Supporting Information for

Improving the Academic Climate of an R1 STEM Department: Quantified Positive Shifts in Perception

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2020 Department of Chemistry Climate Survey

Consent to Participate in Research: Quantifying the academic climate of the Doctoral program in the College of Chemistry at the University of California, Berkeley (Protocol ID: 2019-01-11732).

Our names are Chrissy Stachl, Dan Brauer, Hikaru Mizuno, and Jamie Gleason. We are graduate students in the College of Chemistry at the University of California, Berkeley, and current members of the Chemistry Graduate Life Committee (CGLC). We are inviting you, as a member of the Department of Chemistry, to participate in two online surveys that seek to assess the overall social, interpersonal and academic experiences of members our community. We ask that you read this form very carefully.

Study Purpose: Data from the past two climate surveys have been critical in helping the CGLC and department administration assess our academic climate and identify some of the issues facing graduate student, postdoctoral, and faculty researchers. As a result, we were able to begin addressing some of those concerns. *In order to continue collecting and using our own data to understand and improve the academic climate within the College of Chemistry as a whole, we require your consent to participate in this research study*. The results from this study will be used to continue identifying issues within our academic culture and develop practical solutions in order to create a diverse, equitable and inclusive environment for all members.

Procedures: If you agree to participate in this study, you will be asked to complete two short surveys. The first survey will include questions about your experience of the academic climate within the Department of Chemistry. The second survey is a series cartoons tailored to assess sense of belonging within our academic community. Each survey will take each approximately 10 minutes to complete.

Payment: At the end of the surveys, you will have the opportunity to input your email into a separate submission form in order to enter a drawing, where you will have a chance to receive a $100 gift card to the business of your choice. All individuals contacted concerning this study will be allowed to enter the drawing.

Benefits of participating in this study: We hope this study can benefit our own and other academic communities that seek to create a more diverse and equitable environment for all members. We may share our results with the STEM community to inform program development that seeks to addresses systemic institutional barriers to academic persistence in graduate education.

Risks of participating in this study: Completing the survey should not be harmful to you. Some questions will ask for personal information; please answer them honestly, but only if you are comfortable doing so. If you are uncomfortable answering any question, please just select "prefer not to answer" and continue with the rest of the survey.

Confidentiality: Your study data will be handled as confidentially as possible. Confidential in this case means that no person in the Department of Chemistry will ever have access to identifying information, including the researcher.

Voluntary nature of study: Participating in this study is completely voluntary. You have the right to decline to participate or to withdraw at any point in this study without penalty or loss of benefits to

which you are otherwise entitled. Your decision whether or not to participate in this study will not affect your current or future relations with the investigator.

If you have any questions or concerns about this study, you may contact the researchers or the CGLC (ucbglc@gmail.com). If you have any questions or concerns about your rights and treatment as a research subject, you may contact the office of UC Berkeley's Committee for the Protection of Human Subjects, at 510-642-7461 or subjects@berkeley.edu. After submitting your responses, you can protect your privacy by clearing your browser's history, cache, cookies, and other browsing data. (Warning: This will log you out of online services.)

- ○ Yes, I consent to participating in this study
- ○ No, I do not consent to participating in this study

I am a current:

- ○ Graduate Student Researcher
- ○ Post-Doctoral Researcher
- ○ Faculty Member

Graduate Student and Postdoctoral Researcher Survey

I feel that my research advisor(s) (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5
Is/are easy to talk to about my research	○	○	○	○	○
Is/are available when I need advice concerning my research	○	○	○	○	○
Provide(s) constructive feedback on my research project	○	○	○	○	○
Treat(s) my ideas with respect	○	○	○	○	○
Encourage(s) me to attend and present at conferences	○	○	○	○	○

[New Questions in 2020 survey]

In general, I believe that (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5
Publishing academic papers is an important metric of my own success	○	○	○	○	○
Publishing academic papers is the primary metric my advisor uses to gauge my success	○	○	○	○	○
Publishing academic papers should be the primary metric used to gauge graduate student success	○	○	○	○	○
The impact of a publication is more important than the number of publications	○	○	○	○	○

I feel that my research advisor(s) (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5	Prefer not to answer
Advocate(s) for me when appropriate	○	○	○	○	○	○
Provide(s) emotional support when necessary	○	○	○	○	○	○
Provide(s) non-research advice when necessary	○	○	○	○	○	○
Foster(s) a collaborative environment with minimal competition between group members	○	○	○	○	○	○

I feel comfortable (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5	Prefer not to answer
Speaking with my advisor(s) about non-academic career paths	○	○	○	○	○	○
Disclosing mental and/or physical health conditions that may impact my work to my advisor(s)	○	○	○	○	○	○
Seeking feedback and/or advice on my work from other faculty	○	○	○	○	○	○
Attending and participating in social events hosted by the CGLC	○	○	○	○	○	○

In my opinion, in the Department of Chemistry, I believe that (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5	Prefer not to answer
Exclusionary or offensive behavior is not tolerated	○	○	○	○	○	○
Harassment of any kind is not tolerated	○	○	○	○	○	○
There is sufficient discussion of equity and inclusion	○	○	○	○	○	○
There is sufficient action toward improving equity and inclusion	○	○	○	○	○	○

As a member of the Department of Chemistry, I feel that:(1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5	Prefer not to answer
There are faculty members other than my research advisor(s) who are available to me when I need advice	○	○	○	○	○	○
I know who to talk with about any concerns regarding the departmental climate	○	○	○	○	○	○
Members of the department that identify as minorities feel valued and are included	○	○	○	○	○	○
I am valued and included as a member of the department	○	○	○	○	○	○

In this survey, we use the NSF solicitation definition of underrepresented groups (URGs) in STEM: "Groups underrepresented in STEM may include but are not limited to: women and girls, individuals with disabilities, underrepresented racial and ethnic minorities (e.g., African Americans, Hispanics, Native Americans, Alaska Natives, Native Hawaiians, and Pacific Islanders), English-language learners, veterans and students from rural or lower socio-economic backgrounds."

Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry improve recruitment of _____ who are members of URGs:

	Not Important (1)	Somewhat Important (2)	Very Important (3)	Prefer not to answer (4)
Graduate students (1)	○	○	○	○
Postdoctoral researchers (2)	○	○	○	○
Faculty members (3)	○	○	○	○

Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry take action in each of the following issues:

	Not Important	Somewhat Important	Very Important	Prefer not to answer
Increasing retention of graduate students from URGs	○	○	○	○
Educating members of the department about the representation and compensation of URG members in STEM	○	○	○	○
Educating members of the department about biases and behaviors that negatively affect the experiences of URG members	○	○	○	○

Since the 2018 and 2019 climate surveys, the CGLC and Department of Chemistry administration have worked together to:

- **Ensure discussions of mental health were incorporated into Fall orientation**
- **Incorporate graduate student input in the faculty hiring process**
- **Ensure non-alcoholic beverages and snacks in our weekly chemistry social hour (Chem Keg)**
- **Incorporated peer-led sexual violence & sexual harassment training into new student orientation**
- **Established a monthly diversity & inclusion focus group**

Did you notice any of these changes?

- ○ Yes
- ○ No
- ○ Prefer not to answer

Do you have any feedback regarding the changes listed above?

Are there any particular actions you would like the CGLC or the department to take in order to enhance the environment or climate for all graduate students and postdoctoral researchers? Please be specific.

Of the topics addressed in this survey, which do you personally think are most important for the Department of Chemistry to address? (To reread questions, click the back arrow)

Is there anything else you would like to share about the departmental climate or would like to see the administration or the CGLC address?

What year are you in the Chemistry Ph.D. program at UC Berkeley?

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6+
- ○ I am a postdoctoral researcher

Did you enter the program as a physical chemistry, synthetic chemistry or chembio student?

- ○ Physical
- ○ Synthetic
- ○ Chembio
- ○ I am a postdoctoral researcher

Did you enter the program on an F-1 or J-1 (or other) student visa?

- ○ Yes
- ○ No

Optional: With which gender do you most identify?

- ○ Male
- ○ Female
- ○ Nonbinary

Optional: Do you consider yourself a member of a URG?

In this survey, we use the NSF solicitation definition of underrepresented groups (URGs) in STEM: "Groups underrepresented in STEM may include but are not limited to: women and girls, individuals with disabilities, underrepresented racial and ethnic minorities (e.g., African Americans, Hispanics, Native Americans, Alaska Natives, Native Hawaiians, and Pacific Islanders), English-language learners, veterans and students from rural or lower socio-economic backgrounds."

- ○ Yes
- ○ No

Optional: What is your approximate group size, including graduate students and postdocs?

- ○ <10
- ○ 10–20
- ○ 20+

Faculty Survey

I believe that I (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5	Prefer not to answer
Am available to my students when they need advice concerning their research	○	○	○	○	○	○
Foster a collaborative environment where competition between group members is minimal	○	○	○	○	○	○
Am comfortable directing my students to resources on campus concerning mental and physical health issues when necessary	○	○	○	○	○	○

[New Questions in 2020 survey]

In general, I believe (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5
Academic publication record is the primary metric I use to gauge my mentees' success	○	○	○	○	○
That publishing academic papers is an important metric of my own success	○	○	○	○	○
That the impact of a publication is more important than the number of publications	○	○	○	○	○

In general, in the Department of Chemistry, I feel (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5	Prefer not to answer
Comfortable asking for advice and/or feedback from my colleagues when appropriate	○	○	○	○	○	○
A sense of mutual respect between faculty members	○	○	○	○	○	○
That faculty members cooperate and collaborate	○	○	○	○	○	○

In my opinion, in the Department of Chemistry (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5	Prefer not to answer
Exclusionary or offensive behavior is not tolerated	○	○	○	○	○	○
Harassment of any kind is not tolerated	○	○	○	○	○	○
There is sufficient discussion of equity and inclusion	○	○	○	○	○	○
There is sufficient action toward improving equity and inclusion	○	○	○	○	○	○

In this survey, we use the NSF solicitation definition of underrepresented groups (URGs) in STEM: “Groups underrepresented in STEM may include but are not limited to: women and girls, individuals with disabilities, underrepresented racial and ethnic minorities (e.g., African Americans, Hispanics, Native Americans, Alaska Natives, Native Hawaiians, and Pacific

Islanders), English-language learners, veterans and students from rural or lower socio-economic backgrounds."

In general, in the Department of Chemistry, I feel that (1 = Strongly Disagree, 5 = Strongly Agree):

	1	2	3	4	5	Prefer not to answer
I am valued and included as a member of the department	○	○	○	○	○	○
Members of the department who identify as minorities feel valued and are included	○	○	○	○	○	○
The climate in our department is likely to attract additional faculty from URGs	○	○	○	○	○	○
Faculty from URGs are treated the same as all other faculty members during the tenure process	○	○	○	○	○	○
I know who to talk with about concerns regarding the departmental climate	○	○	○	○	○	○

Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry improve recruitment of _____ who are members of URGs:

	Not Important	Somewhat Important	Very Important	Prefer not to answer
Graduate students	○	○	○	○
Postdoctoral researchers	○	○	○	○
Faculty members	○	○	○	○

Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry take action in each of the following issues:

	Not Important	Somewhat Important	Very Important	Prefer not to answer
Increasing retention of graduate students from URGs	○	○	○	○
Educating members of the department about the representation and compensation of URG members in STEM	○	○	○	○
Educating members of the department about biases and behaviors that negatively affect the experiences of URG members	○	○	○	○

Since the 2018 and 2019 climate surveys, the CGLC and Department of Chemistry administration have worked together to:

- **Ensure discussions of mental health were incorporated into Fall orientation**
- **Incorporate graduate student input in the faculty hiring process**
- **Ensure non-alcoholic beverages and snacks in our weekly chemistry social hour (Chem Keg)**
- **Incorporated peer-led sexual violence & sexual harassment training into new student orientation**
- **Established a monthly diversity & inclusion focus group**

Did you notice any of these changes?

- ○ Yes
- ○ No
- ○ Prefer not to answer

Do you have any feedback regarding the changes listed above?

Are there any particular actions you would like the CGLC and the department to take in order to enhance the environment and/or climate for all graduate students and postdoctoral researchers? Please be specific.

Of the topics addressed in this survey, which do you personally think are most important for the Department of Chemistry to address? (To reread questions, click the back arrow)

Is there anything else you would like to share about the departmental climate or would like to see the administration or the CGLC address?

I am a _____ faculty member.

- ○ Physical, nuclear, or theoretical chemistry
- ○ Synthetic chemistry or chemical biology

Survey Reliability and Longitudinal Analysis of Academic Climate Using Item Response Theory

All of the questions in this survey can be related back to a central "academic climate" construct. Thus, Item response theory (IRT) analysis can calculate a logit score for each respondent who took the climate survey each year, based on each respondent's overall performance on the survey any given year. This leads to the generation of an overall logit score distribution for the respondents of each year's climate survey.[3,4] Here, IRT was used to determine the reliability of this survey to measure respondent perceptions of the academic climate. Additionally, IRT unidimensional latent regression analysis was used to examine whether the mean of two or more respondent logit distributions are different, in order to determine whether there was any overall, significant change in respondent perceptions of the Berkeley Department of Chemistry academic climate of over the past three years of data collection (*generally, did the mean of each year's logit distribution shift?*).[1,2]

The reliability of the IRT partial credit model analysis carried out on these data is 0.84 across all three years of data collection and analysis. This value indicates a high consistency of the survey to measure respondent ability,[5,6] and that the items in this survey relate to each other and do provide a reliable measure of the academic climate construct.

Results of IRT analysis also suggest that there has been a significant change in respondent perception of our academic climate since 2018. The value of the regression variable between 2018 and 2019 is 0.07 (0.07) logits (not statistically significant), and the regression variable between 2018 and 2020 is 0.14 (0.07) logits (statistically significant at $p \leq 0.05$). This suggests that while the perception of academic climate did not change significantly from 2018 to 2019, it did shift significantly from 2018 to 2020. IRT analysis generates a normal distribution of logit values. Thus, ANOVA single factor analysis and Tukey HSD/Kramer tests were completed on these logit distributions (after IRT analysis) to confirm significant change in the distributions based on latent regression analysis using a single independent variable (year of data collection). These results confirm those from IRT latent regression analysis; the change in perception of academic climate was significant from 2018 to 2020, with a *p*-value of 0.029.

Study Participants and Demographic Breakdown

The total response rate from Department of Chemistry graduate community members (including faculty, graduate students, and post-doctoral researchers) was 43.1% in 2018,[7] 35.7% in 2019, and 39.4% in 2020. **Tables S1, S2, and S3** contain a breakdown of the respondent

populations and demographics from 2018, 2019, and 2020, respectively (2018 breakdown replicated from Stachl, *et. al.*).[7]

Table S1. Breakdown of 2018 climate survey respondent populations and demographics (replicated from Stachl, *et. al.*).[7]

Respondent Population	Number of Respondents	Total Population	Percent Respondents	Female-Identifying	Identify as belonging to an Underrepresented Group (URG)*	Entered Berkeley Chemistry w/ Student Visa
Graduate Students	202	518	40%	41%	54%	17%
Postdoctoral Researchers	6					
Faculty Members	38	51	75%	n/a	n/a	n/a

*The term Underrepresented Group (URG) is meant to include, but is not limited to individuals: that identify as female; from underrepresented racial, religious, ethnic, sexual orientation, and international groups; with disabilities (defined as those with a physical or mental impairment that substantially limits one or more major life activities); and with low socio-economic status.[8]

Table S2. Breakdown of 2019 climate survey respondent populations and demographics.

Respondent Population	Number of Respondents	Total Population	Percent Respondents	Female-Identifying	Identify as belonging to an Underrepresented Group (URG)*	Entered Berkeley Chemistry w/ Student Visa
Graduate Students	187	498	38%	40%	56%	28%
Postdoctoral Researchers	31	85	37%			
Faculty Members	28	61	46%	n/a	n/a	n/a

*Groups underrepresented in STEM may include but are not limited to: women and girls, individuals with disabilities, underrepresented racial and ethnic minorities (e.g., African Americans, Hispanics, Native Americans, Alaska Natives, Native Hawaiians, and Pacific Islanders), English-language learners, veterans and students from

rural or lower socio-economic backgrounds (*Updated according to the National Science Foundation, Education and Human Resources Core Research solicitation*).

In 2019, 75 graduate students identified as physical chemists, 70 identified as synthetic chemists, and 30 students identified as chemical biologists. 2 postdoctoral researchers identified as synthetic chemists; the others did not identify their subfield. Additionally, 44% of the faculty classify themselves as doing physical, nuclear, or theoretical chemistry research, and 56% classify themselves as doing synthetic chemistry or chemical biology research.

Table S3. Breakdown of 2020 climate survey respondent populations and demographics.

Respondent Population	Number of Respondents	Total Population	Percent Respondents	Female-Identifying	Identify as belonging to an Underrepresented Group (URG)*	Entered Berkeley Chemistry w/ Student Visa
Graduate Students	174	410	42%	46%	56%	27%
Postdoctoral Researchers	24	90	27%			
Faculty Members	22	63	35%	n/a	n/a	n/a

*Groups underrepresented in STEM may include but are not limited to: women and girls, individuals with disabilities, underrepresented racial and ethnic minorities (e.g., African Americans, Hispanics, Native Americans, Alaska Natives, Native Hawaiians, and Pacific Islanders), English-language learners, veterans and students from rural or lower socio-economic backgrounds (*Updated according to the National Science Foundation, Education and Human Resources Core Research solicitation*).

In 2020, 63 graduate students identified as physical chemists, 61 identified as synthetic chemists, and 41 students identified as chemical biologists. One postdoctoral researcher identified as a physical chemist and one identified as a synthetic chemist; the others did not identify their subfield. Additionally, 44% of the faculty classify themselves as doing physical, nuclear, or theoretical chemistry research, and 56% classify themselves as doing synthetic chemistry or chemical biology research.

Chemistry Department Information and Brainstorming Session (cDIBS)

Since 2018, graduate students in the Department of Chemistry at the University of California, Berkeley have been leading efforts to develop and continue using tailored academic

climate[7] and sense of belonging[3] surveys to better understand the issues inclusivity, diversity, and wellbeing within our community.[3,7]

Each year, the climate survey committee compiles the areas of concern most frequently highlighted by department members in the survey responses. In this way, the department's own data is used to ground open, active community discussion among graduate students, postdoctoral researchers, and faculty, with the intention of brainstorming (in small groups comprised of faculty, graduate students and postdoctoral researchers) specific, practical solutions to address the most pressing concerns within our academic culture.[7] This annual discussion is known as cDIBS,[7] and has proven crucial for collectively generating ideas to guide the implementation of changes to begin shifting the academic climate and culture in a positive and more inclusive direction.[7] cDIBS has also been instrumental in increasing transparency within the department—at the start of every cDIBS, the department chair updates the graduate student body on what has changed in terms of practical action items/interventions since the previous year's meeting.

In 2018, the cDIBS organizers highlighted data showing that nearly all faculty, postdocs, and graduate students unambiguously agreed that URG representation should improve at all levels[7] in order to emphasize that students and faculty largely agreed on this issue and encourage faculty–student communication. We continued to use similar rational in selecting our cDIBS discussion topics each year.

In 2019, we discussed the results of Stachl and Baranger's sense of belonging study.[3] Data from our own Department of Chemistry graduate community data were simplified into a 1-page information sheet and distributed to the 2019 cDIBS attendees alongside the following discussion questions: "Based on the attached figure from the 2019 sense of belonging survey data, please discuss the following:

1. From your perspective, are any of these results unexpected? Is it surprising and/or reassuring to see the commonalities between the statements that are difficult for both faculty and students to relate with?
2. What role could increased communication play in improving sense of belonging among our community?
3. How might the statements that are the most difficult to relate to impact academic productivity among members of our community?"

The resulting conversations made it clear that having data to better understand how sense of belonging is shaped within our own community led to an improved understanding of the challenges we experience collectively. Attendees contributed to honest discussion while sharing and brainstorming strategies to cope with, address, and communicate failure. For example, groups of faculty, graduate students and postdoctoral researchers discussed impostor phenomenon—in particular, the fact that our entire community finds it difficult to relate to being as productive as their peers. Many attendees expressed surprise and comfort in realizing that there is really not much difference in the extent to which faculty, graduate students, and postdoctoral researchers generally experience the impostor phenomenon. Groups then brainstormed ways to make these negative feelings more of a social norm within our community, in order to create a more inclusive environment for all department members. One idea that was readily enforced was to begin admitting personal shortcomings and discussing the failures that lead to scientific breakthroughs more often, so that such negative aspects of academic are seen as valuable rather than as stigmas. A few community members also tried to rationalize why—if

we all feel like impostors—we compare ourselves to each other, and what benefit that has. Additionally, groups mentioned that improving communication between mentors and mentees to include discussions of expectations, realistic struggles and how to overcome failure could lead to improved faculty-student and peer interactions as well.

In 2020, we presented data from 2018–2020 regarding the importance all members of our department place on taking action to improve recruitment of individuals from URGs (**Figure S1**), to illustrate that increasing diversity is still our department's collective priority.

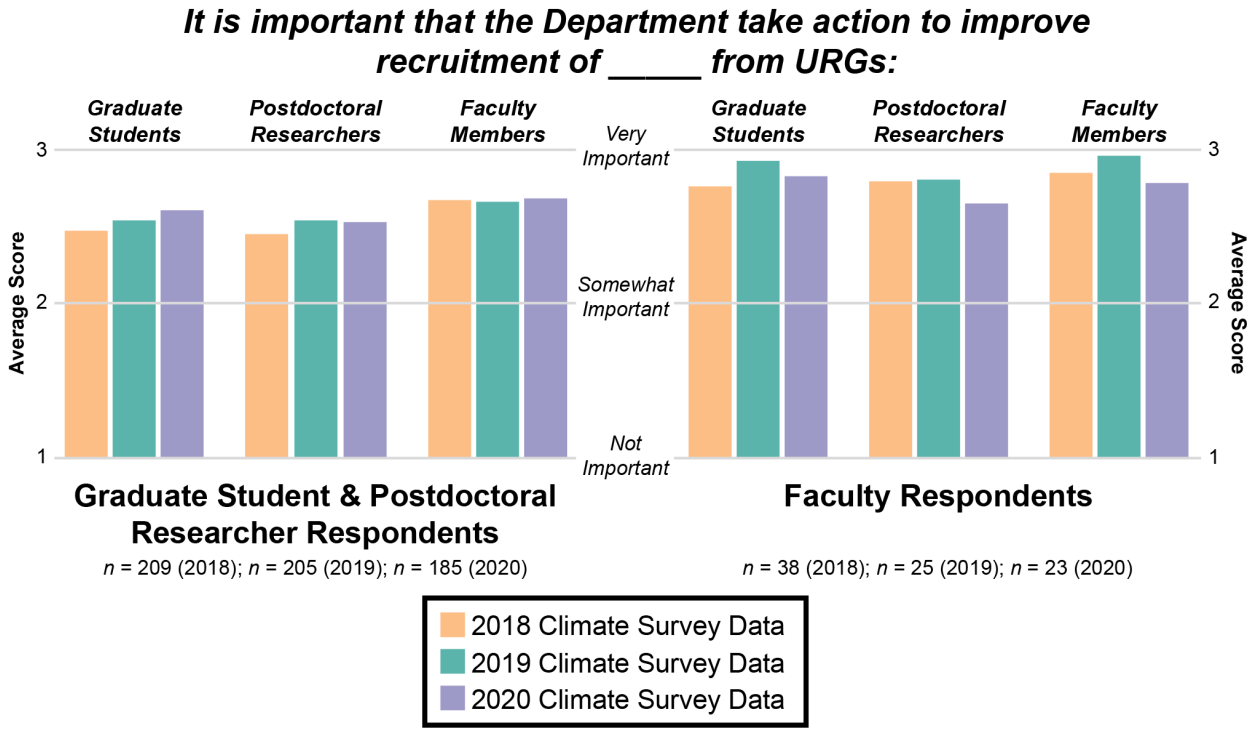

Figure S1. There continues to be unanimous agreement that female and URM representation should improve at all levels of our department.

In addition, we presented a summary of the significant changes in perception regarding our department climate (main text). During small group discussions, we focused on the following three main topics:

1. Inclusivity in the Chemistry Community
2. Mentorship & Faculty–Student Interactions
3. Mental Health and Work-Life Balance

Because of the COVID-19 pandemic, the 2020 cDIBS took place virtually (on Zoom), and the small group discussions occurred in breakout rooms. Attendees in the "Inclusivity in the Chemistry Community" groups focused the following discussion questions:

1.1. Climate survey data suggests there is a persistent, statistically significant gap between non-URG and URG members' perception of harassment, exclusionary behavior, and feelings of inclusion in the department. Initiatives such as diversity & inclusion focus groups (DIFG) have aimed to improve this problem.

- What do you think the main causes are / what can we do?
- Are there other events, policy changes, or culture shifts that you believe could close this gap?

1.2. The climate survey has highlighted a number of differences in perception of department climate between postdocs and graduate students.
- How can we ensure postdocs feel welcomed and included in the department?

1.3. Following the 2018 cDIBS, we incorporated a graduate student committee into the faculty hiring process, to emphasize student engagement and better publicize candidate interviews to the entire department.
- We have discussed using feedback from the hiring panel to develop training for faculty based on student values. What types of training and support would you like to see for PIs?
- Are there other aspects of the hiring process that can be altered to ensure adequate outreach to diverse candidates?

Attendees in the "Mentorship & Faculty–Student Interactions" groups focused the following discussion questions:

2.1. This year's climate survey found that there are statistically significant differences in how those in small groups (<10) rate their ability to go to their PI for both research and non-research (health/well-being) support compared to larger groups (20+) (*data available upon request*).
- How can larger research groups ensure their members have adequate access to mentorship and support?
- How can we shift the social norms for students to receive more mentorship from other faculty? Especially for those in larger groups?

2.2. Several people suggested that the Department could facilitate more general interactions with faculty who are not your PI. With this in mind, what types of events or programs would you like to see to encourage more faculty-student interaction? How would you go about implementing these events and/or changes?

2.3. How have your mentorship experiences changed since shelter-in-place started? What can we learn from these experiences?

Attendees in the "Mental Health and Work-Life Balance" groups focused the following discussion questions:

3.1. This year's climate survey asked faculty and students how they perceived the importance of publishing for themselves and their mentees' success (*data available upon request*).
- Has pressure to publish negatively affected your mental health and well-being?
- Are there ways PIs and mentees can communicate expectations for publishing to alleviate anxiety towards publication?
- What does a successful PI/postdoc/grad student look like?

3.2. Despite improved access to mental health resources in the department and a greater emphasis on mental health in the first-year orientation, graduate students and postdocs continue to suggest mental health resources need to be supplemented.
- In what ways can we provide better support for graduate students' and postdocs' mental health?

3.3. How can we (as a community and as the CGLC) help with wellbeing in times of increased social isolation?

The action items that resulted from community discussion of these topics are currently being addressed and implemented within our community.

Change in Perception of Academic Climate (2018–2020)

To determine the specific aspects of academic climate that have improved, worsened, or stayed the same, data from the 2018 and 2020 surveys were analyzed using the Mann Whitney U Test, to determine whether the respondent distribution for each survey question changed. **Table S4** presents these data for graduate student and postdoctoral respondents, and **Table S5** presents these data for faculty respondents. The main question themes/categories are identical to those presented in **Table 1** (main text). The mean rank of the data for each question was used to determine whether differences in respondent distributions between 2018 to 2020 were positive or negative (right-hand columns of **Tables S4 and S5**). Significance is also indicated. Questions that indicate a significant increase in respondent perceptions of a given dimension of the Berkeley Chemistry academic climate were further analyzed and are discussed in the main text.

Table S4. Directionality of change in graduate student and postdoctoral researcher respondents' perception of the Berkeley Chemistry academic climate, from 2018 to 2020. Analysis was completed using the Mann Whitney U Statistical Test. Significance values are indicated in the right-hand columns.

Graduate Student / Postdoctoral Researcher Survey	**Change in response distribution (2018–20)**		
Advisor Interactions: Research (5 Qs)	**Significant Increase**	**Significant Decrease**	**No Change**
I feel that my research advisor(s) is/are easy to talk to about my research	0.046 * $p \leq 0.05$		
I feel that my research advisor(s) is/are available when I need advice concerning my research			X
I feel that my research advisor(s) provide(s) constructive feedback on my research project			X
I feel that my research advisor(s) treat(s) my ideas with respect	0.0035 ** $p \leq 0.01$		
I feel that my research advisor(s) encourage(s) me to attend and present at conferences			X
Advisor Interactions: Non-research (6 Qs)	**Significant Increase**	**Significant Decrease**	**No Change**
I feel that my research advisor(s) advocate(s) for me when appropriate			X
I feel that my research advisor(s) provide(s) emotional support when necessary	0.008 ** $p \leq 0.01$		
I feel that my research advisor(s) provide(s) non-research advice when necessary	0.026 * $p \leq 0.05$		
I feel that my research advisor(s) foster(s) a collaborative environment with minimal competition between group members	0.050 * $p \leq 0.05$		
I feel comfortable speaking with my advisor(s) about non-academic career paths			X
I feel comfortable disclosing mental and/or physical health conditions that may impact my work to my advisor(s)			X

Non-Advisor Faculty Interactions: Research (1 Q)	**Significant Increase**	**Significant Decrease**	**No Change**
I feel comfortable seeking feedback and/or advice on my work from other faculty			X
Non-Advisor Faculty Interactions: Non-Research (1 Q)	**Significant Increase**	**Significant Decrease**	**No Change**
As a member of the Department of Chemistry, I feel that there are faculty members other than my research advisor(s) who are available to me when I need advice			X
Peer and Community Interactions (8 Qs)	**Significant Increase**	**Significant Decrease**	**No Change**
I feel comfortable attending and participating in social events hosted by the Chemistry Graduate Life Committee			X
In my opinion, in the Department of Chemistry, I believe that exclusionary or offensive behavior is not tolerated			X
In my opinion, in the Department of Chemistry, I believe that harassment of any kind is not tolerated	0.041 ** $p \leq 0.01$		
In my opinion, in the Department of Chemistry, I believe that there is sufficient discussion of equity and inclusion	0.002 ** $p \leq 0.01$		
In my opinion, in the Department of Chemistry, I believe that there is sufficient action toward improving equity and inclusion	0.004 ** $p \leq 0.01$		
As a member of the Department of Chemistry, I feel that I know who to talk with about any concerns regarding the departmental climate	0.000 *** $p \leq 0.001$		
As a member of the Department of Chemistry, I feel that members of the department that identify as minorities feel valued and are included	0.022 * $p \leq 0.05$		
As a member of the Department of Chemistry, I feel that I am valued and included as a member of the department	0.005 ** $p \leq 0.01$		
Inclusion of URGs (6 Qs)	**Significant Increase**	**Significant Decrease**	**No Change**
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry improve recruitment of graduate students who are members of URGs	0.021 * $p \leq 0.05$		
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry improve recruitment of postdoctoral researchers who are members of URGs			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry improve recruitment of faculty members who are members of URGs			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry take action to increase retention of graduate students from URGs			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry take action to educate members of the department about the representation and compensation of URG members in STEM			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry take action to educate members of the department about biases and behaviors that negatively affect the experiences of URG members	0.023 * $p \leq 0.05$		

Table S5. Directionality of change in faculty respondents' perception of the Berkeley Chemistry academic climate, from 2018 to 2020. Analysis was completed using the Mann Whitney U Statistical Test. Significance values are indicated in the right-hand columns.

Faculty Survey	**Change in response distribution (2018–20)**

Advisee Interactions (3 Qs)	**Significant Increase**	**Significant Decrease**	**No Change**
I believe that I am available to my students when they need advice concerning their research			X
I believe that I foster a collaborative environment where competition between group members is minimal			X
I believe that I am comfortable directing my students to resources on campus concerning mental and physical health issues when necessary			X
Peer and Community Interactions (10 Qs)	**Significant Increase**	**Significant Decrease**	**No Change**
In general, in the Department of Chemistry, I feel comfortable asking for advice and/or feedback from my colleagues when appropriate			X
In general, in the Department of Chemistry, I feel a sense of mutual respect between faculty members	0.022 * $p \leq 0.05$		
In general, in the Department of Chemistry, I feel that faculty members cooperate and collaborate	0.047 * $p \leq 0.05$		
In my opinion, in the Department of Chemistry exclusionary or offensive behavior is not tolerated			X
In my opinion, in the Department of Chemistry harassment of any kind is not tolerated			X
In my opinion, in the Department of Chemistry there is sufficient discussion of equity and inclusion			X
In my opinion, in the Department of Chemistry there is sufficient action toward improving equity and inclusion			X
In general, in the Department of Chemistry, I feel that I am valued and included as a member of the department			X
In general, in the Department of Chemistry, I feel that members of the department who identify as minorities feel valued and are included			X
In general, in the Department of Chemistry, I feel that I know who to talk with about concerns regarding the departmental climate			X
Inclusion of URGs (8 Qs)	**Significant Increase**	**Significant Decrease**	**No Change**
In general, in the Department of Chemistry, I feel that the climate in our department is likely to attract additional faculty from URGs			X
In general, in the Department of Chemistry, I feel that faculty from URGs are treated the same as all other faculty members during the tenure process	0.013 ** $p \leq 0.01$		
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry improve recruitment of Graduate Students who are members of URGs			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry improve recruitment of Postdoctoral researchers who are members of URGs			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry improve recruitment of Faculty Members who are members of URGs			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry take action to increase retention of graduate students from URGs			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry take action to educate members of the department about the representation and compensation of URG members in STEM			X
Please indicate how important it is to you personally that the UC Berkeley Department of Chemistry take action to educate members of the department about biases and behaviors that negatively affect the experiences of URG members			X

Diversity and Inclusion Focus Group Assessment

Methods. The DIFG study population includes faculty, graduate students, and postdoctoral researchers from the College of Chemistry (Departments of Chemistry and Chemical and Biomolecular Engineering). All attendees are invited to attend monthly DIFGs *via* existing department-wide email listservs and flyers; there are approximately 10–40 attendees each month.

To assess the efficacy of the DIFG intervention, all Berkeley Chemistry graduate students, postdoctoral researchers, and faculty that attended monthly DIFG meetings since September 2019 were surveyed at the start and end of every DIFG using the online polling platform, Poll Everywhere, Inc. (a web-based audience response system that allows the audience to respond to polls on the web or via cell phone SMS texting). The first question in the "pre-DIFG" poll asked participants whether they consent to participating in the study. Participants were told verbally that their participation in each poll is voluntary, that they are free to skip any question(s) that they do not feel comfortable answering, and that the Poll Everywhere "anonymize responses" function is used to remove all identifying information from survey responses.

DIFG polls included 7–8 questions total, and probe the attendees interest and perception of the importance and relevance of each months' topic(s), how effective they find the DIFG format to be, whether they heard new perspectives during that particular DIFG, how safe they felt discussion the monthly topic with their peers and other attendees, whether attending DIFG has enabled them to productively engage in similar, difficult topics of conversation outside of the DIFG space, and whether DIFG has helped them understand how to contribute to a positive department climate (full survey below). No demographic information is collected in these DIFG surveys.

2019–20 Pre-DIFG Poll Questions:

1. How many DIFGs have you attended?
    a. This is my first!
    b. 1-2
    c. 3-4
    d. 5+
2. What drew you to attend this particular DIFG meeting?
3. How important and/or relevant do you believe this topic is to our academic community?
    a. Important
    b. I'm indifferent
    c. Not important

2019–20 Post-DIFG Poll Questions:

1. The DIFG format was effective for discussing [insert topic of the month here].
    a. Effective
    b. I'm indifferent
    c. Not effective
2. I heard perspectives I wasn't aware of before attending this DIFG.
    a. Yes
    b. No
3. I felt safe discussing this topic with my peers in the DIFG setting.
    a. Yes
    b. No

4. I feel safe discussing this topic with my peers in our academic community.
    a. Yes
    b. No
5. [Starting April 2020] Attending DIFG has helped me feel connected to the chemistry community during the shelter-in-place.
    a. Yes
    b. No
    c. I'm indifferent

The topics covered in DIFGs (during months assessment) are: bias in letters of rec and peer review (September 2019); making UG research more inclusive (October 2019); previous topics discussed in DIFG (November 2019); imposter phenomenon (February 2020); mentoring and communication styles (March 2020); xenophobia related to COVID-19 (April 2020); science communication (May 2020); LGBTQ+ inclusivity and allyship (June 2020); moving from anger to action (July 2020).

Results: Qualitative Intervention Analysis. DIFGs are structured as follows: 1) the purpose of DIFG is introduced (*DIFG exists to provide a structured, recurring, neutral space for members of the chemistry community to: regularly explore and engage in challenging conversations about topics identified as areas of concern in our community; become exposed to alternative viewpoints and experiences; learn from one another; help begin shifting social norms to create lasting and effective change*);[9,10] 2) a brief introduction to the topic is given by the DIFG chair and/or organizers that month, which is grounded in scientific literature and data; 3) community values are presented (Take space, make space; Listen actively, respectfully and with an open mind; De-escalate; criticize ideas, not individuals; Be cautious about sharing specific, personal or targeted situations or people; Use "I" statements; Avoid judgement, blame and inflammatory language; Avoid assumptions about any member of the group; Take care of yourself); 4) we break out into small groups (in-person until March 2020, and in Zoom breakout rooms since April 2020) and discuss a set of pre-decided prompts and/or questions; 5) return to the large group discussion and one person from each group shares their groups main discussion points. College of Chemistry faculty, graduate students, postdoctoral researchers, and staff attend these meetings each month, and the Chair of our Department of Chemistry attends every DIFG.

Figures S2–10 provide qualitative evidence regarding the usefulness of DIFG in helping build community among attendees and providing a safe space in which to talk about challenging topics surrounding issues affecting diversity, equity, inclusion, and belonging. DIFGs have been occurring monthly since September 2018, and assessment of these monthly events began in in September 2019.

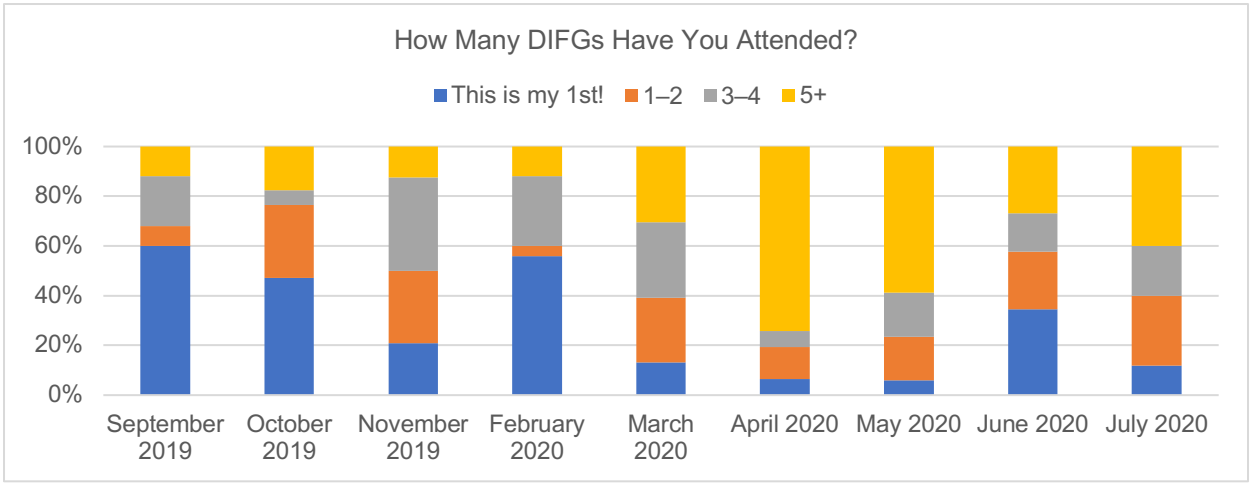

Figure S2. Responses to "How many DIFGs have you attended?".

Figure S3. Word cloud generated from responses to "What drew you to attend this particular meeting?" (September 2019 to June 2020 DIFGs). This word cloud was generated using https://www.jasondavies.com/wordcloud/.

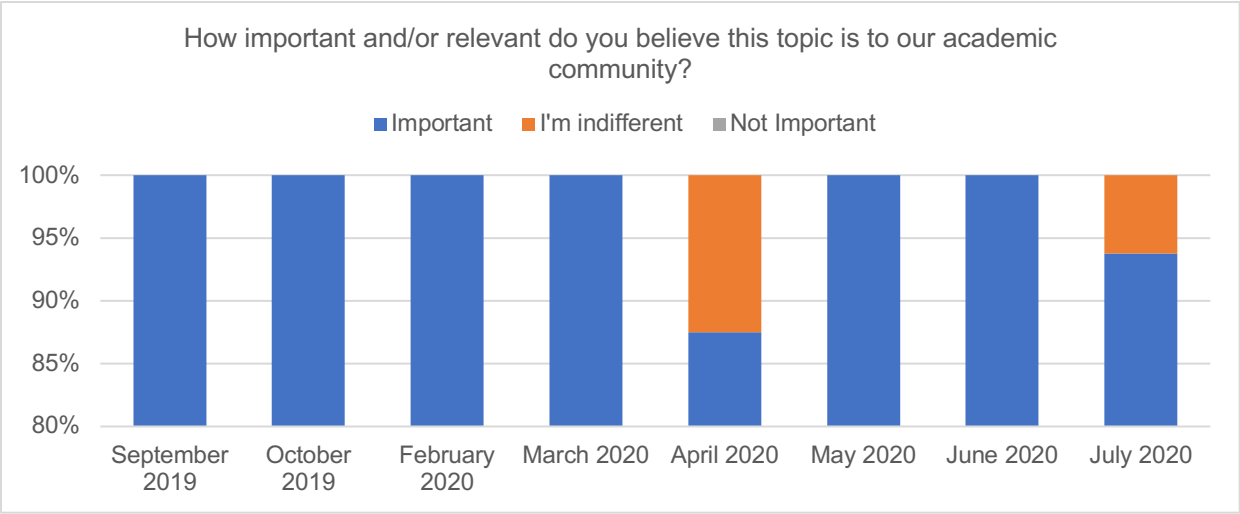

Figure S4. Responses to "How important and/or relevant do you believe this topic is to our academic community?"; we did not ask this question in November 2019 because that DIFG was a trivia event designed to test attendee's knowledge of the facts and topics we had covered in DIFGs from 2018 to then.

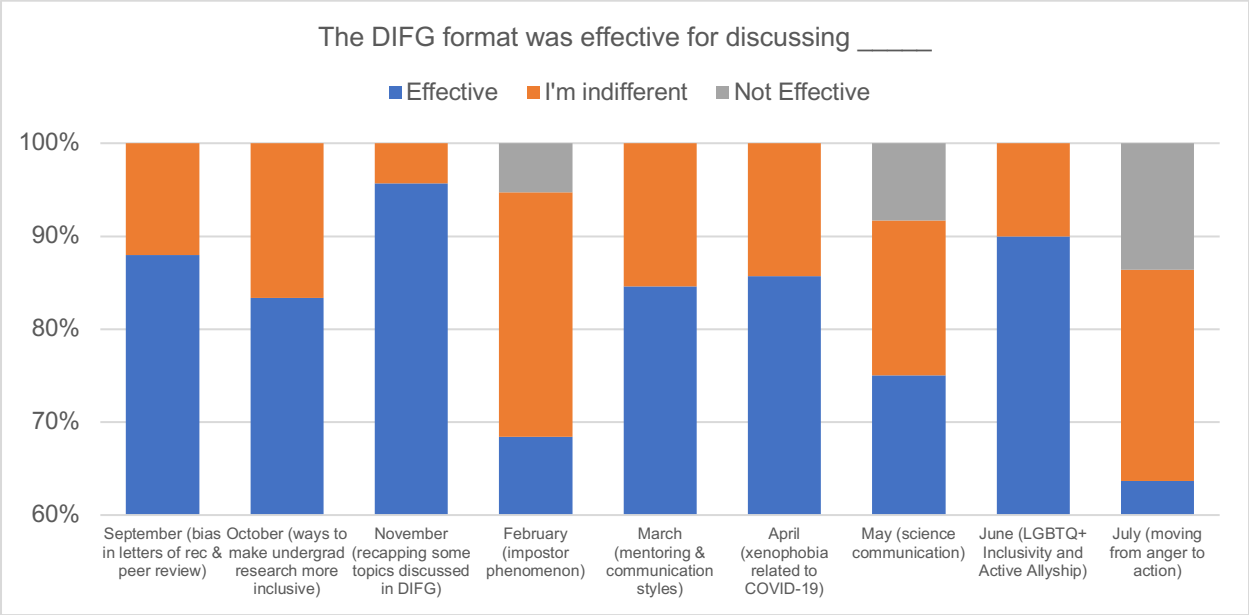

Figure S5. Responses to "This DIFG format is effective for discussing…".

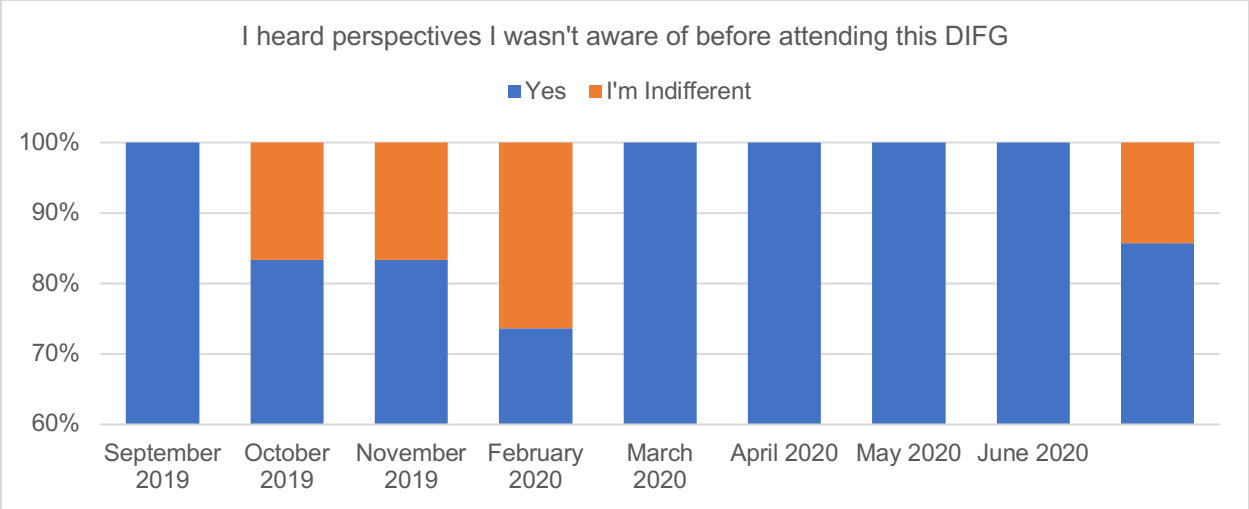

Figure S6. Responses to "I heard perspectives I wasn't aware of before attending this DIFG."

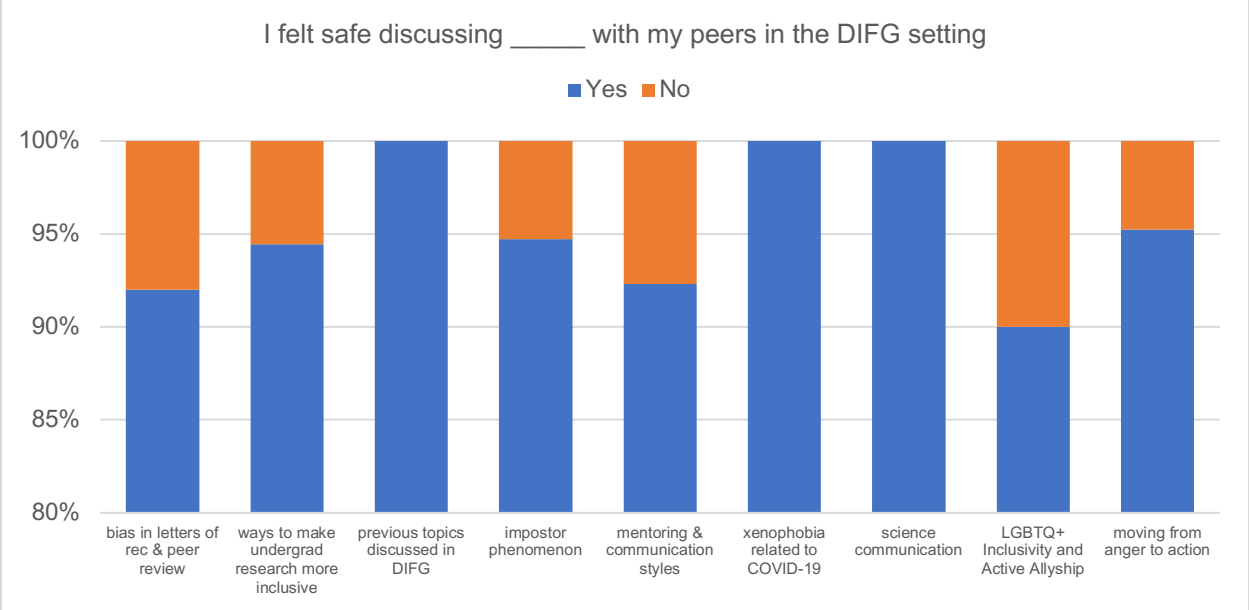

Figure S7. Responses to "I felt safe discussing [this month's topic] with my peers in the DIFG setting."

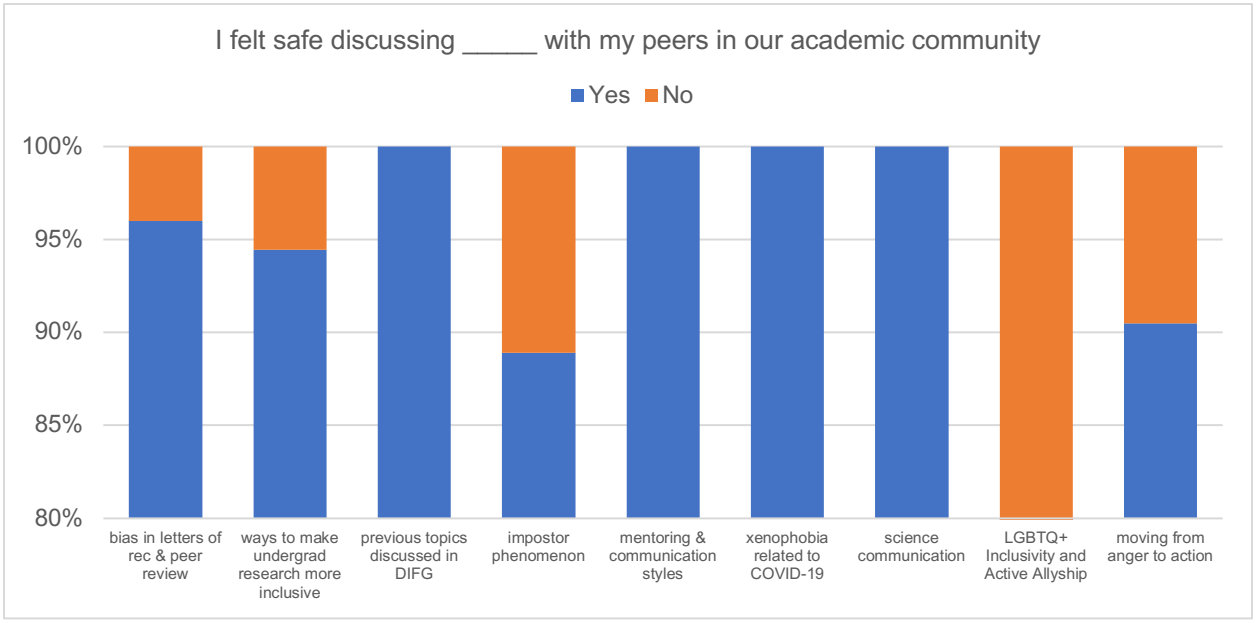

Figure S8. Responses to "I felt safe discussing [this month's topic] with my peers in our academic community."

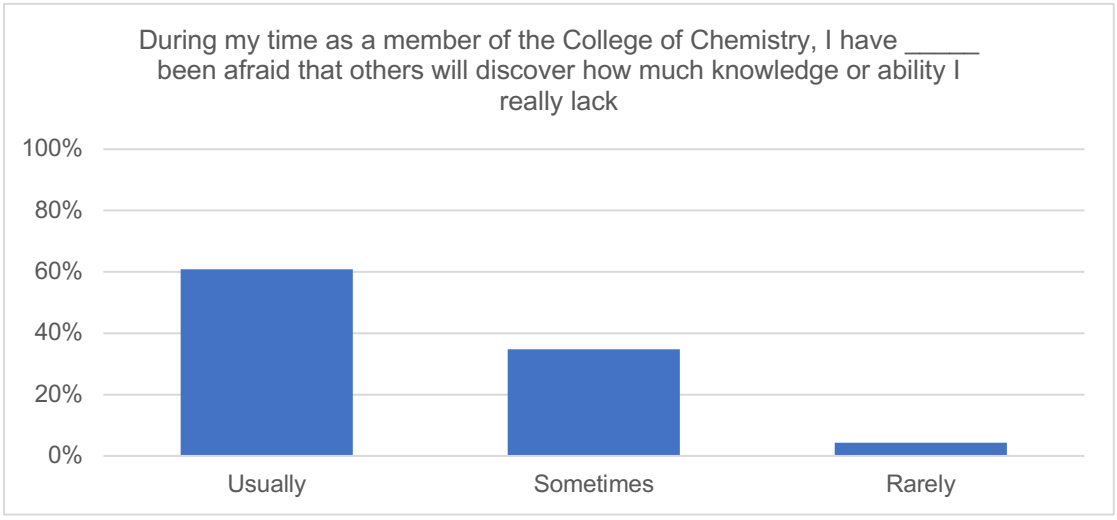

Figure S9. Responses to "During my time as a member of the College of Chemistry, I have _____ been afraid that others will discover how much knowledge or ability I really lack." This question was only asked in February 2020, in order for us to use these anonymized data as a starting point for small group discussions while discussing imposter phenomenon.

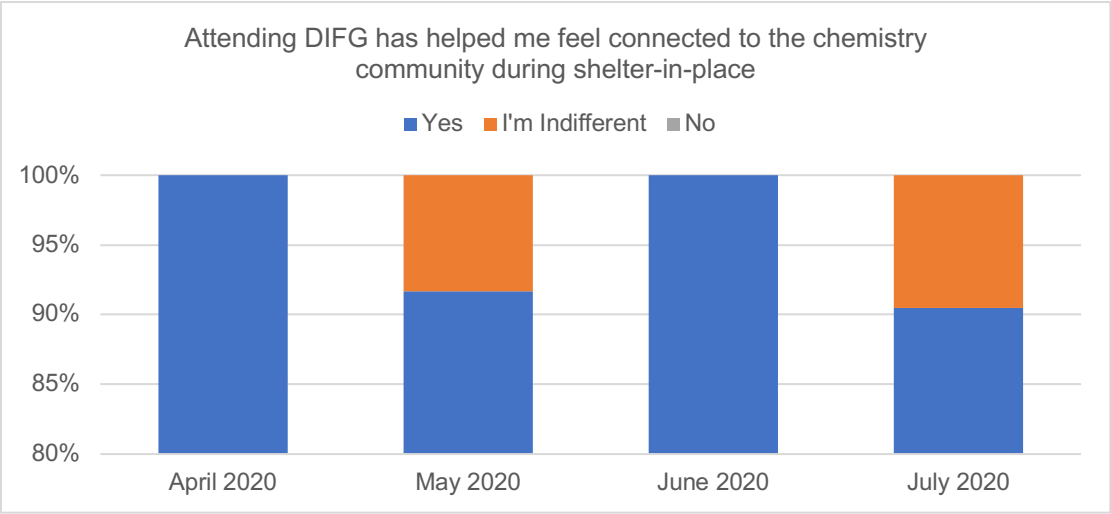

Figure S10. Responses to "Attending DIFG has helped me feel connected to the chemistry community during shelter-in-place." We began asking this question in April 2020 due to the start of the COVID-19 pandemic and orders to shelter-in-place.

In summary, qualitative analysis of DIFG suggests that these monthly events do help build community among members of the College of Chemistry who attend (~8–30 attendees any given month). **Figure S2** illustrates the number of previous DIFGs that the attendees of a given DIFG have participated in. In general, the percentage of participants who attended less than two DIFGs was higher toward the beginning of the 2019–20 academic year. By April 2020, the majority of attendees had been to 5+ DIFGs. However, many of the June 2020 attendees were first-timers at DIFG. Overall, **Figure S2** indicates that while there are often many repeat-attendees at DIFG, ~5% to 60% of attendees are new to the space in any given month throughout the year. Given that DIFGs were held at the same day and time from September 2019 to April 2020 (the second Wednesday of each month at 11 AM), it is likely that new attendees were interested based on positive word-of-mouth, or found a given topic very relevant to them. **Figure S3** highlights many of the reasons why attendees were drawn to attending DIFGs during the 2019–20 academic year. Repeated reasons include the importance of the topic, imposter syndrome, communication, interested, hearing perspectives, the schedule, mentoring, etc. **Figures S4–S8** illustrate that the majority of DIFG attendees each month believe the topic is important and/or relevant to our academic community, that they heard perspectives they weren't aware of before, and that they feel safe discussing the topic in DIFG and with the broader community. **Figure S5** suggests that few participants find the DIFG format ineffective for discussing a given monthly topic. Lastly, **Figures S9 and S10** indicate that while the majority of DIFG respondents have been afraid that others will discover how much knowledge or ability they really lack (indicate feeling imposter phenomenon), the majority of attendees at recent DIFGs feel that the space has helped them feel connected to the chemistry community during the COVID pandemic / shelter-in-place orders.

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