Gender Harassment in the Caltech Graduate Student Experience

Results from the May 2003 GSC/WEST Quality of Graduate Student Life Survey

Executive Summary

The results of the May 2003 GSC/WEST Quality of Graduate Student Life Survey suggest that a large number of Caltech graduate students have been subjected to gender harassment at the Institute. Many graduate students also express a low opinion of how well the climate at Caltech supports gender diversity.

Among other findings, we report that

- **63% of graduate student women and 15% of graduate student men say they have occasionally or frequently experienced at least one of four specific forms of gender harassment during their enrollment at Caltech.**

- **Significant differences exist between the academic divisions in the percentage of their female graduate students who report having experienced various types of gender harassment. No division had less than 44% of its graduate student women report having been subjected to some form of harassment, while in one division this percentage is as high as 87%.**

- **37% of graduate student women state that at Caltech they have experienced negative comments about their scientific ability based solely on their gender.**

- **45% of graduate student women report they have experienced unwanted attention at Caltech based on their gender, including behaviors such as persistent pressure for dates and inappropriate touching.**

- **32% of all graduate students disagree that the climate at Caltech supports gender diversity, while 53% say that it does. This ratio exists within both the female and male graduate student populations.**

- **Both women and men who report they have experienced gender harassment at Caltech express a significantly lower opinion of the gender diversity climate at the Institute. Those who say they have been subjected to harassment are also significantly less likely to indicate they would recommend Caltech to potential graduate students.**

We observe that factors in addition to a graduate student's gender may influence the likelihood that she or he will report having experienced a given type of gender harassment at Caltech. Differences too great to be explained by statistical fluctuations alone are found to exist between groups of students when survey responses are separated either by academic division or by citizenship status.

Executive Summary — continued

The reported gender harassment experienced by graduate students at Caltech is unacceptable. The diminished opinion of the gender diversity climate at the Institute and the decreased likelihood to recommend Caltech to potential students expressed by those who say they are subjected to harassment may pose a threat to the Institute's ability to pursue its core research mission in an increasingly diverse world. Caltech must take direct action to end the practice of gender harassment in its graduate program.

The reader is directed to page 17 of this report for the full text of our discussion of survey results and recommendations. In brief, we recommend:

- **That Caltech hire an external consultant to investigate the problem of gender harassment within the graduate program and to suggest workable long-term solutions.**

- **That concrete steps, with well-defined objectives and measurable results, be taken to improve the climate for women in laboratories and research offices on the Caltech campus.**

- **That focus groups of graduate students be formed to discuss the issues raised in this report.**

- **That an institute task force be formed to act as a central clearinghouse for all information gathered and initiatives undertaken in response to the reported gender harassment in the graduate program.**

- **That orientation programs be held regularly that include a detailed discussion of what constitutes gender harassment and a focus on what campus resources are available for women and men who feel they have been subjected to harassment.**

- **That surveys of graduate students which gauge the extent of gender harassment at Caltech, based upon the present survey instrument but with more detailed and quantitative questions as suggested by the results of this report, be conducted on a regular basis.**

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Introduction

In May 2003, the Caltech Graduate Student Council (GSC) and Women in Engineering, Science, and Technology (WEST) conducted a survey of the Caltech graduate student body to assess the state of many aspects of graduate life. A total of 678 survey forms were submitted, representing a response rate of approximately 57% of the Caltech graduate student population. Full details of the survey methodology are available at http://www.its.caltech.edu/~survey.

Several survey questions asked each individual to characterize the extent to which she or he had experienced certain types of gender harassment at Caltech. Respondents were also asked how supportive of gender diversity they considered the climate at Caltech to be.

Question F1
To what extent have you experienced unwanted attention based on gender at Caltech (e.g., persistent pressure for dates, inappropriate touching)?

Question F2
At Caltech, how often have you experienced each of the behaviors below (a–c) based on your gender?

a. Negative comments about scientific ability
b. Use of demeaning language (e.g., unwanted teasing, inappropriate jokes, and written or spoken remarks including email)
c. Exposure to offensive material (e.g., posters, magazines, video games)

For questions F1 and F2, respondents were asked to choose an answer from the following list: *never, occasionally, frequently, don't know,* and *not applicable.* (In this report, answers of *occasionally* and *frequently* have been combined to form a single *occasionally or frequently* category.)

Question F8a
The climate at Caltech is supportive of diversity relating to gender.

The choice of possible answers for question F8a was *strongly disagree, disagree, slightly disagree, neither agree nor disagree, slightly agree, agree, strongly agree,* and *don't know.* (In this report, answers of *strongly disagree, disagree,* and *slightly disagree* have been combined to form a single *disagree* category; a similar merging has been performed to make one *agree* category.)

In this report we present a brief summary of the responses from female and male graduate students, followed by two detailed analyses examining the responses first by academic division and then by citizenship status. A discussion of the survey results follows, along with our recommendations for actions Caltech should take in response to the results.

Results by Gender

On this page we present a summary of the responses from female and male graduate students to the gender harassment and gender diversity climate survey questions.

For all four specific types of gender harassment described in the survey, significantly more women than men report having experienced a given type of harassment at Caltech. (For details on statistical significance testing used in this report, please see Appendix A.)

The fifth category in Figure 1 displays the percentage of women and men who marked an answer of *occasionally* or *frequently* in response to at least one of questions F1, F2a, F2b, or F2c; we designate these individuals as graduate students who report having experienced at least one of the given forms of gender harassment. As the results of four separate questions have been combined to create this category, we do not attempt significance testing between female and male responses.

Graduate student women and men exhibit no significant difference in their opinion of the gender diversity climate at Caltech. In the entire survey population, with female and male responses combined, 31.7% of graduate students disagree and 52.6% agree that the climate at Caltech supports gender diversity.

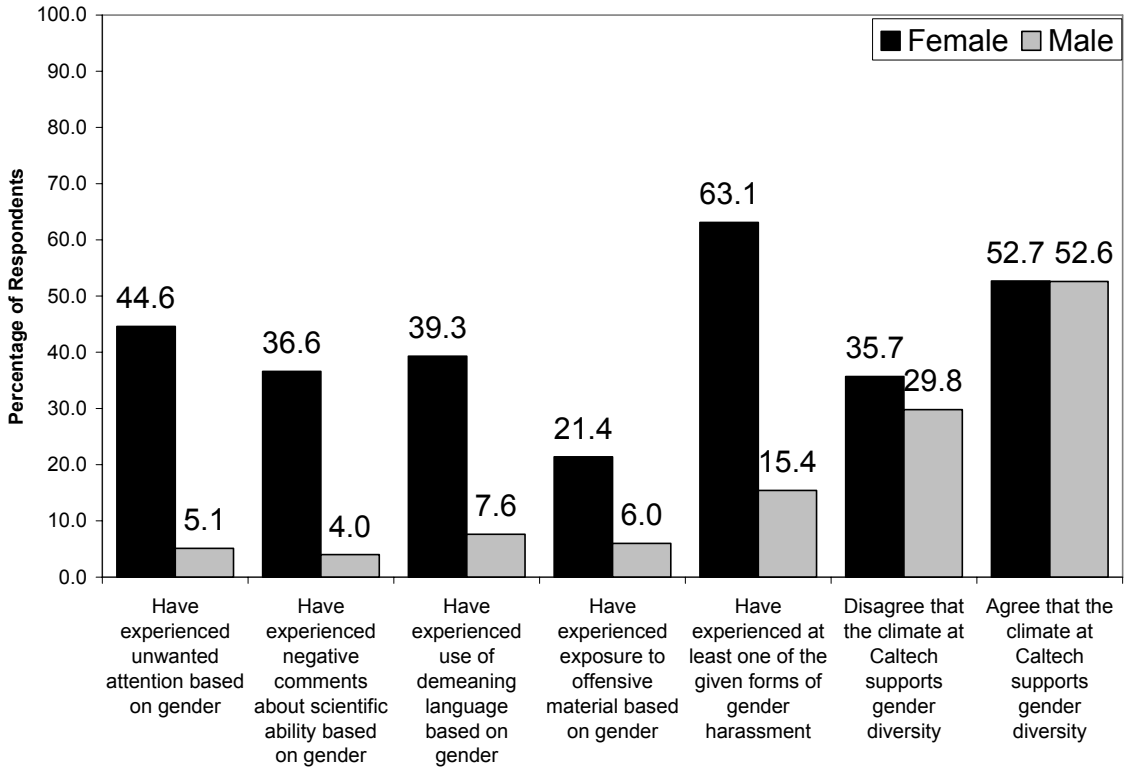

Figure 1. Reported gender harassment experienced at Caltech by graduate students and graduate student opinion of the climate at Caltech with regard to gender diversity.

Results by Division

Overview

In this section we present a summary for each academic division of the responses from the female and male graduate students in that division to the gender harassment and gender diversity survey questions. For an explanation of how Caltech's academic options have been sorted into academic divisions, please see Appendix B.

The Division of Humanities and Social Sciences (HSS) is not included in analyses by division due to its small graduate student population and our confidentiality agreement with survey respondents. However, survey responses from students in HSS are included in those analyses reporting results by gender and by citizenship status.

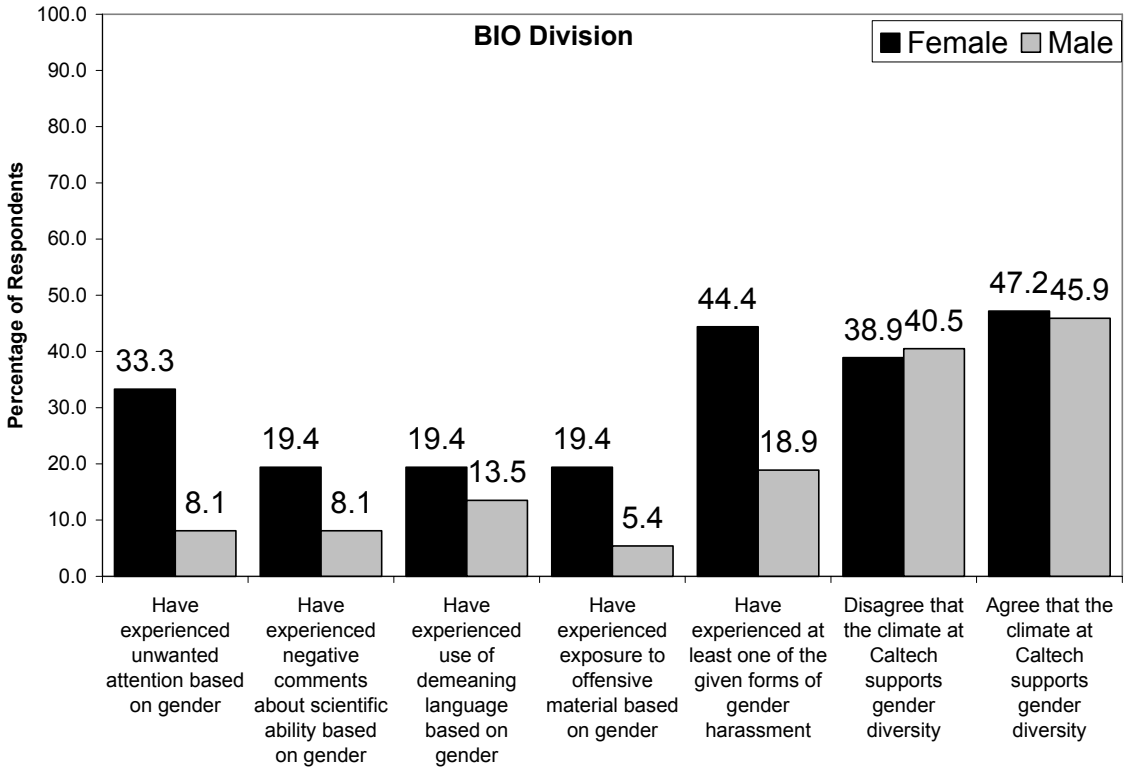

Figure 2. Reported gender harassment experienced at Caltech by graduate students and graduate student opinion of the climate at Caltech with regard to gender diversity for the BIO division.

Results by Division — continued

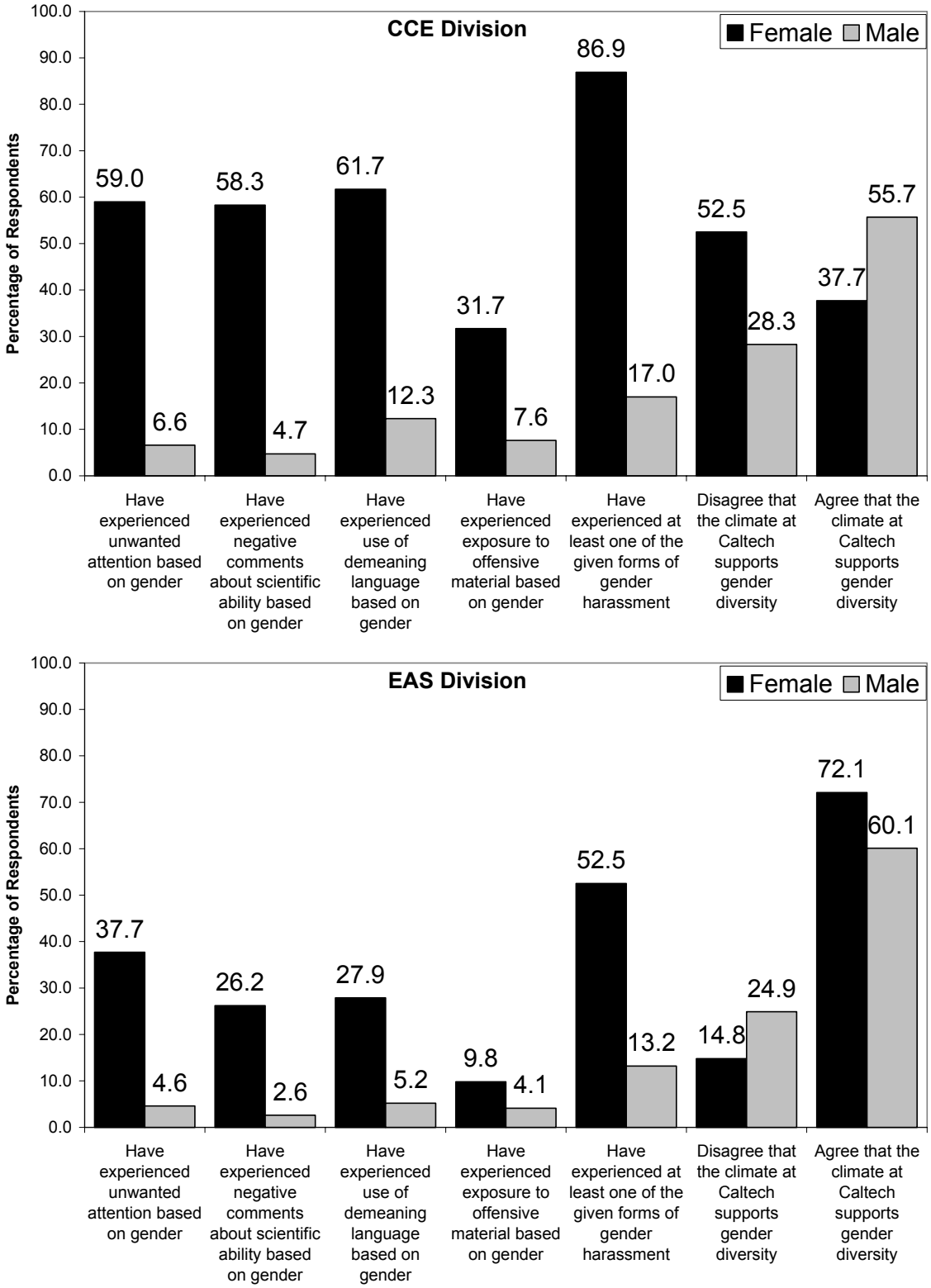

Figure 3. Reported gender harassment experienced at Caltech by graduate students and graduate student opinion of the climate at Caltech with regard to gender diversity for the CCE and EAS divisions.

Results by Division — continued

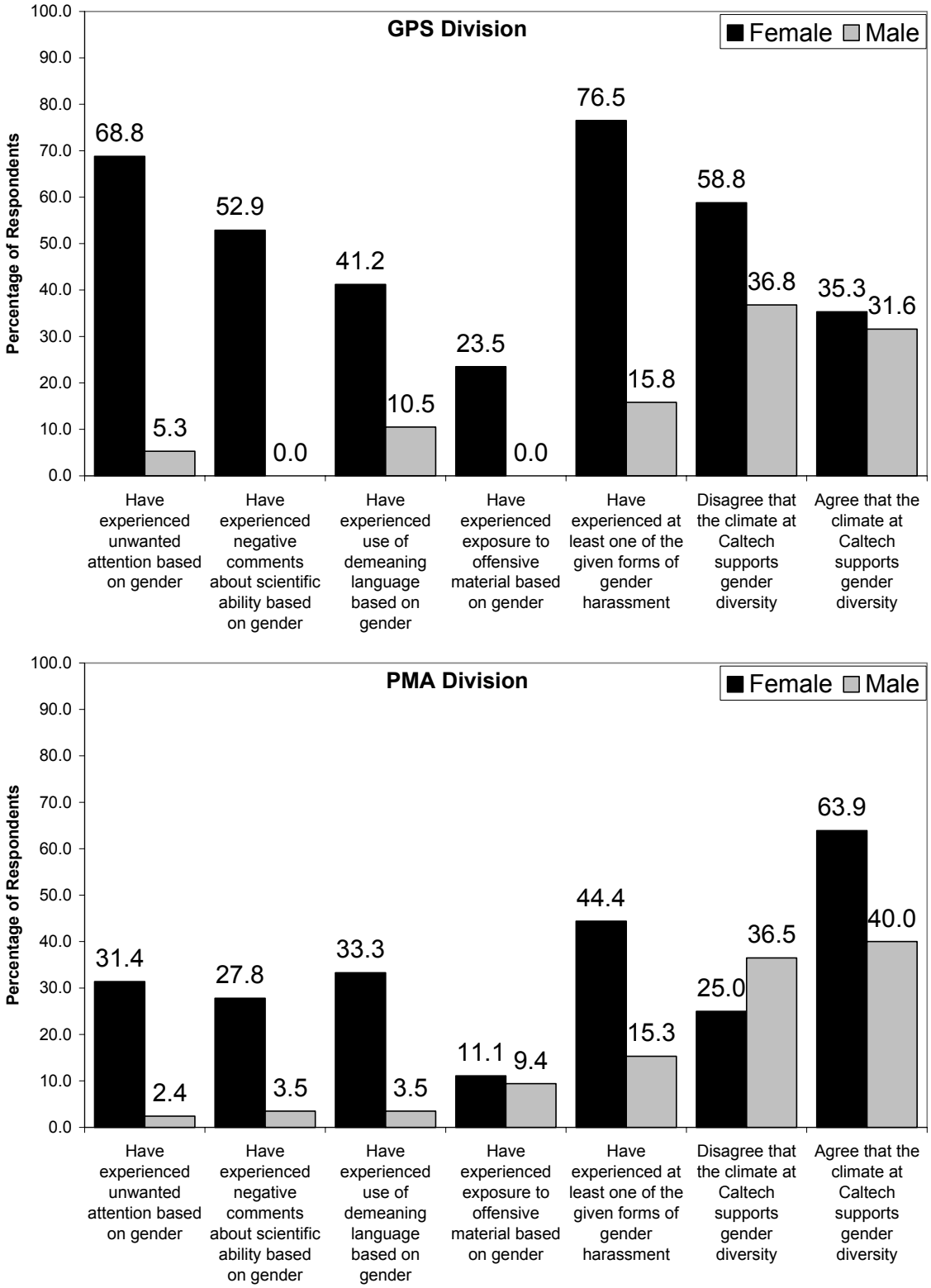

Figure 4. Reported gender harassment experienced at Caltech by graduate students and graduate student opinion of the climate at Caltech with regard to gender diversity for the GPS and PMA divisions.

Results by Division — continued

Differences between Divisions

We observe that the percentages of graduate students who report having experienced the various types of gender harassment differ by academic division. To determine whether these differences are truly significant or whether they can be explained as fluctuations about one mean value, we perform chi-squared testing on the responses from each gender across all five divisions. The p-values from these tests appear in the table below; shaded cells contain values indicating significance ($p \leq 0.05$). Results of significance tests between pairs of academic divisions appear in Appendix A.

	p-values from chi-squared comparison of BIO, CCE, EAS, GPS, and PMA divisions				
	Unwanted Attention	Negative Comments about Scientific Ability	Demeaning Language	Offensive Material	Gender Diversity Climate
Female	**0.0043**	**0.00012**	**0.00025**	**0.025**	**0.00076**
Male	0.56	0.42	0.058	0.31	**0.017**

We conclude that, for all four types of gender harassment described in the survey, significant differences exist between the academic divisions in the percentage of women who report having experienced a given type of harassment at Caltech. The differences for graduate student men are not significant for any of the four harassment questions. Both genders exhibit significant differences between academic divisions in their opinions of the gender diversity climate at Caltech.

Unwanted Attention Based on Gender

In each of the five divisions shown in Figure 5, a significantly greater percentage of women than men report having experienced unwanted attention at Caltech based on their gender.

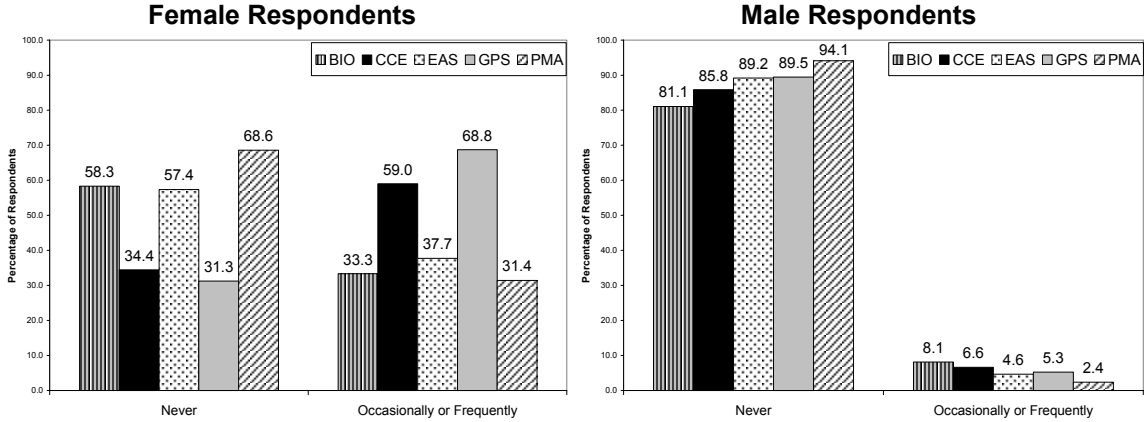

Figure 5. Percentage of Caltech graduate students who report having experienced unwanted attention based on their gender. Sorted by academic division.

Results by Division — continued

Negative Comments about Scientific Ability

Significantly more women than men in each of the CCE, EAS, GPS, and PMA divisions report having experienced negative comments at Caltech about their scientific ability based on their gender. In the BIO division, the difference between the percentages of graduate student women and men who report having experienced negative comments about their scientific ability is not statistically significant.

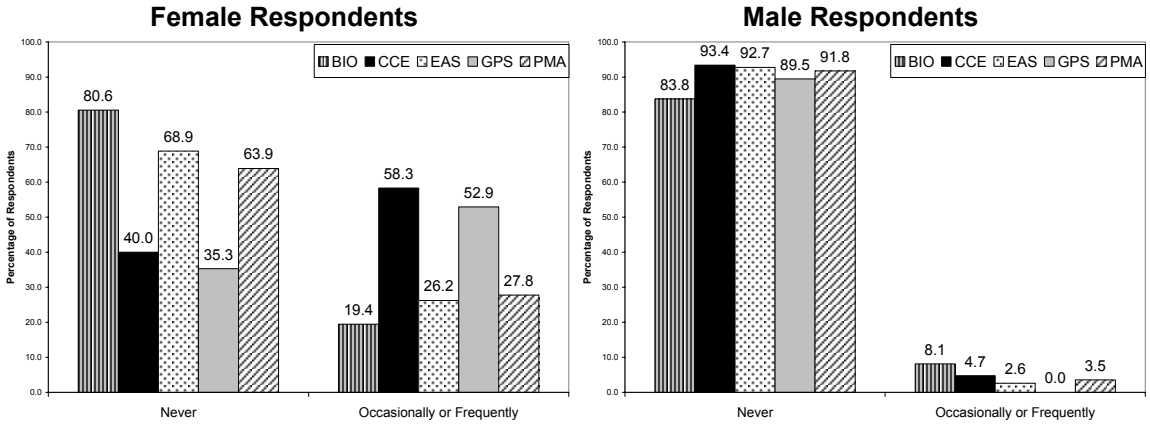

Figure 6. Percentage of Caltech graduate students who report having experienced negative comments about their scientific ability based on their gender. Sorted by academic division.

Use of Demeaning Language

In the CCE, EAS, and PMA divisions, significantly more women than men report having experienced at Caltech the use of demeaning language based on their gender. For the GPS division, significance testing between female and male responses returns a p-value of 0.052, above our threshold for significance of $p \leq 0.05$. Women and men in the BIO division do not differ significantly in their reported experience of demeaning language.

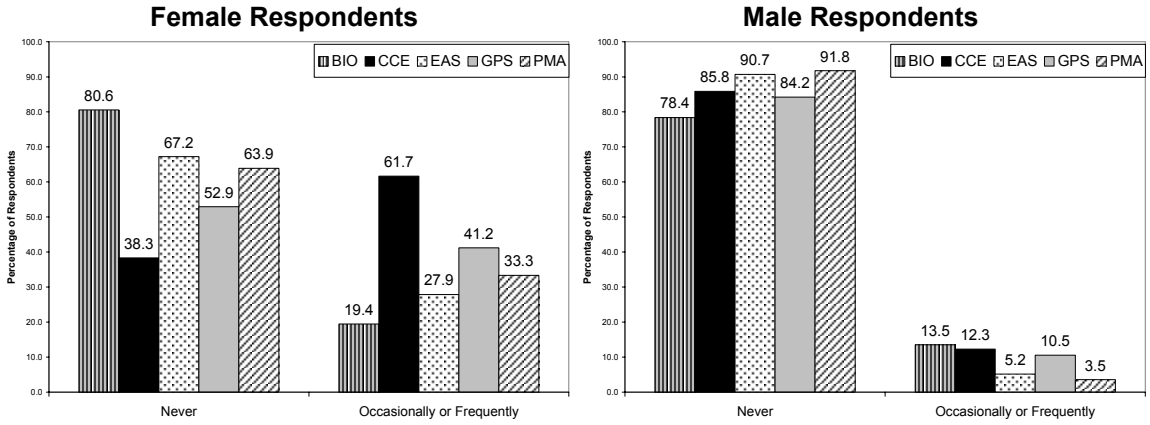

Figure 7. Percentage of Caltech graduate students who report having experienced the use of demeaning language based on their gender. Sorted by academic division.

Results by Division — continued

Exposure to Offensive Material

A significantly greater percentage of women than men in the CCE and GPS divisions report having experienced at Caltech exposure to offensive material based on their gender. The differences between the responses from women and men in each of the BIO, EAS, and PMA divisions are not statistically significant for this question.

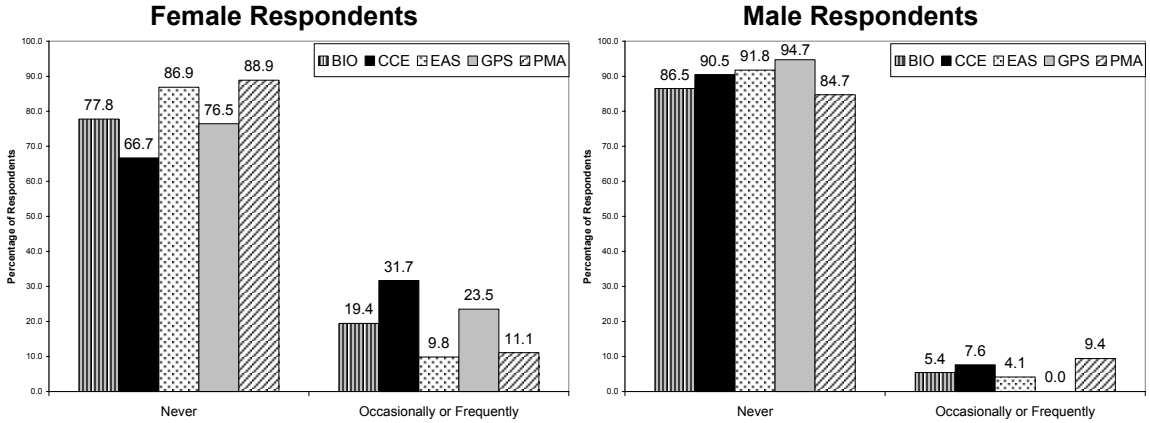

Figure 8. Percentage of Caltech graduate students who report having experienced exposure to offensive material based on their gender. Sorted by academic division.

Opinion of the Gender Diversity Climate at Caltech

Only within the CCE division do women and men have significantly different opinions of how well the climate at Caltech supports gender diversity. None of the differences between the responses from female and male graduate students in other divisions exceeds our chosen threshold for significance.

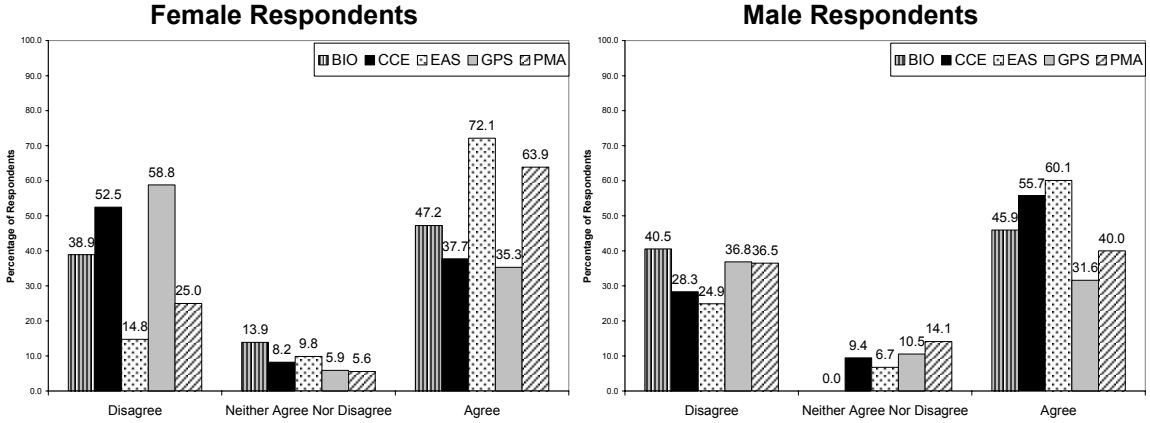

Figure 9. Graduate student agreement/disagreement with the statement, "The climate at Caltech is supportive of diversity relating to gender." Sorted by academic division.

Results by Citizenship Status

Overview

Question I5 of the survey asked each respondent to identify her or his citizenship status from a choice of *U.S. Citizen; Non-U.S. Citizen, Permanent Resident;* and *Non-U.S. Citizen, Student Visa Holder*. In this report, we have combined the responses from U.S. citizens and non-citizen permanent residents into one group (*U.S. students*).

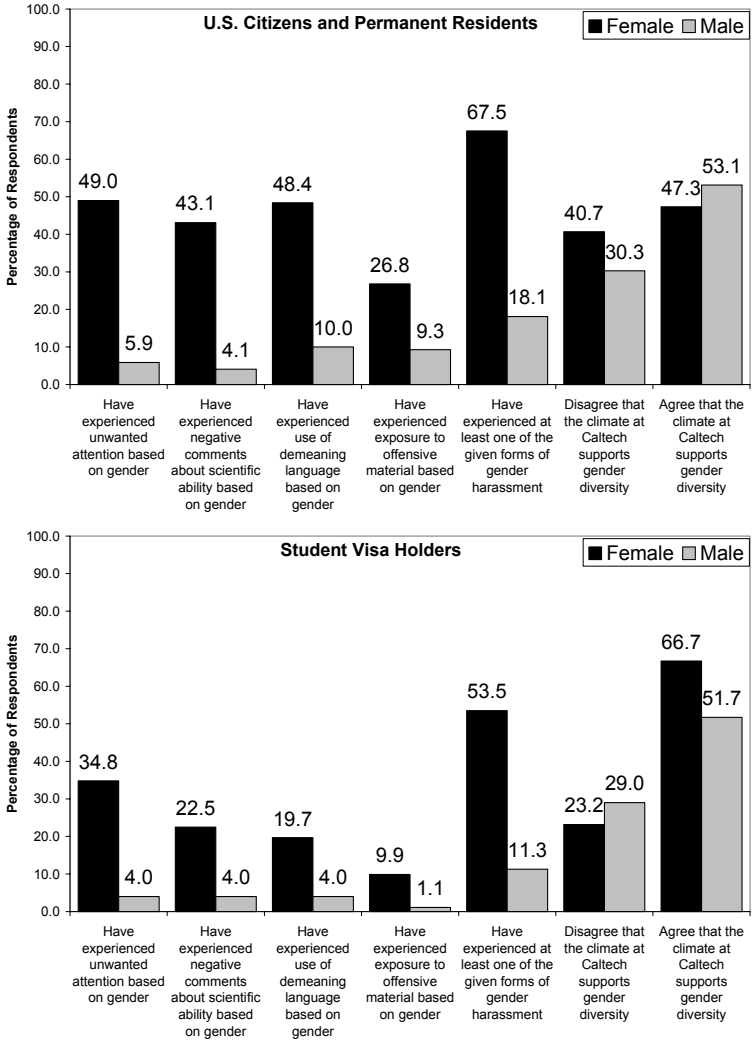

Figure 10. Reported gender harassment experienced at Caltech and opinion of the climate at Caltech with regard to gender diversity for graduate students. Sorted by citizenship status.

For all four types of gender harassment described in the survey, significantly more women than men within each citizenship group report having experienced a given type of harassment.

Results by Citizenship Status — continued

Unwanted Attention Based on Gender

The percentage of U.S. women who report having experienced unwanted attention at Caltech based on their gender does not differ significantly from that of women holding student visas (p=0.073). Men also do not differ across citizenship lines.

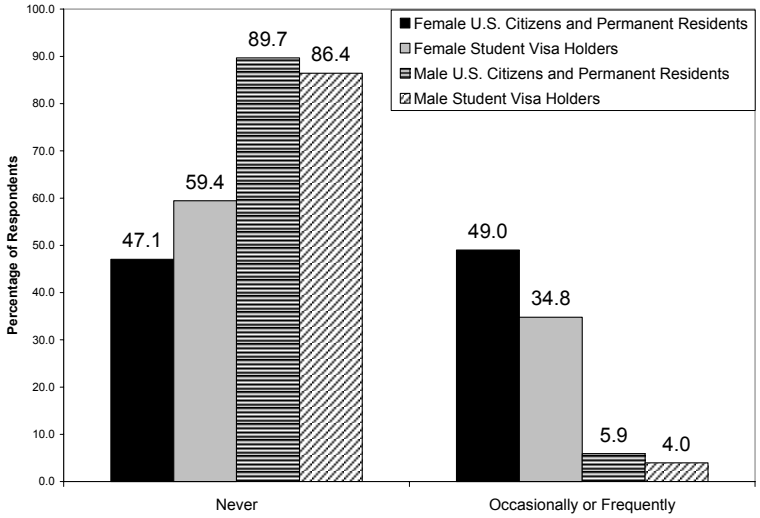

Figure 11. Percentage of Caltech graduate students who report having experienced unwanted attention based on their gender. Sorted by citizenship status.

Negative Comments about Scientific Ability

Significantly more female U.S. students than female student visa holders report having experienced negative comments at Caltech about their scientific ability based on their gender. The two citizenship groups of men exhibit no such difference.

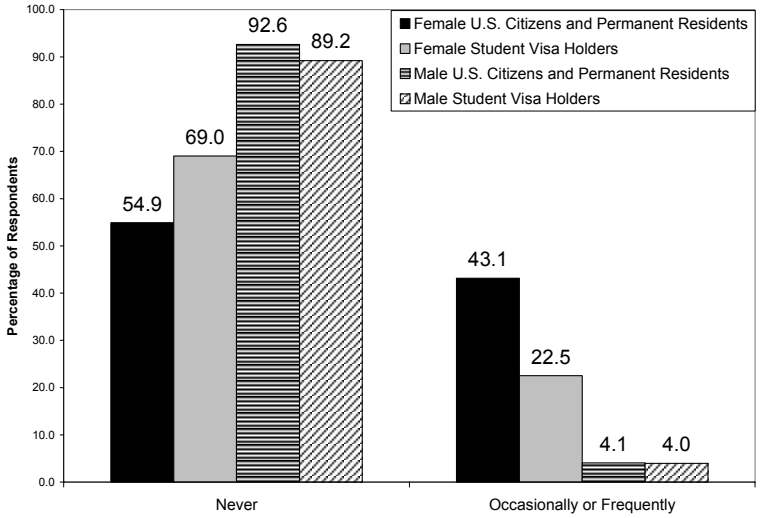

Figure 12. Percentage of Caltech graduate students who report having experienced negative comments about their scientific ability based on their gender. Sorted by citizenship status.

Results by Citizenship Status — continued

Use of Demeaning Language

For both women and men, significantly more U.S. students than student visa holders report having experienced the use of demeaning language based on their gender.

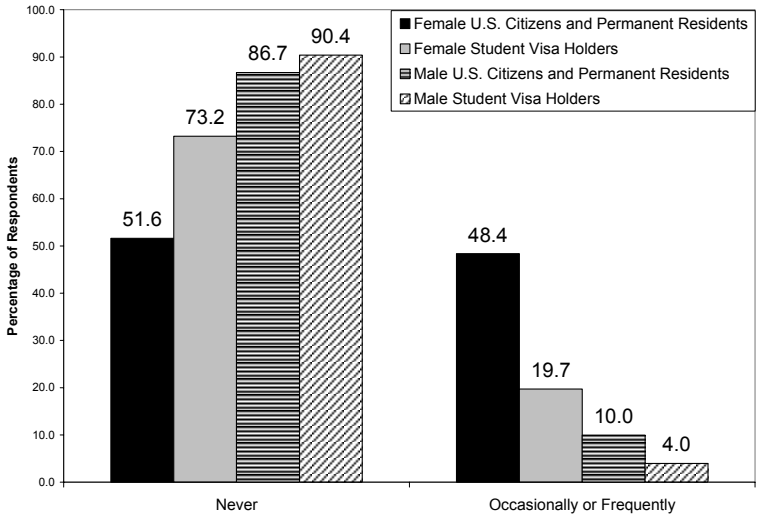

Figure 13. Percentage of Caltech graduate students who report having experienced the use of demeaning language based on their gender. Sorted by citizenship status.

Exposure to Offensive Material

For both women and men, significantly more U.S. students than student visa holders report having experienced exposure to offensive material based on their gender.

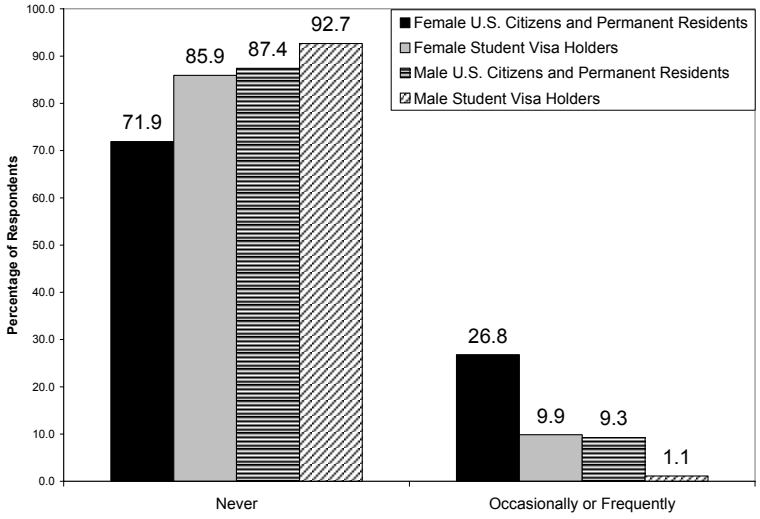

Figure 14. Percentage of Caltech graduate students who report having experienced exposure to offensive material based on their gender. Sorted by citizenship status.

Results by Citizenship Status — continued

Opinion of the Gender Diversity Climate at Caltech

Female and male U.S. students do not differ significantly in their opinion of the gender diversity climate at Caltech. Similarly, no difference in opinion between genders is found to exist for student visa holders.

U.S. women have a significantly less favorable opinion of the gender diversity climate at Caltech than that of women who hold student visas. No such difference exists between men from the two citizenship groups.

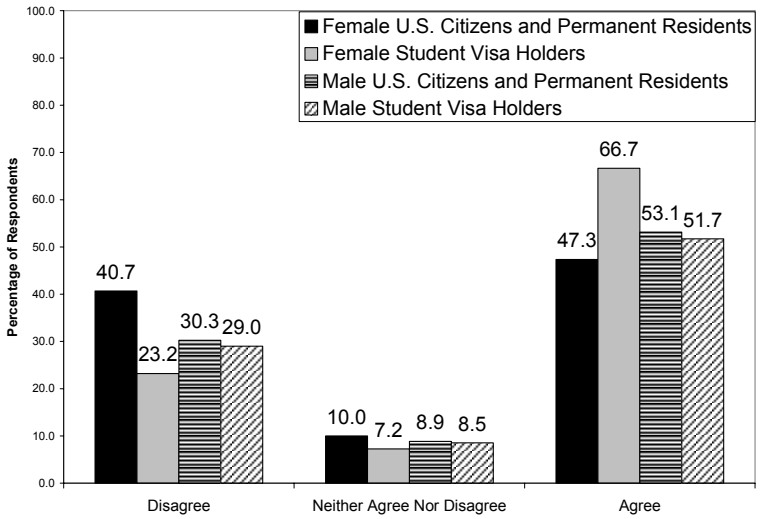

Figure 15. Graduate student agreement/disagreement with the statement, "The climate at Caltech is supportive of diversity relating to gender." Sorted by citizenship status.

Discussion

The May 2003 GSC/WEST Quality of Graduate Student Life Survey was intended to provide a general overview of many aspects of the Caltech graduate student experience, without going into exhaustive detail on any one topic. As a result, the subject of gender harassment was only addressed in a handful of survey questions. Nevertheless, the survey has uncovered what appear to be disturbing levels of gender harassment within the Caltech graduate program.

Occasionally vs. Frequently

One limit of the present survey instrument is that respondents were asked to describe the regularity with which they have experienced harassment by using only the subjective terms "occasionally" and "frequently," rather than by identifying a quantitative rate such as the number of incidents per month. Thus, for two students each experiencing the same rate of a given form of harassment, one student may say that she or he encounters harassment frequently, while the other might characterize her or his experiences as occasional. For any future in-depth surveys investigating gender harassment in the Caltech graduate program, we recommend employing quantitative categories when asking respondents how often they have experienced certain behaviors.

However, any distinction between "occasionally" and "frequently" should be considered immaterial by the Caltech community in determining how to respond to the levels of gender harassment that graduate students have reported via this survey. The *Institute Policy on Unlawful Harassment* makes it clear that no degree of harassing behavior, including gender harassment, is to be tolerated at Caltech.

"Faculty, students, and staff, at all levels, are responsible for maintaining an appropriate environment for study and work. This includes conducting themselves in a professional manner, actively discouraging harassment, and taking appropriate corrective action to prevent and eliminate harassment."

— ***[Caltech] Institute Policy on Unlawful Harassment*** **(Revised February 2003)**

Comparison with Previous Caltech Surveys and Reports

A Quality of Academic and Work Life Survey was administered to all sectors of the Caltech community (faculty, staff, and students) in 1989. Although the GSC/WEST survey committee has been unable to obtain the exact text of the 1989 survey's questions regarding gender harassment — we have been informed by Caltech administrative staff that all documentation from that survey was retained under strict confidentiality rules by the outside firm which conducted the survey — the public report does state the percentage of graduate students who answered they had *"never had various unpleasant sexual discrimination or harassment experiences."* We comment here on those categories from the 1989 survey which most closely match those of the present survey instrument. We note that the 1989 survey received responses from 709 graduate students, comparable to the 678 who answered the 2003 survey.

Discussion — continued

1989 Institute Survey Results		
Form of Gender Harassment	Percentage of graduate student women who reported **never** having experienced this behavior	Percentage of graduate student men who reported **never** having experienced this behavior
Unwanted teasing/jokes/remarks about women or men	32	80
Unwanted teasing/jokes/remarks of a sexual nature	48	85
Unwanted pressure for dates	65	95
Unwanted touching/leaning/cornering	74	97

2003 GSC/WEST Survey Results		
Form of Gender Harassment	Percentage of graduate student women who reported **never** having experienced this behavior	Percentage of graduate student men who reported **never** having experienced this behavior
Use of demeaning language based on gender (e.g., unwanted teasing, inappropriate jokes, and written or spoken remarks including email)	59	88
Unwanted attention based on gender (e.g., persistent pressure for dates, inappropriate touching)	51	88

The above tables are shaded to indicate those categories from the two surveys which we view as describing essentially the same behavior. Noting that these tables state the percentage of graduate students who reported **never** having experienced the described behaviors, we observe that the percentage of graduate students who would say they have experienced demeaning language harassment appears to have decreased for both genders since the time of the earlier survey.

Without more details regarding the 1989 survey, we cannot make a definitive statement regarding the change in reported levels of gender harassment of a more personal nature (e.g., persistent pressure for dates, inappropriate touching). We know that 45% of graduate student women in the 2003 survey population report having experienced unwanted attention based on their gender. The corresponding percentage from the 1989 survey might be as high as 61% — if 35% of women reported unwanted pressure for dates, 26% reported unwanted touching, and there were no women common to both groups. However, it is also possible that the 1989 percentage for women could be less than the present 45%. If the Institute still has access to the 1989 data, a comparison between the two survey populations should be considered for this question.

Discussion — continued

Comparison with Previous Caltech Surveys and Reports

The report from the 1989 survey states that *"the experiences of sexual harassment, unwanted pressure for dates, and unwanted touching … appear to be more of a problem for women"* in divisions *"in which proportionately, women are an extreme minority."* This no longer seems to be the case, as evidenced by the 2003 survey results for the CCE and GPS divisions, in which women are far from representing an extreme minority at 30% and 44%, respectively, of the graduate student population of these divisions. By way of comparison, the Caltech IPEDS data indicates that both the EAS and PMA divisions were approximately 21% female in Fall 2002.

The *Report on Women at Caltech*, released in April 1999, only briefly touches upon the status of graduate student women at the Institute. We observe that the report does not indicate any graduate students were interviewed or surveyed in the preparation of the report. Nevertheless, the report does state that there have been *"occasions, albeit few, of disturbing signs of inappropriate behavior of men to women at all levels."* We are again faced with the difficulty of interpreting the meaning of a subjective term such as "few occasions," but we cannot consider the percentages presented in this report to be indicative of only a few instances of inappropriate behavior. We do concur with the following statement from the conclusion of the 1999 report:

"In summary, although Caltech has improved considerably in relation to women it is far from being able to rest on any laurels. The community needs to continue to improve the environment for women. Compared to other institutions, Caltech is not providing equal opportunity fast enough to women…"

— ***Report on Women at Caltech*** **(1999)**

Academic Divisions

Perhaps one of the most striking results from the present survey is the extent to which the various academic divisions differ in the percentage of their graduate students who report having experienced various forms of gender harassment, particularly for female graduate students. Has competitiveness in some divisions crossed the line from a healthy motivator toward hard work to become a precipitator for harassment? Is the dominant atmosphere within some research groups too permissive of inappropriate behavior? How important is the demographic composition of a division? Do some division social activities, including those supported by institute funds, either unintentionally or overtly reinforce attitudes conducive to harassment? Rather than speculate here on the relative importance of all of these various factors, we leave the investigation of the many significant differences between academic divisions in their reported levels of gender harassment as a priority task for the external consultant whose hiring is recommended on page 22 of this report.

Discussion — continued

Gender Harassment and the Gender Diversity Climate at Caltech

The low opinion of the gender diversity climate at Caltech expressed by graduate students is disturbing and should give the entire Caltech community pause. When we examine the results for this question from the entire survey population, with female and male responses combined, we observe that nearly one-third of all graduate students disagree with the statement, *"The climate at Caltech is supportive of diversity relating to gender."* Only slightly more than 50% of graduate students agree with the statement, with the remainder either ambivalent or undecided. As shown on page 6 of this report, approximately the same ratio is found to exist within the responses of each gender considered separately.

When we separate the response to this question on the basis of whether or not a respondent has indicated that she or he has ever experienced gender harassment at Caltech*, we notice a sharp divide for both genders between the two resultant groups of students.

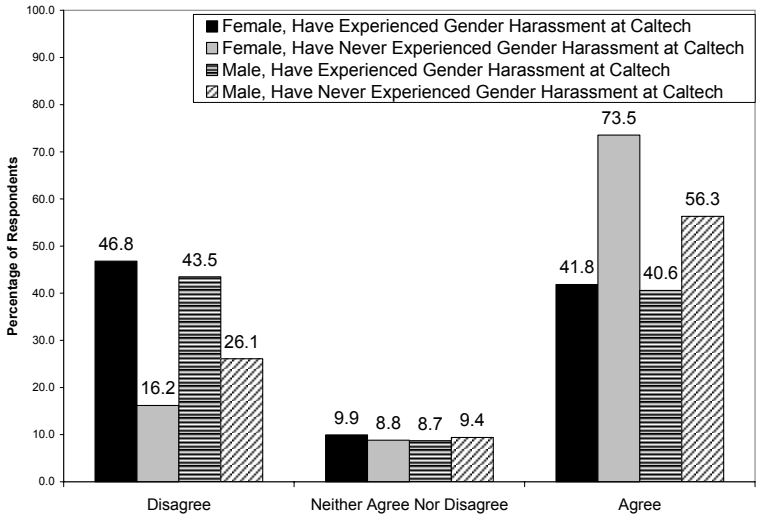

Figure 16. Graduate student agreement/disagreement with the statement, "The climate at Caltech is supportive of diversity relating to gender." Sorted by reported experience of gender harassment at Caltech.

For both genders, the percentage of graduate students who agree that the climate at Caltech supports gender diversity is significantly lower among those who report they have experienced gender harassment. (Chi-squared testing for women yields $p=3.4\times10^{-5}$; for men, $p=0.014$.)

*Here we use the definition from page 6 of this report to identify those graduate students who report having experienced at least one form of gender harassment at Caltech. Only those respondents who answered *never* for each of questions F1, F2a, F2b, and F2c are considered to have reported they have never experienced harassment at Caltech. Respondents whose answers to these questions contain a combination of *never, don't know, not applicable*, or blank responses are not included in the "Have Never Experienced Gender Harassment at Caltech" categories shown in Figures 16 and 17.

Discussion — continued

Gender Harassment and Recommending Caltech to Potential Graduate Students

Question J1c of the survey asked graduate students to respond to the statement, *"If asked today, I would recommend Caltech to potential graduate students."* The choice of possible answers to this question was identical to that listed on page 5 of this report for question F8a. If we separate the response to this question in the same manner as was done on the previous page, we once again observe a large difference between the two groups for both genders.

The percentage of both women and men who say they would recommend Caltech to potential graduate students is significantly lower among those who report they have experienced gender harassment. (Chi-squared testing for women returns p=0.0030; for men, p=0.0014.)

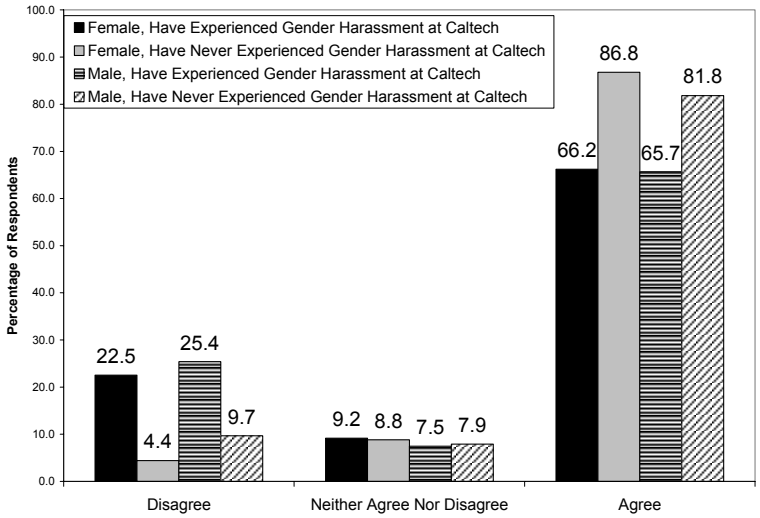

Figure 17. Graduate student agreement/disagreement with the statement, "If asked today, I would recommend Caltech to potential graduate students." Sorted by reported experience of gender harassment at Caltech.

Summary

The reported level of gender harassment in the Caltech graduate program is unacceptable. The decreased likelihood to recommend Caltech to others expressed by the considerable number of graduate students who say they are subjected to gender harassment, combined with a low opinion of the gender diversity climate at the Institute, may leave Caltech at a competitive disadvantage against its peer institutions in its efforts to recruit top graduate students and to create a diverse campus community. While an assessment of the psychological effects that gender harassment can have upon an individual graduate student lies beyond the scope of the present survey, common sense suggests that being subjected to harassment based on one's gender may result in a less satisfactory Caltech experience and a diminished overall quality of life.

Recommendations

Gender harassment is disrespectful to those who are subjected to it and represents the height of unprofessional conduct on the part of the harasser. It should have no place in the Caltech graduate student experience, and yet the results of the present survey suggest that gender harassment is all too widespread in the graduate program. Our survey results indicate that both women and men who report they have experienced gender harassment at Caltech have a significantly lower opinion of how well the campus climate supports gender diversity, and they are also much less inclined to recommend Caltech to prospective graduate students. Both of these consequences have the potential not only to diminish Caltech's reputation in academia and in the view of the general public, but also to impair its ability to attract exceptional graduate students and other researchers. Therefore, for the benefit of the graduate student body as well as for the benefit of the Institute, the time has come for the Caltech administration, faculty, and graduate students to work together in taking bold and decisive action to put an end to the inexcusable practice of gender harassment within the graduate program.

To address the unacceptable levels of gender harassment which have been reported to exist within the graduate student population at Caltech, we strongly recommend

1) That Caltech hire an external consultant to investigate the problem of gender harassment within the graduate program and to suggest workable long-term solutions. The present survey has only begun to describe a situation whose full extent must now be assessed. While employing an external consultant may incur considerable expense, we believe that a full-time professional with experience in impartially assessing institutional cultures is essential in this situation. Such a consultant would enjoy an unbiased perspective from which she or he could examine all aspects of gender harassment in the Caltech graduate program without preconceptions — a vital characteristic to possess if some Caltech practices or traditions should be found to be contributing factors to the culture of harassment.

The consultant should be extended the freedom to pursue this investigation however she or he deems necessary; however, we urge that the following questions be among those answered.

- *What is at the root of the large incongruities between academic divisions in graduate students' reported experiences of gender harassment?*
- *What are the sources of the various forms of gender harassment directed toward graduate students?* Is this harassment by other graduate students? Staff? Faculty?
- *Why do significant differences exist for both genders between the responses from U.S. citizens and permanent residents and those from student visa holders?* Are the two citizenship groups interpreting the same types of harassing behaviors differently, or are they experiencing different behaviors?
- *What actions can the Caltech administration and academic divisions take to create a campus climate that is viewed by both current and prospective graduate students as more supportive of gender diversity?*

Recommendations — continued

The consultant should meet with the faculty often, so that important findings may be integrated into institute policies and procedures. At the end of her or his investigation, the consultant should be required to issue a public report that delineates the full extent of gender harassment within the graduate program and suggests clear steps to take toward the goal of eliminating gender harassment. This report must identify a campus entity that will assume responsibility for further monitoring of harassment levels. We advocate a public report, rather than one restricted to only the Caltech community, as its findings could lead to improvements in gender diversity efforts elsewhere in academia.

2) That concrete steps, with well-defined objectives and measurable results, be taken to improve the climate for women in laboratories and research offices on the Caltech campus. There are several Caltech offices, such as the Women's Center and the Ombuds Office, that are useful in helping female graduate students. However, a graduate student spends most of her working day in a laboratory or research office setting. No matter how supportive outside offices are, nor how much of a temporary refuge they may offer, if the environment within a research group continues to be hostile to female graduate students, the Caltech experience of those students will be tainted by gender harassment issues.

The faculty control the research program at Caltech, and they must therefore take the lead in confronting the culture of harassment within that program. We recommend that the faculty consider how best to implement changes in the laboratory environment; they may find the services of the external consultant to be helpful in making this assessment. Some options include the evaluation of all laboratory environments by outside experts in harassment issues, evaluations by leaders within the academic divisions, or mandatory meetings of all campus research groups with experts in workplace harassment once every several years. However the laboratory environment is changed, it is critical that change occurs and that women are genuinely welcomed and respected in the Caltech workplace.

3) That focus groups of graduate students be formed to discuss the issues raised in this report. The external consultant may independently choose to form such groups, in which case we defer to her or his judgment in how they should be organized. We believe that small group dynamics allow for more open and honest discourse on the issue of gender harassment than would be possible in large "town hall" forums held at the divisional or institute level. For similar reasons, we recommend that any Caltech-organized focus groups be led by Student Affairs professionals and not by faculty.

We envision these focus groups providing invaluable, detailed, first-hand information in the investigation of gender harassment in the graduate program, as well as providing suggestions for how to change laboratory environments. While the proceedings of the focus groups should be kept absolutely confidential, we highly recommend that a summary of general topics discussed be recorded and shared with the external consultant, the faculty, and the graduate student body to encourage a broader discussion.

Recommendations — continued

4) That an institute task force be formed to act as a central clearinghouse for all information gathered and initiatives undertaken in response to the reported gender harassment in the graduate program. This task force may be the same body identified by the external consultant as having the responsibility for further monitoring of harassment levels; at a minimum, the task force should be composed of faculty from each of the six academic divisions, graduate students, and representatives from the Student Affairs organization. This work of this task force would be crucial in ensuring that the divisions coordinate their efforts in eliminating gender harassment in the graduate program. Rather than leaving each division to approach the problem of harassment separately, which would almost certainly lead to the unnecessary duplication of some work, the task force would enable the creation of one common dataset and would also be able to advise faculty members and various campus entities as to which initiatives have been successful for other groups. The task force should be required to report periodically to the faculty and to the graduate student body.

5) That orientation programs be held regularly that include a detailed discussion of what constitutes gender harassment and a focus on what campus resources are available for women and men who feel they have been subjected to harassment. The rights of those who believe they have experienced harassment and the rights of those who are accused of harassment should be explained in clear language, as opposed to complex legal terminology. The possible consequences for those who are found to have violated institute policies prohibiting harassment should also be discussed.

6) That surveys of graduate students which gauge the extent of gender harassment at Caltech, based upon the present survey instrument but with more detailed and quantitative questions as suggested by the results of this report, be conducted on a regular basis. Data on harassment levels at the Institute must be kept current. We recommend a survey at least once every five years, so that the efficacy of any actions taken in response to one survey may be fairly assessed in time for the next.

Appendix A: Statistical Significance

We assume the reader to have at least a basic understanding of statistics and hypothesis testing. For this report, we have adopted the convention of declaring as significant those differences between groups for which significance testing returns a p-value less than or equal to 0.05. (A p-value of 0.05 is analogous to a 95% confidence interval.)

For questions F1 and F2a–c, responses of *occasionally* and *frequently* are combined into one *occasionally or frequently* category. Fisher's Exact Test is then used to determine a p-value for the difference between two groups based on their total numbers of *never* and *occasionally or frequently* responses.

For question F8a and question J1c, the numbers of *slightly agree, agree,* and *strongly agree* responses from a given group are added to form one combined *agree* category; a similar merging is done with the *disagree* responses. The number of combined *agree,* combined *disagree,* and *neither agree nor disagree* responses from two groups are then compared using chi-squared testing.

Numerous internet-based calculators are available for computing a p-value from a given data set. The authors acknowledge the use of the following web sites:

Fisher's Exact Test
http://www.matforsk.no/ola/fisher.htm
http://www.unc.edu/~preacher/fisher/fisher.htm

Chi-Squared Test
http://www.graphpad.com/quickcalcs/PValue1.cfm
http://www.unc.edu/~preacher/chisq/chisq.htm

The following tables list the results of significance tests between groups based on their responses to the gender harassment and gender diversity climate questions. Shaded cells contain comparisons with p-values indicating significance ($p \leq 0.05$).

Unwanted Attention Based on Gender								
Group A	Group B	p-value	Group A	Group B	p-value	Group A	Group B	p-value
All Female	**All Male**	**7.1×10^{-34}**	**Female BIO**	**Female CCE**	**0.017**	Male BIO	Male CCE	0.71
Female U.S.	**Male U.S.**	**4.7×10^{-25}**	Female BIO	Female EAS	0.82	Male BIO	Male EAS	0.40
Female Visa	**Male Visa**	**1.7×10^{-9}**	Female BIO	Female GPS	0.065	Male BIO	Male GPS	1
Female U.S.	Female Visa	0.073	Female BIO	Female PMA	0.80	Male BIO	Male PMA	0.14
Male U.S.	Male Visa	0.51	**Female CCE**	**Female EAS**	**0.015**	Male CCE	Male EAS	0.43
Female BIO	**Male BIO**	**0.017**	Female CCE	Female GPS	0.77	Male CCE	Male GPS	1
Female CCE	**Male CCE**	**7.7×10^{-14}**	**Female CCE**	**Female PMA**	**0.0049**	Male CCE	Male PMA	0.18
Female EAS	**Male EAS**	**7.3×10^{-10}**	**Female EAS**	**Female GPS**	**0.050**	Male EAS	Male GPS	1
Female GPS	**Male GPS**	**0.00018**	Female EAS	Female PMA	0.51	Male EAS	Male PMA	0.51
Female PMA	**Male PMA**	**2.4×10^{-5}**	**Female GPS**	**Female PMA**	**0.017**	Male GPS	Male PMA	0.45

Appendix A: Statistical Significance — continued

Negative Comments About Scientific Ability								
Group A	Group B	p-value	Group A	Group B	p-value	Group A	Group B	p-value
All Female	**All Male**	**$1.1x10^{-27}$**	**Female BIO**	**Female CCE**	**0.00024**	Male BIO	Male CCE	0.41
Female U.S.	**Male U.S.**	**$3.5x10^{-23}$**	Female BIO	Female EAS	0.46	Male BIO	Male EAS	0.11
Female Visa	**Male Visa**	**$1.7x10^{-5}$**	**Female BIO**	**Female GPS**	**0.0077**	Male BIO	Male GPS	0.54
Female U.S.	**Female Visa**	**0.0091**	Female BIO	Female PMA	0.40	Male BIO	Male PMA	0.36
Male U.S.	Male Visa	1	**Female CCE**	**Female EAS**	**0.00075**	Male CCE	Male EAS	0.50
Female BIO	Male BIO	0.31	Female CCE	Female GPS	1	Male CCE	Male GPS	1
Female CCE	**Male CCE**	**$1.0x10^{-14}$**	**Female CCE**	**Female PMA**	**0.0094**	Male CCE	Male PMA	1
Female EAS	**Male EAS**	**$1.6x10^{-7}$**	**Female EAS**	**Female GPS**	**0.031**	Male EAS	Male GPS	1
Female GPS	**Male GPS**	**0.00018**	Female EAS	Female PMA	0.81	Male EAS	Male PMA	0.70
Female PMA	**Male PMA**	**0.00020**	Female GPS	Female PMA	0.064	Male GPS	Male PMA	1

Use of Demeaning Language								
Group A	Group B	p-value	Group A	Group B	p-value	Group A	Group B	p-value
All Female	**All Male**	**$4.1x10^{-22}$**	**Female BIO**	**Female CCE**	**$5.8 x10^{-5}$**	Male BIO	Male CCE	0.77
Female U.S.	**Male U.S.**	**$9.8x10^{-18}$**	Female BIO	Female EAS	0.34	Male BIO	Male EAS	0.062
Female Visa	**Male Visa**	**0.00014**	Female BIO	Female GPS	0.094	Male BIO	Male GPS	1
Female U.S.	**Female Visa**	**0.00016**	Female BIO	Female PMA	0.19	**Male BIO**	**Male PMA**	**0.048**
Male U.S.	**Male Visa**	**0.027**	**Female CCE**	**Female EAS**	**0.00048**	**Male CCE**	**Male EAS**	**0.041**
Female BIO	Male BIO	0.75	Female CCE	Female GPS	0.26	Male CCE	Male GPS	1
Female CCE	**Male CCE**	**$9.3x10^{-11}$**	**Female CCE**	**Female PMA**	**0.012**	**Male CCE**	**Male PMA**	**0.038**
Female EAS	**Male EAS**	**$4.1x10^{-6}$**	Female EAS	Female GPS	0.37	Male EAS	Male GPS	0.29
Female GPS	Male GPS	0.052	Female EAS	Female PMA	0.65	Male EAS	Male PMA	0.76
Female PMA	**Male PMA**	**$2.8x10^{-5}$**	Female GPS	Female PMA	0.55	Male GPS	Male PMA	0.22

Exposure to Offensive Material								
Group A	Group B	p-value	Group A	Group B	p-value	Group A	Group B	p-value
All Female	**All Male**	**$1.8x10^{-8}$**	Female BIO	Female CCE	0.24	Male BIO	Male CCE	1
Female U.S.	**Male U.S.**	**$5.5x10^{-6}$**	Female BIO	Female EAS	0.22	Male BIO	Male EAS	0.66
Female Visa	**Male Visa**	**0.0029**	Female BIO	Female GPS	1	Male BIO	Male GPS	0.54
Female U.S.	**Female Visa**	**0.0047**	Female BIO	Female PMA	0.34	Male BIO	Male PMA	0.72
Male U.S.	**Male Visa**	**0.00033**	**Female CCE**	**Female EAS**	**0.0061**	Male CCE	Male EAS	0.28
Female BIO	Male BIO	0.15	Female CCE	Female GPS	0.56	Male CCE	Male GPS	0.60
Female CCE	**Male CCE**	**0.00012**	**Female CCE**	**Female PMA**	**0.026**	Male CCE	Male PMA	0.61
Female EAS	Male EAS	0.11	Female EAS	Female GPS	0.22	Male EAS	Male GPS	1
Female GPS	**Male GPS**	**0.045**	Female EAS	Female PMA	1	Male EAS	Male PMA	0.092
Female PMA	Male PMA	1	Female GPS	Female PMA	0.25	Male GPS	Male PMA	0.34

Climate at Caltech is Supportive of Gender Diversity								
Group A	Group B	p-value	Group A	Group B	p-value	Group A	Group B	p-value
All Female	All Male	0.61	Female BIO	Female CCE	0.35	Male BIO	Male CCE	0.069
Female U.S.	Male U.S.	0.18	**Female BIO**	**Female EAS**	**0.018**	**Male BIO**	**Male EAS**	**0.038**
Female Visa	Male Visa	0.32	Female BIO	Female GPS	0.36	Male BIO	Male GPS	0.099
Female U.S.	**Female Visa**	**0.020**	Female BIO	Female PMA	0.20	Male BIO	Male PMA	0.061
Male U.S.	Male Visa	1	**Female CCE**	**Female EAS**	**$5.6x10^{-5}$**	Male CCE	Male EAS	0.56
Female BIO	Male BIO	0.090	Female CCE	Female GPS	0.90	Male CCE	Male GPS	0.35
Female CCE	**Male CCE**	**0.014**	**Female CCE**	**Female PMA**	**0.023**	Male CCE	Male PMA	0.12
Female EAS	Male EAS	0.17	**Female EAS**	**Female GPS**	**0.0012**	Male EAS	Male GPS	0.14
Female GPS	Male GPS	0.69	Female EAS	Female PMA	0.37	**Male EAS**	**Male PMA**	**0.0044**
Female PMA	Male PMA	0.063	Female GPS	Female PMA	0.072	Male GPS	Male PMA	0.90

Appendix B: Caltech Graduate Student Demographics

The following table explains how the academic options identified in Caltech's Fall 2002 IPEDS data (Integrated Postsecondary Education Data System) have been sorted into academic divisions for purposes of this report. Note that not all options listed in the table are necessarily represented in the survey population.

Academic Division	Academic Options Associated with that Division
Biology (BIO)	Biochemistry and Molecular Biophysics, Biology
Chemistry and Chemical Engineering (CCE)	Chemical Engineering, Chemistry
Engineering and Applied Science (EAS)	Aeronautics, Applied and Computational Mathematics, Applied Mechanics, Applied Physics, Bioengineering, Civil Engineering, Computation and Neural Systems, Computer Science, Control and Dynamical Systems, Electrical Engineering, Environmental Science and Engineering, Materials Science, Mechanical Engineering
Geological and Planetary Sciences (GPS)	Geobiology, Geochemistry, Geological and Planetary Science, Geology, Geophysics, Planetary Science
Humanities and Social Sciences (HSS)	Social Science
Physics, Mathematics, and Astronomy (PMA)	Astronomy, Mathematics, Physics

The first two columns in the table below list the gender composition, as stated in the Caltech IPEDS data, of the entire graduate student body, the academic divisions, and the two citizenship status groups identified in our survey. The gender composition of the survey population from these same categories is listed in the next two columns. The survey response rate is calculated by assuming the total population of a given group to be that which is stated in the IPEDS data. As that data was collected in Fall 2002 and the GSC/WEST survey was conducted in May–June 2003, there may be discrepancies between the reported response rates and the actual values at the time of the survey.

	Fall 2002 IPEDS		Survey Population		Survey Response Rate	
	Female	**Male**	**Female**	**Male**	**Female**	**Male**
All Graduate Students	26.5%	73.5%	33.4%	66.6%	72.1%	51.8%
Academic Divisions						
BIO	34.7%	65.3%	49.3%	50.7%	83.7%	45.7%
CCE	29.7%	70.3%	36.5%	63.5%	76.3%	56.1%
EAS	21.5%	78.5%	23.9%	76.1%	59.2%	51.5%
GPS	43.5%	56.5%	47.2%	52.8%	63.0%	54.3%
HSS	52.0%	48.0%	53.3%	46.7%	61.5%	58.3%
PMA	21.2%	78.8%	29.8%	70.2%	78.3%	49.7%
Citizenship Status						
U.S. Citizens and Permanent Residents	28.9%	71.1%	36.2%	63.8%	75.9%	54.2%
Student Visa Holders	23.0%	77.0%	28.6%	71.4%	65.1%	48.5%

Appendix C: References

[Caltech] *Institute Policy on Unlawful Harassment.* 2003 (Revised).
Gutek, B. and Searle, S. *Quality of Academic and Work Life Survey: Report.* 1990.
Huang, A. *Report on the Status of Women at Caltech.* 1999.
United States Equal Employment Opportunity Commission. http://www.eeoc.gov

Appendix D: Summary Tables of Results

The "Never" percentages listed in the "At Least One Form of Harassment" columns of the following tables represent only those respondents who answered *never* for each of questions F1, F2a, F2b, and F2c. Note that percentages in this report may not sum to 100 due to rounding and the exclusion of *don't know* and *not applicable* responses.

Results by Gender		Unwanted Attention	Negative Comments about Scientific Ability	Demeaning Language	Offensive Material	At Least One Form of Harassment
Female	Never	50.9%	59.4%	58.5%	76.3%	30.2%
	Occasionally or Frequently	44.6%	36.6%	39.3%	21.4%	63.1%
Male	Never	88.4%	91.3%	88.2%	89.5%	76.1%
	Occasionally or Frequently	5.1%	4.0%	7.6%	6.0%	15.4%
The Climate at Caltech is Supportive of Gender Diversity						
Female	Agree	52.7%				
	Disagree	35.7%				
	Neither	9.4%				
Male	Agree	52.6%				
	Disagree	29.8%				
	Neither	8.7%				

Results by Citizenship Status		Unwanted Attention	Negative Comments about Scientific Ability	Demeaning Language	Offensive Material	At Least One Form of Harassment
Female Student Visa	Never	59.4%	69.0%	73.2%	85.9%	35.2%
	Occasionally or Frequently	34.8%	22.5%	19.7%	9.9%	53.5%
Female U.S. Students	Never	47.1%	54.9%	51.6%	71.9%	27.9%
	Occasionally or Frequently	49.0%	43.1%	48.4%	26.8%	67.5%
Male Student Visa	Never	86.4%	89.2%	90.4%	92.7%	76.8%
	Occasionally or Frequently	4.0%	4.0%	4.0%	1.1%	11.3%
Male U.S. Students	Never	89.7%	92.6%	86.7%	87.4%	75.6%
	Occasionally or Frequently	5.9%	4.1%	10.0%	9.3%	18.1%
The Climate at Caltech is Supportive of Gender Diversity						
Female Student Visa	Agree	66.7%				
	Disagree	23.2%				
	Neither	7.2%				
Female U.S. Students	Agree	47.3%				
	Disagree	40.7%				
	Neither	10.0%				
Male Student Visa	Agree	51.7%				
	Disagree	29.0%				
	Neither	8.5%				
Male U.S. Students	Agree	53.1%				
	Disagree	30.3%				
	Neither	8.9%				

Appendix D: Summary Tables of Results — continued

Female Results by Division		Unwanted Attention	Negative Comments about Scientific Ability	Demeaning Language	Offensive Material	At Least One Form of Harassment
BIO	Never	58.3%	80.6%	80.6%	77.8%	47.2%
	Occasionally or Frequently	33.3%	19.4%	19.4%	19.4%	44.4%
CCE	Never	34.4%	40.0%	38.3%	66.7%	13.1%
	Occasionally or Frequently	59.0%	58.3%	61.7%	31.7%	86.9%
EAS	Never	57.4%	68.9%	67.2%	86.9%	42.6%
	Occasionally or Frequently	37.7%	26.2%	27.9%	9.8%	52.5%
GPS	Never	31.3%	35.3%	52.9%	76.5%	5.9%
	Occasionally or Frequently	68.8%	52.9%	41.2%	23.5%	76.5%
PMA	Never	68.6%	63.9%	63.9%	88.9%	44.4%
	Occasionally or Frequently	31.4%	27.8%	33.3%	11.1%	44.4%
The Climate at Caltech is Supportive of Gender Diversity						
BIO	Agree	47.2%				
	Disagree	38.9%				
	Neither	13.9%				
CCE	Agree	37.7%				
	Disagree	52.5%				
	Neither	8.2%				
EAS	Agree	72.1%				
	Disagree	14.8%				
	Neither	9.8%				
GPS	Agree	35.3%				
	Disagree	58.8%				
	Neither	5.9%				
PMA	Agree	63.9%				
	Disagree	25.0%				
	Neither	5.6%				

Appendix D: Summary Tables of Results — continued

Male Results by Division		Unwanted Attention	Negative Comments about Scientific Ability	Demeaning Language	Offensive Material	At Least One Form of Harassment
BIO	Never	81.1%	83.8%	78.4%	86.5%	67.6%
	Occasionally or Frequently	8.1%	8.1%	13.5%	5.4%	18.9%
CCE	Never	85.8%	93.4%	85.8%	90.5%	73.6%
	Occasionally or Frequently	6.6%	4.7%	12.3%	7.6%	17.0%
EAS	Never	89.2%	92.7%	90.7%	91.8%	78.6%
	Occasionally or Frequently	4.6%	2.6%	5.2%	4.1%	13.2%
GPS	Never	89.5%	89.5%	84.2%	94.7%	73.7%
	Occasionally or Frequently	5.3%	0.0%	10.5%	0.0%	15.8%
PMA	Never	94.1%	91.8%	91.8%	84.7%	78.8%
	Occasionally or Frequently	2.4%	3.5%	3.5%	9.4%	15.3%
The Climate at Caltech is Supportive of Gender Diversity						
BIO	Agree	45.9%				
	Disagree	40.5%				
	Neither	0.0%				
CCE	Agree	55.7%				
	Disagree	28.3%				
	Neither	9.4%				
EAS	Agree	60.1%				
	Disagree	24.9%				
	Neither	6.7%				
GPS	Agree	31.6%				
	Disagree	36.8%				
	Neither	10.5%				
PMA	Agree	40.0%				
	Disagree	36.5%				
	Neither	14.1%				