

**Harvard-Smithsonian Center for Astrophysics
Gender Equity Study Qualitative Report**

Wendy D. Roth
Harvard University

**Prepared for the CfA Gender Equity Committee
December 13, 2004**

**Harvard-Smithsonian Center for Astrophysics
Gender Equity Study Qualitative Report**

TABLE OF CONTENTS

I. OVERVIEW	1
II. EXPLICIT DISCRIMINATION AND HARASSMENT	4
III. GENDER DIFFERENTIATION IN THE CfA CULTURE AND SOCIAL ATMOSPHERE	7
<i>Treatment in Meetings and Talks</i>	8
<i>Exclusion and Marginalization in Discussions</i>	10
<i>Lack of Support, Encouragement, or Promoting Work outside CfA</i>	12
<i>Disrespectful Treatment</i>	15
<i>Inappropriate Comments</i>	19
<i>Double Standards in Evaluating Performance</i>	20
<i>Power Dynamics: Female Non-Scientists</i>	22
<i>Male Scientists and Non-Scientists</i>	26
IV. CfA ORGANIZATIONAL STRUCTURE AND GENDER INEQUITY	30
<i>Organizational Fragmentation and the Centrality of the Supervising Relationship</i>	32
<i>Managerial Training and Management Skills</i>	36
<i>Unclear Criteria for Promotion</i>	42
<i>Information Diffusion and the Distribution of Resources</i>	43
<i>Personal Networks and Informal Mentoring</i>	47
<i>Organizational Barriers to Perceiving Gender Inequities</i>	52
V. LEADERSHIP POSITIONS AND CAREER PRIORITIES	53
<i>Support for Families</i>	55
VI. CONCLUSIONS & POLICY RECOMMENDATIONS	57
Appendix A: Contact Procedures and Responses	63
Appendix B: E-mail Invitation to Participate in Interview	64
Appendix C: Consent Form	65
Appendix D: Interview Guide	67

Harvard-Smithsonian Center for Astrophysics

Gender Equity Study Qualitative Report

I. OVERVIEW

This qualitative study of gender equity in the CfA community was initiated by the Harvard-Smithsonian Center for Astrophysics Gender Equity Committee (CGEC). This report serves as one component of a larger body of research initiated by CGEC to examine the status of women at the CfA and determine the existence and possible causes of any gender inequities. The purpose of this qualitative component of the research project is to explore the experiences of the CfA community in greater detail than is possible with survey research.

Between June and September 2004, 60 interviews were conducted with CfA employees and postdoctoral fellows. The study was designed to cover scientists and non-scientists, as well as men and women. Fifteen interviews were conducted with each of the following groups: female scientists, female non-scientists, male scientists, male non-scientists. Interviewees were randomly selected. Four separate lists dividing all CfA employees and fellows based in Cambridge into these four categories were provided by the CGEC. From these lists, people selected at random were invited to participate in an interview until the quota of 15 interviewees in each category had been met. Graduate students, visiting fellows, and contractors were outside the scope of the study (see Appendix A).

The interviews lasted approximately an hour. In addition to specific questions about gender equity at CfA, the interviews covered a number of topics ranging from career advancement and the promotion process, to the work climate, the organizational structure of CfA, and balancing family and work (see Appendix D).¹ The interviews were tape recorded and transcribed. A qualitative data analysis program, Atlas.ti, was used to explore differences between the four categories in people's experiences with these topics.

In this report, names have been omitted or replaced with pseudonyms and all information indicating specific divisions, departments, or other recognizable groups has been changed. Other non-essential details may have been changed to disguise the identity of particular individuals or groups. Where the details of an incident could not be changed to protect individuals' confidentiality, the examples were omitted.

The findings presented in this report are not statistically representative of the CfA. The purpose of qualitative research is to uncover patterns in people's experiences, particularly those revealing differences in the categories being analyzed, and to understand the mechanisms behind those different experiences. In particular, this analysis is intended to provide a more detailed understanding of the statistical results of the CGEC survey of gender equity, conducted by Dr. Gerhard Sonnert.

The survey of gender equity has revealed statistically significant differences in the experiences of the four groups being considered. To summarize, the survey found that

¹ These topics served as a organizing framework for the interview; however, the specific questions asked in each interview varied, based on the nature of the respondent's experiences and the need for in-depth follow-up questions to explore those experiences in greater detail.

women were less likely than men to agree or agree strongly that staff were treated without regard to gender in terms of work assignments, performance evaluations, and career advancement. Women scientists were most likely to perceive gender bias, and those who had been at the CfA for longer periods of time were more likely than newer hires to feel that staff are differentiated by gender in their division or department and within the CfA in general. Women were less likely than men to report that they had received a formal opportunity to take on a leadership position at CfA and fewer women felt supported in their advancement to promotion. Women were also more likely than men to report that they had encountered unwritten rules concerning how one is expected to interact with colleagues. Women scientists most strongly felt that they often forewent personal activities because of work, while women non-scientists disagreed most strongly with this statement.

Although the qualitative study is based on a random sample, there may be some selection bias if employees with no experiences of gender differentiation were less interested in taking part in the study (see Appendix A for contact responses).² However, in general, the findings of the survey and the qualitative study are quite consistent, as highlighted in this report.

The findings of the qualitative study may be summarized as follows:

- Most female scientists believed that women are not treated equitably to their male colleagues at CfA. Almost all female scientists who had been at the CfA for 5 years or more, reported experiences where they felt disrespected, uncomfortable, or believed that they were not given equal encouragement or consideration by their colleagues or supervisors.
- Female scientists who had been at the CfA for less than five years, referred to in this report as junior scientists,³ had more diverse experiences. Some reported personal experiences of disrespectful or unequal treatment or observed it in the treatment of other women at CfA. Others had no such experiences and did not perceive any gender equity problems at CfA. This difference between junior and more advanced female scientists is consistent with the survey finding that female scientists who had been at CfA for longer periods of time were less likely than newer arrivals to believe that staff are treated without regard to their gender.
- The experiences of female non-scientists were also very diverse. Most of them had high levels of job satisfaction and had neither experienced any disrespectful or inequitable treatment of women nor observed it elsewhere in the organization. However, a subgroup of female non-scientists experienced antagonistic or

² Selection bias is relevant to determining whether specific forms of treatment are experienced more by some groups of employees than others. From the perspective of identifying the patterns of differential treatment, it can be beneficial for a sample to include more individuals who had experienced the treatment being explored, particularly when the study is complemented by a more statistically representative quantitative analysis.

³ All of the female scientists interviewed who had been at the CfA for less than 5 years were at early stages of their careers and were typically younger than those who had been at the CfA for longer periods of time. For this reason, I refer to them as “junior” scientists. 7 of the 15 female scientists interviewed fell into this category.

condescending treatment from their supervisors or other higher status employees. In these cases, they felt vulnerable to perceived inappropriate behavior due to their lower status positions within the organization. In many cases, it was difficult for female non-scientists to determine whether this treatment was related to gender because of the lack of male counterparts for comparison.

- Only a few women, either scientists or non-scientists, experienced overt forms of discrimination, sexual harassment, or inappropriate comments by male colleagues. But many women felt that subtle differences in the treatment of men and women create a social atmosphere where women feel that their contributions and abilities are not given equal weight. The types of experiences they described included substandard treatment in meetings and talks; exclusion or marginalization in discussions; a belief that they were not encouraged, supported, or that their work was not promoted by their supervisors; disrespectful treatment; or inappropriate comments. Some women also believed their gender created double standards in the way their performance was evaluated.
- Male scientists and non-scientists expressed fewer problems and higher levels of satisfaction with their opportunities for career advancement at CfA, as is consistent with survey results. Some male scientists and non-scientists perceived the same types of disrespectful or inequitable treatment as described by their female colleagues, but did not feel specifically targeted in this treatment or felt that such treatment subsided after a short period of initiation into the CfA. No major differences were found between the experiences of junior male scientists and male scientists who had been at CfA for more than 5 years.
- Most male non-scientists did not perceive any unequal treatment of women. More male scientists than non-scientists were attuned to potential gender inequities, but also felt they were not in a position to recognize the extent of gender inequities that might exist.
- The subtle disadvantages that women believed they faced are fostered and augmented by various aspects of the organizational structure and norms of the CfA such that the structure may enhance gender inequities without the explicit recognition of most CfA employees or leaders. This was experienced in many ways including:
 - The isolation of divisions and departments, and differences in the way these units are run, created problems of communication and the diffusion of information. Interviewees felt this structure led to informality or randomness in the way decisions were made, or a lack of systematic policies to ensure equal treatment throughout the organization. This resulted in a perception of secrecy or “unwritten rules” for promotions and resource allocation. Women, particularly female scientists, were more troubled by their uncertainty over the criteria for advancement.

- Due to the uneven distribution of information, personal networks—especially access to individuals in decision-making positions—were seen by many as the most important resource to accomplish individual goals. Women are likely more disadvantaged by a more informal decision-making structure based on personal networks, due to their greater difficulty establishing mentors at higher levels, where fewer women are present.
- Interviewees in all four categories observed considerable variation in people's experiences based on their relationship with their individual supervisor. This led to a perceived lack of alternatives if problems with a supervisor should arise. The de-emphasis of managerial skills in those supervisory relationships contributed to potential problems, particularly for more junior employees. Female scientists and non-scientists were more likely to describe these as concerns or problems.
- Many people complained of social isolation and a lack of interaction between different departments and divisions. This, together with the perceived lack of information diffusion, may explain why many respondents outside the female scientist group were unaware of any gender equity problems in the CfA.
- There were no consistent patterns with regard to employees' experiences with CfA family policies. The vast majority of respondents were extremely satisfied with the support they received from supervisors if family issues or emergencies arose. Several employees who had had small children while at CfA were dissatisfied with the leave policies or lack of daycare facilities, but there was not a strong consensus on the need for stronger family policies.

II. EXPLICIT DISCRIMINATION AND HARASSMENT

Relatively few of the female scientists or female non-scientists interviewed had experienced overt forms of gender discrimination or sexual harassment. Approximately half of the instances that emerged in the in-depth interviews took place many years ago. Two women, one scientist and one non-scientist, described being told that they were passed over for career opportunities because of assumptions that their husbands would support them and they did not need the money. A female non-scientist explained that she felt she had no chance of career advancement at CfA because her boss held this attitude:

Q: How satisfied have you been with the opportunities for career advancement at CfA?

There was none for me. None. Every time I ask my boss for a raise he will tell me I don't need the money because he knows that my husband [earns enough money] and I'm just there [by choice].

Her boss repeatedly used the argument that she had no financial need to be working there as a way to avoid accommodating any concerns she raised. She explained that he would often say to her directly, “If I didn’t like it, I should leave.”

A female scientist who had been at CfA for many years also described how, shortly after joining CfA, her salary was lower than that of a male colleague in a similar position because of assumptions that, as a woman, she needed the money less:

I discovered that another [male employee] who was really comparable to me [had a salary] ten thousand dollars higher than mine...Well, so I went and I researched it. How many papers did he publish? How many papers did I publish? You know, what had I done? How many conferences? I went through all the usual things. And I went to see my boss...and I said...you know, “[his] salary is ten thousand dollars higher than mine.” And he looked at me. He said, “Yeah, well, you know, you’re married. You’ve got a husband; you don’t need the money so we’re giving it to him.”

Another female scientist revealed that she was passed over for a promotion because of assumptions that her husband’s career would take precedence over her own:

Several years [ago]...along came a position to work out in [a CfA location outside of Cambridge]. And I applied for it. And I was the only woman ranked in the top candidates...I didn’t get the job, and I was later told I didn’t because my husband probably would not have moved to [that location]. Now it turned out he would have, but no one bothered to ask me. They just turned me down on the basis of their feelings about what they felt my family situation was, without ever even asking.

Some of these women were unsure whether similar instances would take place at the CfA today, since organizations are generally more alert to the dangers of overt gender discrimination. Nonetheless, explicit forms of gender discrimination that happened in the past colored these women’s experiences with CfA, often making them more attuned to subtler forms of unequal treatment that continue to exist. In some cases, these negative experiences actually hindered the types of opportunities that women at CfA took advantage of. The scientist who was turned down for a promotion explained that she believed this discriminatory treatment of women still exists, if more subtly, and that it discouraged her from applying for other positions that came along.

Q: Do you feel that those attitudes still exist now?

Yes, yes. I mean, they obviously do. They’re now institutionalized and federalized because no women have been hired in these positions.

Q: Have you had experiences here at CfA where you felt that you deserved certain positions or promotions that you were passed over for?

Yes, that was one of them. I didn't bother applying to any more because that was such an underhanded experience. What was the point?

Other women at CfA, too, believed that gender discrimination continues to exist, even if those responsible are less explicit in attributing their actions to considerations of gender. Indeed, to make such an explicit statement now could open the individual to legal action. Yet this female scientist believed that gender discrimination is nonetheless apparent. She described how some of her male colleagues refuse to give assignments to the women she manages and instead deal only with the men on her team.

It's really the disrespect that has been so difficult. And it *is* discrimination because I have a team right now, a group of people [who] work for me, [including] women and...men. And...the higher-level people, about my level, will not talk to the two women in my group. They wait until [the women are not around] and then call...in, talk to [the men]. And my people know this. They don't know what to do about it, but they know it.

Q: ...And how do the men who are in your group respond to this or deal with it?

It's a very tense situation for them because, of course, they're quite junior to the men who are calling them and giving them an assignment or telling them things to do. And so they don't feel that they can say anything. But they know what's going on. They don't feel in a position to act on [it]. But they're not comfortable. And we've talked about it, you know. And I've said..."You know, this is not your problem. Just go along. If you're asked to do something, go ahead and do it."

Not only does this create an uncomfortable work environment, but the women on her team are denied opportunities to gain experience that might help their careers.

Only one of the women interviewed had experienced sexual harassment, although others had had to deal with it either in a managerial capacity or as an advisor to other colleagues. A female scientist explained that she felt sexually harassed several years earlier:

I was at a meeting...and a very senior person was sitting there playing with my foot during the meeting...[It's] like you're sitting here with your legs crossed and all of a sudden, his foot's kind of going around your foot. And you think, this isn't what I had in mind. Well, I moved my feet away and I sat at the other end of the table for the...next several meetings or something like that. Nothing was ever said, but it was very strange.

She never pursued a complaint because she felt it would have harmed her relationship with her colleagues. Another female scientist had to deal with such a complaint against one of the people she supervised. After looking into the matter, she felt that it represented a clear case of sexual harassment that called for severe disciplinary action. However, she felt that her intolerance for sexual harassment was not supported by those higher up at CfA, who

criticized her actions. Another female scientist claims that overt sexual discrimination or sexual harassment is rare at CfA, although when it does occur it is more likely to involve female non-scientists who have less power to successfully contend with it. She described two instances of inappropriate sexual comments made by one individual toward two different non-scientist women.

I think it tends to happen more towards younger women...Also,...[the] two cases I know of are not scientists. I think it seems easier to the man who did this...They're more inclined to say inappropriate things to women who are lower level. And...the two women who...told me that,...the things that they've told me I would consider over the line. But...he's never gone that far in a conversation with me...And, again, I mean, it's intended in good fun, kind of not really...to treat people horribly. But I think...he doesn't understand that the relationship is a power base relationship and that it's even less appropriate with him, not more appropriate.

The qualitative research cannot speak to the extent of sexual harassment and overt gender discrimination at the CfA. Yet even this relatively small number of interviews revealed that instances still do occur.

III. GENDER DIFFERENTIATION IN THE CfA CULTURE AND SOCIAL ATMOSPHERE

Most of the female participants who believed they experienced inappropriate or disrespectful treatment because of their gender said it was not a result of explicit discrimination. Rather, it was hidden in the daily social interactions and practices that make up the organizational culture at CfA. They noted subtle differences in the way men and women were treated, how they were spoken to, and how their work was regarded. Women repeatedly described subtle ways in which they felt they were differentiated or disadvantaged because of their gender. These issues typically related more to scientific interactions, and therefore emerged more from interviews with female scientists, although some of the same problems also affected female non-scientists. In meetings, conferences, and talks, women felt they had to fight to make their comments heard and their contributions were often not valued. They noted differences in the way women were spoken to and questioned. Some women felt excluded from scientific conversations with male colleagues and were uncomfortable joining in discussions. Female scientists reported not being taken seriously by some male peers, feeling that their contributions were not respected, or that their work was not equally encouraged and promoted by their supervisors. Such experiences reflected a social climate where women are not always held in equal esteem, and occasional inappropriate comments belittling women reinforced an atmosphere where women felt unsupported.

Research such as this helps reveal the patterns in women's experiences. Yet these trends, and their relation to gender, are often not clear even to the individuals involved. Often these patterns were unnoticeable to those who were not already attuned to them. Many women, particularly non-scientists, did not believe women were systematically treated

differently than men at CfA. Those involved in an uncomfortable situation may puzzle over all the potential causes, often internalizing the problem and assuming that their contributions are undervalued because they are not as good as a male peers'. Scientists, true to their analytical training, were particularly reluctant to make causal inferences about the treatment they received lacking appropriate comparisons. This study cannot systematically control for every potential alternate explanation in each negative experience women described, but by comparing the four groups of interviewees, it does reveal what experiences emerged from which groups. Women much more frequently described disrespectful treatment, difficulties with their supervisors, exclusion from group discussions, or feeling that their contributions were not welcomed. These themes were much less likely to emerge in the interviews with male scientists or non-scientists.³

Treatment in Meetings and Talks

One male scientist explained that he was completely unaware of any differences in how men and women were treated in meetings until a female colleague pointed it out. After that, he began to pay attention and noticed how one male colleague would consistently cut off a female colleague.

I've been in these meetings where [women] have not been listened to as carefully...It's basically [this one scientist, John]. He's a nice guy. I have a lot of respect for him. He's incredibly capable, but I know that when [our group] has a meeting,...there are a couple of women in particular that it's almost impossible for him to allow them to finish a sentence...And it's like a blind

³ Because of the nature of qualitative research, it is extremely difficult to quantify the precise extent to which the different groups experience these types of treatment. These patterns emerged over the course of the fieldwork, volunteered by some respondents as the interviewer probed their subjective experiences; therefore the same questions are not asked of every respondent. However, with these substantial caveats, it may be helpful to indicate the extent to which these responses appeared within these interviews in order to provide some context for the discussion. Taking together the five types of experiences some respondents believed were affected by their gender (treatment in meetings and talks—including limiting participation or harsher criticism; exclusion and marginalization in discussions; lack of support, encouragement or promoting work outside CfA; disrespectful treatment; and inappropriate comments), 73.3% of the female scientists interviewed personally experienced at least one type of such treatment. 88.9% of female scientists who had been at the CfA for more than 5 years mentioned at least one item, as did 50% of junior female scientists. 66.7% of female non-scientists experienced one of these forms of treatment. The comparable figures for male scientists and male non-scientists respectively, are 30.8% and 26.7%. For those who did experience at least one of these types of treatment in each employee category, the mean number of types of behavior is as follows: male scientists=1.25; male non-scientists=1.0; female scientists=3.09; female non-scientists=1.5. One should bear in mind that different findings might emerge if specific questions about each type of behavior were asked consistently of every respondent in a survey-like format.

Because it is possible that the qualitative sample is biased toward people who have experienced disrespectful treatment, a 95% confidence interval (i.e. 2 standard errors on either side of the point estimate) can be calculated to determine the lower limit probability of experiencing one of these forms of treatment if we assume that the contacted employees who were eligible and did not participate all did not experience any of these forms of treatment. In the female scientist category, for example, the lower limit of the 95% confidence interval is .212; therefore even if we assume selection bias in the sample, the qualitative results represent at least 21.2% of female scientists who experienced one or more forms of the gender differentiated treatments described here.

spot because I don't think he thinks of himself as sexist, and I don't think he's even necessarily aware that this is going on. In fact, I wasn't aware until [Jane] said to me one time, "Do you [see that?]...I couldn't get a word in edgewise. And then I started watching, and I said, well, sure enough. Absolutely. When [Jane] says something, she doesn't usually get to finish the sentence. And when any of the other men say something, you know, [John] will shut [other] people down as well, but it's less frequent.

Several female scientists felt that their male colleagues would not let them speak at meetings, or that they had to be excessively aggressive to make themselves heard. One scientist described an experience where she was the only woman at a meeting. She had been invited to attend as a representative of the topic being discussed, and still had to fight to be heard:

I was one of two people [who] were invited to come and talk to them. And for a half an hour they talked...They talked about [this topic] and we never got, I couldn't get a word in. And finally I said, "You've all been talking about this for a really long time. If you want to actually know anything, you could let me talk now." I mean how aggressive do you have to be, right?

Even when women did contribute, their comments were frequently overlooked until others made the same points. A female scientist explains how she has to fight to have her contributions at meetings recognized:

You have to say things and say them again and then remind people that you said them. I mean...it's happened so many times...It happens. It's gotten so that you just have to say, "Look, you know, I said that," or..."we brought that up earlier." The other thing I try to do now is I try to refer to the other women when I'm in a meeting. In other words, pick up on what they say and say, "Well, you know, as [Mary] said this is really important" or, you know, "I like what [Tracy] said because it does this and this and this." So I try to be aware of that and try to help, you know, make sure that I emphasize what they've said or remind the chair that that's happened.

Comments about unequal treatment in meetings were made more often by female scientists than female non-scientists. Many female non-scientists are administrators who spend less of their time in such meetings. But some of the female non-scientists who do work in teams had similar experiences. This female non-scientist described how she quickly got the sense that her contributions in group discussions were unwelcome:

The very first time I set foot in that building,...I was asked to come into...a major meeting about this project, and...it was an advisory meeting so the advisors and the subcontractors [were there] and they brought me in...And so I piped up in the middle of the meeting with my two cent's worth about how we should proceed. And I felt as though [the project leader] just shot my idea right down, a brand new person right off the street...But I was asked to come

to this meeting, and I thought that he could have handled what I said with a little more care...As it turned out, what I said was not incorrect. You know, I thought he could have just been a little more sensitive to what I was saying, or at least understanding that here I was coming in and not knowing anybody and trying to make a contribution. So that did not feel good at all. That's just the very first day I walked into that building in that environment, and just subtle interactions like that—and that wasn't even so subtle.

Because of this and similar experiences, she became uncomfortable speaking up and making suggestions in meetings. Instead, she has tended to float new ideas by e-mail but this does not improve matters much. Her supervisor often fails to respond to her ideas, leading her to worry that her contributions are not being well received.

Subtle differences in the treatment of male and female scientists were also noted at colloquia and conferences. One female scientist described the different types of behavior toward men and women at scientific talks:

They're subtle. For instance, when someone's giving a talk, and someone's making a comment, you know, who gets asked to say the question first. The attitude with which people will respond to the question or not, the attitude towards male and female speakers, and over the years, again, I used to be skeptical about this, but then things started happening to me, and then I started noticing these things.

Such differentiation is not specific to CfA, she noted, but exists at academic settings throughout the field. But she remarked on how such behavior manifests itself at CfA. When women give presentations, the questions they are asked are harsher and more critical in tone. She felt that male speakers are given more glowing introductions than equally accomplished women, and that male visiting speakers are made to feel more welcomed at CfA. She knew of female visiting scientists who, despite having been invited by CfA, were left unsure of whether the CfA really wanted them or valued their presence.

Exclusion and Marginalization in Discussions

Both female scientists and non-scientists described experiences where they felt excluded from conversations with their male colleagues, but female non-scientists did not see this as a problem because those conversations typically were only social by nature. Female scientists sometimes felt excluded from scientific discussions either that directly involved them or that would have been beneficial for them. Often this sense of exclusion stemmed from their male colleagues' body language or subtle behavioral cues. One female scientist explained:

In terms of subtle stuff, and it really does get to me, and not just to me, is you'll find, for instance, at coffee, or during lunch, these little cliques of males being very male-like in terms of body language...With some of these little cliques I do feel unwelcome...

Q: You mentioned that some of the body language at coffee, or in some of the cliques, is very masculine. What do you mean by that?

Well, maybe I'm extrapolating that it's masculine, but I'm pretty sure that's part of it. It's very closed, very unwelcoming. You know, there's just something odd about showing up -- because I don't go very often, so I just take a look, and having a group of people with this sort of aggressive conversation, a very closed circle, and then if someone -- you know, sometimes I want to talk to one of them, like, I do talk to some of them sometimes. You know, you'll just sort of stand there and go like, "Doo-doo-doo [Twiddling her thumbs]...Are you going to pay attention to me at some point?" Or now, again, it could just be the outsider thing. But maybe that's part of what it is. You know, if there's a group of males and a female's an outsider. So I'm not really sure it's gender or not gender, but these little groups that seem closed do tend to be male...Very early on, I don't do that anymore, but I would be sitting down in one of the common areas and then one of these groups would show up, and I'd just feel like I had to leave because I didn't feel comfortable. Again, it was just a subtle thing. But it's like, "okay, I'm an outsider here. I'm the odd person out here."

Q: ...When you said that it wasn't particularly welcoming, do you think it was intentionally so?

It's hard to tell...I don't know if they do it on purpose or if they just feel...you do get a sense of an old-boys' network sometimes.

Other female scientists described body language at meetings that felt exclusionary. One woman described with bemusement how at meetings, men would physically spread out their belongings to take up most of the space around them at a table:

You learn very quickly, first of all, that you've got to get there early, because if you get there late, what happens is the dominant men come in and they start spreading out; and they spread stuff out...on the table...So they kind of take -- there's a chair there but, you know, man, they got their notebook over to the right and other notes here, and their laptop over here, and their cell phone over here. And so they're making their space, you know, for where they are. And so if you get there late, you end up sitting in a corner like a little gerbil. So you have to get there early, first of all, and start laying stuff out to maintain your place in the meeting.

Another female scientist felt physically marginalized in a small group meeting by her male peers' body language:

I was on a little committee; there were four of us. We were sitting at a [pretty small] round table probably just about this size [seating about four

people]...Is it possible that at a round table that someone could actually sit in front of you? I just could not get a word in.

Her male colleague's positioning blocked her from physically joining the group at the table, and the atmosphere made it difficult for her to contribute.

Exclusion can also be more deliberate. Another female scientist described being intentionally excluded from meetings or left out of e-mail exchanges about her project by male colleagues.

Q: Have you felt socially excluded at any time either from your group or from other parts of CfA?

From my group, definitely. They have meetings without me, you know. They talk without me. They make decisions that affect me and then just tell me this is how it's going to be...

Q: And what type of thing would that involve? Would it involve your own project?

It [is] the area I'm responsible for...Sometimes there will be an e-mail conversation where they decide what my group should do without me being involved in it. And then I'm just told this is what you're going to do without any input from me. And if I say, "Well, here's a part of this you haven't considered and you may not be aware of the fact it actually won't work," just ignored. "No, we've made up our minds what you're going to do." It's been very difficult.

These were not group leaders who could rightly decide who to include in discussions, but peers who were either junior to her or at a comparable job level. This type of behavior was part of a larger pattern of exclusion and disrespect by particular co-workers that shaped this woman's entire experience at CfA.

Lack of Support, Encouragement, or Promoting Work outside CfA

Some female scientists felt that their work was not promoted as much as that of their male peers, or that they were not supported and encouraged by their supervisors and others within the organization. Many women felt that, at the level of the highest honors and positions, CfA did not promote its female candidates to the extent they deserved. While male candidates might be nominated for external prizes or distinctions, potential female candidates were seen as not having the support of the institution. Many felt this was also the case with leadership positions within CfA, and noted situations where women would be turned down, with explanations blaming the source of their funding in CfA, only to later find men with the same funding sources appointed to those positions. Many women were left with the sense that either women were deliberately being excluded, or else there was a randomness to the nomination and appointment process that could not be fully rationalized by the explanations given.

Both men and women, at all levels of the organization, said it was extremely important to have a supervisor who was proactive and took the initiative to encourage and advance his group members. Yet it was more common for female scientists than for male scientists to say they had had problems with their supervisors or that they felt their supervisors did not encourage or support them enough. Many women noted feeling that their supervisors encouraged or favored male group members. A female scientist described how she had to push her supervisor toward advancing her toward promotion, rather than her supervisor taking the initiative:

And then my supervisor, was he in favor? Most of the time he was, but, to be honest with you, I had to push him a couple of times and tell him that – I had to tell him that I deserve this, and we should do this, and I wanted to go ahead with it. Now, he did [support it]...and that's okay. But one might say, well, gee, he should have been pushing you before you were pushing him. I mean, that would be – I think, that would be the better circumstance, more appropriate...

Q: Do you know if he has been less or has he been more proactive about putting forward other people in your group?

I don't know for sure, but I suspect the answer to that is yes. And I only say that because I frequently hear him telling me, you know, singing praises of other people in our group to me. And I think, gee, I work more directly with him than these other people do. He should sing my praises. But he doesn't...But that's okay...I mean, he certainly doesn't go around saying derogatory things about me. It's just a question [of] whether he sees me – I would say, no, he doesn't see me in the same light, the same positive light as some of these other people, but one has to say, well,...he has his opinion. Maybe he doesn't think I'm as bright, as smart, as these other people. And that's a – you know, if he feels that way, that's okay. I don't need to feel that way.

Although the people her supervisor praises more are all men, she was quick to point out that there are more male scientists than female scientists, so the fact that he seems to think more highly of them is not necessarily influenced by their gender.

One female scientist described how her supervisor had discouraged her from applying for a higher-level research position that she had been invited to apply for, telling her that she was unqualified and would not get the job. Yet another female scientist also felt that her previous supervisor of many years had not encouraged her and at times seemed somewhat doubtful of her abilities. Her new supervisor is much better in this respect, but she felt that her career might have advanced further if her previous supervisor had offered the same type of support:

The thing that I would say in retrospect I'm disappointed about is that he didn't do anything to push me. He didn't do anything to, and in fact I talked about it, when I should go up for promotion, and he was a little, "Well, you know I'm not sure." Now we have a new [supervisor who is much younger]...and this

guy came in and called me into his office, and said, "I am shocked to see what a low level you are at, we have to move you up quickly. Given your work and who you are, you should be at a higher level." I said, "Well I have been thinking about going for promotion, but [my previous supervisor] wasn't encouraging about it, and I was a little worried because...I don't have mentors who are in a position to write the kinds of letters that I would [need],...and therefore I'm not quite sure – because you have to get outside letters – how that process will work in my case." He said, "Don't worry, I will help you. We will find people to do that for you, but if we don't do it this year, we are just wasting another year." And not only that, there are resources; I have never been asked whether I need resources from the group. He is asking me, "Do you need resources?" You know, he's ready to appoint me to committees, if I want to be appointed to them. So for the first time, I am feeling that I am part of things, which makes me realize that for a long time, I wasn't part of things.

Not being promoted or encouraged by a supervisor may be particularly detrimental for junior scientists, who are just starting to make contacts and develop their reputations. One female junior scientist said that she received so little guidance or support from her supervisor that she sought other mentors outside of CfA to fill the void:

My supervisor is around but, in contrast to many other supervisors I've had, he doesn't introduce me to people. Like, when I got here, I didn't even know he had graduate students for the first three months, so I'd like to have [felt] like part of the group. So I've felt like I've had to sort of go independent of my supervisor and kind of join [a group outside of CfA] so I could have a group that I could just have weekly discussions with and some supervisor who – I mean, he's not a real supervisor...[I'm a] guest at their group meeting. But I had to leave CfA and go to a group meeting [elsewhere] to feel like I had someone who would sort of introduce me to people – I don't know somehow, more group interactive dynamic – my supervisor, that's not his style...And also just to have sort of more unstructured discussions...With my current supervisor, if I have a question, I can sit in his office and we can discuss this particular issue. But, what I have enjoyed in the past is people who just have a group meeting every week or month or whatever it is, and you just talk about whatever there is to talk about. And there are some questions, like I said, you don't know you have until you're having a discussion and something comes up and that reminds you of something else or you learn something that makes you realize you didn't understand something else. But, of course, if you had never had that spontaneous discussion, you would have thought – gone happily along thinking that you know what you're doing.

When she does receive feedback from her supervisor, she feels it often comes across as extremely negative. She was discouraged by his criticism, which other scientists did not seem to share:

Q: Do you receive much feedback from your supervisor, in terms of things that you need to improve or how well you're doing?

I do, although...my feedback from my supervisor is mostly negative, or a lot of it's negative. And I think if I didn't have some balance from other people who I really trust, who have given me much more positive feedback, I would be very discouraged. And maybe even if he asked me what's my ideal career plan or career path, [I'd] say, "Well, who knows, I will probably never be able to get a faculty job" because that seems to be what my supervisor thinks. Luckily, my old Ph.D. supervisor and this other [mentor outside CfA] seem to think quite differently.

She was unsure whether this supervisor really holds her in low esteem or is simply not very skilled at giving positive feedback, suspecting perhaps it was a little of both. But she did feel that some of his comments seemed exceptionally harsh. She, too, felt that her supervisor encouraged other male scientists more and held them in higher esteem. Although she did not feel she could necessarily attribute this to gender, there were clear situations where she was disadvantaged in certain career opportunities because of her supervisor's higher evaluation of another male junior scientist.

These patterns are consistent with the survey findings of gender differences in attitudes toward leadership opportunities and the promotion process. According to the survey, fewer women than men felt supported in their advancement to promotion and were overall less satisfied with the promotion process. Fewer women than men also reported that they had received an opportunity to take on a leadership position at the CfA. Women's experiences with their supervisors, particularly their perceptions that supervisors are less proactive in their promotion of women, helps illustrate those findings.

Disrespectful Treatment

Both female scientists and a few female non-scientists described other forms of disrespectful treatment by their supervisors or co-workers. A female scientist described an extremely difficult situation where she had been brought onto a project, but was later fired by the project leader whom she believed felt threatened by her expertise in that area. Both female scientists and non-scientists described being given assignments and then later, after they had finished them or spent considerable time on them, being told that the supervisor no longer wanted to do the project. While female non-scientists were annoyed by this, they attributed it to an unfortunate lack of organization. Female scientists were more upset because they felt their supervisors were not soliciting their views or taking their contributions into account. A female scientist related the recurrent difficulties she had had with her supervisor:

It was just horrible, because he kept subverting me. He would ask me to do something, I would do it, and just as I was reaching the end, he would say, "Oh, we don't want that done anymore." So my time had been wasted. And then this would happen again, project after project after project. I'd be put on a project and then the project would be pulled. And one of the main things I was supposed to do was [a particular project]...something I was very good at and

experienced with, he pulled the plug, just at the point when we were [starting to launch it]. So it was a very frustrating experience, because I wasn't really allowed to do a job, I was pulled off everything that was, you know, coming to fruition, [it] would just be ended.

Scientists were more upset than non-scientists because their career advancement depended partly on the success of their projects, while the non-scientists were assessed based on how well they did the work their supervisors asked them to do. Thus, for non-scientists, while the last minute changes were annoying, they did not necessarily harm their career progress.

Both women and men described situations where women were not taken seriously or were treated disrespectfully. A female scientist was upset to learn that a high-level male scientist had a low opinion of her abilities, but was even more upset by the condescending way he congratulated her when she did enjoy success. Speaking of this male colleague, she said:

[He] discussed my case with [other colleagues], and said I was highly unsuccessful at getting grants. He didn't expect that I would be able to get them. And he was not interested in having me supported. And later on, after I think the year I brought in [a very high amount of funding], he said, "You know you surprised me." He didn't apologize, he never told me what he had done, but I had heard it from some of the [colleagues] themselves. Didn't apologize and, you know, "You surprise me, I'm shocked that you're getting this kind of funding." So there was no recognition [that] I came into the field, in fact had done pretty well.

Q: Did [he] say it just like that, in a way that assumed that you couldn't do it?

Yeah, he said, "I'm surprised, I didn't think you could do it."

She felt this man probably did not realize how patronizing his comment had sounded, or that it exposed his doubt in her capabilities. He probably saw this as a compliment. But the underlying tenor of the comment only reinforced her view of an atmosphere that did not support her or her accomplishments.

A male non-scientist described a male colleague in his group who displayed considerable disrespect for two female co-workers. He did not know the source of the man's belief that these women were not competent and he did not personally agree with that assessment. Both he and the women involved attributed these disparaging comments to a "personal prejudice," but believed it did not affect their work and therefore did not really matter:

I had one part time woman...[who] would come over to work occasionally in my group...Had one [male non-scientist] who looked down on her as not being that competent, but then I would try to convince him otherwise...

Q: Has something like that ever occurred in other instances or was it only with these two people...?

Well, I had...another woman who did some part time work as needed...but he would say a few disparaging remarks here and there [about her too], but...I just took that as his general attitudes. I was aware of it, but it never did anything to affect either one, and, I think, they knew his attitude anyway. So it was known that, it didn't affect anything in terms of the work...But she worked with some of the other groups down the hall from me...The head of that group would come up and tell me how good of a job she was doing there, so I knew that she was a capable person. So I think this was more just a personal prejudice on his part. But it didn't manifest itself in terms of anything in work. It was just attitude...And I would say it wasn't all the time. It was just an occasional thing. So I just knew where he was coming from...

Q: Did either of the women ever complain about it?

No. Because they knew him and kidded him back. So I think a lot of it was in jest.

It is sometimes difficult to conclude that a person's low opinion of his colleague relates to gender rather than her individual skill set. Obviously we cannot definitively determine what this individual believed, although his supervisor did not think that the women's abilities provided any basis for such a low evaluation. The supervisor concluded that this employee's views were based on prejudice; the fact that the same individual held similar beliefs about the incompetence of two different women would have supported this conclusion. But if there is an important lesson to draw from the experiences discussed in this study, it is that many women take these comments extremely seriously. The individuals at whom such comments are targeted may respond publicly by joking or kidding the person back. Often it is expected that the target will simply dismiss the comments. There seem to be few other responses, as issuing a complaint is often not considered an option. As is discussed more below, many women believe issuing a complaint will be viewed negatively by others, as a woman overreacting or simply "being difficult." This alternative may be rejected out of concern for the way it could affect a woman's career.

Some female scientists described a continuous pattern of disrespectful treatment by their male colleagues. One woman described how her colleagues repeatedly belittled her suggestions and abilities:

If I propose an idea to the group, there's several of the gentlemen who will just laugh -- big belly laugh, not snicker. Big belly laugh as though it's the funniest thing they've ever heard. No consideration given to the idea. If I have an assignment to do a job, one of these men will say to me, "Well, you can't do it unless two other people check your work." And the next week, that job belongs to another person [and] they can do it just fine. They don't need to have their work checked...So it's a little obvious.

She found the implication extremely insulting that her work had to be checked over while another colleague's did not.

Another female scientist described a pattern of inappropriate behavior by male colleagues who refused to accept her authority and repeatedly slighted her. This treatment

became so bad that the woman felt she had to sacrifice her own career interests to avoid these colleagues. She explained the situation:

Q: Have you ever felt hat you were treated disrespectfully?

...I did, several years ago...I had had some...I want to say bad run-ins. But I had some unfortunate circumstances with some of the [lower-level people]. That had to do with their not accepting me as a scientist when I first started ...And I guess I remember [these incidents] because I was so embarrassed about it...I had been working at CfA for quite awhile by then...I had been in the scientific world...So I just was offered and accepted this job to take over this [group]...I remember telling one [of the people I was going to supervise] that I was – the, whatever I was – you know, the [lead] scientist now,...and he laughed. And we were in the car, and he laughed, and he told his friend,...”Hey, [Mike],...this is...she's now the [lead] scientist,” and he laughed. What are you laughing about? And I was so embarrassed. I didn't say anything. You know, I just said to myself, “Yikes.”

She also related another incident where men working on her project rejected the rules she had established for the group and blatantly disregarded them in front of her and other co-workers. She described how she felt after this incident had occurred:

I was terribly embarrassed – I felt like a real jerk...It felt like they had just stepped on you, didn't care, didn't – you know, you had no control, no power. What did they care?

At the time, this woman did not say anything about the incidents. She was too embarrassed to mention them to anyone. But several years later, in a reorganization of office space, she was told she would have to move to the location where the people who had made fun of her worked. At that point, she went to an ombudsman to explain why she did not want to move, both for professional reasons—to avoid being so cut off from other scientists and collaborators—but also because she felt she could not work in the same facility as the people who had been so disrespectful and had humiliated her. To avoid having to move, she accepted a compromise to stay in her current location but give up half her office space, a clear disadvantage for her scientific career. Looking back on it now, she says:

In retrospect, I think that I shouldn't have agreed to the compromise. I should have argued more forcefully and kept the whole...space, but, actually, this ombudsman...suggested it was in favor of a compromise rather than my being adamant about not giving in at all.

She noted that her relationship with those individuals has improved and they now accept her as a professional. She also remarked that this occurred a few years ago and she could not say whether such treatment could take place today. But she felt that her career had suffered as a result of these problems.

Inappropriate Comments

Disrespectful treatment of women could also emerge in the form of inappropriate comments belittling or insulting women. Similar to the more general pattern described here, more overt forms of sexist comments were rare, although not non-existent. This female scientist related an incident described to her by another female colleague:

She was in a common area, like using the microwave or something, and there were some guys who always sat there, one of these little cliques, and they made a comment like -- I forget exactly what it was, but it was about, "Oh, well, we wouldn't want to sit here talking all day doing nothing like women." And she was within earshot...It was very obvious that she was there.

A few women described comments that, while obviously insulting, were likely said without any conscious recognition of the way the comments could be interpreted. These comments typically imply that women are less intelligent or capable, and were perceived as very condescending by the woman involved. A female non-scientist in her early 30s described one such example that she believed exemplified the gender problems at the CfA:

I can give you a perfect example of where I think you guys [the Gender Equity Committee] might be looking for things. One time...I was waiting for [someone] down in the rotunda area at 60 Garden Street. I was supposed to meet with her at ten o'clock and it was about five past ten; she was a little late. So I am sitting there, and there is a big poster out in the rotunda area, that I think it's the Milky Way...So I was looking at it trying to make sense of the science behind it, it was really interesting. Well anyway, this older guy, he must have been a scientist; I am assuming he is a scientist from what he said to me. He comes walking out of one of the doors, and he looks at me and kind of smirks, and he's like, basically..."Oh I bet you would like to be able to figure that out." I mean he didn't know me. He didn't know if I had a Ph.D. or a Master's in Astronomy. He didn't know me, and it really, really angered me that he would have the audacity to say that. And...he just...kept walking off. So I really feel for the...female scientists, and I can understand why this is an issue and why it's come up, because I am not at Garden Street, I don't see what happens over there, I don't go over there very often. But for me to be in there...and to have someone walk through and say something like that to me,...I could sense why some women there sense hostility.

Another story was related to me by several individuals who had witnessed or heard about it. It occurred during a meeting of several scientists, and involved the interaction between two of them:

There's [Megan], who's incredibly energetic and works hard. She has some personal issues with [David]...We had this meeting where...[David] said something like – to [Megan] – "I don't know what's going through your little brain." And other people [in the meeting] said, "You mean big brain," because

she's an incredibly accomplished person who's a very solid scientist...And he quickly corrected himself, but I don't think he would have said that to – and [Megan] had this look about her like, "Jesus." And [David] approached her afterwards and said, "Is there something bothering you?" And...like he didn't notice that he had just insulted her in a group.

Many of these stories seem to result from a lack of sensitivity more than explicit sexism. Some of the incidents are situations where the person did not even realize that their comments were inappropriate or made a female colleague uncomfortable. But to the women involved, and to some male observers as well, these reveal a set of stereotypes about women, their capabilities and role in society that is allowed to exist unchecked in the institutional culture of CfA.

Double Standards in Evaluating Performance

Female scientists, in particular, sensed that they were disadvantaged by a cultural double standard that judged their behavior differently from that of their male peers. In order to contribute at meetings or have their views considered, women had to be vocal and aggressive, taking the onus on themselves to insist that they be heard. This is a typical attitude toward people who feel excluded—that they simply need to be more proactive and assert themselves. It leads many women to feel it is their own fault for not succeeding. Men who were successful, it was believed, were those who are confident and assertive. Yet some female scientists noted that behaving in exactly the same way could backfire for them, causing them to be seen as difficult or argumentative. One female scientist described this, starting by explaining how you often have to scream at meetings to make yourself heard:

If you can figure out what kind of level of screaming you have to do to win, then you can win. But, you know, women are always judged differently when they act aggressively than men do. So you have to be careful, too... If you see a woman who talks a lot or who has opinions or something,...people just don't like them...It...doesn't work as well for women as it works for men.

She explained how being confident and speaking clearly is regarded highly. But women, having higher standards to meet, often fail to come across that way:

I mean this is probably a societal thing, but also in the science culture...if you're really articulate, you can do well. I mean being...verbally articulate can be very good for people's careers. People who are...strong and clear and sound smart and talk a lot [do well]. [You] don't see a lot [of] women talking a lot. You don't see a lot of women asking questions at conferences. You tend to see women waffling more. If somebody asked them a question -- well, I'm not sure...they might ask somebody else or they might hedge a little bit. And so that very "I-know-what-I'm-talking-about" manner works well. And when somebody does know what they're talking about, that's fine. But you see men do perfectly well when they don't know what they're talking about just by adopting that approach. And you don't see women ever do well if they adopt

that approach and they're wrong. I mean you don't see women doing that, ever. I don't in this business. And so I think being too sure of yourself, I think women are less inclined to be...They can get attacked pretty viciously...if they're wrong.

Because women tend to assert themselves less or appear less confident than men, they are sometimes judged less capable.

Some female scientists believed that people feel more comfortable criticizing women, or making harsher comments than they would for men. Another woman was upset by the way her assertiveness was turned into a very personal criticism, which she believed would not have been the case for a man:

There are also a lot of issues where I think people somehow react very viscerally or personally to women...in an unprofessional way. I mean I still remember distinctly, I had applied [for a faculty position] a long time [ago]. I wasn't selected...and I remember asking the department chair why wasn't I selected...You know, "What was wrong with my dossier? Why was -- "...and he sort of looked uncomfortable and he said, "Well, we didn't know whether you could get along with the students." Now, you know, there probably were a million reasons why I wasn't selected. That's fine. But it was intriguing to me upon reflection that the reason given wasn't that they wanted someone in another area of science or they wanted someone who had done more work; or they wanted somebody who was more advanced; or -- I mean any one of a million other reasons. But it was really intriguing to me that he picked "we didn't think you'd get along with the students." I mean...I've had [a lot of] students. But...it was like a personal thing...Well, you know, I never hear them say men don't quote "get along" with them. Maybe men get along better; and maybe women are a little – well, we're either bitchy or abrasive or we're, somehow have...rough personality edges or something. But it just strikes me that many of these comments are really personal behavior comments, whereas men can be rude and they say, "Oh, well, you know, that's just – he's just that way, a little rough around the edges or something." But somehow I feel that – not only myself, but other colleagues were criticized for being a little too forward.

There were several examples in these interviews of both men and women describing aggressive or confrontational behavior in men and saying precisely this—that such behavior was “just his personality.” The episode quoted above of the male non-scientist who looks down on his two female co-workers was one example. The important point is that these comments for men are not seen as affecting their work or impairing their ability to do the job. For women, as this quotation shows, they sometimes are.

Women may be less assertive or aggressive because of the way they are socialized or because of the negative reinforcement such behavior receives in a scientific environment. Yet women perceive that the institutional culture of the CfA, and the field in general, rewards this type of assertive, confident behavior. Those who see a double standard recognize that this behavior is rewarded in men, but often not in women. Yet in explaining

why women do not do as well as men, it is often precisely their lack of this type of behavior that is pointed to.

Power Dynamics: Female Non-Scientists

Some of the patterns described above affected female non-scientists, although they were themes discussed more by female scientists. It is often difficult to draw conclusions about gender inequity for female non-scientists, as the non-scientific positions are quite segregated by gender. Administrative staff, for instance, often had no basis to determine whether treatment they received was related to gender because they had no male counterparts for comparison. Yet some issues emerged even with female non-scientists that are relevant to issues of gender equity.

The majority of female non-scientists were very happy with their jobs at CfA and had never experienced any discriminatory or disrespectful behavior. However, a small subgroup, composed mainly of female administrators, described antagonistic treatment from their supervisors and inappropriate comments or behavior. Some revealed feeling powerless to deal with these situations because of the major status differences between them and their bosses.

A female administrator who had been at CfA for many years described an openly hostile relationship with her boss spanning several decades. She claimed her boss was rude and condescending to her on a regular basis. She said, "He never cared for me from the very beginning...They don't know how to treat the employees, and if they have a dislike for a person, that person's not going to get anywhere." He would yell orders at her, criticize her work, and refused to support her when she had a problem. Rather than discussing her performance in an annual review, he filled out the form himself, dropping it on her desk and saying, "For whatever it's good for, sign it." She received no feedback or guidance for improving, claiming "There was no talking or anything about it, because all he would say was, "You don't like it here, leave." So I said nothing. So every year when I get this thing thrown at me, I [just] sign it." Her co-worker had an equally troubled experience with the boss, as she explained:

Obviously the person who was working with me was going through the same thing. She had a [serious medical issue] and she had to tell him she was supposed to stay out for six weeks and he had a fit. He had a fit..."What for? Why so long?" There was no compassion, nothing.

She often thought her boss needed some kind of managerial workshop or etiquette training because of his lack of manners and rude treatment.

This boss also allowed his personal preferences for his staff to influence their work assignments. The woman claimed her boss visibly favored his secretary, she felt for inappropriate reasons. Whenever the secretary said she could not do certain work, the boss would assign it to the respondent:

Q: Would he make unreasonable demands on you for your work?

Well, yes, so that his secretary didn't have to do it He had no respect for any female. He enjoyed watching his secretary and that's all he cared for...

Q: You mean in a sexual way?

Yes, yes, yes. And you know, he had all kinds of conversations that really didn't belong in the office, but he had conversations with her, and they were kind of loud and they were kind of coming in the hallways, and that's how I know.

Q: Were these sexually explicit conversations?...Suggestive?

Yes.

Q: Do you know if she was also very unhappy working there?

Well, why should she be unhappy? She had [very little education,] she was making good money and she was being catered to by her boss. What [more] did she want...? And whatever she didn't want to do was just pushed on my desk.

Q: Do you think that he gave you her work as sort of a favor to her because he would give her preferences?

Oh, yes. She had too much to do, so she couldn't do it (sarcastic).

A few other female non-scientists complained of sexually explicit or inappropriate language, gestures, or office decorations from their male bosses, a pattern which was not mentioned by any female scientists.

The type of rude or disrespectful treatment that some female non-scientists described was related to a broader pattern, described by both female and male non-scientists. Many of them sensed a huge divide between the scientific and non-scientific communities at CfA, and felt that scientists did not understand that the job they had to do was also crucial to the smooth functioning of the organization. Their treatment by scientists spanned from impatience, a sense that they were holding up the more important work, to a clearly expressed belief in their incompetence. Yet while both men and women noticed this divide, women more often complained of a pattern of regular disrespectful treatment stemming from it, which may also relate to the types of positions non-scientist women tend to hold within the organization.

Some of the disrespectful behavior that women described also had gendered aspects to it, such as men's use of body language or power to intimidate their female staff. A female non-scientist described the type of behavior she saw scientists target at non-scientist staff:

Abusing people verbally; humiliating people in public,...making unreasonable requests of individuals...Having expectations that go beyond the scope of the numbers of people in a particular group; for example, if they're going for a

proposal and they have an idea for what they want to create...the PI might have a glorious view and expectation of what he wants to have happen and everyone under him thinks that what he wants to have happen is way beyond the numbers of people they have in the group who have a finite amount of time in which to do the job. ...Whatever needs to be done falls on one or two of that group, and if they are pushed to the brink of breakdown, the stress gets so bad that they can't function, that they get sick...And I know one person in particular who has tried to get out of her job because it's been so bad...When this person...went to apply for [a job] within the CfA, the person who was hiring told her... "Well, what would [your boss] ever do without you and how can you leave him?" And her boss found out about it and threatened her and said "I will make sure you don't get a job anywhere if you ever try to leave."...And I know a lot of people who work under really stressful situations like that, especially secretaries and low-level administrative women who put up with a lot of crap from both inadequate oversight or management skills of...scientists who either don't want to see what's going on, are incapable of seeing what's going on, or unwilling to do anything about it.

In this case, the boss uses his power within the organization to try to prevent her from leaving the job. Male supervisors may also use body language to physically intimidate their female staff. This female non-scientist describes that type of behavior:

[It's] just the very body language, you know? The standing over you. The distance thing. The talking down to you like you're an idiot.

Q: Distance meaning that they stand very close?

Personal space. Invading your personal space, you know? Just the whole power play, especially men on women. I've seen that done. As a matter of fact, I had to counsel this one administrator -- I told you that she tried to get out and couldn't get out and felt trapped, her supervisor does that to her all the time.

Q: Stands too close and invades her space?

Oh, yeah, he...blocks her in her office, just stands in the doorway and doesn't let you go. So, she used to be in a closet size office and [he] would block her in there and just loom over her and yell in her face, and, you know, condescending disrespectful, humiliating kinds of talk.

Q: ...Do you think that the gender element is an important piece of this dynamic, of how the intimidation takes place?

Yes. Yes...[One] man would talk to me in a certain way that I found extremely condescending and disrespectful, and I'd look right at him and say stop talking to me that way. But a lot of women can't do that. And how do you

teach women to stand up for themselves in the face of that? It's not easy, especially when you're an underling who needs their job.

Women's lack of power—both physically and within the organization—may leave them feeling vulnerable in these situations.

A few women in the administrative staff objected to being asked to make coffee or run errands for their boss. Sometimes they were asked to make personal travel arrangements, often during a business trip when there was some personal time in the middle. But sometimes even arranging these side trips would require considerable time, with the woman being directed to go back several times if the price or specifications were not right. Another woman described having to babysit a boss's child in her office, although she emphasized that it was more fun than her normal job. She was not clear whether such activities were inappropriate or not, since her job was defined to her as doing anything that would make the scientists' work easier. And while she did not mind running some of these errands, she also felt that these tasks were somewhat humiliating. She says:

My boss...teaches a small class,...and he'll often just sort of ask me to buy juice and cookies and things for it. And I'm like, I feel like a secretary from the 1950s making the coffee. But I mean, it needs to be done and it's part of the job...My job is to do whatever they need me to do within reason. I mean, I guess I could say no, but I'm not really supposed to...But I do get a little twinge of like, "Oh my god, that's demeaning." Like I'm the errand girl. That's why I feel like a hired lackey.

Other women were more upset by what they saw as demeaning errands. One described a co-worker whose boss made her make coffee, run personal errands, and type all his e-mails because he would not type. If forced to work for him, she claimed, she would quit. Describing her attitude toward having to make personal travel arrangements, she said:

I think that's wrong and I think really she should say, you know, "This is your personal [business]"...but, then, I can see why she doesn't, too, 'cause, you just -- you know --

Q: You feel nervous saying that to your boss?

That's right. Yeah. And I think, if a man were in that job, he wouldn't ask the man to do it.

She feels that being asked to do such chores is related to being a woman, yet at the same time she recognizes the power dynamic that prevents many female staff from asserting that these tasks feel inappropriate.

The power dynamic which makes some female staff feel vulnerable to inappropriate treatment is not restricted to male bosses. There were also women who felt badly mistreated by female bosses. At work in much of this discussion is a cultural understanding of gender roles and a set of social norms based on that understanding prescribing how women may be treated. These views and norms for behavior may be held by women as well as by men. In

many of the cases, disrespectful treatment stemmed from a lack of managerial skills or an unwillingness to train or give employees feedback, which came from both male and female bosses.

Because of their low status within the organization, and often because they needed the job to support their families, those members of the female administrative staff who were treated disrespectfully felt powerless to do anything about it. Surprisingly, despite their higher status positions and high qualifications, some of the female scientists felt powerless too. They felt that both the CfA and the field of astrophysics in general were not hospitable to complaints about disrespectful treatment towards women, and that a woman could not issue a complaint and expect to remain on her career path. A female scientist who described a regular pattern of exclusion and disrespectful treatment from male peers who consistently undermined her authority said she was deeply offended by this behavior, but did not feel she could make a formal complaint:

Some of the things, I have documented it and they are really quite disrespectful and, you know, completely disvaluing the work that I do and saying I don't know what I'm doing and...it's very hard to overcome that kind of stuff. You leave every day thinking you're worthless.

Q: Do you think you have the kind of evidence that would enable you to bring a formal charge?

I probably do but I wouldn't. I know better...That's the end of your career for sure.

Q: [Would you be] black listed?

Oh, yeah. You could never get another job if you do that. I only know one person who ever brought a complaint and kept the job. [The others],...they're not in the field anymore. So you don't do that.

Another female scientist who had grounds for a discrimination suit decided not to bring a charge for similar reasons. She explained, "I think it really would have changed the relationship [with my colleagues]. I mean people would have said, 'Oh my gosh, trouble maker, you know. Trouble maker – look what she's doing,' see?"

Male Scientists and Non-Scientists

Did male scientists or non-scientists have any comparable experiences with disrespectful treatment? Did they feel their contributions were not welcomed or valued, or that they lacked the encouragement and support of their peers? Virtually none of the male scientists or non-scientists described feeling excluded or marginalized in discussions or informal interactions. In meetings, most felt that their contributions were given consideration and respect. The vast majority of both male scientists and non-scientists felt they were never treated respectfully, and that they had a supportive work environment

where all contributions were encouraged and considered. This response from a male non-scientist was typical:

Q: When you're in meetings, have you ever felt that your contributions haven't been given consideration?

No. I haven't had that happen to me. At least if it's in the department when we've had meetings, all suggestions are looked into and I feel that every suggestion has its own merits and we do within the department look at it, and as such the whole department makes a decision as to whether this would be right or wrong to solve the problem.

Most men described the work climate in very positive terms, and enjoyed the collaborative, relaxed atmosphere of working at CfA.

Practically all⁴ respondents were asked specifically if they had ever had any experiences at CfA where they felt they were treated disrespectfully.⁵ 23% of male scientists said they had experienced disrespectful treatment, as had 27% of male non-scientists. By contrast, 40% of female non-scientists and 53% of female scientists felt they had been treated respectfully.⁶

A couple of men did experience the same types of behavior that women found problematic. They felt that scientists, both at the CfA and in general, could be overly critical and sometimes excessively harsh. Sometimes this verged on disrespectful, but the male respondents who noticed this were not generally bothered by it. They did not feel they were specifically targeted for disrespectful treatment, but rather that it was part of the broader culture, something that must be accepted or ignored. One male scientist explained:

Q: Have you ever had any experiences where you felt you were treated disrespectfully in any way?

No, I don't think so. There is this general disrespect...particularly in the physical sciences, some biological sciences, for just about anybody. You know, opinions, thoughts, concepts, are constantly being challenged...

Q: That discussion of the merit of people's work, does that ever verge on inappropriate or disrespectful?

...I haven't had anybody tell me personally, although I know of other people, particularly students, advisors or somebody on their committee will tell them

⁴ Two interviews with male scientists did not cover these questions.

⁵ Few other questions were asked as consistently throughout the fieldwork period to permit comparable quantitative comparisons between groups.

⁶ A 95% confidence interval (i.e. 2 standard errors on either side of the point estimate) can be calculated to correct for possible selection bias toward people who have experienced disrespectful treatment. The lower limit of female scientists who would have experienced disrespectful treatment if we assume that the contacted female scientists who were eligible and did not participate all did not experience disrespectful treatment is .118; therefore even if we assume selection bias in the sample, at least 11.8% of female scientists would have experienced disrespectful treatment.

what they think is the true opinion of a person's abilities. In most cases, I think it is a bit inappropriate because they are not always right. They may be right in the sense [that there are problems with the work] but saying "you are no good at this" [is an overstatement]. [Saying] "You are not the best [in this] field," that may be right. [But] it is not anchored.

Q: Have you ever had any experiences like that?

Me personally, no, but other people have told me that they have advice like that. And for [scientists outside of CfA],...yes, they all say "He is an idiot, he doesn't know anything," which is not true. You know, [he has] written a bad paper or screwed up somewhere or probably said the wrong thing in a casual conversation. That is why you have to be careful. One of the failings I think of a lot of the people in our group is the tendency to make quick opinions and never change them.

This behavior is part of the ethos of the field, he claimed, an academic culture that its members understand. He also noted that the examples where he heard of advisors being excessively critical of students and telling them they are worthless involved a female student and a female advisor.

One male scientist related that there is someone who always cuts him off in meetings and make harsh comments about it, a very similar pattern to what several female scientists described. Yet he felt that he is probably partly responsible for the behavior because of his treatment of this person. He also suggested that this stems from his difficult relationship with that individual, rather than a more systematic pattern:

Q: Do you ever feel that you've been treated disrespectfully?

Yep.... I think it's one of those issues where familiarity breeds disrespect sometimes. Yeah, there's one person who tends to interrupt me a lot and not recognize...what he's doing...I think it's just that -- again, it's a slight personality issue. And there's probably some responsibility for that on my side too. I tend to not hold his approaches in high regard. I think that frustrates him sometimes; and I think probably in reaction he tends to interrupt me and be not so professional and say things. But it's a two-way street. But I think that -- yeah, it's a lack of professionalism on his side more than mine I think.

Only one other man received treatment he thought was really inappropriate or disrespectful. After making what he thought was a very reasonable comment in a big meeting, he received a nasty answer putting down his idea in front of a room full of people. Even if it had been a bad idea, he did not feel such a negative public response was warranted. He attributed this experience to scientists not having the best "people skills."

Another male scientist also recognized the importance of being aggressive and forthright to make his contributions heard, a theme that concerned several women. But he did not feel this was an impediment to open discussion. He said:

Q: When you're in meetings do you feel that your contributions are given consideration and respect?

Yes. Sure. I think that's true for almost everybody in the meeting, you know?...Because of my personality, I'll tend to be very vocal, but I hear lots of other people who are very vocal, and I think their contributions are listened to carefully.

Q: Is it very important to be very vocal in these meetings to get your ideas heard?

Oh, I think, that it's a good idea if you want your ideas heard to just say them, and I think there are a lot of people who tend to dominate a meeting just because of their personalities, but I've never seen a case where somebody was hushed up in a derogatory way, "oh, your opinion doesn't count" kind of way.

In his case, the need to be vocal in meetings works to his advantage since he often is vocal anyway. The few men who noted the type of concerns raised by women—such as the harshness of criticism or the need to be vocal in meetings—did not see them as particularly problematic. They did not feel disadvantaged by these aspects of the institutional culture.

While women talked at greater length about feeling that their contributions were not welcomed or respected, the most comparable experience described by men was a temporary period, usually shortly after joining the CfA, of having to prove that their contributions were valid. In that initial period, people might overlook their recommendations and turn to others instead, or question every suggestion they made. Although the incessant questioning and doubting of their decisions might have seemed a little disrespectful at times, most of them believed it was necessary for them to establish their reputations in the new environment. A male non-scientist explained:

Q: Have you ever had any experiences where you felt you were treated disrespectfully?

No. Not disrespectfully. I think early on there was some aspect of, sort of, proving myself, which I think you have to expect when you go to a new job. You're going to question a little more about why you might have recommended something or made such and such a decision than you might be later when they just, sort of, would accept it, what you're talking about in making a recommendation or whatever...But I don't consider that disrespectful. It's just, I think, when you work on projects where - - if you're [working] in space science, there's a big difference there between that and making a product for a company because you only get one - - your product is one and one only, and therefore you don't get a second try at that experiment. So they're right in a lot of ways to be questioning every decision at that level...For me, I think it's normal.

One male non-scientist even described the occasionally disrespectful comments that came while he was trying to establish his reputation at CfA as a kind of “hazing.” He had previously described how, in the period after he joined CfA, some colleagues would get quite defensive over any suggestions he made in meetings to review work on a particular project. Here he explained how he saw the kind of treatment he received:

Q: Have you ever felt that you were treated disrespectfully?

No. Not really.

Q: Even in those... [project review] meetings it never got to that?

That's a good question. I suppose I have but, I mean, it's almost like a fraternity type of hazing...It's like you have to, in any organization, you sort of have to prove yourself to people. I mean, respect is earned. So if somebody makes a comment or something that might be disrespectful, it's sort of a test. How do you respond to that? So...at some level, it's a fraternity type atmosphere. I don't view that as anything big. It's part of being a younger person in an organization like this.

The men who described having to prove themselves believed that any disrespectful treatment or questioning of their abilities stopped after a time. This contrasts with the experience of female scientists, who often described continuing behavior over much of their careers.

IV. CfA ORGANIZATIONAL STRUCTURE AND GENDER INEQUITY

Many of the disadvantages that women feel they face are perpetuated by the organizational structure of the CfA. Its structure as an institution not only fosters some of the problems women experience, but it gives them few avenues to deal with problems that arise and makes it harder for others in the organization to recognize the extent of the problems. There are several ways this comes about, including the location of decision-making authority within divisions and departments, the centrality of the supervisory relationship, the lack of emphasis on managerial skills or training, how information is diffused through the organization, and the importance of informal contacts and personal networks. These and other aspects of the organization create a structural basis for some of the conditions women find problematic.

A case study illustrates how gender inequity can stem not from intentional discrimination or sexist treatment but from structural aspects of the organization. The previously discussed instances of unequal pay for men and women doing the same work occurred many years ago. Some of the women involved were unsure that such discriminatory conditions could exist today. Yet one female non-scientist revealed a similar situation brought about not by explicit consideration of her gender, as was the case in the past, but by the nature of how position titles and pay grades are set within the CfA and how inequities must be rectified. She became aware of a male employee at CfA who does the

same work as she and who had a higher title, and presumably a higher salary. The titles here have been changed, but her job title reflects an entry-level position, even though she has taken on new responsibilities. She explains:

It did come up [that] my job is very similar to other people's jobs within CfA...I am a [Project Assistant] right now. Half of my job is a [Project Manager], because there is somebody that is actually my equivalent [in another part of the department] in terms of [the work we do], the sort of thing that I do. And he is a [Project Manager]. I am a [Project Assistant]. So it's kind of weird...I mean it is an issue with my boss too, but he is so busy and we are so understaffed that he doesn't have the time to ghost chase and figure this out, like why my title has never changed...

And [it was] even to the point where I told my boss you know, "How do I get a different reaction when I am dealing with [people outside of CfA], I am dealing with outside people and then like, oh they are fine with me we are moving ahead and then they ask me my title, and that's it. The tone totally changes." He is like, "Just tell them you are [a Project Manager]." I'm like, "Well, that's not really fair." And I said, "I'm not really going to do that, I don't feel comfortable telling them I am one thing when I am not, and just to get the job done. Because if I am really doing that job in that capacity, as that title, then my title should change"...

Maybe my title hasn't changed because of awkward ways to get me funded...because I [had several different funding sources] at one point...[This male Project Manager] was here before me, and...I don't even know if he's Harvard or SAO, so that may make a difference too...So...I understand the whys behind it, but mostly it still seems weird to me that I know that my [job] is totally drastically changed since when I first started here. And that I am not compensated for it, my title hasn't changed, and that's really frustrating.

This is a situation where a woman, hired into one position, took on new responsibilities that make her job more equivalent to a higher-level position. The peculiar combination of funding that pays for her job may make it difficult to get more money for her. She is also not certain if there are differences between the Harvard and SAO regulations that complicate the situation because the different policies for these types of employees is not clear to her or many others in CfA. In this case, her boss is supportive of her changing her title, but is too busy and concerned with other priorities to follow up on the situation. The employee believed that there is no other official in CfA to monitor the situation and follow up on it for her. She felt this is the reason the issue has not been resolved, explaining "it's...because no one is really there to say, 'Hey this doesn't look right' that nothing has really been done about it." In fact, there are routes at CfA for this employee to pursue a complaint, although she may not have been aware of them or may not have felt comfortable following them. She felt that there should be more systematic overview within the organization so that it would not be necessary for her to have to take her complaint to a higher level.

Present in this example are several of the themes that emerged in discussions of gender equity: employees' dependence on their supervisors and perceived lack of avenues to follow up on problems their supervisors had no time to pursue; the lack of information about employment and promotion policies; and the absence of individuals with oversight into workplace issues, given that supervisors' jobs concentrate more on science or supporting science than on management of employees. This case also reveals that gender inequities may no longer be explicitly about gender, yet here—as in many of the other examples that emerged—it is still a woman who experiences the problem.

The purpose of this section is not to criticize the organization of the CfA. Obviously, the organization has developed the particular structure it has for many reasons, many of which advance the overall purpose of the institution. The goal here is to illustrate the unintended consequences that some aspects of that structure can have, and how those consequences may foster gender inequities.

Organizational Fragmentation and the Centrality of the Supervising Relationship

The divisions and departments of the CfA were frequently described as “fiefdoms,” with relatively little interaction between them. Even within those units, most people’s formal interaction was with the members of a work group or team. Particularly within the scientific divisions, these groups work fairly independently, and a large amount of the administrative authority for the work done, assignments, and promotions lay with the leaders of those groups or with individual supervisors. In discussions of satisfaction with career advancement and the promotion process, many men and women said that experiences depended largely on an individual’s relationship with his or her supervisor, and there was therefore a great deal of variation in people’s experiences based on those relationships. Having the right supervisor could bring a wide range of benefits. One female non-scientist noted that she is in one of the better groups because hers is the only one where everyone always gets annual cash awards; this is because her supervisor always makes a point of giving awards to everyone. A female scientist said the supervisor one has is crucial in affecting the kinds of information one receives about leadership opportunities and ways to advance. Asked how satisfied she was with the kinds of opportunities for leadership positions at CfA, she said:

Well there had been none that I was aware of until this new [supervisor] stepped in. And so, again one needs to know what the opportunities are...And that depends very much on having somebody who wants to see you participating in that way.

Some people were very happy with the amount of feedback, training and mentoring they received from their supervisor. Others claimed that they rarely saw their supervisors and received little to no feedback. One female scientist felt that while this mainly had to do with each supervisor’s personality, the structure of supervision—specifically the fact that all formal supervision was centralized in this one relationship—could perpetuate the problem:

I think it's very much a personality issue. [Other supervisors] really do promote their [junior people] and tell them things like, “this is a meeting you

should be going to" or "here, we have a visitor." Like, my supervisor had a visitor for a month, and I met her just in the bathroom...He didn't even introduce me to this person who was visiting for a month...So I think that's a personality issue...My impression is that it's really dependent on the person. But what is institutional is that it's all down to one person,...it's really all dependent on my supervisor. There's no other person – you could imagine some kind of institutional setup where there'd be some other sort of secondary supervisor. And I have sort of – because of my personality, sort of tried to develop these. Like, a woman in our division, who...I talked to, went to her office, and sort of tried to make my own sort of mentors. But again, that's because I'm not shy. And so,...if someone was shy...if their supervisor wasn't proactive or promoting them and they were shy, it's hard for me to imagine how they would get any sort of help in this regard.

Below we will discuss how it may be more difficult for women to find additional mentors than for men, suggesting that employees' dependence on their relationship with a single supervisor may disadvantage women more.

In general, many scientists and non-scientists felt that their success within the organization depended partly on how proactive their individual supervisor was in trying to advance them. Informal knowledge of who was particularly good at this helped some determine which jobs they took when they moved within CfA, if they had the personal networks to access this information. But given that there was such variation on this, those employees with supervisors who were not proactive in furthering their career felt they were at a severe disadvantage. Individual variation in how proactive supervisors were willing to be led to concrete inequalities between employees. Some salary inequities stemmed from nothing more than the effort that an individual supervisor was willing to put into pushing for a higher pay scale or a promotion for an employee. A male non-scientist explained:

Certainly for like research assistant positions at the CfA, there are a number of different levels at which one can enter. It's the federal pay scale, and you enter at some point and...they [loosely] base it upon previous salary, experience, and all these other sorts of things, but it also seems to be based upon who your supervisor will be when they're hiring you, and some people seem to fight harder for getting their new hires entered at a higher position so that they'll have...better pay living in somewhere like Boston, where the cost of living is extremely high...

Q: So, is there a lot of leeway for the supervisor to push?

Not a lot but, you know, a couple of steps on the scale can make a pretty big difference if you're...more at the entry end...I mean, I entered at a decent step, I think,...given the experience that I had or didn't have when I started at the CfA, but I know people have started at lower steps than they probably should have, or at annual reviews have not been promoted and probably should have...or [have] not been promoted as high as they could have been and probably should have been, based on the work that they'd done...

Q: And why do you think they weren't promoted?

I think it's largely the supervisors that they have had, and either those people not understanding the process well enough [or] not knowing that they could push to have their employees raised to a higher level.

A female scientist explained why she did not get a promotion one year—her supervisor forgot to submit the paper work. This was simply an oversight on his part, but it meant that she had to remain in a lower position and at a lower pay scale for an extra year.

It is not inappropriate for a supervisor to be central in determining whether employees receive promotions or other rewards—they presumably are more familiar with the individual's work than anyone else in the organization. What was problematic was the variability in supervisors' commitment to advancing their employees and the complete dependence on this one relationship. Many believed there was little recourse if they disagreed with a supervisor's decisions or if their supervisor actively tried to block their advancement. Moreover, they noted that the relationship with one's supervisor is greatly shaped by individual personalities and how well the individuals get along—an issue that may affect women more given the subtle disadvantages some perceived in this area.

The centrality of the supervisory relationship, and the lack of additional oversight, meant that there were few recourses if personal problems did arise. Employees could confide in an Ombudsman but several people noted that when relevant issues came up, they avoided this path because there was no guarantee that the discussion would be held in confidence. If denied a promotion they believed was deserved, employees could appeal the decision. A male scientist described how he thought the person should handle that situation—by making noise and bringing it to the attention of people higher up. But he acknowledged that appealing often did not result in a satisfactory resolution:

I do see other groups here that I feel people don't put the push in [to get their employees the promotions they deserve].

Q: ...Is there anything that the individual can do, then, if their supervisor just isn't very proactive about making noise?

Well, there is. And I think -- you know, I hear people complain about lack of promotions, and I can think of a couple of people right now, honestly, and if they directly work for me, they would have it, and that's a fact. And the fact [is] that they're not making noise themselves...[and] I have suggested, you know, make some noise. Things don't just happen, let me put it that way...They should write an e-mail, or something in writing, stating you...don't accept your review. You don't have to. If you see a review, because what happens, a lot of people say, "Yes, you did a great job. Here you go, sign here." But there's no promotion...They, themselves, should start making an effort. But you know, honestly, sometimes that may not go anywhere.

The likelihood of success for such an appeal was unclear to many people. Many others said they would feel uncomfortable challenging an annual review as this would be seen as tantamount to publicly criticizing their supervisor and could damage the relationship. Given the importance of that relationship and the uncertainty of resolution through an appeal, this is unlikely to be an option many people would pursue.

Some supported efforts to create more oversight for promotions at a centralized level to ensure greater equity and fairness. They noted that until recently, responsibility for individual employees' promotions lay with their supervisor, although efforts had been made to create greater attention to the process at higher levels. A male scientist felt that the leadership of the organization should promote accountability for ensuring equity in the promotion process. He supported initiatives for the heads of divisions and departments to ensure that deserving employees were being promoted and to take an active role in disseminating information on the promotion process to employees. He explained:

I don't get the feeling that in every instance the Associate Directors have aggressively gone out and said, "Okay, this individual is performing above their job description and should be promoted." And it may be that, at least until recent years, the scientists weren't so fully aware of this process. I think the PAEC [Professional Accomplishments Evaluation Committee] process has evolved. For example, all these things which are written down in the website have probably only been there for only a few years. So, ten years ago [the process] may have been...more opaque.

Q: Other than the website is there a mechanism for making this process known to people who might come up for review?

I don't think there's a formal mechanism...I think that a certain amount of initiation by the Associate Directors is called for if people aren't aware of it. As you know, every scientist is reviewed once a year by their Associate Director,⁷ and if...as a result of this review, the Associate Director feels the scientist is really performing extremely well and, also, reviewing their employment history, they say, "Gee, this person's been at the level 14 for five years and has really performed extremely well," and I think it's appropriate [to] ...discuss it with the scientist first and then put their name in to the PAEC...I think that...there should be a deep discussion in my view, if there has not been,...between the Director and the Associate Directors of this process, so it's completely understood by the Associate Directors that they have sort of an obligation to insure that nobody gets left behind...I think they have become more proactive, but I think...continual...consciousness raising in this area would be useful...Calling new employees' attention or all employees' attention to the PAEC process is a good idea. Most of us would like to think we're scientists, and we don't want to worry about these things. We want to do science, but of course we all do worry about these things.

⁷ The CGEC notes that the annual review by an Associate Director, described by this respondent, does not take place in every division. This further illustrates how employees' *de facto* supervisory experiences can vary from one group to another.

A female scientist agreed that the initiative to ensure equity in promotions had to come from above, and that the Director and Associate Directors needed to make this a priority:

We don't have any kind of systematic training or...any kind of real oversight for...these earlier career years...I think the kind of thing that might work...would be a more aggressive oversight...The Associate Director...should be thinking about "Is everybody here where they should be?" And ...the Director...should be saying "Is everyone in your division where they should be?" And it should be part of that supervising responsibility. And I think what happens instead is it's kind of random. [They] all supervise too many people. And it's kind of random...So the people who are more aggressive – "I want a promotion." The people who are not, don't [get one]. So it comes down to who asks and who doesn't ask; and it isn't really about who belongs or who doesn't belong in a particular [grade]...We have this very bureaucratic review process...but then...until the Grade Fourteen promotion, there isn't a systematic look at "Is everybody using the same criteria?"

The lack of oversight in this process has clear implications for gender inequities. Women may be less assertive in asking for a promotion, meaning they are less likely to get one. Since decisions to promote are generally made by individual supervisors, women may be disadvantaged by the subtle differences in treatment or evaluation discussed above. This scientist noted that the only cases she knew of where a scientist had gone for review at the PAEC without being recommended by their Associate Director were two women. Both of them were promoted, even though their Associate Director had not initiated it and, she believed, should have. Given the variability in individual supervisors' efforts to promote their employees, and the gender inequities that may result, it is reasonable that some proactive oversight from the organization leadership should attempt to ensure greater equity in the promotion process.

Managerial Training and Management Skills

A common theme to emerge from interviews with all four groups, as well as from the open responses to the online survey, was the lack of emphasis on managerial training or management skills. This is an issue that takes on even greater importance when coupled with employees' dependence on their relationship with their supervisor. The business of the CfA is to advance science. Therefore, employees are selected into positions of leadership based on their success in scientific research or supporting that research. Their ability to be effective leaders and managers was usually not a criterion of becoming a supervisor or taking a leadership position, and the need to develop such skills was not emphasized. A male non-scientist described this:

In this organization, management and supervision is not valued. It is not valued, and it is a shocking thing to say, or to hear, but it is the truth. Certainly from my perspective, and I believe that if you ask other people who are in

positions of management, ...I believe the consensus would be in agreement with that statement...It's not so much the training because the training follows from the imperative to do good management, right?...What I am saying is that the basic imperative itself of really being a good manager, and I mean investing the time in doing that. Not in any way, shape or form encouraged. In fact, in some ways, it's sort of like discouraged. It's like, "Oh, yeah,...doing performance reviews is something you've got to do, but it's a pain in the (expletive), or something." I mean it's basically that.

...I'll give you a for instance...There are mandatory training courses that all supervisors and managers are supposed to attend. All. Okay? For example, EO [Equal Opportunity] training. Training in preventing sexual harassment...As well as how to conduct performance reviews, performance appraisal reviews, and so forth...Smithsonian Institution say[s] all supervisors and managers should attend these training courses. I've attended every one of them. In every case, there are almost no scientists there. Almost none. And every case, you'll see most of the people from the business, the services side of the organization. You'll see most of us there, right? So, there's this real dichotomy and the message is clear, because we're a science research organization, and so there is a pecking order. The science is the mission, and so... that's on top...But, when you've got the primary focus of the organization saying this is not important, right? Then it filters down. And...everything falls from there.

Many believed that the CfA did not prioritize managerial training for scientists, sending a clear message that such skills were not important. Respondents suggested that there was a general perception among many scientists that there would be few if any repercussions for not attending these training sessions or taking them seriously. Some noted the irony that supervising other people was sometimes required to move into a higher position or pay grade, and yet there was no evaluation of whether someone is a good or a bad manager.

It was felt that the organization believed management would simply come about naturally, something its highly skilled scientists would be able to easily master. In reality, this was often not the case. In the words of one male non-scientist:

What happens is...you're a scientist. You do a great job. You've come up with this fantastic discovery. So you get more money, and that means you hire some people to help you with that. So now you're a manager, right? And eventually, you might become the Associate Director for the division that you're in. Nothing in your training has...trained you for that. You know, courses in quantum mechanics don't teach you anything about management, right? And so you've not at all been trained for that, and there is this real sense that a Ph.D. in Astrophysics is hard, and everything else is easy by comparison. I'm sure a Ph.D. in Astrophysics is hard. That said, however, being a good manager is also very hard. And requires a lot of work.

Those experiencing problems with their supervisors felt that, rather than people with a Ph.D. being able to effortlessly handle management, scientists often made particularly bad

managers—either due to a lack of social skills or because their focus on their science was so all-encompassing that they did not take the time to specify to others what needed to be done. As another male non-scientist pointed out, they were applying one organizational model—an academic one—to a completely different set of tasks:

I think the problem arises, first of all, from the academic culture, which is that you get smart people and you let them go do the right thing. And that works sometimes...That may work in other parts of the CfA where the astronomical research is the only thing. With us, we're building a [product] and trying to get it to work, and that's a well-defined technical problem which doesn't necessarily lend itself to the academic approach. It's not a research project; it's a construction project. And so I think that that approach toward managing the project comes from the academic attitude that, "well, we'll just hire good people, and they'll figure it out...If we hire good enough people, we won't have to tell them what to do." And...I guess that that's approved all the way up to the top of the CfA because no one's tried to change it.

Because the CfA evolved from an academic institution, that organizational model is still dominant, even when it is not appropriate for a given objective. This observer insightfully notes that it is an institutional model embraced by the organization, because the organization leadership has never focused on the areas where it fails.

In the interviews, there were numerous examples of managerial problems, such as a lack of communication with employees, particularly insufficient feedback on the work they were doing. The excessively harsh and disrespectful treatment many women complained of was often attributed to a lack of people skills—managers not knowing how to talk to their employees or not realizing how their comments came across. Because management was not emphasized within the organization, supervisors had little incentive to train employees or help them learn the skills they needed.

This female non-scientist's situation with her bosses exemplifies the difficulty many managers had communicating with their staff. They would not take the time to tell her what they needed, yet expected it to be done anyway. Often their responses came across as harshly critical, due in part to what she described as her supervisor's abrasive manner. She explained:

My bosses really,...it's not that they don't care or they're uncaring people, but they're very involved in their science, and...they just want me to be able to do the job without even telling me what I need to do. They want me to be a mind reader. And they've admitted as much, and they know it's impossible...But they still want it. And then they get frustrated when [I can't do that.]

Q: Have you ever been treated in a way that you felt was rude or inappropriate—?

Oh, yeah!...I mean, there's mild instances...with my boss where, I mean, I don't know, they're sort of brilliant people, but socially they can be a bit strange at times. And sometimes they're very brusque or difficult. [The

scientists I work for], when they have a problem with me,...they don't want to sit down and talk to me; they complain to my manager. And my manager tells me they're unhappy...When they have a problem with what I'm doing, they usually don't tell me, they tell her. I feel like they're like telling on me to Mom, which is really uncomfortable. And it's also incredibly passive-aggressive and slightly insulting that they can't take the time to say, you know, "I'd like you to do—" You know, they're really overbooked and busy, and the science is the most important thing. And so I'm just really not that important in the scale of things. But it's sort of a self-fulfilling prophecy; if they want me to do the best job that I could do, they should take the time to make sure that we have a good relationship. But they don't, so we don't really have a great one...I mean, it's really demeaning, to have people not be able to say..."Well, I needed that report yesterday and you didn't get it to me." It was like, "Well, you didn't tell me you needed it yesterday." "I didn't?" "No." It's things like that.

She believed that the lack of communication between managers and their employees was the biggest administrative problem at CfA.

Many people complained of not receiving enough feedback from their supervisors, although this was particularly the case for women. The annual review was often the only time people got any feedback from their supervisors. Even this process was disappointing for people who wanted more feedback. Repeatedly people said that the review lasted 10 to 15 minutes and consisted of a supervisor saying they had done a good job or giving them a thumb's up, with little detailed discussion of any areas that could use improvement. Many people found this frustrating, and believed they could not possibly have met or exceeded every expectation their supervisor had. Although the review is supposed to take place yearly, several people noted they did not have it every year or that it was several years after joining CfA before they had their first one. There was a general sense that managers, particularly scientists, were too busy and did not think the reviews were very important.

A related comment, which came mainly from female non-scientists, was the unwillingness of their supervisor, and of the CfA in general, to support additional training or learning new skills. There was very little emphasis on training within the organization and most supervisors did not have time to train their staff. At the same time, many supervisors objected when they tried to take external courses to learn relevant skills. One female non-scientist had already gained approval to take a training course to learn a relevant computer program. The leader of her project later came to her and told her "No, you don't need that." She felt that symbolized the lack of support for professional development for CfA staff. Another female non-scientist described what she saw as the biggest challenge to the morale of CfA employees:

I would have to say it's the...professional development piece. I mean, there doesn't seem to be room for that and I think often times, when you don't have something tangible to work towards,...I think after a while people...either they become complacent or...they all together...are just not happy and they take action. They leave...I think the biggest thing is promotion and mobility. And knowing that you're working towards something or...you can kind of put

your finger on a place where you'd like to be and have a goal to be there [in] whatever amount of time you set for yourself. That's important. Or to feel as though a company will support you in professional development.

The female non-scientists expressing this sentiment felt there was little room for mobility in their jobs. Because there was no investment in training them or developing their skills, they could only stay in a dead-end job or worse, be replaced when the current technology advanced beyond their skill set. What some of these women felt was disrespectful treatment stemmed from being seen as disposable within the organization. A female staff person who had an antagonistic relationship with her boss at one point tried to move to a job with another boss, but said "I know I wasn't able to do the job without any training. He told me that he couldn't give me the job because he had no time to train me." What they felt was disrespectful treatment by the organization reflected a sense that the organization could only use them as long as their current skill set was valuable. The experience of her friend illustrates that feeling:

She's worked [at CfA] for a long time...But, okay, the new [technologies] come in there. She was never asked to go to school for Peoplesoft. What did they do? They brought in temps. See what I'm saying, though? I mean, [they treat you like] you're lower than dirt. They don't care. They want you to leave, you know? They don't want you to stay and grow up. She has to find out herself how to do this.

Q: They don't want you to improve your skills?

It seems that way. You know? And that's fine for them, but it's not fine for the people because this individual, she's not married, and she's got a mortgage to pay. You know what I'm saying? She needs to make more money, and at this point in her life she probably needs to save it, because...nobody would want [to hire] her any more.

Part of a manager's job is to decide how much of an investment the organization can make in its staff. This implies that managers receive the training to make that calculation. More harmful is what several of the female non-scientists perceived: a blanket policy of discouraging professional development and growth. This was an issue that particularly affected people in administrative support positions, and therefore affected female staff disproportionately only because they were more likely to occupy such jobs. The positions that male non-scientists typically employ, such as technical or engineering jobs, usually involve more time to develop new skills. More of the jobs typically filled by women do not offer many opportunities for growth.

If the lack of managerial training was a problem, it was particularly problematic when issues of gender discrimination or harassment did arise. A female scientist who had substantial problems with her male colleagues explained her frustration at her supervisor's response to the situation:

My supervisor is the type of person...[who] tends to...overlook some interactions in the group that aren't appropriate...I'd had a number of difficulties with several of the male members of this group, of very disrespectful treatment. And only very recently have I been able to convey to my supervisor that this is really inappropriate. In the past...[my supervisor] has come to me and said "You don't get along with these people." And I would point out that what was done was completely one-sided. And [the response would be], "No, it always takes two," which I don't think is quite a fair thing to say. If there's any possibility it's discrimination, in discrimination it doesn't take two. It's one person who's not valuing the other person very well in the workplace.

This woman was angered by the supervisor's admonition that she should try to get along better with people, claiming that much of the responsibility for handling inappropriate workplace behavior and managing a hostile work climate rightly lies with the supervisor. She said:

I think it's a matter of not actively stopping that kind of behavior whenever you see it...I mean [it's] let...go unless it gets really ugly. And what [we see] in a meeting is probably very small compared to what's actually happening by e-mail, by phone calls, you know, as far as negative behavior. And I wish [that more had been] done to get the whole group to treat each other well with respect in the beginning.

Other women, too, noted that a commitment to rooting out inappropriate behavior toward women must come from the top. This requires greater sensitivity to these issues than many managers show.

There was a general sense that CfA scientists would show great resistance to managerial or sensitivity training. Many noted how scientists resented what they saw as useless meetings that only took them away from their work. This was related to the view that being a good manager in general is not valued or rewarded by the organization. Yet a few scientists who supervised others did recognize the need for greater managerial training in their own jobs, often after confronting difficult personnel issues that they were uncertain how to handle.

The behavior that results from insufficient managerial skills may bother women more than men. Certainly more women, both scientists and non-scientists, were concerned about not getting enough feedback or guidance from supervisors, or were upset by the way in which a manager's comments were given. Given that little emphasis is placed on supervisors' managerial responsibilities, the fact that supervisors play such a prominent role in promoting and advancing their employees, with little oversight elsewhere in the organization, may affect women disproportionately. The decentralization of this authority within divisions and departments increases the onus on individuals to be assertive and proactive in advancing their own career. Yet if a cultural double standard penalizes some women for being assertive, labeling them as "difficult," this organizational structure would help any such disadvantage escape unseen.

Unclear Criteria for Promotion

The web-based survey of CfA discovered that women were more likely than men to feel unsupported in the promotion process and to believe that there were “unwritten rules” that guided these decisions; in the open-ended responses, some participants called for clear and objective criteria for promotion. This finding was mirrored in the qualitative data, although the in-depth interviews revealed different ways that this could be experienced. Female non-scientists and more junior scientists typically explained that they did not know how the promotion process worked. They understood that there is an annual review, but they were often unclear about the basis for the evaluation. Many said they suspected this information was available, but they did not know where to look for it. Several people said they wished this information had been given to them or made explicit by their supervisors. A junior female scientist expressed this sentiment:

I'm sure there are written rules but I don't know where they're written...One criticism you could make is that maybe it's not really clear what the criteria for advancement are. I know that I have been getting promoted a certain number of steps in my current grade based on my evaluations every year but if I wanted to get promoted to the next grade I have no idea what I would have to do.

Male and female non-scientists who had done well in their annual reviews were less troubled by the review process, but their discussion of the criteria by which they were judged were quite vague. Typical responses claimed that to be promoted “you have to do a good job” or that “it depends on your performance.”

Scientists, especially those at the higher levels, felt more familiar with the criteria for evaluation, but more often felt that there were “unwritten rules” or variability in how those criteria were applied. Such comments were sometimes given by male scientists, but were more recurrent and seen as more problematic in discussions with women. As they got higher up in the organization, they had more experience with the promotion process. By that point, they had a firmer grasp of the formal process, but believed there was still a lot of room to interpret the rules—and it was this process that was unclear or “unwritten.” A female scientist said:

[The] PAEC...review[s] whose ever folder is given to them. They review that to decide whether or not that person should be bumped up to the next level. And...that's still all I know about it...And there is...some online information, which I have read, that says to be level thirteen, you have to fulfill these things, at fourteen, you have to fulfill these things...But one still has to do some interpretation of what -- for your particular case, what does that mean?

Many of these women felt that the application of criteria to individual cases was where personal judgment was allowed to enter in—and that judgment could be affected by the subtle disadvantages women faced in the institutional culture.

In particular, loosely applied criteria for promotion allowed double standards for how women are judged to influence promotion decisions. Earlier we saw that women feel

being aggressive or outspoken can be interpreted negatively, in a way it would not be for men. One consequence of permitting greater flexibility in promotion criteria is that these subtle cultural assumptions may affect the opportunities offered to women. A female scientist expressed this idea:

Q: You said that sometimes when women are more aggressive or assertive, people can just decide "I don't like them." Do you feel that that is ever used as an excuse for not making those promotions...if the guidelines for making those promotions aren't stated?

Yes. Yes, I think so...You know, the woman might have a reputation for not being a team player or not being a good committee member who tries to go along with consensus...I think it can. And I think a lot depends on -- we're still [at the point] where it gets pretty typical on any committee to be the only woman...At ten percent, committees aren't usually big enough for two of you. So, yeah, it does have a dynamic that it's very difficult sometimes to find the right way to make your points.

In one example, a talented female scientist voluntarily left CfA because she felt she would have little chance of getting promoted because her assertiveness caused her to be negatively perceived. A male scientist explained:

[She] didn't feel that she was treated very well...She sort of annoyed [some people] by her complaints about the way that things were run. And her complaints were reasonable, but most people aren't quite as vocal...But she just felt unwelcome because [those people] just didn't like her...I think she felt justifiably that there would be little chance that she would get [promoted] because [those people] seemed to be...not very enthusiastic about what she was doing.

Obviously it is difficult to specify explicit criteria for hiring scientists, particularly at the highest levels. Individuals must be judged on their merit. But more explicit criteria can help prevent personal opinions, shaped by cultural assumptions about gender, from playing a strong role.

Information Diffusion and the Distribution of Resources

Related to the lack of clarity in the promotion process is a more general concern with the lack of open communication about the CfA's policies and how decisions are made. The organization was frequently described, particularly by higher level scientists, as "secretive" about its resources, policies, and priorities. Important information was never formally dispersed and instead circulated informally by word of mouth, reaching only select people. Because information about available resources and how they were distributed was not transparent, there was great concern that positions or resources were being distributed based on informal or personal decisions. A female scientist expressed this sentiment, saying "I

think...we've been suffering because a lot of the decisions are just being made very quietly and unilaterally. And there's just not much information that's getting out – which is bad."

Many people noted the lack of set policies within the CfA. This made it particularly difficult to find out how things were run or what steps needed to be taken. A male scientist describes one such problem he encountered:

You have policies and procedures, and many times you go into departments, primarily,...but even in divisions...they say, "Well, that's not SAO policy." Okay, I can live with that. Where's it written? It's not written down. Well, ladies and gentlemen, if it ain't [written] down and distributed, it ain't policy; it's your wishful thinking. And that's been an issue. And we've had numerous conflicts over hiring people. "Well, we can't hire that person at that grade level." "Why not?" "It's not SAO policy." "Well, what is the –" "Well, we don't want to have disparities between postdocs' salaries." "Where is that written down?" "Well, it's not written down. It's a guideline." "Where is it written down as a guideline?" "It's not written down as a guideline; it's just the way we do it." Well, ladies and gentlemen, just because you want to do that way doesn't mean it's the right way to do it. So get out of my way and let's either write it up as a policy or do it. ...That also speaks a whole issue of information hiding in the sense [that] that's a bit of information and it's a power play. [They] wanted to have this little bit of power.

This is relevant for people's own career advancement as well. A female scientist, being told that all the senior staff knew about a certain issue, then wanted to know how someone can get to become senior staff. She was frustrated to have to ask this over and over without receiving an answer. There was no clear policy that anyone could tell her. In another example, a female scientist was told her postdoctoral fellow had to be located at a different CfA building because there was no room in hers. After several male scientists' postdocs were moved to her building first, despite having started after hers, she finally set out to determine what the policy was:

There's no policy! They're just doing whatever they do. They're just randomly doing what [they want]. And I don't think it was blatantly gender discrimination against me. I think it was just I didn't scream loud enough.

To an outside observer, the preference given to the male scientists might have seemed like explicit gender discrimination. She did not believe gender was a conscious consideration, but the fact that women may be less likely to scream loud enough, or push their weight around to get their goals achieved, has the *de facto* impact of hurting women more.

The lack of set policies at CfA is believed to be an asset by the organization, giving it the freedom to take individual circumstances into account. One scientist believed that a phrase used by some in the organization symbolized its leadership style: "in ambiguity lies opportunity." The flexibility of not being locked into formal policies allows the organization to act freely in its best interests. Yet that same flexibility can disadvantage groups of people—such as women—through its very informality. A female scientist said:

We...tend to be very loose, right? We tend to want to make exceptions to help people do whatever they want to do. We're a bureaucracy that's trying to [be] as un-bureaucratic as we can, which is mostly a good thing. But it means that the rules aren't really all that clear. And then the problems can't get easily solved...

[I] very much... believe that things like gender equity rely on having policies that are open and clear and are being implemented the way people expect them to be. And then it's this loosey-goosey kind of, you know, there aren't any rules because we'd rather make deals because that way we can make more people happy. It leaves the people out who didn't know you were supposed to be making a deal. And that tends to be the women and the minorities and the less aggressive men. And it isn't because it's...gender discrimination, but it leads to it. That's what I see here.

When a policy is written, everyone has equal access to it. When no policies exist, people are dependent on personal networks and informal channels to discover the information. And those are precisely the types of resources to which women and other minorities may have less access.

Many men and women expressed concern over the apparent lack of openness in the hiring process. A male non-scientist explained that many hires are technically “open,” but the odds are often stacked in favor of a particular applicant:

The way that jobs are given is interesting. The job description is written and then...they publicize it to the world and anyone can apply. But these things are usually written because there's some internal person whom they want to have this position. And they...write the descriptions to match exactly what that person does, so that they'll be the best candidate for that...You know, we basically set it up so that you'll get the job...I mean, I don't know that that's a terrible thing. But it certainly can have the effect of shutting people out.

Furthermore, information about available positions is not often circulated to potential candidates. A male scientist claimed it is not enough to post a new position on an employment website—a more proactive approach is needed to disseminate information about new opportunities:

When you have new positions, you would expect them to pass information out that there's a new position opening up. Push rather than pull. I mean do I really want to go look into personnel website every few weeks to find out what's been posted? Not really...I've [already] got a job...It's a lack of information flow that's been characteristic of [the CfA] for a long time. And I think it's filtered down through a number of the administrative divisions.

The lack of open, advertised hires was a particular concern for the most desirable jobs, such as Federal positions, many of which were described as being allocated through “secret deals.” From the organization’s perspective, greater flexibility in hiring helped it offer

positions to extremely qualified scientists who advanced projects in prioritized fields. From many employees' perspectives, this enabled the organization to exclude many qualified female candidates.

There was also a perception that "secret" resources were distributed at CfA -- cash awards, retention bonuses, internal funding for postdoctoral fellows or Research and Development. Many of these resources were discovered informally, heightening suspicions that such goods were available to some and not to others or were allocated by whim rather than systematically. One male scientist said:

There have been some retention bonuses that have been controversial, because retention bonuses really should be strictly to keep someone from leaving under temporary circumstances. And there's been some evidence that [they've] used those year after year [for] individuals whose work [they] like very much. And it's just sort of like a general bonus. And...it's supposed to be a retention bonus, not just a regular yearly bonus for merit. And so there's some controversy there.

He believed that none of these retention bonuses had ever gone to women, further heightening concerns about them.

Internal research funds are a particularly desirable resource. Yet even high-level scientists had little information about these resources and how they were distributed, or whether there was a formal process for it at all. This high-level male scientist describes how some people seem to have access to this information while others do not:

Getting internal funding has always been a mystery to me. Getting external funding, I know how to do that. But saying, "Look, I need seed money for this."...I always basically saw that kind of thing from the outside, and I think there's a formal process. But it's – the older people seem to be more attuned to that...They know the rules...I think, for younger people, for other people, that's completely opaque...[I was in a conversation recently where] I said I thought that the [allocation of] [Internal Research & Development money],...I thought that that was a vague process, but then another person who's at the same level as me said, "No, I've actually used that a couple of times." ...I didn't know how to use it.

Those who were knowledgeable about these resources noted that there is a formal application process for Internal Research and Development funds that is open to everyone. Funds are judged by the Director and Associate Directors and are awarded on merit with the schedule and applications available on the web. But information about this resource and the evaluation process does not reach many people in the scientific community. This became a gender issue, as many female scientists claimed that these resources were particularly unlikely to go to women. One female scientist said:

We have some internal funds that are competed internally. And...you could argue it's more for instrumentation and, therefore, men do that more.

But...there are also aspects of it where people don't know to compete. So I see [that] a lot. I think there are a lot of cases where, you know, women didn't [know] to ask for a retention bonus. Women didn't know that there were cash awards. Women didn't know to ask. So it isn't even just that they were blatantly not given something, but that the information has not always been distributed equally.

The reliance on informal channels results in unsystematic access to information, and women are particularly likely to be excluded.

Personal Networks and Informal Mentoring

The decentralization of authority within scientific divisions and the lack of systematic information diffusion make personal networks especially important for discovering information and accessing those in decision-making positions. Establishing relationships with powerful mentors was seen as central to advancing politically and scientifically within the organization. Such networks are not always made up of "old boys," but women are particularly likely to be excluded from these channels.

The way those "in the know" tended to hear about internal resources and other opportunities was often through informal conversations with powerful contacts. A male scientist explained how he learned of several different types of resources that were not made publicly known:

It came out...that there were actually funding sources...that weren't known to anybody. For example, there were retention bonuses that were available to some people. Well,...up to the point I was having a martini with this person, [I] didn't know that there were retention bonuses or I'd [have] threaten[ed] to quit long ago (laughs)...There were issues of interim funding available for some people...whose grants didn't get accepted but whose next big one was likely to be accepted but there was a gap in the [funding]. I didn't know about that...There were these things that I just didn't know about. And you'd think that these kinds of things would be widely distributed...Certainly issues like retention bonuses should at least [be] public knowledge [that] they exist, forget whether or not you want to have it public as to who's stuck them up for it.

Q: How did you find out about the interim funding?

Same conversation. Came out there were a lot of things -- somehow that person had been participating in a meeting where they got a whole bunch of information that just was not widely known. There [were]...three or four or five items that came out in that conversation.

Informal networks and relationships with powerful individuals were seen as particularly key to getting things done at CfA. Having those networks was often the

“unwritten rule” for promotion or success. A male scientist explained his experience with the promotion process:

Having been a supervisor myself and having dealt with Human Resources and the...PAEC, the formality gets more daunting every time for me and the people I was trying to promote. And yet it still seems that at some point, if a high enough level person wants it to happen, they just find the magic words and yell at Human Resources people enough, and it will happen...[The promotion process] has the formality of all the written stuff but if you don't have somebody who is strongly supporting you, which is the unwritten rule, then I don't think you would get promoted.

Another scientist noted that aligning yourself with the right powerful people is likely to help your success in any profession. The concept of science being based only on an objective estimation of the quality of an idea is probably somewhat naïve, he felt. Yet there is also variation between institutions; structural aspects of an organization shape the extent to which such contacts must be relied upon for information that would otherwise be available to everyone.

Personal networks that provided access to the Director of the organization were considered particularly important. Although every division had an Associate Director, not all Associate Directors were seen as being politically connected, with direct access to the Director's ear. Because of this, the position of Associate Director was not seen as necessarily holding enough authority that it would be a locus to bring concerns or ideas. One scientist who did have a personal connection to the Director explained how a scientist with a problem would not necessarily approach their Associate Director first:

In any organization, if you think you're going to talk to somebody and their voice is going to be heard after you talked to them, then you talk to them. But if not, why bother?

Q: So what ends up happening now? If people have problems, they just don't talk to anyone about it?

Well, it depends who they are. So in my own case, if I had a problem, I'd go straight to [the Director] -- just by-pass everybody else.

Q: But somebody who doesn't have that direct connection to [the Director]?

Somebody who doesn't have that direct connection might go to somebody who does.

Q: They might go to you, for instance?

Right. So they might by-pass the [Associate Director]. It depends who the AD is.

An example of this chain of command occurred during this interview. Another scientist came to the door several times to see if the interview had concluded. After the second interruption, the respondent said:

This person who just came to the door wants to talk to me because I have a direct route to the Director to get a million dollars for the project that he and I and a bunch of other people want to do. And he's a [high-level] scientist and does not have his direct route to the Director. So there you go. That's why he keeps knocking on my door.

The *de facto* reliance on informal, personal connections rather than the institutional structure emphasizes the extent to which the formal hierarchy of authority is not utilized to give all employees a means to resolve their problems.

One female scientist believed this reliance on informal networks helped men more than women. She explained:

The younger men that I see being really successful here and getting promoted really quickly and winning a lot of internal money and doing generally well tend to be guys who would go down and talk to the Director, tell him their great idea and get money. It just wouldn't occur to me in a million years to do something like that. I would go to my boss, but I wouldn't go to my boss's boss. I just wouldn't. I see the younger men who do that, they tend to do really well here.

I mean I had a [junior scientist] that was working for me. And he had his own money...[and] he was at a level where he didn't need to run everything by me [although] I was his supervisor. But it didn't matter. It was totally appropriate for him to go to the [project] director. But he went a lot. I was surprised at how many times he went to the [project] director...And he would think nothing of going to [Jim] or going to [my boss] and not ever coming to me. I would hear it from [Jim] or I might hear it from [my boss]. And I just wouldn't do that...I mean now that I see how well it works, I might try it. But it wouldn't have occurred to me to do that unless it was really something that had to go to that level. And then I would always run it by my supervisor first. He would never do that.

She sees very few women going directly to the top in this way. This also creates the potential for female supervisors to feel insulted or slighted by employees who choose to go over their head.

Informal mentors become particularly important in this situation. Scientists in particular can benefit a great deal from being connected to the right people. Significantly, most of the female scientists felt they would benefit from more mentoring, while most of the males either felt they did not need mentors or that they received sufficient mentoring. This was particularly true among the junior female scientists, as one explained:

Q: How satisfied have you been with the opportunities for career development or advancement at CfA?

Somewhat dissatisfied. It can be difficult to find mentors here, and you know, I'm aware of a number of people having come here as a postdoc and then gone on to get a more permanent position here, whether it be a Federal position or a Trust position, but how people secure those positions is not clear to me.

Q: Do you have anybody who serves in a mentoring role here, or a supervisor?

Not really. We're sort of by default assigned a division head as our...contact person, but whether or not one actually interacts with that person is just a matter of the circumstances. For example, the person I was assigned doesn't work in my scientific field and so we've essentially had no contact in regards to my work here.

Q: OK. Has there been anybody else who...you've been able to talk to?

Yes...there have been people, but...it has taken me time to find these people and get to know them, so [I've been here several years now and]...I've finally found some people that can serve in that role, but it can take a long time if you come here and don't know anyone from the start...They don't necessarily have the same scientific interests as me, but they just might be people who take a more active role in making sure that the younger people here are satisfied, are getting the guidance need. Some people,...they're more interested in that and other people feel they should just sort of stand back and let people be independent and not interfere. So it's just...a matter of luck.

Women may have less access to mentors within the organization because there are fewer women in high-level positions who could serve as mentors. A male scientist, discussing how important it is for young scientists to have contacts who are politically networked in the organization, saw this as a potential problem for women:

The people who are at the top who might be able to help a postdoc or a graduate student, I think, there's very few women in that position at the CfA. So the people that...you would ally yourself with or try to work with...the people who are higher up, are on important committees in the field, who work to put together the conferences who decide who gets to give a talk and who gets to give a poster, things of this nature. So,...if you've been working at some level with one of these people, it's reasonable to expect that you're more likely to get a talk and higher degree of visibility at a conference. And, it seems like a small thing, but over a period of years, it adds up; and visibility is important. And...I would say the fact that there aren't more women in high positions at the CfA, it's quite possible that would have a negative effect on

the ability of women graduate students and postdocs to sort of find a political ally.

The group of people holding these higher positions tends to be mostly older men. One male scientist thought it could be seen as inappropriate or uncomfortable for these men to act as mentors to younger women:

Q: Do you think that women are as plugged in to the most helpful networks?

Probably not, because they tend to be less senior. And the mentors are – there are only one or two senior women here...And they can only mentor so many people...So probably the answer is they're disadvantaged from that perspective, unless they're comfortable to go [up to] a senior man and [say], you know, "Let's go have lunch." How many younger women do that? It's a real issue, you know. [He's going to wonder] "[Are you] trying to get me in bed with [you]?" ...You know, a thirty-year-old girl comes up to a sixty-year-old man and says let's go have lunch so that you can tell me what's going on. He might say no, because it doesn't look good, right? Even in a group, it can be dicey.

Q: Or do you think that she might be reluctant [to even ask] because of what he might think that she's proposing?

The whole thing. You know, you can play that whole scenario out. But I know, for example, that I'd be very reluctant to -- In fact,...we have a woman in our group who likes to play [poker]. And I love playing [poker]. [So] I made the invitation, but I made sure as hell that I invited her office mate. Not that he cared, but I didn't want to deal with the potential talk. I mean it just isn't worth it, which is a real downside to this whole thing, you know...to the aspect of the women and the gender issue trying to get the equity. But I can't approach them in the same way I could on a man. I can't just say, "Okay, I'm going down to [play cards] now; do you want to go?" I can't. I mean...it just -- I wouldn't do it. So to the extent that I have information they could gain by [playing cards] in a social [setting]-- they're not going to get it.

An informal system for distributing information is more likely to leave women outside the loop.

The organizational structure described here is one that values flexibility over consistency. There are undoubtedly many arguments to be made for such an approach, particularly in an academic setting where contributions and policies cannot always be easily specified. Formality creates its own set of problems; no organization wants to become so bureaucratic that it hampers efficiency. At the same time, it is important to recognize that more informal structures usually disadvantage minorities and groups that traditionally have less access to networks or powerful individuals. From the perspective of gender equity, this is a structure that creates barriers for women, and perpetuates the more subtle differences in treatment that persist in the organizational culture.

Organizational Barriers to Perceiving Gender Inequities

The structure of the organization may also make it less likely for people to perceive a gender equity problem outside of their own research group. The lack of interaction between different divisions and departments made employees feel connected to their particular work group, but disconnected from the organization as a whole. Non-scientists in particular, but also some scientists, felt extremely isolated within the CfA and unaware of what other groups were doing. Although gender equity is an issue that has been much discussed in some social circles, the perception in other parts of the organization that there were no gender equity problems is likely perpetuated by the isolation and lack of information flow to all parts of the organization.

The lack of interaction between different departments and divisions was a common complaint in the interviews. This is perpetuated by the physical separation of the CfA into different locations. With all the busy schedules, even crossing the street to attend talks or coffees in a different location posed a barrier. Scientists discussed this from the perspective of dampening scientific interaction. Although one of the CfA's greatest assets was the wealth of talent in its staff, many people felt that there was relatively little opportunity to meet other scientists and discuss new ideas. It was common, many said, to attend a conference and meet someone else who had been at CfA for several years and who was completely unknown to them.

Non-scientists discussed the isolation more from the perspective of social interaction. Although many were very happy with the work climate in their respective groups, they felt cut off from the organization over all. Sometimes this created problems for their work, particularly when scientists had little idea about the nature of their work or why it was important. Many believed the lack of interaction helped scientists treat them disrespectfully because they simply did not know them or understand why they were creating perceived impediments to their science.

When asked directly about any perceived problems with gender equity at CfA, most people said they could only respond for their department, division, or work group. This meant that most non-scientists who were in departments that were highly segregated by gender had little basis on which to judge. A male non-scientist's comment was typical:

In my experience here, let's say in this department, I don't see any [gender equity] issues at all there, you know? It depends on each department...how that's handled. I don't really see, there's no particular difference [here]. As I said,...there aren't any women in my area. So I can't really help you in that area. But as far as the one woman who's working on like [computer assistance] and things like that, I think she's treated quite as well as all the others in our department. I don't see any differences.

Many defined the issue of gender inequity in terms of overt discrimination or sexual harassment. In the absence of such explicit sexism, they believed gender equity was not a problem. Yet when asked specifically if the social atmosphere made women feel less comfortable than men or if women were treated differently in any subtle ways, many men and some female non-scientists did not perceive any problems. A few men recognized that

men are generally less likely to be as attuned to ways that women are subtly disadvantaged. In general, the lack of information flow and knowledge about other parts of the organization makes gender equity problems less recognized.

V. LEADERSHIP POSITIONS AND CAREER PRIORITIES

One potential explanation for women's lesser representation in leadership positions at the CfA is a differing set of preferences that gives greater priority to their families. A legitimate question is whether women have opportunities for leadership positions, but turn them down because they want to spend more time with their families. One female scientist posed this question:

There aren't that many women who are in [upper-level] position[s]...And there are some [women], myself...included, who, if you say, "Well, have you ever been offered administrative positions that you didn't want?" we'll say "Yes." And then you say, well, look at the statistics. There's no women who are in these administrative positions. Why not? And then you find out subjectively it's because I wanted to [spend time with my family]...I've become very non-idealistic about feminism as I get older and older. It's like I do not believe that men and women are equal in their priorities in life. I believe they're equal in their abilities, absolutely. But I think that it's just true, whether it's biological or cultural, I don't know what, but that women find their family life more important and that they're willing to forego opportunities that men are not for their family. "Why aren't there more women in positions of authority?" Some of that is because they don't want to be.

In the online survey, respondents were asked whether they were interested in taking on leadership positions. The survey found that almost all scientists with an interest in leadership wanted to become a Principal Investigator, regardless of gender, and becoming a supervisor was also very desirable. But more male than female scientists aspired to become Department Chair, Director, or a Project Scientist.

Consistent with the more representative survey, the in-depth interviews found that almost all female scientists were interested in taking on leadership positions, but most of them aspired to higher scientific positions, such as a Federal appointment, faculty position, Principal Investigator. Some women were interested in becoming a supervisor, particularly those who were more junior and saw fewer high-level positions as possibilities for them in the near future. A few women were also interested in becoming Associate Director, serving on committees or other administrative positions. Yet those who said they were not interested in taking on administrative positions did not feel this way because they wanted to spend more time with their families. In fact, the only woman who gave this response was the woman who posed the question. Rather, they felt that administrative positions would take time away from their science. Female scientists felt they had to devote every ounce of their time to their scientific work if they were to compete with male colleagues for a coveted Federal or faculty job. The survey also found that female scientists most strongly felt that they often forewent personal activities because of work; in the balance between

family/personal life and work, the work side often seems to come first. A female scientist in her early 30s was saddened by the fact that so few women her age felt able to have families while her male peers often did. Yet this feeling reflected their prioritizing their work:

Q: Do you see women almost limiting their own opportunities in a way, because they want to devote more time...to family?

To family? No, I see them limiting their own family opportunities because they want to [devote] more time to work!

One of her female friends in graduate school, after telling her Ph.D. supervisor that she had a boyfriend, was given a lecture on how it would be a bad idea to get pregnant. She and her female peers get the message loud and clear that having families can be an impediment to their careers.

There was also no sense among female scientists that serving as an Associate Director or being on a committee would help them advance to higher scientific positions. Some women felt that being Associate Director did not bring a lot of power because most decision-making authority was concentrated in the Director's office. Others simply felt that the best way to advance a scientific career was by concentrating more on science, and administrative positions, too, took time away from that.

The survey also found that fewer women than men felt they had been given opportunities for leadership positions. This theme was forcefully expressed in the in-depth interviews. Opportunities were denied them for many of the reasons already discussed—their supervisors were not proactive enough in promoting their careers or suggesting what opportunities were available, or there were simply no positions to move into. One female scientist explained:

Q: And how satisfied are you with the kinds of opportunities for leadership positions here?

Well there had been none that I was aware of...And so...one needs to know what the opportunities are, I think. And that depends very much on having somebody who wants to see you participating in that way.

Another woman said she has been engaged in an ongoing discussion with her supervisor for many years about taking over the project, but she feels he has been reluctant to give up his control. Other women agreed that there would be few leadership positions available until someone retired, and scientists and academics tend not to retire early.

The sense that serving in an administrative position would take time away from their scientific research was a particular concern for women who had to fund themselves with their own grants. One female scientist said this left her little time for other positions:

There are more women in Trust positions. But that's our default. That's the only place we can be. And this is actually a disparity that I find terrible. If you're a Federal scientist and you write grants, and they don't come in one year – because grants are very difficult to get – you still go home and eat and

pay your rent and feed your babies and heat your house. I don't. I have to leave. So I have to spend a disproportionate amount of my time writing grants with a high failure rate and accepting that. Yet I'm supposed to be judged by scientific productivity equal to someone who doesn't have to worry about where they're going to get the resources to live in the next year. But the only place where women can be is on the Trust side right now, by writing competitive grants.

When asked if she would be interested in taking a leadership position, she responded, "If it led to real employment, yes."

Furthermore, it is not clear to many women to what extent having held administrative positions, such as Associate Director, matters for promotions and scientific appointments. There is a general sense that these positions are not given much weight, leading to the response by both male and female scientists that they are not interested in administrative positions because it would take time away from their science. If being an Associate Director or taking leadership positions are factors considered in promotions or appointments, that information should be made clear and available.

Support for Families

Although few female scientists claimed they turned down opportunities because of prioritizing their families, most still felt it was extremely difficult to balance work and family life. This was also revealed in the survey research. Several male scientists, especially men who have young children and are actively involved in providing childcare, said the same thing. Yet this was a burden that the CfA helped to lessen. All four groups of respondents viewed the CfA's commitment to supporting families in very positive terms. While there was some sense that its formal family policies could be strengthened further, respondents were quite happy with the level of informal support they received from their supervisors and co-workers whenever family obligations arose. Even people who had very negative experiences in other realms were extremely grateful of the CfA's position that family came first. For a few female non-scientists, this was an important consideration in their decision to join or remain at CfA. A female non-scientist's comment was typical:

Q: I wanted to ask you a little bit about balancing work and family, which I gather is relevant because you have young kids.

They are very supportive of that. Absolutely supportive...[If I need to take time off], I go to my direct supervisor or the project manager...And they've always, always been very accommodating, very understanding. I can't say anything other than all good things about that...Nothing but very high glowing remarks in that area.

Scientists also felt their supervisors were very supportive, sometimes allowing them to rearrange their schedules to spend more time working from home. A female scientist described this:

Q: How has it been for you to balance work and family?

Extremely difficult. And I have to say, my supervisors have been terrific. I've made arrangements to...do a lot of work at home. I make sure I have my computer and high speed Internet connection. And there's a library access now that we can get at home, online. And they have been very supportive of me in just looking at the bottom line of what you did...in meeting your criteria for work for the year. So they have not looked at absence from the desk at certain hours as a negative.

Allowing flexibility in working arrangements is the flip side of the less structured managerial style, as one male scientist with a young child pointed out:

They've been very understanding in my group. I took off a bunch of time when [my child] was born, and...they've allowed me to adjust my work schedule [to provide childcare]. They've been very accommodating...I feel really lucky about that. But that comes with the *laissez-faire* approach to management. They kind of trust us to do the right thing. And you know, are happy to accommodate us.

Although there are many ways that a lack of clear and consistent management policies may harm women, there are some areas where permitting greater flexibility benefits all employees. Allowing managers to accommodate employees' individual needs appears to be one of those areas.

At the same time, a commitment to supporting families and flexibility in work arrangements is beneficial as long as it is consistently applied. Respondents noted that the kind of arrangements they reached depended on their individual supervisor, and there was concern that not all supervisors or divisions would be as supportive. One female non-scientist said:

In our division, in any case, [it] was very clear –if something was going on in your family, that came first.... You got the feeling from that, and, if something was going on with your child, take care of that...I always felt free to take care of whatever problem I needed to. My sister was hospitalized, you know, “see you later...take care of your sister, and come in when you can.” That was one thing, that's a very big bright spot...That's our division. I don't know if it's the same in other divisions. In fact, in speaking with some other support person in another division, it's not so in other divisions.

Because these arrangements were decided by individual supervisors, there was a strong sense that it depended on supervisors' personalities, and was not a benefit that everyone could enjoy. A female scientist described this:

I do know that outside of [my group], I don't think all supervisors are as supportive as mine...[I] know two women [who] both said to me...when they were pregnant “I'm dreading telling my supervisor, because he's going to think

I'm not serious...I'm not going to be considered for promotion." ...They work in different divisions and both of them were worried about it. They both later said that some of their fears...were not realized; but they were worried about it.

Even when those fears were not realized, the concern over how an individual supervisor would respond stemmed from feelings that family considerations are inconsistently applied. Allowing flexi-time or telecommuting, for example, depended on the supervisor. While some people enjoyed these arrangements, others complained that CfA should have policies allowing them, not realizing that they were allowed elsewhere in the CfA. It was not only non-scientific departments that would not allow flexi-time or telecommuting; even some scientists claimed their supervisors would not let them work from home, despite the fact that constant interruptions in the office made them less productive. Other scientists claimed that they had natural flexibility in their schedules, since the nature of their work was so independent.

Several people who had had small children while at CfA were critical of the parental leave and childcare arrangements. There seems to be considerable variation in the parental leave policies based on one's position and the amount of time spent at CfA. But some saw the leave arrangements as insufficient. A female non-scientist said:

The maternity policy is you are allowed to take six weeks of your sick time...I don't know what happens if you haven't [accumulated six weeks of sick time in the years you've been here]. But the daycare center my kids go to won't take a child before they're three months old. So six weeks is not going to do me any good.

Some noted that the CfA has a policy of allowing people to donate accumulated leave time to others, a policy which may not be widely known, especially by newer employees who would have accrued less time for parental leave. Many people felt there was sufficient demand for a daycare facility, which would greatly help mothers and fathers with young children. Non-scientists claimed that the daycare available in the area was far outside their budgets. But there was disagreement over whether it is the role of an employer to be providing daycare facilities. Those who felt there was a demand for daycare thought it would be extremely welcome to many CfA employees, but typically saw it as an added benefit the CfA could provide rather than an obligation.

VI. CONCLUSIONS AND POLICY RECOMMENDATIONS

The qualitative interviews reveal many of the ways that women feel disadvantaged at CfA, and how the institutional structure either perpetuates that disadvantage or prevents it from being recognized. Although some of the patterns discussed apply to female scientists as well as non-scientists, female scientists most consistently perceived barriers to their career advancement. Some female non-scientists also believed that there were ways in which their gender negatively affected their treatment. The concentration of women in lower-level

administrator positions caused status level and gender to interact, often producing uncomfortable power dynamics that revealed themselves in gendered ways.

The subtle cultural differences in treatment of men and women, and the institutional structures that perpetuate these disadvantages, are directly relevant to the underrepresentation of women at the highest levels of the organization. Even if high-level appointments are based solely on merit, different treatment of men and women at earlier stages of their career—both at the CfA and elsewhere in the field—can affect the opportunities available to women and the subsequent qualifications on which they are later judged. Obviously there are many women who manage to overcome these disadvantages and go on to the highest levels of their field. But the extra hurdles that women must go through to reach that level of achievement helps explain why fewer of them do so.

A number of policy implications follow from this study. The following are the author's recommendations to the CGEC to consider in generating their recommendations to the CfA. These recommendations are derived from the analysis of the qualitative interviews. As this study did not involve a systematic evaluation of existing CfA policies, it may be that some of these initiatives are already in place. If so, the implications of the employees' subjective experiences, revealed in these interviews, are that such initiatives may need to be strengthened, enforced more systematically, or made known to all CfA employees.

1. ***Formalization or clarification of written policies*** – Policies for the operation of the institution should be clearly written and formalized. Procedures should be put in place for the allocation of goods and resources and the criteria for promotion at each level of the organization. The consideration given in the promotion process to employees holding administrative positions should be clarified. While it is helpful to post this information on the CfA webpage, written copies should be given to every employee, updated as necessary.
2. ***Utilizing the hierarchical structure to disseminate information*** – A hierarchical authority structure already exists at the CfA. It should be activated to disseminate information more efficiently and systematically throughout the organization. Information about internal resources and how to apply for them, new job openings and opportunities, and other decisions made by the Director and Associate Directors should be disseminated regularly to members of their divisions or departments. Regular meetings at the different levels of the organization should promote open communication and provide feedback mechanisms for issues or problems to flow up as well as down.
3. ***Creating oversight in the promotion process*** – The management structure should be made to oversee more effectively the promotion process across divisions and departments, to ensure that all employees are being treated equally, evaluated consistently and in a timely fashion. Associate Directors may be able to provide this oversight for particular divisions, or a committee may compare promotion decisions across the organization. Such oversight is particularly important given the different types of employment within the organization; more consistent standards for

promotion and application of those standards will help promote equity across the CfA.

4. ***Emphasizing mentoring*** – Mentoring is a crucial element of younger employees' training that many (particularly women) felt was lacking. Greater emphasis on mentoring could be fostered in a number of ways.

- A Secondary Mentor position would be beneficial for junior scientists, creating an additional contact aside from the primary supervisor. The individual serving as Secondary Mentor should not be appointed, but chosen by young scientists after a set period of time at the CfA. This relationship should be formalized with a minimum number of meetings throughout the year, and should focus on broader career goals as well as individual research projects. It should be noted that the obligations of serving as Secondary Mentor may not be evenly distributed among high-level scientists, and the CfA should take this into account in order to not place undue burdens on particular individuals.
- Mentoring can be further encouraged within the CfA through substantial awards for mentoring, with nominations submitted by employees and staff. To be effective and illustrate the value that the institution places on mentoring, such awards should be more than a token acknowledgement. They should involve a financial reward or other real assets.
- Informal gatherings, such as morning coffees, were seen as extremely valuable in helping scientists make contacts, develop mentoring relationships, and establish scientific collaborations. Unstructured events were considered more helpful for developing such relationships than more structured events, such as colloquia and lunchtime talks, where social interaction was minimal. Coffee gatherings and other social events should be encouraged. To avoid women or newcomers feeling excluded during such informal gatherings, some semi-structured social events should be held. Dinners or lunches could be established for junior scientists to meet with high-level scientists in small groups. Information about senior scholars' research interests could be disseminated and junior scientists could sign up for meals with scholars in their field. This program could be established to help junior scientists develop contacts with visiting scholars or guest lecturers at the colloquia series, and with high-level scientists within the CfA to help them learn about the work being done in other groups. Not only junior-level scientists, but scientists at any level should be able to participate if they choose.

5. ***Rewarding managerial and mentoring ability*** – Managerial and mentoring skills should be both encouraged and rewarded within the organization, for both scientists and non-scientists.

- Formal consideration of management and mentoring ability should be calculated into promotion and appointment decisions. Associate Directors or evaluation committees should solicit confidential letters from the advisees of those in a

supervisory role to determine how well that individual performed as a manager or mentor. Promotion criteria should consider not only whether or not an individual has served as a supervisor, but their skill in that capacity.

- Formal management training and workshops in developing mentoring skills should be provided for all employees serving in a supervisory or mentoring position. Interviewees expressed considerable doubt as to the willingness of scientists to participate in management training, although some managers did feel the need for greater training. The CfA leadership must decide whether such training should be mandatory or simply available; in either case, the CfA should provide positive incentives for developing managerial skills, such as evaluating and considering such abilities in the promotion process. Training courses that are appropriate to employees' skill levels and the nature of their work should be sought or specifically created. The CfA leadership should further work to stimulate interest in developing managerial skills, emphasizing the value of good management abilities for the success of scientific projects. The CfA should also recognize that a commitment to developing managerial skills necessitates ongoing discussions, and not simply one-time or annual training courses.
 - There should be more communication at all levels of the CfA with regard to the annual review of employees. Although guidelines already exist for a detailed employee review process that will provide constructive feedback, the CfA should ensure that these reviews are providing useful feedback in practice. Both supervisors and supervisees should be made aware of the CfA's expectations for the duration and content of reviews. In addition to checking off whether the employee met his or her planned goals for the year, supervisors should give an in-depth assessment of the employee's skills, weaknesses, and what steps they should take to improve performance in the next year. Employees should be made aware of the steps they can take if they would like more feedback or additional meetings to assess their progress. Supervisors should be encouraged to provide more regular feedback throughout the year.
6. ***Promoting the Leave Donation policy*** – Although many CfA employees were satisfied with CfA's family policies, some of those who had most need of parental leave felt that the provisions stipulated by the Family and Medical Leave Act were insufficient. The CfA has a policy of allowing employees to donate their vacation time to others, which can be used for family emergencies and maternity/paternity leave. This policy was not widely known to many CfA employees, and information about it should be disseminated more broadly throughout the organization.
 7. ***Supporting a change in the institutional culture*** – Perhaps the most important form of change suggested by the research is also the most difficult to implement. The study calls for a change in the institutional culture that would prioritize the equal and respectful treatment of women. This is a culture shift that has to be enforced from the highest levels of the organization, and reinforced at every other level of management. It involves a firm commitment that inappropriate behavior, treatment,

and comments will not be tolerated. That commitment should be backed by public statements from the organization and an avenue for reporting grievances in a confidential manner. Attempts should be made to raise awareness in the CfA community about the types of behavior deemed inappropriate. The interviews reported previous negative experiences with mandatory sensitivity training; this suggests that the CfA should prioritize finding avenues to raise awareness that are appropriate to its population.

8. ***Prioritizing hiring women to high-level positions*** – Whether or not special consideration should be given to gender in hiring and promotions, especially to the highest-level positions, is ultimately a political and philosophical decision; this research suggests that there are valid reasons for the CfA to engage in an open discussion of this position. The qualitative interviews offer the following reasons to consider making it a priority to appoint more women at the highest levels:

- The interviews show that previous hiring and promotion processes have not been completely neutral with respect to gender. Even if the final decisions are evaluated based on individuals' qualifications, development of those qualifications are themselves subject to long-term processes where women are judged or treated differently. Some interviews suggested that recent Federal hires at the CfA have emphasized areas of astrophysics where women are particularly underrepresented, and defining openings in broader terms could expand the pool of applicants to include more women. Prioritizing the hiring of women could recognize and counteract some of those obstacles.
- Hiring more women into high-level positions should help shift the institutional culture to reduce disrespectful treatment of women. Although some disrespectful treatment, particularly in supervising relationships, did come from other women, having a greater proportion of leadership roles filled by women will likely change the way women are viewed and treated in the organization.
- Senior women serve as both mentors and role models to younger women within the organization. Having more women in high-level positions would encourage new generations of women, particularly among scientists.

The difficulties female scientists face at the higher levels of the organization are not lost on their younger counterparts. The example of one young scientist illustrates the importance to the field of correcting these issues. She explained how disturbed she is by the way high-level women scientists are treated at the CfA:

[The treatment of women] at the senior level,...those of us who are younger do notice these things and do get annoyed about these things, because you just see the lack of senior women, and it's very obvious, and you start wondering. And then you start talking to some of them, and you start finding frustrating stuff, so that's not something that affects me directly in the sense of it's not being done to me, but just in terms of the environment it's a big thing.

Even from a short interview, it was clear that this woman is a very promising scholar, with considerable accomplishments and honors for someone of her age. At the end of the interview, she mentioned that the barriers female scientists had to face and the way they were treated on a daily basis had made her consider leaving the field of astrophysics. The CfA, as part of its discussion on prioritizing the hiring of women, should consider whether the field as a whole can afford to lose some of its most promising young scholars because of the barriers they see in their path farther down the road.

Appendix A: Contact Procedures and Responses

In the Spring of 2004, the CfA Gender Equity Committee (CGEC) provided four lists of female scientists, male scientists, female non-scientists, and male non-scientists in the CfA community based in Cambridge, MA. The qualitative study was intended to cover permanent employees and postdoctoral fellows. However, the lists also included contractors, graduate students, and visiting scholars, explaining the large number of people ineligible in the table below. The lists were also out of date, and many of the people contacted had since left the CfA (also considered ineligible).

The names on the lists were put in random order by the CGEC. The researcher then selected a random starting point on each list and a random number (X). From the starting point, each Xth person was invited to participate in an interview. Members of the CGEC and people who had participated in the pilot phase of the study were excluded from the list.

The individuals selected were contacted by e-mail (see Appendix B) which, if necessary, were followed up with multiple phone calls. More people were contacted in each of the four groups until the quota of 15 interviews for that group had been met.

Because the goal was to obtain a quota number of interviews, and not to contact the entire target population, the numbers below cannot be interpreted as standard response rates. In the case of the last two groups to complete the interview quota (male scientists and male non-scientists), a larger number of contact e-mails was sent out before the quotas were reached, resulting in the higher number of non-responses. The percentages given are those interviewed out of the number contacted who were eligible to participate, rather than out of the total number on each list. This is because the total population of eligible candidates in each group is unknown.

A higher proportion of female scientists were ineligible than of any other group. These were mainly graduate students and visitors to the CfA, including those who were no longer at CfA. Since these data are not representative, it is not clear whether the population of female scientists is a more transitory group than the others.

The interviews included representatives from a range of different departments and divisions. They also include a mixture of Harvard, SAO Federal, and SAO Trust employees.

Table 1: Contact Responses

	Female Scientists	Male Scientists	Female Non- Scientists	Male Non- Scientists
<i>Interviewed</i>	15	15	15	15
<i>Ineligible (of those contacted)</i>	18	7	6	7
<i>Declined</i>	6	2	5	7
<i>No Response</i>	7	11	6	10
<i>Total on list:</i>	84	313	221	283
<i>Percent interviewed of eligible contacted</i>	54%	54%	58%	47%

Appendix B
E-mail Invitation to Participate in Interview

Dear Mr./Ms. _____,

You may have received an e-mail from the CfA Director or the Gender Equity Committee describing a research project the Committee initiated to assess the status of gender equity at the CfA. The first stage of this project was a web-based survey, and the second stage involves in-depth interviews with a random sample of scientists and non-scientists in the CfA community. I was hired as an independent contractor to conduct this second stage of the project, and I randomly selected your name to invite to take part in an interview.

The interviews will last approximately an hour, and they can be scheduled at your convenience, either at the CfA or at my office near Harvard Square. They will be an informal discussion of your experiences working at CfA with regard to issues such as the quality of work life, career paths and advancement opportunities, and the work climate. The study is intended for CfA employees and postdoctorate fellows, but not graduate students or independent contractors. If you are a student, contractor, or visitor to CfA, please let me know.

The interview is completely confidential, and I will not identify who does or does not participate. The research is intended to help the CfA Gender Equity Committee address issues of concern to the entire CfA community.

Since you were randomly selected, your participation would help ensure that the study results are more representative. I hope you will agree to help with this project. Would you please let me know whether or not you would be willing to take part? If I don't hear back from you, I'll call or e-mail again in a few days. Please feel free to call or e-mail me if you have any questions, as well.

Thank you in advance, and I look forward to hearing from you.

Best wishes,
Wendy Roth

Appendix C:
Consent Form*

Wendy D. Roth
Research Scientist

*Malcolm Wiener Center for Social Policy
79 John F. Kennedy Street
Cambridge, MA 02138*

*Phone: (617) 384-9505
FAX (617) 496-3900
Email: wroth@wjh.harvard.edu*

Consent Form

Study of Gender Equity for the Harvard-Smithsonian Center for Astrophysics Community

The Center for Astrophysics Gender Equity Committee (CGEC) is conducting this study to assess the status of gender equity at the CfA. The CGEC wants to understand the experiences of the entire CfA community with regard to issues such as the quality of work life, career paths and opportunities, and the work climate. This study will help the CGEC determine and address issues of concern to the CfA community.

You may have participated in an earlier survey component of this research. This part of the study involves in-depth interviews about these topics to learn about your personal experiences in detail.

My name is Wendy Roth. I am a Research Scientist and Ph.D. student at Harvard University in Sociology & Social Policy. I have been hired as an independent subcontractor to conduct this part of the study on behalf of the CGEC. I was subcontracted by Dr. Gerhard Sonnert, a sociologist who, for more than a decade, has been researching the careers of women in science, and who is currently a Research Associate at the Department of Physics at Harvard University. Dr. Sonnert was independently contracted to consult on the survey portion of the research.

I would like permission to interview you about your experiences. The interview will take approximately one hour. I will tape the interview so I can record the details accurately.

Your participation in this study will be completely confidential, and every precaution will be taken to ensure your confidentiality.

- Your name will not be used, and some details may be changed or omitted in reporting so it will not be possible to identify individual participants.
- This consent form will be kept in a locked file cabinet to which only Dr. Sonnert and I will have access. The forms will be destroyed as soon as the project is completed.
- The tapes and transcripts will be identified only by an ID number. These will also be secured in a locked cabinet. A key linking participants to the ID numbers will be kept until the end of the project on a disk to which only Dr. Sonnert and I have access.
- The transcripts will be analyzed by Dr. Sonnert and myself. The analysis will be given to the CfA Gender Equity Committee as aggregate conclusions and non-identifiable quotes.
- When the project is completed, the key and tapes will be destroyed. The transcripts will be destroyed 6 months after the project is completed.
- These procedures have been reviewed and approved by both the CfA Gender Equity Committee and the Harvard University Committee on the Use of Human Subjects.

Participating in this study is voluntary. You can refuse to answer any questions or stop at any time.

Dr. Sonnert, the CGEC, and I will make our best effort to guarantee the non-disclosure of any of the contents of the interviews, but there is a remote risk of court-ordered disclosure of the interview transcript data before they are destroyed. While we feel that the likelihood of such a court-ordered disclosure is extremely small, individuals who still have concerns about the confidentiality of the process should either decline to be interviewed or exercise caution about the content of their comments. The benefit of participating in this study is that your answers will help the CfA address issues of gender inequity and be better informed about the types of issues that are of concern to you.

Further details about this project and participant confidentiality are posted on the CfA Intranet at
http://www.cfa.harvard.edu/cfa_only/geneq/interviews.html

If you have any questions about this research, you can contact me at (617) 384-9505 or wroth@wjh.harvard.edu. There is also a Standing Committee on the Use of Human Subjects at Harvard University to which complaints or problems concerning any research project may, and should, be reported if they arise. The Committee's phone number is (617) 495-5459, and e-mail may be sent to Jane Calhoun at jcalhoun@fas.harvard.edu.

Participant: This research has been explained to me and I agree to become a participant. I understand that I can stop at any time, and that the investigator will gladly answer any questions I have.

(Participant's signature)

(Print name)

(Date)

Investigator: I have discussed with the participant the above procedures, and have pointed out potential risks or discomforts. I have asked whether any questions remain and have answered these questions to the best of my ability.

(Investigator's signature)

(Date)

* This represents the final version of the consent form. Some changes were made during the course of fieldwork.

Appendix D: Interview Guide*

Employee Equity at the CfA

Interview Guide

Wendy Roth

Thank you for participating in this interview. This study is to learn about your work environment, career path, and the general climate at the CfA. This project is meant to identify any problems that any employees might be having and try to address them.

The interview will be completely confidential. I will not reveal the names of anyone who participated, and I will leave out or change any details that might identify you. You should feel free not to answer any questions, or to stop at any time.

First, I need to get some information from you just to make sure that I'm interviewing people from a range of different positions in the CfA. This will not be used to identify you, and this information will be kept separate from the rest of what you tell me today (write on separate sheet):

- Gender
- Department/Division
- Job Title [or Scientist/Admin/Technical/Engineering]
- Employed by Harvard or SAO? If SAO, Trust or Federal employee?

1. How long have you worked at CfA?
2. What were the most important factors for you in deciding to come work here?
3. Have you received any promotions or changes in your job description during your time at CfA?

[IF YES]:

- a. Can you describe those changes for me since you started at CfA? What job did you start in, and what changes have you made along the way?

Career Advancement

4. How satisfied have you been with the opportunities for career advancement at CfA?
5. ~What do you see as your likely career path?
6. What things do you feel have hindered your career advancement here?

PROBE:

- a. Are there particular *policies or rules—written or unwritten*—in the institution that make advancement more difficult?

- b. Are there particular *attitudes* you've encountered at CfA that make advancement more difficult?
7. What things do you feel have particularly helped your career advancement?
- PROBE:**
- a. Are there any particular programs, or support services offered that you have found useful?
 - b. Have any particular individuals been helpful to you? How have they helped?
8. Are you interested in taking on a formal leadership position?
- [IF YES:]
9. Have you been given opportunities to take on a formal leadership position at CfA?
- [IF 9=NO:]
- a. What types of barriers do you feel have stood in your way?
- [IF 9=YES:]
- b. How satisfied are you with the types of opportunities or the types of positions you have been offered?
- Promotion Process**
10. How would you describe your feelings about the process of promotion to higher steps or grades at CfA?
- PROBE:**
- a. Is the process straightforward and clear?
 - b. Have you had any problems with it? Concerns or frustrations?
11. How would you describe your feelings about the process of promotion to different job titles at CfA?
- PROBE:**
- a. Is the process straightforward and clear?
 - b. Have you had any problems with it? Concerns or frustrations?
12. What type of feedback do you receive about your progress toward promotion?
13. What type of mentoring do you receive?
14. What types of support do you think would be helpful to you during the promotion process?

15. Do you feel there are any inequities in the promotional process? Do people all get to the same grade for the same reasons?

16. How does age affect the promotion process here?

PROBE:

- a. Does it seem that older people are promoted automatically because of their seniority, or denied opportunities because of their age?

17. Some institutions are described as having “unwritten rules” for promotion or success, that employees have trouble finding out. Others are described as having clearly stated criteria and expectations. How would you describe CfA?

[IF CRITERIA NOT CLEAR:]

- a. Do you think certain people are more likely to figure out those rules, or to be told what they are? What kinds of people?
- b. What do you think needs to be done to improve this situation?

[IF CRITERIA CLEAR:]

- a. Do you think any changes need to be made to improve the promotion process?

Decision-Making

18. How involved do you feel in the decision-making process in your department?

PROBE:

- a. Do you feel you have a voice in the important group decisions that affect your department?

19. How are decisions typically made?

20. What types of issues, if any, do you feel need more inclusive group discussion?

Climate

21. How would you describe the work climate in your work group?

22. How would you describe the work climate at CfA in general?

PROBE:

- a. What is the atmosphere like among colleagues?

23. What types of conflicts, if any, are there between colleagues or group members?

24. When you're in meetings, do you feel that your contributions are given consideration and respect?

[IF NO:]

a. Can you describe what it feels like for me?

25. Have you ever felt socially excluded in any of your informal interactions with your colleagues?

[IF YES:]

a. Tell me about that. Do you think that has affected your career opportunities?

26. Have you had any experiences where you felt you were treated disrespectfully? Tell me about them.

Organizational Structure

27. How well integrated are the different divisions in general?

PROBE:

a. Is there enough communication among divisions?

[IF NO:]

a. What problems has that caused for you in your work?
b. Has that created larger problems for the institution?

28. Are there any important differences between Harvard employees, SAO Federal employees and SAO Trust employees in terms of their career paths and opportunities?

29. ~Are there any other differences in terms of how Harvard, SAO Federal or SAO Trust employees are treated by CfA?

[IF DIFFERENCES BET. HARVARD, FEDERAL, OR TRUST EMPLOYEES]

30. What do you think could be done to address those problems?

31. Are there any [other] organizational problems that make your job more difficult?

[IF YES:]

a. How big of a problem is that for you?

Balancing Family and Work

32. Do you have children?

[IF YES:]

- a. What are their ages?

33. Have you ever provided care for an adult family member?

[IF YES:]

- a. For whom? Can you tell me about that?

34. How much of a problem is it for you to balance your work and family life?

[IF HAS CHILDREN/CARES FOR RELATIVE:]

- a. Do you have a partner who shares some of those caring responsibilities with you?
How do you divide them?

35. How supportive is CfA in helping you balance them?

PROBE:

- a. What types of formal support do you receive?
- b. What types of informal support do you receive—for example, from your supervisor or co-workers?
- a. What types of things could CfA do to make a difference in helping you balance work and family life?
 - i. How important is this to you?

Gender Inequities

36. Do you feel that men and women are treated equally at CfA?

37. Are they treated equally with respect to...hiring?

- a. ... work assignments?
- b. ... career advancement?
- c. ... performance evaluations?

38. Do men and women receive equal training and development opportunities?

[IF ANY GENDER INEQUITIES:]

39. Do you think this is this more of an issue for women scientists or non-scientists?

40. Does the *social* atmosphere of CfA contribute to gender inequities in any ways?

Concluding thoughts

41. What would you say are the greatest challenges to the morale or motivation of CfA employees?
42. What changes to the CfA environment, either formal or informal changes, would make the biggest difference for your experience here?

* These questions serve as a guide to structure the in-depth interview, but the actual questions asked in each interview varied based on the respondent's experiences. A slightly different version of this interview guide was used for interviews with postdoctoral fellows.