Departments do not line up neatly with discipline—e.g., life sciences versus physical sciences (Barthelemy et al., 2016; Cain & Leahey, 2014; Ecklund & Lincoln, 2016; Ong, 2005; Ridgeway, 2011). Variations in climate are based not only on disciplinary norms but also on department-level factors.

In *Inclusive* departments, all of the department members interviewed voice inclusion in their departments, speaking about why they perceive their departments as welcoming. These departments appear to have supportive, friendly environments, with frequent informal interactions between colleagues, and a strong shared investment in maintaining a positive culture. Faculty in these departments were most likely to refer to their departments as feeling inclusive, with accessible mentors, though not necessarily formal mentoring programs, and opportunities to have a voice in formal decision-making. Representing life and social sciences, these departments are also compositionally more diverse by gender, race, and nationality than other departments in the study.

Table 2: Characteristics of Inclusive, Improving, and Marginalizing Departments.

<i>Type of Department</i>	<i>Broad Discipline</i>	<i>Number</i>
<i>Inclusive</i> <u>Representation</u> : compositionally diverse <u>Informal Collegiality</u> : supportive, friendly environment with effective informal faculty mentoring, frequent check-ins, and investments informal in collegial relationships <u>Formal Decision-making</u> : supportive chair, with conflicts typically addressed directly	Life sciences, social sciences	3
<i>Improving</i> <u>Representation</u> : improvements in diversity due to recent hiring <u>Informal Collegiality</u> : acknowledgement of some exclusion and bias, with inconsistent faculty mentoring <u>Formal Decision-Making</u> : underrepresented faculty often unheard in decision-making	Engineering, physical sciences, social sciences	5
<i>Marginalizing</i> <u>Representation</u> : little to no diversity <u>Informal Collegiality</u> : Exclusionary environment with little mentoring, primarily accessed by men, and many faculty feeling isolated <u>Formal Decision-Making</u> : underrepresented faculty unheard or downright ignored, and conflicts left unresolved	Engineering, physical sciences, social sciences, life sciences	6
TOTAL		14

In *Improving* departments, faculty members perceive their climate as improving due to greater compositional diversity through recent hiring, despite challenges. While some faculty members report that they receive informal or formal mentoring and can voice concerns, others receive less mentoring and are less certain about speaking up in department meetings and formal decision-making. Generally, faculty in these departments are less likely than in *inclusive* departments to identify their departments as inclusive, with accessible mentors, and opportunities to formally voice their opinions. In these settings, perspectives of faculty members in the same department diverge more. *Improving* departments are in engineering, physical sciences, and social sciences, and somewhat less compositionally diverse than *Inclusive* departments.

In *Marginalizing* departments, faculty emphasize a lack of inclusion, and relate the climate to a lack of compositional diversity by gender or race. Women and underrepresented faculty report feeling isolated, unable to connect informally with colleagues, and unheard, unlikely to feel that they can participate in formal decision-making. In these departments, faculty do not only refer to their departments as less inclusive with fewer opportunities to voice their opinions, but also particularly weak regarding mentoring, even when they have formal mentoring programs. Conflict in these departments is unresolved. Lack of representation has led to exclusion for at least some groups and faculty agree that those groups feel excluded. These departments include engineering, life sciences, social sciences, and physical sciences.

Inclusive Departments: “Really Awesome and Very Supportive”

We identify three departments as inclusive. Faculty members in these departments portrayed their departments as friendly, supportive environments, often identifying their “culture” as a good one. With strong compositional diversity, including foreign-born faculty (common among STEM departments), women faculty (less common in STEM), and some diversity by race, faculty point to representational diversity as key to their inclusive culture.⁴ Some faculty members further explain that their departments are inclusive not simply because they are diverse, but also because they emphasize collegiality, through informal and formal mentoring, and democratic leadership in their formal decision-making.

In Department 1, Ava (U.S. born, white woman) notes that her department is inclusive to foreign-born faculty “because again we’re probably oh [counting]. . . we’re at a third to almost a half foreign born.” Ava further explains that the gender balance among their faculty and the gender diversity among students makes inclusion feasible: “It is a little bit different. We’re not like [less diverse departments] that may be more male dominated so in that regard, we’re very equivalent, feeling pretty equal.” Ava notes that while each faculty member has an official mentor, faculty should feel comfortable approaching any of their colleagues. Indeed, Emilia (foreign-born, Latina) also characterizes Department 1 as very inclusive, explaining that she would immediately talk to any of her colleagues when she needs something: “I’d go for my colleagues here. I wouldn’t even hesitate. . . I would look for the person that is an expert or has the resources.” Emilia feels a strong sense of solidarity with her colleagues. Her colleague, Diego (foreign-born, Latino) agrees, “I feel that the department is a very fair place in general, even though I disagree [with departmental decisions] sometimes. . . But I’ve never felt that someone is against me or someone else.” Diego feels that his department has a healthy and inclusive culture, and one that allows everyone to voice their perspectives. Yet, establishing that culture does take work, as Ava explains:

I think a lot of that is establishing, just, just a relationship first, you know. Human to human first and understanding . . . and asking you know, ‘how is this?’ or . . . congratulating on a grant or . . . I hear great feedback from my advisees about the class you’re teaching and convey that. So, just little seeds that will build a strong relationship.

⁴ In order to avoid identifying either departments or individuals by specifying departmental demographic breakdowns, we do not provide more detailed information about how diverse these departments are.

Establishing a friendly, supportive environment requires time and effort, slowly building relationships with new colleagues, checking in with them, and supporting them. Yet, these efforts pay off with a collegial department culture that retains faculty over the long run.

In Department 2, James, Shan, and Mei all see the department's diversity as one of its key strengths. James (U.S. born, white man) explains: "I mean that's the majority of our department. Percentage wise, 75% of our graduate population is international. And I haven't counted it up but yeah, we have a strong set of international [faculty]." James also notes that women are very well represented among faculty and students, which makes it more inclusive than many STEM departments at Research U. Shan (foreign-born, Asian man) emphasizes that gender inclusion is clear "because we have many, many female faculties in the department. Actually, many of them are excellent." While Shan's "Actually," might be read as a back-handed compliment, he argues that the numbers suggest women feel included. Mei (foreign-born, Asian woman) agrees with Shan and James, saying "we have . . . Asian, and . . . Hispanic, then the other ones are just Caucasian. So, I think it's a pretty good diverse mix it up. So yeah, so I think it's pretty good." For Mei, the diverse mix helps create an environment that makes her feel included as a woman of color.

All the faculty members in Department 3 describe receiving both formal and informal mentoring, and have no concerns about reaching out to colleagues for support. Chang (foreign-born, Asian man) emphatically explains that international faculty are very welcome: "that kind of diversity of different experiences is definitely appreciated in the department. . . as international scholars, we don't feel any problem with exclusion." Tiana (foreign-born, Black woman) notes that faculty engage regularly, "if your door is open, people will just step in and continue the conversation," creating an open and warm feeling. Carol (foreign-born, white woman) similarly discusses Department 3 as welcoming: "I know I feel like pretty supported in the department, maybe starting to spill outside of the department [to the university more broadly] a little bit now." Interestingly, Wyatt (U.S. born, white man) worries that not everyone shares his experience of collegiality, saying that while he feels close to his colleagues, "this is probably where there's also inequities because it's sort of, you know, do you feel comfortable or entitled to knock on people's doors or access people?" It is meaningful that Wyatt recognizes these potential dynamics. Yet, importantly, Chang, Carol and Tiana also express that their colleagues in Department 3 make them feel welcome. They do not only receive mentoring through a formal mentoring program, but recount informal mentoring as central to the departmental climate and culture.

Inclusive departments do face issues. Yet, good leaders ensure that problems are addressed through honest and open discussions, and democratic formal governance that allows faculty members voice. Ava, from Department 1, emphasizes the importance of maintaining inclusion:

We really value our collegiality above all else. I mean we can disagree at faculty meetings if we get heated, you know, then the email goes out 'okay sorry, boy my emotions got the better of me.' You know but it's. . .this overarching, you know, collegiality that is just so important to maintain and to protect in this department.

Diego, also in Department 1, similarly notes, "We have practically no problems; we discuss and fight to the face [rather than behind closed doors]," referencing a lack of space as the most pressing issue. While Diego and Ava both describe conflicts, these conflicts are

addressed, safeguarding long-term good relations. Collegiality is an explicit departmental goal, and not something they take lightly.

Respondents in inclusive STEM departments did not seem naïve, unable to recognize darker undercurrents, often referencing negative stories from colleagues in less inclusive departments. All of the faculty in Department 2 discuss mentoring as natural, even though they do not have a formal mentoring program. Shan (foreign-born, Asian man) explains:

I think for me, I really like this department. Because every time when you get a paper out or a grant, especially a grant, so many people will come to the office to say “congratulations” so it is very positive. Because my friend told me [a] completely different story in his department.

Judy (U.S. born, white woman), similarly notes about Department 2, which she characterizes as “really awesome and very supportive”:

And we like each other, which is apparently really unique with other science departments or other departments even at [Research U]. . . we’re not all besties, right, but we have a strong respectful, congenial . . . department.

James also describes Department 2 as having a fun department culture, emphasizing, “we have a lot of . . . departmental events that sort of, you know, reinforce our community. Yeah, we’re super lucky.” Judy, James, and Shan express pleasure in their collegial department with people who treat each other well. This is not because they see the world through rose-colored glasses; they recognize that it is unusual, and work to bolster their “respectful” community.

One leadership issue that comes up among inclusive departments is expectations for women to carry out more of the formal governance work, which might be inclusive, but also, unfair. Wyatt emphasizes this point about Department 3:

This is the case in many places-women are over included in service responsibilities and expectations. And with male faculty, they are more often let off the hook. . . there were some very senior men who have been around for a long time and never served [in leadership] and there are a lot of women who have already stepped up and there are clear inequities.

If inclusion also comes greater expectations for leadership – women’s inclusion may not be entirely positive. Similarly, Mei, from Department 2, explains:

Although our female faculty, I mean, in some cases, has more of the service roles. And [the chair] already acknowledged that. Maybe because the way we are much better to do something like [service]? (laughs)

Inclusion comes at something of a price, in so far that it leads women to carry out more of the service. Mei did not seem bitter about this point, noting that her chair acknowledges the tension.

Overall, among *inclusive* departments, faculty emphasize that an inclusive culture benefits from diversity in faculty representation, and active commitment to collegiality as well as informal mentoring, and in some cases formal mentoring programs. Leaders help ensure that conflicts are addressed, and formal governance appears to be fairly democratic

and inclusive. Yet, there are some thorns with these roses, since women's inclusion may also lead higher service workload.

Improving Climates: "Improving but I Still Think There is a Long Way to Go"

A second group of departments, which we refer to as *Improving*, are more challenging settings, with some faculty experiencing marginalization. We consider these five departments "improving" as faculty members seem alert to inclusion, and suggest that the climate is getting better, in part due to recruitment aimed at greater compositional diversity. Yet these departments also vary more; faculty from different vantage points do not always read their department's climate the same way, in contrast to the "inclusive" departments, in which colleagues, regardless of race or gender, share similar perspectives. For example, both formal and informal mentoring programs may not consistently provide faculty with the mentoring they need. Formal decision-making does not always include all voices. We focus on three of the seven departments that best exemplify the group.

In Department 4, most faculty express confidence that women's inclusion is strong. As Alexis (U.S. born, Black woman) explains, in her program "we outnumber the men. So, there's no problem there. . . [women] definitely feel included." Eva (U.S. born, white woman) similarly says, "we're like a cohort together that have a voice together. . . So, I don't think our voices are less." Rohan (foreign born, Asian man) also explains "we are not bad, we have a considerable number of women faculty in the department, and a number of them are in prominent leadership roles. So, we are killing it, I would like to say, from what I've seen." John (U.S. born, white man) is more careful in his assessment, suggesting the potential for bias, and the need for more training to ensure that colleagues know how to effectively mentor women faculty. Yet, when asked if he thinks women faculty feel included in his department he also notes, "I think for the few women that we have in that department, I feel like I would say that there is. They are improving but I still think there is a long way to go." For members of this department, women's representation and movement into leadership roles suggests that they are improving their climate.

Yet these issues are stickier for faculty of color. Eva isn't sure whether faculty of color feel included in Department 4, saying "It's hard to parse out that link right now," given that faculty of color are newer and relatively few. Alexis points out that she is one of very few women from underrepresented groups in her college, making it difficult to know whether faculty of color feel included or not: "It's very, very few. Maybe less than, like, what you can count on one hand is very, very few. So, in terms of how included they feel? I'm not sure. Because there's so few, and we don't really talk about it." Alexis further notes that she initially felt less included: "when I was first starting, it was very frustrating. And I think it was, it was a combination of not feeling included, but also not knowing my voice and being able to stick up for myself." Over time, though, Alexis has made connections that make her feel more included, and she now feels that she can engage in formal decision-making with little fear of reprisal.

John's account seems to triangulate with Alexis', noting that he thinks that faculty of color have been less included, but that this is improving, saying "I do feel that I hear the voices a lot. I don't, I cannot speak though too much if the voices are being heard. They are being spoken but what extent they're being acknowledged and incorporated into the decision processes, I'm not sure." While John is cautious about equating faculty of color voice with inclusion, he sees signs of an improving climate. Most of the faculty in Department 4 see mentoring as effective, though they emphasize that informal mentoring, like meetings over lunch, can be more effective than formalized mentoring. However, as

Rohan says about his mentor, with whom he meets a few times a semester, “[he] has been super useful as a bouncing board for, you know, things, so I’m happy with the program.”

In Department 5, many faculty members express confidence that faculty, regardless of nationality, feel included in the department, but worry that this breaks down around gender and race. Liu (U.S. born, Asian woman) explains that she feels closest to another woman of color in the department, further explaining

so, it’s not like you know anyone’s hurling racial insults at me or something but somehow it’s just like the. . . community sense or something. . . yeah, there can be a. . . numbers thing where it’s not necessarily like you’re being excluded but just, you’re like, “Oh, I’m the only person, whatever here.”

Liu generally feels the department is collegial, and knows who to go to for mentoring or support, but recognizes that she doesn’t quite feel a sense of inclusion, which she thinks relates to her lower levels of representation of faculty of color. Kurt (U.S. born, white man) similarly reflects that “we have far fewer faculty of color. And yeah, that creates kind of marginalization in the department.” Just as Liu feels some marginalization, Kurt suspects that low numbers contribute to that feeling. These concerns also extend to inclusion by gender. Olivia (foreign born, white woman), notes that:

I think our department tries really hard to be aware of biases and keep an eye on them. But I think they’re still there. But people are sensitive, you know like we, whenever we have meetings and discuss candidates or whatever, like, we talk about gender bias and things like that. . . I suspect that probably most women in the department feel maybe a little bit less heard than their male colleagues.

Olivia appreciates being in a department that recognizes and attempts to address gender bias. Yet, she also recognizes that despite these efforts, it is likely that women feel a little less included, including in formal decision-making. Echoing Liu, she emphasizes that she has received the mentoring she needed, and doesn’t think women are treated with hostility or intentional exclusion, saying, “it’s not like, oh, all the boys go for a drink and then I don’t. I don’t think I’ve ever had that sense.”

Liu and Olivia’s colleague Harish (foreign born, Asian man), also agrees that women feel less included in the department, “I don’t know why but I suspect, because of just, kind of, the sexism that sort of pervades society as a whole.” Harish names other departments that are less diverse, suggesting that that having more women in Department 5 balances things out, but saying the department could still do better. Kurt similarly notes, “On the binary it’s closer to not being included than I think is advisable or is good. . . we have a gender imbalance that . . . goes the wrong way. . . that creates a sense of pressure and marginalization that I know they feel.” These faculty recognize that the climate needs to improve, even though the environment is not overtly exclusionary.

In Department 6, faculty reflect on the challenges of their department, while also suggesting important changes, particularly in leadership. Niu (foreign-born, Asian woman) emphasizes that she doesn’t completely know why she feels marginalized, but she does:

I guess for many other reasons like you know, I don’t live here and being woman maybe one of them, and being also a racial minority. All this probably prevents me from feeling being more included. But I guess it’s just natural that you know, if you

come from a very different cultural background, you feel more included when you [are] in a metropolitan area than in a small town?

As Niu explains, her identities intersect, she's a woman of color, originally from another cultural background, and she lives further away from campus, which means that she is on campus less often. Women faculty members are also more likely to commute from longer distances, which has its pitfalls (Yakaboski, 2016). While Niu does not express frustration or anger, she does feel outside of the department milieu. This extends to informal mentoring, with Niu explaining that she rarely reaches out to colleagues. Yet Niu's colleague in Department 8, Jane (U.S. born, white woman) connects more to other women in the department. She explains:

I, as, as a woman faculty I feel included in the department. I think I've tried to make efforts to make sure all of my colleagues. . . one, because of work life balance situations, isn't available as much. So, I've been trying to make sure that the rest of . . us are regularly connected and at least have some sounding board for things and ways to work things out. . . I mean, it's not perfect, but I think it's pretty, it's pretty good.

Jane actively engages in creating a community, with regular informal collegial interactions among women in the department, even though Niu appears to be less connected to this group. Jane notes "I think there's a lot of good mentoring in the department. It's very informal. We don't have a formal mentoring program. But there's a pretty open-door policy." In this case, it appears that informal mentoring may be more effective for Jane than for Niu, which they both appear to recognize.

The men in Department 6 also consider women's inclusion. Man-Soo (foreign born, Asian man) explains, "I think we have relatively maybe small number of female faculty, but I think they are very included." Although the gender composition of the department skews toward men, Man-Soo views women as "very" included. Differently, his colleague Mark (U.S. born, white man) shares: "I don't know, but I feel like there are so few of them they must feel something. Like you know I've talked to them and my colleagues have said nothing has been overt, but at the same time. . ." While Mark does not think women face blatant hostility, he worries that their small numbers may make navigating the department challenging. As in other departments, Mark also notes that senior women may be pulled into too many mentoring and leadership roles:

I just see my female colleagues in particular just carrying this huge service and mentoring burden, because, again, there's so few of them. . . I feel like they feel included, but I definitely feel like they've got that to deal with that I don't have to deal with.

Just as in inclusive departments, Mark pinpoints how women may get more drawn into mentoring and service work, which may have unintended outcomes.

Overall, among *improving* departments, there is less compositional diversity than in *inclusive* departments, while there is also less consistent mentoring, either informal or formal. It appears that formal governance is not consistently inclusive in these departments, although faculty members in these settings do suggest that these environments are improving, in part in response to hiring that has led to somewhat greater compositional diversity.

Marginalizing Climates: “For the Most Part, Don’t Feel Included”

While faculty members consider their departments as more inclusive when they are diverse, in six departments with less compositional diversity, faculty members see their department as less inclusive. Faculty in this group of *marginalizing* departments mostly agreed that they have issues of inclusion, seeing this marginalization as tied to low numbers (relating to retention as well as recruitment). For example, men, as well as women convey concern about women’s exclusion. Faculty mentoring, both informal and formal, appear to be inconsistent in these department, while faculty voice in formal departmental decision-making is also varied.

Faculty in Department 7, with relatively few tenured women, see their department as one where women feel marginalized. Courtney (U.S. born, white woman) had no trouble answering a question about whether women feel included in the department: “Oh, women definitely feel less included, I mean that’s universal. Really universal yeah. . . it’s very universal.” Lucia (foreign born, Latina), experienced marginalization from faculty members in the department even before moving to the university with her husband: “we were at a conference together, and in the dinner, one of the faculty didn’t talk to me until I started talking about the same field. But he mostly acted like I wasn’t there.” Even as Lucia tried to engage, her future colleague excluded her, even after she established her credentials. Another woman of color in the same department, Atithi (foreign born, Asian woman) suggests that marginalization is more complicated:

I know we have at least one senior faculty member who disagrees strongly, who feels that we don’t do well by our women faculty in terms of... maybe. . . two senior women faculty feel that way. . . I think it is the problems there have been slightly two-way. And with small numbers again you don’t know. I mean women are always told that it’s just you, right? It’s, it’s your individual problem and it can’t always be.

For Atithi, gender may not explain the exclusion that senior women claim, yet she recognizes that with such small numbers, it’s hard to disprove. Thus, all three women recognize challenges women appear to face in the department.

Lucas (foreign born, Latino), also in Department 7, similarly points to some of the challenges, noting that women “feel less included, definitely,” further saying “I think the representation of women is very not good here.” David (U.S. born, white man) agrees that women, “for the most part, don’t feel included.” For example, he refers to a problematic hire, saying “There were a number of the women in the department who had had an issue with him because he’s an arrogant person. . . all of the women in the department every single one of them, raised concern about him” in a departmental meeting. He links this issue to a lack of representation, as well as problems in how formal decision-making is conducted, noting

the more senior men outnumber the women by quite a bit. . . so basically, they just ignored the women. . . we’re going to ignore all this other stuff that even though we’d like to talk about how we’re very forward thinking and how we are inclusive and blah blah blah blah, but when push comes to shove, we’re not.’

For David, senior men’s actions suggest that the department is not actually inclusive when jointly making decisions like hiring. Men’s accounts triangulate with women’s accounts, and

reinforce their perceptions of the department as a context in which women feel marginalized.

Faculty also voice difference in experiences of mentoring; Lucas describes the Chair and senior colleagues as mentoring him effectively through personnel decisions, while the women and David convey that mentoring has not been ideal. David explains:

There was one woman professor that I know who struggled. And I'm- so, it's not 100%, they didn't get tenure and I blame the department for part of it, because they didn't give her the feedback she needed. The feedback . . . would be things like, 'we look forward to improved blah blah blah.' Okay, now if you have no clue what that really means, you're lost.

Informal mentoring in this setting appears to be working more effectively for men than for women.

In Department 8, we interviewed full professors, importantly because there was a dearth of younger women in the department. Thus, the faculty conveyed their experiences over a longer range of years in the department, which included women's tokenization in a department that has consistently had few women. Katrin (foreign-born, white woman) observes that when she entered the department:

There were a lot of men, believing that the women should be at home. That's what they told me . . . "you have kids, you know, why are you here?" Because their wives were housewives, so this was their image of a woman. I see more and more spouses of professionals so they understand that this is a new life, or new way.

Although Katrin had direct experience with sexist colleagues, she also believes that this is changing. Yet she struggled when she was put up for promotion later than expected, in part because she was less connected to her colleagues:

I think this may be partially because I'm not part of the old boys' club. I don't socialize with them. I don't, I don't have friendship. . . it's just fact. And after [a] very good recommendation everything went really smooth. Some of [the external reviewers] even wrote, and said 'How come [she was] not promoted before?'

Katrin's case reflects multiple challenges to her career based on her gender. Katrin argues these issues remain salient, suggesting the need for formal mentoring programs. She explains, "you know, when I do meetings with the faculty, the women are the ones showing up immediately. Because they just are seeking belonging." In the same department Chyou (foreign-born, Asian woman) notes that it's difficult to identify whether women feel included, since there are so few women. Like Katie, Chyou did not experience consistent mentoring, noting that when she had questions, "I have to find a right time. I don't just pop into somebody's office and ask." Chyou created opportunities to receive mentoring, but it was not part of the structure of the department.

Li (foreign-born, Asian man) also in Department 8, shared Katrin's concerns regarding gender inequalities. He noted that some of his insights came from watching family members and women students struggle professionally:

I'm not saying women can't be aggressive, but women are taught not to be aggressive. In big groups, being aggressive is important, but makes for difficult

politics. Rarely, I seldom, see women leading big multimillion dollar grants, not because of intellect, but politics. There are 20 people in the room, 5 from MIT, 5 from Harvard, it's intimidating, you need a thick skin and to talk in a loud voice . . . we are not brought up the same way.

Li suggests that women are less likely to lead very large research teams due to gender inequalities. Rather than blaming women, suggesting that they should act more aggressively, Li emphasizes that women are held to different standards, putting them in a double-bind:

[Women] might be angry, but can't act angry, because they would be shocked, but I can act angry without being treated differently. . . With my women students, I can't tell them to do what I did, because it can be different. I was never trained in how to be with people, but I can tell that women cannot do what I can do. . .

Chyou and Katrin have struggled in Department 8, and their colleague Li recognizes that gender inequalities are deeply fraught, and hard to disentangle. Li's experiences with women students and his family members have brought these lessons home, making him recognize that even in formal decision-making, women cannot engage the way men colleagues can.

In Department 9, faculty see the department as somewhat supportive with a formal mentoring structure in place, but note that its underrepresentation of faculty of color has long term effects for the few faculty of color in the department. Gabby (U.S. born, Black woman) explains:

There's not that many faculty of color, to be honest, in the department. But I think there are, again, from some conversations that have come up . . . some faculty of color, who, maybe for whom this is their first time being in a predominantly white institution, and so there's some tension there around, you know, just this new experience.

Gabby notes that it may be more difficult for other faculty of color to find themselves in a department with less compositional diversity. Min-ho (foreign born, Asian man), also in Department 9, discusses the challenges of being in such a white space: "it's unfortunate that we don't really have, like, non-white faculty members in our department." While neither Min-ho nor Gabby express feeling deeply marginalized, because faculty of color are underrepresented relative to their field as a whole, they do feel less included. Their colleague, Clara (foreign born, white woman), notes that she doesn't know if faculty of color feel included, since "we don't have any faculty of color in my [program], which is something we've talked about." While less pressing a problem for Clara, she recognizes the lack of representation.

Mentoring also differs for the members of this department; despite the department's formal mentoring program, Clara is the only one who feels supported. Gabby responds to a question about whether she has mentors to talk to with, "within the department, I don't know, that's a harder one to think of who I would go to. Maybe my postdoc mentor?" Min-Ho explains that he has reached out to his official mentors in his department, but probably not as much as he needs.

I have asked people in my department. . . to take a look at [papers or grant proposals] but I really feel bad you know, taking up their time. . . it's really hard for me to ask that kind of favor. . . But I do worry about their time especially when I have paper or grant proposal for them.

Zach (U.S. born, white man) also feels marginalized, explaining: “Initially, I did approach people. I wouldn’t say that the results were stellar, and I think I’ve more or less got the advice to just shut up and do my work.” Thus, the faculty members in this department share a sense that the department is not particularly collegial, despite its formal mentoring program.

In these marginalizing departments, faculty conveyed a sense that a lack of representation leads to a lack of inclusion for women faculty members and faculty of color. Mentoring appears to be very inconsistent, even where formal mentoring programs exist, which suggests that a lack of informal mentoring mechanisms can lead to negative career outcomes. Faculty in these programs were the least likely to express that they could voice their concerns in formal departmental decision-making. In these settings, faculty members also share similar negative perspectives on their departments, regardless of their own race and gender.

Discussion

We have focused on how faculty inclusion around gender, race, and nationality operates for 57 faculty members in fourteen STEM departments. Our findings add to existing knowledge, but our unique design allows us to analyze the perspectives of multiple people in the same department who vary by race and gender, contributing new insights about how faculty experience inclusion. While many studies recognize that faculty members who differ by race and gender may experience the climate of their university differently, examining differing perspectives of faculty members in the same department creates a more robust, contextualized understanding of inclusion. We focus on how *departmental* climate is assessed from multiple perspectives, which is important because departments are a key space that determines whether faculty members who differ by race and gender feel included in their working environment.

We drew from the diverse learning environments model, to explore how faculty members may experience inclusion and campus climate (Hurtado et al., 2012). This model suggests that climate reflects not only individual perceptions and interactions, but historical legacies, compositional diversity, and institutional policies and processes, both formal and informal. Our research suggests that faculty members in departments with the highest levels of compositional diversity report the greatest perception of their environments as inclusive. While formal mentoring programs were not consistently associated with greater inclusion, robust informal mentoring practices in departments do appear to make a difference to feelings of inclusion. At the same time, in departments with more opportunities for faculty members to voice their opinions in formal decision-making processes, faculty members see those settings as more inclusive.

As the literature suggests, diverse departments are also more likely to see themselves as inclusive, while departments with relatively few women or faculty of color describe the environment as marginalizing (Hurtado et al., 2012; Maranto & Griffin, 2011; Settles et al., 2007, 2019; Smith & Calasanti, 2005; Stewart & Valian, 2018). Yet representation alone does not create inclusion. Similarly, collegial mentoring is part of an inclusive department (Bilimoria et al., 2006; Dill & Zambrana, 2016). We further find that more inclusive departments are also successful at “informal mentoring,” creating opportunities for faculty

to engage with many colleagues. Indeed, one *marginalizing* department had a robust mentoring program, yet three of the four faculty members did not feel confident about seeking mentoring. Thus, simply developing formal mentoring programs does not ensure that faculty *actually* experience a feeling of mentoring; indeed, in one of the *inclusive* departments, faculty members describe rich informal mentoring, but no formal mentoring program is in place. Formal mentoring programs do not necessarily lead to inclusion; inclusive informal mentoring often meant that faculty members felt that they had a number of colleagues supporting them.

As previous research suggests, voicing concerns through formal decision-making processes can make faculty feel more included (Belle et al., 2014; Settles et al., 2007). Our respondents note the important role department leaders play in ensuring that faculty members have voice in their department, and that governance is relatively democratic. Our research unpacks further how collegiality plays out. One participant, a white foreign-born nonbinary person located in a department we identify as *Inclusive*, explains, “Our department is so lucky. It’s very collegial and it is very consultative and democratic.”⁵ This feeling is widely reported in inclusive departments, as well as in some of the improving departments. Inclusive department leaders are more likely to address conflict directly, to ensure that collegiality is maintained (Gmelch & Carroll, 1991). In marginalizing settings, leaders sidestep or do not address previous conflicts, leaving departments unsettled.

Even inclusive departments struggle with unfair mentoring and service workloads, with white women and women of color carrying out more work, in part due to gendered-racialized expectations (Bird, 2011; Hirshfield & Joseph, 2012; O’Meara, 2016). As universities become more diverse, leaders must remain attentive to how inequalities become re-inscribed. Thus, mentoring and leadership should be expected of all faculty; additional workload should be compensated, through teaching reductions, additional research support, or service sabbaticals.

Limitations and Implications

Despite making contributions, several limitations suggest the need for future research. Most notably, the sample was drawn from faculty members in the STEM fields of computer science, engineering, natural science, and social science at one research-intensive university in the Northeast United States. Examining these processes at more varied institutional locations (e.g., community colleges, liberal arts colleges, minority-serving institutions), and with a wider array of fields, would provide deeper insights in how departments are understood by their faculty members. Future research could explore how diverse work environments play out for faculty in different settings, identifying the factors that are most consistently related to perceptions of inclusion.

Another central limitation is that the diverse learning environments model emphasizes historical context, analyzing, for example, what departments have historically done to address issues of exclusion, create greater compositional diversity, or develop formal and informal mentorship programs (Hurtado et al., 2012). Yet given the design of our study, we were not able to incorporate this historical dimension into our analyses of the departments, although that background would be quite useful for departments trying to disrupt inequities and alter policies and practices. While our work has aimed at linking the micro to the macro, future work could more effectively build on the diverse learning environments approach to consider the historical context of each department.

⁵ To avoid identifying either the individual or the department, we do not include this data point above.

Our sample was diverse by gender, race/ethnicity, and nationality, but included only one nonbinary faculty member, no Indigenous faculty, and six non-tenure track faculty members. It is imperative that future research incorporate even greater diversity, allowing for more insight on the specific issues faced by particular marginalized groups. Future research could also more systematically collect information on how faculty members who share the same department and rank, but differ in social identities in addition to race, gender, and nationality. More exploration is needed to know whether these inclusion factors play out similarly for faculty who differ in other often marginalized dimensions of social identity like dis/ability status and LGBTQ identities.

Practically, these findings suggest a number of approaches that senior colleagues, department chairs, and university leaders can take to make departments more inclusive. University leaders, such as Provosts, Deans, and Chairs, need to understand how important diversity is for inclusion – for all faculty; departments that are compositionally diverse and focus on hiring initiatives allow for consistent progress in this area (Wingfield, 2020). Faculty members only expressed confidence about inclusion in departments that are already compositionally diverse, making it appear to be something of a *necessary* condition. Yet, in addition to hiring faculty, it is critical to retain a diverse faculty, which requires a number of other elements that make departments diverse

To ensure that departments remain diverse, deans, department chairs, and senior faculty must work to create departments with inclusive formal and informal practices. We learned that formal mentoring programs can be a route to inclusion, but not always. Rather than putting all efforts into formalized mentoring structures, departments need to develop more informal mechanisms for mentoring and socializing among faculty members. In the most inclusive departments, faculty members saw their departments as inclusive not because one or two colleagues took an interest in their career development, but because many people treated them in collegial ways. At the same time, formal decision-making structures need to ensure that all faculty have a voice. This may include taking closed votes, as well as consistent recognition of a range of faculty viewpoints in discussions. Chairs need tools aimed at helping departments deal with conflicts in healthy, open ways, that maximize the voices heard, while reaffirming their commitment to collegial relationships.

Our research has larger implications for theory on climate in higher education, including the diverse learning environments model that guided our analysis (Hurtado et al., 2012). This model suggests that exploring climates requires understanding not only individual perceptions and interactions, placing those into institutional and historical context. Our interview data allowed us to flesh out some of the specific institutional processes that allow faculty members to perceive their working environments as inclusive, reinforcing the model's findings about the importance of compositional diversity, as well as identifying the formal and informal mechanisms that play out for faculty members in STEM departments. While informal and formal mentoring derive from the diverse learning environments model (Hurtado et al., 2012), the need for inclusive governance structures that allow diverse faculty greater voice might form another effective mechanism that explains not only faculty inclusion, but inclusion for students as well as a staff at higher education institutions that need to transform themselves to be more inclusive.

We also make contributions to organizational theory. As Sturm (2006) suggests, true inclusion requires addressing the barriers that limit the participation of women and people of color. These barriers cannot only be addressed at the university level, but must be recognized as embedded in departments, which is where norms and policies are implemented. Departments provide a key context for sustainable change (Britton, 2017; Fleming et al., 2016; Sturm, 2006). At the department level, policies, practices, and cultures

may reinforce gendered and racialized inequalities, but can also be transformed to create more inclusive settings (Acker, 2006; Ray, 2019; Wingfield, 2020). Organizational theory is right in identifying the department level as a key location for further intervention; we hope this work stimulates more research on inclusion at local levels, including in other educational and work contexts.

Our analyses have explored how departments feel to colleagues in the same department, focusing on the social structures in which faculty members work. By focusing on faculty who share the same department, but differ by race and gender, we are better able to identify approaches that can create an “architecture of inclusion” for academic departments (Sturm, 2006). All faculty members thrive in more inclusive departments: a rising tide lifts all boats. While in marginalizing departments, some faculty with privilege report better experiences, even some white men struggle. Marginalization has a depressive effect on all faculty – while inclusive environments are happier and more productive for all. Thus, investments in inclusion pay off for all faculty members, providing a particularly strong windfall for women of color.

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