4.1.5 Conclusion

While there is a need for affirmative action programs, they have large negative effects that must be considered. Even if a program does not entail lower standards for women, doubts are cast on a woman's qualifications in a society that already mistrusts them. Programs with lower qualifications may be a tactical mistake (in addition to being unjust) because people may be put in situations for which they are not qualified, giving them less overall success and self-confidence than they would have had otherwise. These negative effects should be weighed when considering implementing an affirmative action program.

As phrased in [Ernest 1976, page 607]:

> We strongly support such affirmative action to ensure that all potential female candidates are considered. Such increased recruitment efforts can only enlarge the list of qualified candidates and thus result in the *raising* of standards. To immediately dispose of a red herring, let us state emphatically that none of us believe a *less* qualified [scientist] should be hired, just because she is female.

4.2 Informal Special Treatment Harmful

Not only can institutionalized special treatment be harmful, but so can individual initiative. Many instances exist of mixed attempts to encourage women:

- A female professor taught an electrical engineering course and announced that she especially wanted the women in the class to do well. During tests, she went around to the few women in the class and would try to help them. The female student I talked to said this behavior made her very uncomfortable, and she felt that the men in the class resented it.

- A female computer science graduate student had these experiences:

  > My undergraduate advisor consistently encouraged me to go on to graduate school, to apply for scholarships and fellowships, and basically gave me a strong consistent message that I was good at this stuff....[While I have had many bad experiences,] I have had a number of friends, bosses, advisors, over the years who have been very supportive, some seeming to disregard my gender, others aware of it and patting themselves on the back for being so good about recognizing my talent anyway. The classic example of this is the well-meaning professor who asks every woman student he has opportunity to talk with, about whatever topic, 'How are things here for you as a woman?'

- When a female computer science student visited a top graduate school to which she had been admitted, she told me that a male graduate student presented each of the women with a rose and told each that he wanted her to come to that school. When I heard this story, I asked a female graduate student in the department whether this student was trying to sabotage female recruitment. She answered:

> It turns out a bunch of people who were doing a lot of work on organizing the recruiting weekend had decided, off the cuff, that they thought this could be nice (as in: what should we do with the leftover roses). So it wasn't this one grad student working on his own, and it was not an attempt to sabotage recruiting.
>
> Its effect, however, was slimy and sabotaging. As you note. Some of the women decided it was the one unsocialized nerd, others thought it was strange but disregarded it, and others realized fully how totally inappropriate it was even as the rose presentation was happening. One of these let the deliverer know, too, what she thought of it.

All these cases have in common that women are conscious of being treated differently from men by someone who is trying to encourage women. Most women do not like this sort of treatment, although they are grateful for encouragement when it is sincerely offered. Nevertheless, it would also be wrong to suggest that professors not encourage women if it does not come naturally to them and that computer professionals should be as obnoxious to women as they often are to men. Additionally, people disagree on when special treatment is positive and when it is negative. For example, one woman objected to there being a class entitled "Women and Computers":

> I think the class is very poorly named, and I for one would *not* sign up for such a course. It assumes that women have different/special issues with regard to computers than men have, solely because of their gender. This gives exactly the wrong message to both men and the more 'traditional' women. What we as liberated women *should* be doing is asserting over and over until we can make it so that, except for a few basic physical differences that we unfortunately can't deny (e.g., size and upper body strength), *women and men are the same.* By naming a course 'Women and Computers,' all you are doing is helping to perpetuate the myth that women are somehow 'different' and should be treated differently. That's how we got where we are in the first place![5]

This behavior is closely related to condescension, a problem described in [MIT 1983, page 9], from which the following quotations are taken:

[5] Bond, Patricia. Comp.society, April 20, 1990.

- "Often, when I ask a male graduate student how to do some task, particularly something on the system, he will do it for me rather than explain to me how I can do it for myself."

- "I asked a male graduate student a technical question and got an answer that seemed to be aimed at someone with little or no knowledge of computer science, as if it were being explained to a high school student rather than a colleague."

Thus, in attempting to help women, people sometimes end up implicitly insulting them.

4.3 Special Awards for Women

4.3.1 Separate Categories for Males and Females

Some people propose female-only competitions as a way to benefit women. However, the psychological effects of such contests are sometimes negative.[6] One female undergraduate wrote:

> I [disagree] with the suggestion that they have different contests for boys and girls. I believe this has a negative effect. My high school was big on "top boy" and "top girl". I think it is from traditions like that I got the idea (now mostly eradicated) that I would be smarter if I were male. Until recently, I couldn't stand not being the top girl in a category (i.e., being beaten by a girl), but I didn't mind a guy's beating me. The award categories seem to imply that females can't compete with males. Wouldn't people find having separate competitions for whites and blacks offensive, particularly if the blacks weren't allowed to enter the white contest?

It should be mentioned, however, that some women believe that the contests are worthwhile by providing rewards and encouragement to highly-achieving females. Thus, no consensus can be said to exist on the issue.

4.3.2 Fellowships for Women

One popular way of encouraging female graduate students is through special fellowships for women. Again, the opinions are divided on the psychological effects. On the negative side, the same student who complained about female-only contests wrote:

[6] The quotations from this section are largely taken (with permission) from a discussion within a large electronic mailing list of women in computer science.

> I am a senior, applying to graduate programs in computer science, and was just offered a fellowship from [X]. At first, I was very pleased and proud (called my parents, went out to celebrate), but then I went back to my fellowship application material and saw that certain fellowships are awarded particularly to women and minorities in fields in which they are most underrepresented. (I can't tell if my fellowship is in this category. I will try to find out.) While I can understand how such awards might be good for women who were very worried about costs, the offer has left me feeling more bad than good. For a few hours, I was thinking of myself as the best of the best — i.e. as having won the fellowship on merit — but now I feel like I wasn't allowed to play in the big league.
>
> In contrast, I was offered a RA [stipend and tuition waiver in exchange for research] next year by my bachelor's thesis supervisor. That made me feel great. If I thought the offer were related to my being female, I would have rejected it.

She reported that a male friend of hers said:

> I'm glad I'm not in a similar position — you know I'm trying to improve my self-confidence, and I'd feel so unsure in a world that wouldn't tell me whether I was good or just the recipient of a less-deserved award.

Another female graduate student wrote:

> I don't want anyone ever to think that I got where I am because of special favors granted to me because I'm female. I decided ... that I would not apply for any fellowships or special programs for women. I [don't want people to] think that I don't have to work as hard as a man to succeed in my chosen career.

The majority of women who expressed an opinion, however, supported special fellowships and urged women to accept them. One female computer science professor wrote:

> While I was a graduate student at [X], I got a fellowship that was earmarked for women. Initially I felt ... that while I was glad to get the fellowship, ... it was second class in some way. Two things have changed my mind on this. First, I found out that my fellowship was in fact harder to get because it was a national contest rather than a intra-university contest. This solved my initial problem with respect to the particular fellowship.
>
> The second thing completely changed my attitude about what it takes to be successful. Now that I am faculty, I realize how hard it is to raise money. I now actively search for sources of funding that

> are slightly unique to me: funding for women, funding for first year faculty and so forth. And why not? Others look for funding that is particular to VLSI say.... [W]e are judged on our output, and ... we should take advantage of any opportunity that comes our way. That initial ... fellowship has caused doors to open for me all along my career — job offers, research funding, etc. In hindsight I would have been an idiot to decline it.
>
> I now realize that my initial feelings about the fellowship said more about my attitude toward women than reality. That fellowship wasn't second class, I just thought something special for women must be. I've been taught an important lesson.

Many people do not realize how competitive some fellowships for women and minorities are. The competition for the top women and minorities fellowships is now so intense that a female computer science student I spoke with was not surprised when she failed to win a special fellowship for women but won the most coveted fellowship that was open to both sexes. Because outside funding makes graduate life easier and because any stigma associated with special fellowships seems to be decreasing, they are almost certainly a worthwhile way to help women further their education.

Another issue is whether such programs are morally justified. There would be an outcry against a publicly-funded scholarship for which only men were eligible, so a women-only scholarship program might not be morally justifiable. On the other hand, as this report has documented, women face so many biases that there is reason to believe that practically all women are unfairly handicapped in some way relative to men. Different people will have different opinions on whether a biased program is a legitimate response to existing bias in a community.

4.3.3 "Heck, We Want More Girls"

Perhaps the most insidious form of sexism is practiced by men who are eager for more women to enter computer science, but for social reasons. The following quotations from female graduate students are from [MIT 1983, pages 14–15]:

- "A male graduate student said, 'The problem with this place is that there aren't enough attractive, available female graduate students.' Enough for what? I'm not here to be available and attractive."

- "A graduate student said, 'Men are tired of only seeing men. They want to see women in dresses, not women who look like men.'"

More recently, in a public discussion on women in computer science, an ostensibly sympathetic male wrote, "Sigh. I'd love to see more girls [sic] as my classmates!" The "sic" was added by the moderator of the newsgroup (who can edit messages before they are posted), in protest of using that term for college-aged females. This sort of message is not uncommon. In another discussion, a man wrote:

> At the time, we were *really* trying to hire some females into the software side and I was interviewing a bunch of new grads — mostly girls. There was this girl whose resume looked good and since she was as they say — easy on the eyes, I was trying hard to find reasons to hire her.[7]

Such examples occur not only in informal exchange but also in published books. On several occasions, in *The Psychology of Computer Programming*, Gerald Weinberg expresses opposition to sexism, decrying prejudice (page 98) and scoffing men who initially fail to take women seriously (pages 147–148). The chivalry of his appeal, however, undermines his point:

> Each prejudice has its price. In a programming project, the exclusion of anyone from any position on any basis besides lack of competence robs the project of the best possible performance. Moreover, once one faction begins to feel that they are being judged differently from others, they will begin to act differently.... Possibly the greatest single action to relieve the shortage of programming and programming management talent would be to start treating women as true equals — if indeed they are only that (page 112).

Additionally, at another point in the book, he refers to a female employee as "an attractive young thing" (page 48). Most women would probably consider themselves better off without allies like this.

4.4 Bad Consequences of Raising Consciousness

While consciousness-raising is beneficial overall, it has several negative effects. After hearing how other women have been mistreated, women sometimes become hypersensitive, particularly because they do not necessarily know which person made which egregious statement that they have heard third-hand. Men, too, also can become unnecessarily inhibited in their actions with females, and being the victim of hypersensitivity could cause them to be suspicious of just complaints.

4.4.1 Female Hypersensitivity

One consequence of increasing awareness of sexism is that women may then expect it and treat men with more suspicion. For example, at MIT, there

[7] Chow, Stanley T. H. Article 17986 of alt.folklore.computers, date unknown.

were many cases of men misinterpreting women's friendliness as expressions of romantic interest [MIT 1983, page 14]. While women should know that their behavior could be misinterpreted, such knowledge has negative effects as well:

> Some women react by becoming wary of all new men they meet. Thus, some men are confronted with negative reactions from women to seemingly innocuous, friendly overtures [MIT 1983, page 4].

Men who have been overreacted to are likely to, on the basis of a misinterpreted event, treat women's complaints with skepticism.

This phenomenon is also illustrated by the following letter from a male computer science student:

> First, let nothing I say leave you with the impression that I don't believe sexism or racism exists. However, I think that many incidents are incorrectly interpreted.
>
> I am TAing the introduction to AI this semester. After I graded and returned the first assignment some woman and her boyfriend questioned me about the grading. Her grade was somewhat below his (about 5 out of 30 points I think). Her homework was one of the sloppiest ones in the class, and probably deserved a lower score but I had been instructed to grade generously for the first assignment. Among her arguments was something about how hard she had worked on it (there was no evidence of hard work). And something about how she and her boyfriend had done it together. Ignoring the possibility that this was cheating (cooperation was not allowed) I felt that there was some implication that she felt I was giving her a low grade because of her gender....
>
> Since then I have talked to her several times. At first I think she may have worried that my grading was gender biased, but I don't think she now believes that.
>
> By the way, I did a very rough check of my grading records some time ago. By sorting the class by average grade and eyeballing the result I think that about $\frac{1}{3}$ of the women are in each of the top, middle, and bottom thirds of the class.

Also, there have been cases where women have gotten upset at unwanted physical contact, such as being patted on the back by a man, before finding out that he treats both men and women in that manner. (Of course, there are many more cases where men only try to touch their female colleagues.)

Because of consciousness of discrimination, sometimes people who are "obnoxious to everyone" get falsely accused of sexism or racism. For example,

> 'General' harassment often takes a specifically sexist form when applied to women.... Instead of saying to some average white male, *'Your work on this project has been inexcusably sloppy, you blinking*

idiot; you'll never make it that way!', the remark may come out, *'My God, you think no better than my wife; why don't you go home and have babies!'* [Rowe 1990, page 159]

Additionally, reports and anecdotes are filled with anonymous examples of sexist statements by male professors, staff, and students. After hearing such things, a female student has no idea which people around her hold such disturbing attitudes and is likely to distribute her distrust among the guilty and innocent alike.

4.4.2 Male Hypersensitivity

After men are made aware that women are unhappy with receiving unwanted and improper attention from male colleagues, there is the risk that they will be hesitant to socialize with females. This phenomenon followed the distribution of the MIT report on discrimination [MIT 1983, page 19]. Because informal interaction is an important part of the educational process, this represents a serious loss. For example, it is not uncommon for professors to have meals with their students. It would be a shame if they failed to invite their female students, out of fear of being misunderstood.

Hypersensitivity on both sides occasionally escalates an innocent incident into a colossal misunderstanding. When "Jane" was interviewed for a job by "John", she found the interview style strange. John spent almost all the time talking about the company and appeared uninterested in hearing Jane say anything about herself. Jane mentioned she thought this style odd. Later, she spoke to a friend "Mark" who had worked at the company and was friends with John. He said that John had said that Jane was suspicious at the interview and seemed to think that she was being interviewed purely for quotas — i.e. that they were not interested in her qualifications. This idea had never crossed Jane's mind — until that point. After Mark made some further statements about how the company's leaders were opposed to affirmative action, Jane decided it was likely that the reason she had not been asked many questions was because they did not want to hire a female. She felt confident of this conclusion when they offered a job to a male whom she considered to be of equal skill to herself. A few days later, however, they invited her for a plant visit and offered her a job. Thus, both John and Jane incorrectly leapt to conclusions.

4.5 Summary

Even when people genuinely want to encourage women in computer science, their plans sometimes backfire or have mixed effects. Good intentions do not always lead to good results. This is emphatically not an argument against working to help women; rather, I mean to alert people to carefully consider the consequences of their plans and to work to minimize any negative effects. My recommendations for effective behavior are in the next chapter.

Chapter 5

Recommendations and Conclusions

A taste for the abstract sciences in general and above all the mysteries of numbers is excessively rare; one is not astonished at it; the enchanting charms of this sublime science reveal themselves only to those who have the courage to go deeply into it. But when a person of the sex which, according to our customs and prejudices, must encounter infinitely more difficulties than men to familiarize herself with these thorny researches, succeeds nevertheless in surmounting these obstacles and penetrating the most obscure parts of them, then without doubt she must have the noblest courage, quite extraordinary talents and a superior genius — Gauss to mathematician Sophie Germain.[1]

As the data from women's career studies and anecdotes from personal experiences of women professionals begin to accrue, one of the questions that arises is not 'Why are there so few successful professional women?', but rather, 'How have so many been able to survive the vicissitudes on each rung of the career ladder?' — Dorothy Zinberg[2]

There are a large number of factors that discourage women from becoming computer scientists and computer professionals. From early childhood, females are treated differently from males, and, to become computer scientists, they often have to face problems that males do not have to deal with. In this chapter,

[1]Bell, Eric Temple. "The Prince of Mathematicians", James R. Newman, ed., *The World of Mathematics*. New York: Simon & Schuster, 1956, volume I, page 333.
[2]Kundsin, Ruth B., editor. *Women and Success: The Anatomy of Achievement.* New York: William Morrow & Company, 1974, page 129.

I suggest how people can work to counteract these effects. Because this chapter is based so heavily on material earlier in the report, I recommend that earlier chapters be read first.

5.1 Recommendations

The recommendations are divided into four categories: programs that could encourage women in technical fields, ways for women to build their self-image as scientists, ways for women to deal with biased behavior, and suggestions for men and women who wish to encourage women in the sciences.

5.1.1 Programs and Policies to Encourage Women

Programs that could be implemented to encourage women are discussed by [Keith et al 1990, Leveson 1989, Sandler 1986], and interested readers are urged to read the full suggestions in these documents. Many of the following suggestions are from these sources. While the suggestions are geared to universities, most can be adapted to industry as well. Recommended actions are:

- *Making clear that sexual harassment will not be tolerated.* Individuals in supervisory positions, such as professors or managers, should make it clear that they will not tolerate sexual harassment. Not only would this discourage such behavior, but harassed females presumably would feel more comfortable reporting any problems that do occur to supervisors who have made it clear that they are aware of the possibility of sexual harassment and want to fight it. One way an EECS department head did this was by announcing during a graduate orientation session that sexual harassment was unacceptable and that any harassment victims or witnesses should alert someone in a position of authority. See [Rowe 1981, Rowe 1985] for advice on implementing effective programs to fight sexual harassment.

- *Educating all members of the academic community — including board members, administrators, faculty, students, and staff — about professional climate issues; the various forms differential treatment takes; and the institution's commitment to ensure equitable treatment* [Sandler 1986, page 17]. One way many schools do this is by teaching about subconscious discrimination when training graduate students to be TAs.

- *Establishing a dialogue with women in the department to make sure their concerns are being communicated and addressed.* Many women have given thought to how their department could be improved but are never asked.

- *Regularly gathering data by sex, race, and age* covering areas such as salary, benefits, promotional analyses, special perquisites, awards, grants, courseload, advising load, committee assignments, and so on to determine if men and women at all ranks and within all units are treated equitably with regard to responsibilities and rewards [Sandler 1986, page 18].

- *Making equitable treatment of women and minorities part of the formal reward structure.* For example, when evaluating performance, give commendations to individuals and extra positions to departments that excel in this area [Sandler 1986, page 19].
- *Providing a method for individuals to turn off the tenure clock so they can have children without sacrificing their career.*
- *Providing opportunities for professors to serve as mentors to students or for graduate students to mentor undergraduates.*
- *Making sure that female students are involved in research.* Much of the information about research opportunities, particularly at the undergraduate level, is communicated informally, and some students may be left out. Additionally, if pre-college experience is a prerequisite for undergraduate research, women and minorities, who tend to enter with less experience, may fall further behind. This could be avoided by informing students what knowledge is needed for interesting jobs and encouraging them to take such classes early, or by setting aside money for research groups that are willing to provide training.

5.1.2 Ways for Women to Build Self Image

As described throughout this report, being a woman in computer science is unusual in that the majority of one's peers are male and many people, consciously or subconsciously, expect the men to perform better. These expectations are subtly communicated to both males and females. Fortunately, there are many ways that a woman can increase her self-confidence and her self-image as a computer scientist.

Attending Classes with Other Women

A female computer science student often find herself in a classes where she is one of the only women. Additionally, she is likely to have few, if any, female professors. Even in the absence of being treated differently, this is likely to affect a student's self-image and perceptions of women. In reality, females in coed classrooms are usually treated differently from the males:

> [T]eachers praise boys more than girls, give boys more academic help and are more likely to accept boys' comments during classroom discussions... While girls sit patiently with their hands raised, boys literally grab teacher attention. They are eight times more likely than