Barriers to Equality in Academia:

Women in Computer Science at M.I.T.

Prepared by female graduate students and research staff in
the Laboratory for Computer Science and
the Artificial Intelligence Laboratory at M.I.T.

February 1983

545 Technology Square, Cambridge, Massachusetts 02139

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1. Introduction and Summary

This report describes aspects of the MIT Computer Science environment that hinder the professional and social development of many female graduate students and research staff. The environment is challenging, competitive, and difficult for both men and women. However, many women encounter additional problems that unfairly limit their academic, professional,and personal growth. These problems are widespread and have led to a perception outside MIT that this environment is particularly harsh for women. As a result, many women who start graduate work at MIT choose to leave before finishing their degrees, and many women who complete a graduate degree suffer unnecessarily while they are at MIT, because of their gender. In addition, many women choose not to apply to our Department for graduate work or do not come when accepted.

The principal conclusions of this report are:

- Although not a generally accepted fact, the women here are as qualified as the men. In order to realize their potential, women must be given the same opportunities as men to participate in and benefit from all aspects of the professional community.
- Many individuals in the community, either consciously or subconsciously, have expectations of women that are different from their expectations of men.
- Pervasive subtle discrimination can do as much damage as, if not more damage than, isolated incidents of overt discrimination.
- An uncomfortable social atmosphere interferes with a woman's ability to work productively.
- Responsibility for change rests with the entire community, not just with the women.
- Many problems would be alleviated by increasing the number of women.

We have two major goals in writing this report. The first is to heighten other people's awareness of the severity of these problems and of the effect of their own actions on the women around them. The second is to let women in other professional communities with similar problems know they are not alone. We believe that members of other minority groups encounter many of the same problems we describe in this report. We discuss, however, only our own experiences as a group of women in a predominantly male environment.

This report was written by female graduate students and research staff in Computer Science. At the graduate level, the Department of Electrical Engineering and Computer Science (EECS) is divided into six academic Areas, one of which is Computer Science. (See Table II-3 on page 35 for a

breakdown of the Areas.) Most of the problems described in the report are not specific to MIT's Computer Science Area; many of us have experienced similar difficulties at other academic and research institutions. It is to our Department's, Area's, and laboratories' credits that we received support and encouragement from the administration and faculty in preparing this report.

The next two subsections present an overview of the problems encountered by women in the Area of Computer Science. Problems related primarily to professional interactions are discussed in one subsection; problems related primarily to social interactions are in the second subsection.

1.1 Professional Inequality

Graduate education and research are more difficult for women in Computer Science at MIT than for their male colleagues. There are two significant obstacles that women have to overcome in the professional environment.

- Preconceived notions about the seriousness of women's commitments as Computer Scientists.
- Negative judgments of women's qualifications made on the basis of gender.

Women are handicapped by doubts about the seriousness of their professional intentions. Comments like "Jane came to MIT only to get a husband" make women feel that their academic and career goals are not treated with respect equal to that accorded to their male colleagues' goals. Personal comments about women made in professional situations -- for instance, during class lectures or technical discussions -- convey the attitude that women are there for personal reasons, not professional ones.

We believe that most faculty, staff, and students want to treat all members of the community fairly, as individuals with different talents and abilities. However, despite good intentions, their behavior can express different expectations for women than for men or may be interpreted as doing so by others. Women come to MIT to receive a technical education and begin careers, just like their male colleagues. Behavior that implies or may be interpreted otherwise, especially in professional situations, is harmful to women.

The qualifications of female Computer Science graduate students are systematically doubted at MIT. Some female graduate students are told that they have poor backgrounds, although male graduate students with the same undergraduate background are not told that. Frequently heard comments like "I really don't think the women students around here are as good as the men" do great

damage to women's self-images. In an environment that is difficult for all students, such comments make it even harder for women to perform well. It is not possible to succeed as a researcher if one's technical judgment and expertise are not respected by others in the field. It is very difficult to achieve a level of expertise if, as a student, one's peers and advisors have low expectations for one's success.

The low percentage of women in the Area may give the erroneous impression that there are a lower percentage of well qualified women than men. The women at MIT are well qualified. According to the Chairperson of the Computer Science Admissions Committee and the Directors of the MIT Laboratory for Computer Science and the Artificial Intelligence Laboratory, everyone who is accepted into Computer Science at MIT is qualified. Over the course of several years, some faculty members may not encounter any exceptional women students, while over the same period they may encounter several exceptional men. Consequently, some of them may conclude that women are inferior. Only the presence of more women will rectify this situation.

The obstacles described above sometimes are manifested through overt discrimination, for example explicit verbal comments that convey negative attitudes about women. Most of this report addresses more subtle behavior. Often, subtle behavior is not recognized as discriminatory, for two reasons. First, the actions often are not *intended* to be discriminatory; the people who convey biased attitudes toward women may be well-intentioned. Nevertheless, the *effect* of their behavior is to undermine the professional image of women held by their colleagues and the women themselves. Second, any particular incident might appear trivial when viewed by itself. However, when women experience such incidents daily, the overall effect of the environment is much greater than the sum of the individual incidents [8].

Because subtle discrimination is harder to recognize than overt discrimination, it sometimes does more damage. Constant exposure to negative comments diminishes a woman's self-esteem and leads her to believe that she cannot succeed. If she does not recognize such comments as discriminatory, she may not know the proper framework in which to deal with them; she may even blame herself for the problem.

1.2 Social Inequality

All students try to develop the social side of professional relationships. A large component of graduate education comes from informal interaction with colleagues. Informal settings such as luncheons and technical "bull sessions" provide relaxed atmospheres in which students can receive feedback on their progress from peers and supervisors, as well as valuable technical knowledge.

Personal relationships among colleagues also foster the development of understanding and respect, which contribute to a student's self confidence and ability to work well in groups. Often, women feel that they cannot develop the social side of professional relationships because they run the risk of attracting romantic attention that will erode the relationship. They are more likely to miss important opportunities for feedback and exchange of technical ideas, because they are not as easily accepted in informal settings as male colleagues.

Students also try to develop a social life in their professional environment -- a social life that does not necessarily include romantic relationships. For women, the development of friendships often is inhibited by an attitude among male graduate students, faculty, and staff members that a woman who is not romantically involved with someone is "available" and looking for a romantic relationship. Women feel that many men are not able to view them as a friend, but only as a potential date. As a result, women's actions are often misinterpreted; casual friendliness is mistaken for romantic overtures.

Within the Computer Science community at MIT, female graduate students are an extremely small minority. Many of the men in the laboratories are unaccustomed to being around members of the opposite sex in professional contexts. This gives rise to differential treatment of women that can make it more difficult for them to work effectively. The imbalance harms both men and women. Women are inundated with social attention, creating an uncomfortable social atmosphere that interferes with their academic progress. Women must spend extra time and energy dealing with problems that arise from the social imbalance. 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. In addition, men are frustrated by the lack of women with whom to interact socially.

Finally, social behavior in a few research groups sometimes approximates that of the locker room. Such things as demeaning posters, cards, and comic strips, sexist jokes, and inappropriate attention in the form of staring and following serve to remind women that they are different. As a result, many women feel excluded from the community and become isolated.

1.3 Organization of the Report

The rest of this report is organized as follows. Section 2 contains the bulk of our discussion of particular issues and problems. This discussion is based on a list of representative comments and incidents that contribute to an inhospitable environment for women. The original list and a revised

version were prepared by female Computer Science graduate students and technical staff and were distributed throughout the Area in 1981.[1] This section also discusses the reactions of the community to the problems raised by the list. Reactions of both men and women were strong and often highly emotional. In general, the men's reactions were positive; however, negative reactions often followed protestations of sympathy.

Section 3 contains recommendations that we feel are the key to improving the MIT Computer Science environment. Our general recommendation to individuals throughout the community is that they think more deeply about how their actions and words may convey negative attitudes, especially negative attitudes toward women. This report is filled with examples of how such attitudes can be conveyed, sometimes in subtle ways.

Some women have received positive reinforcement and encouragement from their research groups and the faculty at large. Section 4 is included both to present examples of supportive behavior patterns and to emphasize that not all of our experiences at MIT have been negative ones.

The bibliography is followed by three appendices. Appendix I lists the names of the authors of the original list on which this document was based: female graduate students and technical staff in Computer Science. Appendix II is a brief history of MIT women in EECS, with an emphasis on the Computer Science Area of EECS. It also contains the numbers of female students enrolled in the Department and Area over the last 10 years. Appendix III presents comments by some members of our community.

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[1] Copies of the revised version of the list can be obtained by contacting the EECS Graduate Office at MIT, Cambridge, MA 02139.

2. What Happened to Us

This section contains an annotated, revised version of the list that was circulated among our colleagues in the Area of Computer Science. There are two subsections that correspond to the two major aspects of our graduate careers: Professional Identity and Social Identity. A third subsection addresses the reactions of our community to distribution of the list.

Throughout this section, we discuss actual experiences of women in Computer Science at MIT that convey pervasive, biased attitudes about women. Some of the specific comments may at first appear insignificant, with consequences that are difficult to understand. However, when these experiences occur daily to many women, they create an atmosphere in which it is difficult for women to work effectively.

2.1 Professional Identity

2.1.1 First a Woman, then a Professional

The day-to-day experiences of many women in Computer Science are characterized by a greater emphasis on their gender than on their identity as serious professionals.

- Following a technical discussion over lunch with a faculty member, I was asked for a dinner date. I was left wondering whether the faculty member went to lunch for the intended technical discussion or for personal reasons.

- During a technical discussion with a faculty member, he made an obscene remark about my clothing when another man entered the room.

- While I was teaching a recitation section, a male graduate student burst in and asked for my telephone number. Men often interrupt me during technical discussions to ask personal questions or make inappropriate remarks about non-professional matters.[2] Faculty members have referred to personal details about me in class lectures.

- When I was a teaching assistant (TA), one of my students missed the lecture and saw me later. He said, "Will you come sit on my lap sometime and tell me what I missed?" This illustrates a lack of respect for me as the instructor as well as an attempt to undermine my authority as a TA by focusing on the fact that I am a woman. Respect from one's students can be as important for developing self-confidence as respect from a peer or supervisor.

- If, during a technical meeting, a sexist comment is made, all eyes turn to me for my reaction. Not only am I constantly in the spotlight, but many men think it is alright to make sexist comments during technical meetings, even when I am in the room.

[2] This generalization from the experiences of the women in our Area is supported by Hall in her report of a study conducted by the Project on the Status and Education of Women of the Association of American Colleges [3].

- A male graduate student said "Gee, I don't think it's fair that the only two girls in the group are in the same office. We should share."

- I was told by a secretary planning a summer, technical meeting at an estate owned by MIT that the host of the meeting would prefer that female attendees wear two-piece bathing suits for swimming.

- During a grades assignment meeting, a professor decided to give a borderline student the higher grade because she was "cute." When I suggested that this was not a relevant basis for grading, another staff member chimed in, "Yeah, she's not *that* cute."

- A male student identified a particular female colleague as "the one with no chest."

These examples represent professional situations in which men make sexual or other personal references to women. Such references can take the form of specific comments about a woman's appearance and personal relationships or stereotyped comments about women's abilities and personal traits.

- When I first met the professor in charge of a course for which I was a TA, he said, "Boy, the TAs have gotten a lot better looking around here."

- I received an anonymous message saying, "Looks like there is a hot item in the department."

These examples may seem less problematic than the previous ones because they were intended as compliments. In other, non-professional situations, they might be interpreted as compliments. However, regardless of the intent, in a work situation such comments detract from a woman's professional image. As one woman summarized: "In professional situations, comments about my appearance are upsetting. They make me feel insulted, embarrassed, offended, hurt, and concerned for my stature as a professional."

- "Why do you need a degree for marriage?" -- a male colleague.

- "Jane came here only to get married." -- a male graduate student.

- "What's an attractive girl like you doing in a place like this?" -- a male colleague.

- "Jane flirts to get whatever she wants."

This last set of examples reflects stereotypical assumptions about women's roles and values. Some male colleagues view women only in traditional, gender-typed roles. Their stereotyped comments further convey the attitude that women are not serious professionals.

Whether intentional or not, personal comments about a female colleague made in professional

situations create the impression that the woman is there for personal rather than professional reasons. They convey the attitude that men think of us first as women and second -- if at all -- as professional colleagues. During a technical discussion, these experiences detract from the value of the woman's technical contribution and damage her credibility. Inappropriate comments by professors in the presence of graduate students and comments by graduate students that are not discouraged by senior colleagues legitimize these attitudes and perpetuate the lack of respect displayed for female members of research groups. As a result of these experiences, women feel undervalued and lose self-respect and self-confidence, all of which hinder their professional development.

The comments described above undermine women's professional identities by drawing attention away from their roles as professionals and focusing it on stereotypic roles for women. It is inappropriate to make such personal comments during technical discussions, either with MIT colleagues (for example, in a class, a technical seminar, a group meeting, or a meeting with a supervisor) or with visitors (for example, outside consultants, government representatives, or visiting scholars).

2.1.2 Invisibility

- I know men who ignore my questions about their work, but respond to a man who asks the same questions.
- It's very common not to be asked for my technical opinion on a relevant subject in my field of interest.
- I have been excluded from discussions. I even had two people with whom I was trying to have a meeting pull their chairs together and start talking to each other as if they'd forgotten I was in the room.
- In response to being asked about my work, a male colleague took over, gave my analysis of the situation, and said how long it would take me to do a task.
- I have been ignored, constantly interrupted, and talked over in meetings as if I weren't there.
- I was the only woman in a group working on a machine. Only one person could use the machine at a time. Often, while I was working on a task, a male graduate student would physically push me away from the machine and interrupt my work so that he could get at the machine. This didn't happen to the men in the group.
- It is a common experience for me to receive professional correspondence addressed to "Mr. Jones." Also, I have observed some of my male colleagues who are very surprised when they discover that a good technical article written by, for example, J. Jones, was

written by a "Jane" rather than a "John." Although men form a large majority of researchers in computer science, women have proven themselves capable of making valuable contributions to the field. When it is always assumed that engineers in general, and authors of good work in particular, are men, women's contributions are implicitly being overlooked.

Many women are treated as if they were invisible in technical situations. They feel that this is one way in which they are not taken seriously as professionals. They are overlooked in technical discussions and excluded from group efforts, their work is attributed to male colleagues, and their opinions are not sought on relevant technical subjects. One reason for this invisibility is that an aggressive discussion style is inappropriately viewed as a sign of competence. If a woman (or, for that matter, a man) does not discuss issues aggressively, then she (or he) is often viewed as less competent, and is not taken as seriously as a "more visible" colleague.

The examples listed above convey the attitude that women cannot make contributions to technical discussions or group work that are as valuable as men's contributions. Experiences that lead women to believe that they are not doing good work and are less competent than men promote a negative self-image for women. Also, such prejudices foster a lower image of women throughout the field and can inhibit the development of their careers.

2.1.3 Patronizing Behavior

- "We'll see how we can fix things for you so they're better." -- a male colleague.
- 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.
- It seems like all I have to do is ask one simple question and the people I work with try to take over my entire research problem and solve it for me. I think they're trying to be helpful, but it doesn't help me if I'm never allowed the chance to do my own project.

On the other end of the spectrum from invisibility is patronization. The final comment above emphasizes the key point: women, as well as men, need the opportunity to work on open-ended research projects on their own. They need this experience to develop the discipline necessary to focus on a research problem; the creativity to formulate alternative paths to pursue; the technical judgment to evaluate different alternatives and to choose the most appropriate one to follow; and the technical skill, self-reliance, and perseverance to carry a task through to its completion.

For a project to be a significant learning experience, it must be challenging. Because less is expected of them, women are relegated to straightforward, menial tasks more often than their male counterparts.

- "You want to do research? Let me see what I have that you can do.... This paper needs proofreading."[3]

Concerning the assignment of menial tasks, one woman comments:

- I resent being given what are considered menial tasks for two reasons: first, the dispenser of the tasks assumes that women should be doing more menial tasks than men, second, the dispenser is making a statement about whomever does the tasks by labeling them as menial.

Women ask only to be given the same chances to pursue challenging research problems and the same opportunities to prove themselves as are given to their male colleagues.

2.1.4 Qualifications

- "You got into graduate school because the Area needs more women."
- "You got into graduate school because Professor Jones is in love with you."
- "What am I going to do? This is an important course and my teaching assistant is a girl."
- I was told by a male faculty member that women do not make good engineers because of early childhood experiences ... little boys build things, little girls play with dolls, boys develop a strong competitive instinct, while girls nurture....
- "Women aren't concerned with technical details." -- a male colleague.
- I've heard several teaching assistants come to the conclusion that women always ask for help more than men, with an implication that women can't figure things out on their own.
- I've heard men chuckle when a women's technical opinion is mentioned, and say "Oh, Jane," in a tone of voice that dismisses and ridicules her opinion.

Many of the problems that women encounter arise from some men's basic doubt that women are qualified to pursue a graduate career in computer science. In our Area, no unqualified students are accepted. Nevertheless, the qualifications of female graduate students are systematically doubted by male faculty members, graduate students, and undergraduate students. Many women feel that they have to be more qualified than men just to be considered as capable.

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[3] We refer here only to relatively unchallenging work like proofreading, not more challenging work like reviewing papers.

Women are often told that they lack qualifications needed for research projects and consequently are not given the opportunity to prove themselves. In addition to restricting the opportunities available to female students, this frequent questioning by others of women's qualifications leads women to doubt their own qualifications. Self-doubt leads to lower self-confidence and makes women reluctant to take on challenging projects to prove that they really are capable.

Some people find it difficult to respect the goals of women in a technical field because they believe that women are incapable of technical endeavors. While most people would agree that men and women are socialized differently as children, these differences should not be allowed to form a permanent barrier to a woman's training in a technical field. Instead, these insights should be used to construct academic programs for students that take advantage of their strengths and correct their weaknesses, should such weaknesses exist. In fact, most women applying to engineering schools have worked hard to overcome "deficiencies" in their backgrounds and, by the time they enter graduate school, are as well prepared as male students to undertake research in computer science.

Some research supervisors believe that women do not examine problems to a sufficient level of detail, do not exhibit independent thought, or cannot make substantial contributions to a technical discussion. Broad generalizations about women's qualifications and abilities lead to reluctance on the part of some supervisors to accept women in research groups or to give them critical tasks.

- "I don't like to supervise female graduate students. For instance I can't stand it when they start to cry if you criticize their work. In general, I have trouble relating to them," - a male faculty member.

While it is understandable that some male faculty members feel more comfortable dealing with stereotypically male reactions, they should accept the responsibility for learning to deal with both men and women in academic situations. Otherwise, differences that have no bearing on technical ability will continue to be used to deny women the opportunities that are available to men.

As mentioned before, stereotyping restricts opportunities available to women in the Area and encourages them to doubt themselves. One woman comments:

- Stereotypes make it harder for me to work here because they reinforce the idea that I can't be a good engineer. This attitude is pervasive. It affects other people's behavior towards me as well as my own self-image.

2.1.5 "Acceptable" Behavior for Women: A Double Bind

> Some argue that women students would be best to adopt a "masculine" style in order to achieve classroom credibility. Others point out that a woman who does so may be perceived as "aggressive" rather than assertive because her way of talking and acting does not conform to "feminine" expectations: what a female student says in a "masculine" style may be rejected out-of-hand on that basis. Indeed, the same behaviors seen as "forceful" in a man may be viewed negatively -- perhaps even as "hostile" -- when used by a woman. ([3], p. 10)

The experiences we have had in the Computer Science Area of our Department at MIT reflect the double bind in which women are caught. On the one hand:

- I was once told that the reason women don't finish here is that they are trained by society not to be aggressive.
- "You'll never make it through MIT. You're too feminine. You're just not aggressive and pushy enough."

And on the other hand:

- "You're so aggressive."
- "Mrs. Attila the Hun."
- "I'll bet she doesn't take any shit."
- "You sure are bitchy today; must be your period."

If a woman appears quiet and feminine, her success may be hindered because she is not competitive. If she does not appear quiet or feminine, she is socially ostracized. Women feel that there is no way for them to be accepted by their colleagues.

2.1.6 The Consequences for Women

Many of the individual experiences presented in the previous sections have the same consequences. Most directly, women suffer from the actual limitations placed on their professional development by the refusal or reluctance of faculty members to supervise them, to provide financial support for them, or to allow them to work on interesting and important problems. For any graduate student, there is often only one professor at a given institution whose interests coincide with the student's. For a woman, whose interests coincide with those of a professor who does not provide a supportive environment for women, there are no easy alternatives: she cannot continue her education unless she moves to another group, school, or field of work. Because the professor's attitudes often affect the research group's attitudes, an unsupportive professor contributes to a lack of valuable

support from peers. When a woman leaves a group, her departure often is blamed on her lack of ability, rather than the faculty member's lack of support or responsibility.

Other consequences for women are less apparent and more difficult to measure. Like everyone else, women internalize the opinions of themselves that others express frequently. When people whose ability they respect, such as their advisors, continually undervalue their contributions and imply that they are incapable of succeeding, they come to believe this negative appraisal of themselves. This problem leads to a vicious circle: once a woman is made to feel incompetent, she is less likely to accomplish as much as if she had received the encouragement given to her male colleagues. Dealing with biased behavior takes time and energy. Women who are subjected to this kind of behavior have less of each to devote to their work.

This treatment and the resulting struggle take their toll personally. One survival tactic that some women adopt in an unsupportive environment is withdrawal. They isolate themselves from their research groups and may select a research topic that requires little interaction with others. The environment encourages them to deprive themselves of the benefits of working with and learning from others -- an integral part of a graduate education. Alternately, some women choose to hide their femininity. They intentionally dress unattractively or adopt a louder and more aggressive manner than when they are in more comfortable circumstances. Such behavior has the dual benefit of stopping sexual overtures and creating an image that is more in keeping with their colleagues' view of an engineer or scientist. However, for many women, it is impossible or personally unacceptable to modify their behavior so drastically in these ways, even to become more acceptable to their colleagues. This alternative may backfire too, since some men cannot accept women who completely deny traditional women's roles. (See [3].)

For many women, dealing with the problem of inequality in any of these ways is an unacceptable burden. Some leave MIT rather than remain frustrated with professional and personal compromises they find unavoidable. Some very capable women with the potential to make strong contributions to their field of research have left MIT without completing their studies. (This information was gathered from private conversations.) This is a loss to MIT as an institution, as well as to the women involved.

2.2 Social Identity

2.2.1 Misplaced Expectations

- In an interview with a faculty member about research the following gestures made by me were interpreted as "come-ons": (1) looking him directly in the eyes, (2) smiling while talking to him, and (3) leaning back in my chair.

- All I did was say "Hi" to a male graduate student, and the next time I saw him, he asked me out.

- A male student who had lunch with me a number of times when we were teaching assistants for the same course regarded me as his "territory." I overheard him say to another male graduate student, in reference to a third, "John is muscling in on my territory."

- Having lunch with male graduate students seems to signify that I'm going out with them. The same is implied by technical discussions. In short, people seem to assume that I'm going out with any male I talk to.

- Professor Jones and I were working late on a project, and we decided to grab something to eat. I thought we'd go for a sandwich. Imagine how I felt when we drove up to a fancy, candle-lit restaurant. I didn't want to go in because it seemed too much like a date situation, but he insisted and also wouldn't let me pay for my dinner. I felt as if I had been forced into going on a date with him, and after that I always felt nervous about being alone with him.

- A male faculty member and I played tennis together a few times until I realized that he was viewing our games as dates.

- Following a technical discussion over lunch with a faculty member, I was asked for a dinner date.

Men's expectations of how a woman should behave frequently cause her actions to be misinterpreted. Women in this environment often feel that they are viewed primarily as potential dates. A female graduate student who is friendly with a male colleague runs the risk of having the male colleague assume that she is romantically interested in him. Other men may make this assumption, whether or not the man concerned does. A lunch appointment with a man to discuss a technical matter may be viewed by him and/or other members of the community as a social date. It is difficult to keep a professional relationship from being mistakenly interpreted as a romantic one. Such misinterpretations disrupt both social and professional relationships.

Some men expect the women to bear the burden for the imbalance in the number of women and men; they expect the women to *accept* the excessive social attention that results from the low percentage of women.

- 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 attractive and available.

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

Other men use the lack of women as an excuse for unrelenting sexual advances and other unacceptable behavior; they argue that there are too few women around for men to know how to act toward them.

When viewed only as social beings, women are sometimes felt to be disruptions to the work environment. They are not considered to be part of the research atmosphere and are treated as distractions and nuisances.

- A faculty member told other students that one of his male students wasn't getting his work done because I had started going out with him and he was spending too much time with me. I wasn't going out with him. His lack of progress was due to completely different reasons.

Some men seem unable to view a woman as an individual, not associated with any man. At times, women find it extremely difficult to participate in group social activities because of expectations that they pair up with men.

- I went on a ski trip with a number of men in the Area. At the conclusion of the day, there was an explicit discussion among the men about who was going to be my "partner" for the night.

The following are comments from female graduate students about how experiences like those presented have affected them.

- I am uncomfortable about asking certain male graduate students for help (about the system, projects, etc.) because it might be viewed as "coming on" to them. More times than not, the answer to a question is followed by an invitation to go out.

- I find that I have a sense of anxiety all the time here. Because I never know who's going to decide that I'm "available," I'm not comfortable away from my desk, and I find it difficult to talk to male graduate students. This is particularly noticeable because I am comfortable talking to female students and the majority of the faculty.

- These situations have made me stop talking to male faculty members and fellow graduate students. Any approach made to me by male faculty members or graduate students I view with great suspicion.

- Because men always think that I'm coming on to them, I don't feel comfortable joining technical bull sessions. I feel as if I'm missing a valuable part of my graduate education.

2.2.2 Unwanted Attention

- One of the male research associates started taking an interest in me. He went out of his way to find opportunities to talk with me. However, once he found out that I was engaged to be married, he completely ignored me. Subsequently, he began to bother my female officemate. He wouldn't leave her alone even though she said "no" to several dinner invitations. I resent the fact that I was treated as a potential date instead of as a colleague.

- Male graduate students will often walk into my office just to "talk" or "chat." Many times when I want to work and I ignore them, they stay. Even when I explicitly ask them to leave, they continue to dawdle in my office.

- I continued to receive dinner invitations from a male graduate student after I'd been turning them down at least twice a week for two months.

Women are as interested as men in romantic relationships. However, in an environment that is ninety percent male, the women are inundated with unwanted attention. Often a woman's response of "no" is not taken seriously; she is repeatedly bothered by the same man or by others.

If a woman is approached romantically by a colleague, particularly someone in a supervisory position, she might hesitate before rejecting the social overture, because rejection of social attention will often harm the professional relationship. The fact that this is more of an issue for women than for men results from the imbalance in the number of women and men and the resultingly larger amount of social attention that each woman receives; it is compounded by the predominance of males in supervisory roles.

- I have been grabbed and tickled by a male graduate student in my research group with whom I have no personal involvement.

- When I was sitting at my terminal typing, a male faculty member came up behind me and started rubbing my neck and shoulders.

- While talking with a male colleague in my office, he suddenly placed his hand on my breast and said he liked me.

A few men are much bolder in their attentions to women. They use physical contact in demeaning and taunting ways or as an excuse to be deliberately personal. Physical contact can be comforting and reassuring between friends. However, the set of examples above illustrates inappropriate instances of physical contact.

Many men fail to understand why women do not appreciate constant attention like that described above. Some believe that their comments and actions are "flattering" or "cute." They do not realize

that women find such comments and actions bothersome. Furthermore, the large number of men in the Area causes the number of offenses to be unacceptably large.

The following are comments from female graduate students about how unwanted attention has affected them.

- Approaches from Prof. Jones made me feel uncomfortable with him. In situations where I should have been able to go to him with questions, I avoided him. I still feel uncomfortable around him and have yet to say more than "hello" several years later.

- Faculty members should understand that personal attentions from a faculty member threaten my professional image. I don't want to fight the "She got through because of Prof. Jones" syndrome.

- Trying to have a social life here is very difficult. I have to be constantly on guard for "wanton" men. I don't have the time and energy to be constantly having to "defend" myself while I am trying to get work done on my thesis.

- We don't want it to seem like we're saying all attention is bad. We want the men here to treat us as well-rounded people, which includes desire for human relationships. The problem with the attentions we receive now is that our freedom of choice is ignored.

2.2.3 Obscenity

- I have had obscene mail sent over the computer system to me by male graduate students.

- There is a picture of a nude woman on our system which is printed out and displayed. It is also used occasionally to demonstrate the graphics capabilities of the system.

- "That's where you belong: on your knees." I was kneeling in the library in front of the card catalog. He walked up and planted himself right next to me such that if I turned to face him, my face would have been just below waist level.

- There was an obscene decoration on display in a professor's office. When I objected by pointing out that it might offend some women, my objection was laughed off.

Obscenity is pervasive in our environment. Humor in the laboratories often takes the form of sexist, demeaning jokes. By placing women in demeaning roles, these jokes make women acutely uncomfortable. By focusing attention on women as sex objects, obscene material makes it difficult for them to establish identities as professionals. Obscenity tends to keep women from becoming integrated into the community as colleagues and adds to the "locker room atmosphere."

2.2.4 The Fishbowl Syndrome

- Wherever I am, be it in my office or the elevator, or at a lecture, seminar, or meeting, male graduate students, faculty, and staff are always staring at me as if I were some sort of freak.

- A male graduate student sitting next to me leered at me all through a seminar. This happened so often that in subsequent seminars I made sure that my friends sat around me to "shield" me from this particular graduate student.

- As a first year student I was followed around intermittently by a professor who was teaching one of my courses. He never said anything and kept his distance, but he was watching. It was unnerving.

- A faculty member started paying a lot of attention to me -- going out of his way to "run into" me, talking to me a lot, and flirting. When I asked another woman student what she thought was going on, she told me he had made advances to a couple of other students. She was surprised that I had not been warned about him.

- A male graduate student said, "What do you expect? You are a very attractive and interesting woman so you are going to attract a lot of attention."

Female graduate students are continually stared at in classes, group meetings, even their offices, and are often followed by male colleagues. This kind of unwanted attention is more subtle than that of the previous sections, because there may be no verbal or physical interaction. Although the casual observer may not even be aware of it, women are constantly under surveillance. This makes them feel uncomfortable and out of place. As one woman commented:

- I always feel as if I am being pursued. I also feel like I'm in a spotlight. All my actions are under close scrutiny constantly and I feel extremely self-conscious.

2.2.5 The Consequences for Women

Women in the Area are in a double bind. If they choose not to get involved in social relationships, they can alienate themselves from particular individuals and from the community. This detracts from career growth because the women do not get the valuable feedback and technical interaction offered by informal settings. Isolated from the community, they also forfeit supportive relationships with friends and colleagues. On the other hand, friendships with male colleagues usually are assumed to be romantic, not only by the male colleague, but also by the community at large. This assumption disrupts both professional and non-professional relationships.

For many of us, the consequences of the attitudes described in this Section can be summarized by one woman's comment:

- I feel like I can never have any friends here, like I can never fit in. I've never felt so isolated in my life.

2.3 Reactions

Reactions to the problems raised by the list were strong and often emotional. The reactions of men and women are addressed separately in the following subsections. The reactions of some individuals in the community are presented in Appendix III.

2.3.1 Men

The men's reactions to the list were generally positive. Most conversations, whether in groups or privately, began with an affirmation that we had raised legitimate issues, and most men supported our concern that these issues be addressed. Beyond that, reactions varied widely.

The Associate Head for Computer Science of the EECS Department was dismayed at the extent of our problems. In a memo to the faculty, he described why he believed they should not dismiss these problems as merely oversensitivity on the part of the women (see Appendix III.1). Another professor sent a letter to us expressing his concern about our problems (see Appendix III.3). A group of men began meeting weekly to discuss our situation and theirs; some of their comments are in Appendix III.4.

There was a general feeling among many men that the list and the discussion following its distribution were useful and important first steps toward improving the environment for both women and men. Some men spent a great deal of time analyzing their behavior toward women. They commented that the discussions prompted by us increased their sensitivity to how their actions affect women around them. Although the amount of harassment is difficult to measure, many men appear to have become more aware of the feelings of women.

There also were negative reactions, often following protestations of sympathy. Some men said that they agreed with the points we raised, but their actions did not bear that out. There were a few cases in which harassment increased. Many men expressed anger and frustration. They were angry at us for "publicly airing dirty linen" or behaving like spies. They were frustrated for several reasons. Some men could not understand how people they had considered to be reasonable and rational could reach conclusions so different from their own. Others were frustrated by our lack of consideration for the problems they face due to the small number of women to date. Some were frustrated that we had not sought them out individually to hear their concerns. Still others were embarrassed at the possibility of having made mistakes in the past, and self-conscious about the possibility of making mistakes in the future. These reactions led some men to avoid women.

In looking for a reason to dismiss the issues addressed, some men attacked what they considered to be incidents taken out of context. There were two reasons that incidents were not described as some might have wanted. First, in many cases, descriptions were changed to mask the identities of the participants. Second, incidents could not be described in their full contexts either because the women describing them did not have complete information or for lack of space. In all incidents described, we felt we had included enough information to make the point. Some men have since told us that they originally wanted to dismiss the list as a whole because of a small number of incidents that they felt were taken out of context.

The following is a partial list of frequently heard comments from men and our reactions to these comments:

- "Can't you take a joke?"
  Usually, when a woman's complaints evoke this response, she does not think the incident in question was funny. If she lets the episode slip by without complaining about it, she is giving tacit approval to something that upsets her.

- "It wasn't meant that way."
  Perhaps no offense was intended, but the speaker should be more sensitive to how other people perceive his comments or are affected by his actions.

- "Tell me whenever I am doing something you don't like."
  In this case, the speaker is relieving himself of the responsibility for thinking of others and is putting the full responsibility to point out problems on the woman. He is asking for the impossible. Women form only a small percentage of the Area; they cannot be expected to be everyone else's consciences. Also, women cannot always speak out; often, it would be damaging for a woman to say something (for example, to her thesis advisor or in the middle of a technical meeting). In other cases, no woman is present when an offensive remark is made.

- "Are you going to put that on your list too?"
  This was an immediate reaction that continues to be heard months later. Frequently, a comment like this comes from someone who feels betrayed, who perhaps feels his privacy was invaded. The speaker does not understand the anguish many of us felt while creating and publishing the list.

- "I agree with the important points, but you should get rid of the trivia."
  The most interesting aspect of this common comment is that each speaker labels a different set of items trivial. More importantly, one of the significant aspects of the women's lives at MIT is our continual bombardment with discrimination in the form of minor, offhand comments and almost unnoticeable, suggestive actions. Incidents that may appear trivial can be seriously upsetting when they occur continuously.

2.3.2 Women

Many women who had not participated in creating the original list reacted very strongly to it. First, when the original list was distributed to the faculty it contained several items related to secretaries. The secretaries showed us how these comments portrayed them in a demeaning way; we realized that we had been insensitive to some of the implications of these comments. We removed the offending items from the list before distributing copies to the other members of the laboratories and continued to discuss the issues with secretaries and among ourselves. Second, the group of authors was composed of all the female graduate students but only some of the research staff. Unfortunately, many groups in the labs are isolated from other groups, and we did not find all the research staff. Those women who were omitted were justifiably hurt by not being included. In general, many of the women in the labs who had not participated in preparing the list were frustrated, because, as women, they were expected by male lab members to defend the list. We have been very touched by the expressions of support and loyalty that we received from so many of these women.

Our own reactions to general distribution of the list were very complicated. We found ourselves more in the limelight than ever before; everything was scrutinized and questioned, where previously it had just been watched. We found that even after all the energy we had expended in creating the list, we were misunderstood. Some of us became frustrated at having to say things and explain ourselves so many times. Others became depressed about the need for so much additional explanation. Most were angry that a few people could express sympathy for us and continue or increase their misbehavior. We were also disappointed with ourselves for not being more sensitive to the other women in the labs in the way we were asking the men to be sensitive to us. All of us were exhausted and torn between the desire to straighten it all out and make everyone understand what we were trying to say and the desire to get back to our work. Few, if any, had realized how much energy and emotional strength the process could take and continues to take.

There were also positive reactions. The open and honest effort of some of the men to understand and improve the situation was elating. That, and a closeness among the women that had not existed before, made many of us realize that our efforts had been valuable. All of us learned more about ourselves and each other.

3. Recommendations

Women in Computer Science at MIT have spent many years of their academic and professional lives attempting to come to terms with a predominantly male environment. Many have made uncomfortable adjustments in their lives and styles of behavior. We ask that women not be forced to continue to make these adjustments. We hope that everyone in the community accepts the responsibility to work towards change.

Our general recommendation is to think about and discuss how actions and words may be interpreted as a statement of underlying attitudes, especially attitudes toward women. A first step in this direction is to modify outward behavior. Since we cannot expect people to change their attitudes immediately, we look for an initial change in behavior and hope that a change in thinking will follow in time. We ask that you examine your colleagues' behavior, as well as your own; if you witness a situation in which a woman is treated unfairly, say something to the people involved. In the short term, better behavior at least will make daily life easier for women; in the long term, it will improve the behavior of others by setting a good example.

No list of formal recommendations will solve the problems discussed in this report. However, we offer the following recommendations as suggestions for ways to begin improving the environment for women. Most of the recommendations below are excerpted from a report of the Project on the Status and Education of Women, of the Association of American Colleges [3]. We highly recommend this report to all faculty, administrators, and students. The organization of subsections below parallels that of the subsections dealing with Professional Identity in Section 2. Section 3.6 provides additional recommendations to the administration and faculty. We have not made specific recommendations for improving the social environment, because social behavior is a matter of individual taste and values. For some guidance, we suggest that you reflect on the experiences illustrated in Section 2.2, which have led to an uncomfortable social atmosphere for women.

3.1 First a Woman, Then a Professional

- Do not make inappropriate personal remarks to or about women in professional situations.
  - Never make demeaning remarks, such as "...come sit on my lap sometime...", in professional situations.
  - Do not use sexist humor to "spice up a dull subject..." or make disparaging comments about women as a group.

  - Do not allow a discussion of a female student's work to be turned into a discussion of her physical attributes or appearance. In general, do not make more references to women's appearances or personal lives than to men's appearances or personal lives.

- Avoid stereotypical assumptions about women's roles and values.
  - Assume that women's reasons for pursuing an education are professional, not personal.
  - In addressing a class, use terminology that includes both men and women in the group and that reinforces an equal view of men's and women's roles and career choices. Avoid using the generic "he" when possible. Experiment with language that reverses expectations based on gender.
  - Group students in a way that implies that women are as competent as men, not according to gender.

- Faculty members should be careful in approaching female students as dates to avoid putting the women in untenable positions. The role as potential date must not supersede the professional and academic roles.

3.2 Invisibility

- In a technical meeting or classroom discussion, if someone has something to say, make sure he or she has a chance to say it without interruption. Some people talk louder and longer than others and may have to be asked to allow others to finish speaking.

- Intervene in communication patterns among men and women that may shut women out. For example, ensure that women are not "squeezed out" from viewing laboratory demonstrations or engaging in group projects.

- Watch for and respond to nonverbal cues that indicate a female colleague's readiness to participate in the discussion. Reflecting back on stereotypes, do not dismiss as incompetent people who are not aggressive in technical discussions.

- Pay particular attention to classroom interaction during the first few weeks of class, and make a special effort to draw women into the discussion during that time. Call upon each woman directly and as often as each man.

- Ask women qualitatively similar questions as men, give them the same amount of time to respond to the question as you would give a man, and respond to men and women in similar ways when they make comparable contributions to class discussions.

- Use student evaluations as a source of feedback on the treatment of men and women in your classrooms.

- If there is a woman working or taking a course in an area of interest to you, seek her out and question her. Such questioning is a good means for initiating technical discussions with women and indicates to them that you take them seriously as professionals.

- Include women in the "informal" interactions that are important in communicating support and acceptance as a colleague.

- Discuss academic and career goals with women, offer to write letters of recommendation for them, and consider women as well as men when making nominations for fellowships, awards, and prizes. Contact both men and women when publication, research, and other professional opportunities arise.

3.3 Patronizing Behavior

- Assume that women are knowledgeable in technical matters; if they do not understand something, they will ask.

- When a woman asks a technical question, answer the question in the same way that you would for a man; do not do her work for her. Avoid seemingly helpful comments that imply that she is not as competent as a man.

- As mentioned before, ask women the same kinds of questions as men and use the same tone of voice and attitude in responding as you would with a man.

- Consider women as well as men when choosing classroom, teaching, and research assistants. Give men and women the same responsibilities.

3.4 Qualifications

- Do not associate competence exclusively with some qualities -- especially traditionally male qualities, such as assertiveness -- and not others. There is much variation in the technical expertise, creativity, motivation, and perseverance of individual women and individual men. Some are theoreticians, others are system builders; some are innovative and impulsive, others are methodical. Judge the abilities of every individual objectively and design a research program to suit his or her particular talents.

- Try to consider ways to bring new students "up to speed" when they first enter graduate school. For example, give them research literature to read and then discuss the research with them. Provide small projects for new students and suggest background material that will be useful in their research. Take an interest in their progress and help them build the skills that they need to do research.

- When supervising graduate students and research staff, express confidence in their ability to develop their own research projects and provide help and encouragement along the way. Assume that women are as capable of completing research tasks as men.

3.5 Double Bind

- Try to notice whether a "feminine" or "masculine" style of a student's comment, question, or response affects your own perception of its importance. Some female students tend to state their comments hesitantly or in an "overly polite" fashion; do not assume because of this that they are uncertain about what they want to say or that they are not saying much that is worthwhile.

- Do not assume that women who do not work in a "masculine" style are not competent. At the same time, do not ridicule women who choose a masculine style for doing so.

3.6 Additional Recommendations to Administration and Faculty

The following recommendations were composed by the authors of this report.

- Promote open discussion between men and women about problems that have been encountered in the Area. In particular, the faculty and administration should

  - Sponsor regular faculty discussions of this topic.

  - Sponsor additional meetings open to all members of the laboratories to air these issues.

  - Distribute this report to all new members of the laboratories to ensure their awareness of the problems.

- Demonstrate a formal commitment to providing a positive educational environment for women. In particular, the administration should

  - Publish a formal policy statement articulating this commitment.

  - Establish a formal grievance procedure that addresses both overt discrimination and the subtle inequities that contribute to a woman's discomfort with the environment.

- Establish a committee responsible for improving the environment for women. In particular, the committee should

  - Oversee implementation of the recommendations contained in this report and seek additional solutions.

  - Provide advice to men and women on the issues discussed in this report.

  - Take an active role in the solution of problems that require outside intervention.

- Make Area-wide and Departmental commitments to increasing the number of women faculty, staff, and students. In particular, the faculty and administration should

  - Lobby for Institute-wide support of this commitment.

- Actively recruit female faculty, staff, and graduate students.

- Encourage female undergraduates to consider graduate training and challenging research careers.

- Include student representatives on Area-wide and Departmental committees, such as the graduate admissions committee, and on faculty search committees. In the area of graduate admissions, female graduate students could provide valuable input into the evaluation of women's applications.

- Maintain records on students that leave the Area before fulfilling their original goals, in an attempt to assess whether changes in the educational or administrative policies of the Department might help to decrease the loss of good female students from Computer Science.

- Improve the advising and professional training of both graduate and undergraduate women. In particular, the faculty and administration should

  - Encourage the visibility of female members of the research groups at conferences, and promote contacts with researchers outside MIT. This exposure contributes to the placement of women in good positions in academics and industry.

  - Provide regular feedback on students' progress as suggested in [1].

  - Provide and promote formal as well as informal training in the critical presentation of technical material, both in written and verbal form. For example, offer a seminar on how to give a presentation.

  - Promote good undergraduate preparation of women at MIT by encouraging them to undertake UROP (Undergraduate Research Opportunities Program) projects; undertake substantial B.S. theses; present their work in group seminars; talk to professors, research staff, and graduate students in their area of interest; and read relevant literature.

  - Improve the communication between undergraduate and graduate students: establish a system of graduate students serving as co-advisors to undergraduate students; establish a formal means of communication between female graduate and undergraduate students (such as monthly lunches); organize a meeting of undergraduates interested in applying to graduate school in which they have an opportunity to speak to graduate students in their areas of interest.

4. A Positive Note

Although the experiences described in this report have affected all the women in Computer Science, some women have found supportive research groups in which to work. They were respected as members of a group. Other members of the group consulted women for their technical opinions, cared about their work, and treated them as equals. These women worked closely and successfully with their supervisors. Since their supervisors demonstrated respect for them by encouraging them to take on significant responsibilities within the group, other colleagues were apt to show them respect as well.

The following comments provide a glimpse of the supportive atmosphere that could surround every research group, but unfortunately surrounds only a small percentage of them. These kinds of experiences should be part of every graduate student's training.

- At technical seminars, when questions arise in my area, my supervisor always refers the questions to me, even though he is certainly capable of answering them himself.

- When visiting scientists come to see my supervisor, and are interested in work in my area, he always includes me in the discussions.

- I have had several discussions with my advisor, in which he spent considerable time with me, discussing possible paths that I might follow. He discussed how I could best prepare myself for each option. These talks made me feel that my advisor respected my goals and was concerned about ensuring that I would be prepared to meet them.

- One semester, I was put in charge of organizing a weekly informal seminar dealing with my research area. My responsibility was to select a paper weekly and lead the discussion. This experience was valuable to me in many ways; not only for the professional skills I acquired, but also for the confidence I gained. In particular, the interest and commitment of the other participants was especially gratifying.

- A professor invited me to present a guest lecture on the work of my group in his undergraduate course. The respect from this professor that this gesture demonstrated and the subsequent respect that I received from his students meant a great deal to me and helped to build my self-confidence.

- If my supervisor is unable to attend a conference in which he was asked to speak about our work, he always suggests that I take his place.

- When I first started, some senior graduate students and research staff had just begun implementing a large project in my area of interest. They invited me to participate in this project, and we found some small problems I could work on. The project was a valuable experience for me since I had had no research experience in that area. I received an excellent introduction to my area of interest by being able to participate in and contribute to an ongoing effort. It was especially important to me that the students and staff took the initiative to include me and help me get started.

- I once took a course in an area that was somewhat removed from my area of research, but which I found very interesting. I took an active part in the class, regularly asking and answering questions. Toward the end of the semester, the professor encouraged me on a couple of occasions (before the entire class) to attend the regular seminars of his group, if I was more interested in their research. This type of encouragement can really go a long way in developing a woman's self-image.

- Whenever my supervisor finishes a new paper, he gives it to me to read, not because he needs a proofreader, but because he is genuinely interested in my technical opinion of the work.

- When I started as a graduate student, I had no background in the particular area that I chose to pursue in my research. My supervisor was not concerned about this. It was apparent to him that I had a good general technical background and that I showed enthusiasm for the subject. He gave me a small project right away, encouraged me to read the literature, and was confident that things would work out. They did.

With the same positive stimulation, encouragement, and respect that men receive, women are as successful as men in pursuing professional careers in computer science. Senior women in research groups may also serve as role models for new women, which often leads to the perpetuation of women in the group and the continuation of a supportive environment for women. MIT and other academic institutions have the potential and the responsibility to provide equitable training for female computer scientists by promoting the kind of positive, educational experiences reflected in the above comments.

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I. Appendix - Authors

The original list on which this report is based was prepared by the following graduate students and research staff. This report should not be cited according to any one of the authors' names but rather as: "MIT Computer Science Female Graduate Students and Research Staff."

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All the authors listed above are associated with either the Laboratory for Computer Science or the Artificial Intelligence Laboratory. All the women who were Computer Science graduate students in residence at MIT in 1981 participated in writing this report.

In addition, Ronni Rosenberg, a former Computer Science graduate student, edited the report.

We also would like to acknowledge the care and effort given by the many people who read and reviewed this document during preparation. They are too numerous to list here, but their contributions were of great importance to us.

II. Appendix - Background

Efforts to address the special problems of women in EECS can be traced back at least to 1976. They are documented in Table II-1. Many members of the Computer Science Area have made significant efforts to integrate women into the academic and professional community on an equitable basis. Had the women who produced this report not been certain of the commitment and support of those members, they would not have felt it possible to publish a document of this nature.

The statistics presented in Tables II-2 and II-3[4] indicate the continuing scarcity of women in Computer Science at MIT. The low ratio of women to men contributes to many of the problems described in this report. As discussed in Section 1 and shown in table II-2, the percentage of female graduate students in the EECS Department has risen very slowly over the last decade. In particular, the increase has been slower in Computer Science than in the rest of the Department; the number of women in Computer Science has grown less than threefold in ten years, while the number of women in the rest of the department has grown almost tenfold. In addition, the number of women in the Computer Science Area appears to have reached a plateau over the last five years, whereas the remainder of the department continues to increase both the number and the percentage of female graduate students. Table II-3 shows that there is a smaller percentage of women in Computer Science than in any other area of the EECS Department.

[4]The numbers in both of these tables include women in the co-op program. No female co-op students in our Area were on campus in the autumn of 1981. For this reason they did not participate in the original list or this report. This accounts for occasional inconsistencies between the figures in the tables and other figures mentioned in the report.

Table II-1: A Partial History of EECS Women at MIT

1976	Prof. Arthur Smith, Graduate Officer in EECS, held a meeting with female EECS students to uncover issues concerning the female students.
1978-79	Ms. Marilyn Pierce, Administrator in charge of EECS graduate students, met individually with the female graduate students to continue the discussion.
1979	Ms. Marilyn Pierce produced a report documenting the female students' complaints and making suggestions for improvement.
Spring 1981	Ms. Candace Sidner, third female recipient of an MIT Ph.D. in Computer Science, published a paper about the difficulties encountered by women at MIT and the prevailing attitudes that make it hard for women to succeed.
Fall 1981	Ms. Marilyn Pierce and Ms. Emily Weidman, Special Coordinator for Women's Students' Interests, sponsored monthly lunches for the female EECS graduate students, at which the severity of the problems facing Computer Science women became apparent.
Fall 1981	Female graduates student and research staff members of the Laboratory for Computer Science and the Artificial Intelligence Laboratory (the report authors) began meeting weekly to discuss their common problems in greater detail.
Fall 1981	From their experiences as EECS graduate students, the report authors compiled a list of representative incidents and comments that had contributed to an inhospitable environment for women. Items on the list were phrased so as not to reveal the identities of the participants.
Spring 1982	The report authors met with Prof. Peter Elias, the Associate Head of the EECS Department, to discuss the list and investigate future courses of action.
April 1982	The list was distributed to the Computer Science faculty and was the topic of two of the weekly faculty meetings. As invited guests, Ms. Marilyn Pierce attended the first meeting and Ms. Mary Rowe, MIT's Special Assistant to the President, attended the second.
May 1982	The report authors met with Prof. Peter Elias, Prof. Michael Dertouzos, Director of Laboratory for Computer Science, and Prof. Patrick Winston, Director of the Artificial Intelligence Laboratory, to discuss the impact of the list and the need for further action. It was proposed that: (1) the list be circulated among all members of the two laboratories; (2) an open forum for discussion among all members of the community be held; and (3) this report be written.
May 1982	A revised version of the list was circulated to all Computer Science faculty, staff and graduate students.
May 1982	The MIT Computer Science community came together in an exceptionally well-attended lunch meeting to discuss the issues raised by the list.

Table II-2: Fall Registration Statistics for Female EECS Graduate Students

Year	In all of EECS %	In all of EECS Number	In CS %	In CS Number	In EE (Non CS) %	In EE (Non CS) Number
Increase in women in 10 years	558%	55	286%	13	940%	42
1982	11.9	67	12.1	19	11.8	48
1981	10.8	61	8.8	13	11.5	48
1980	9.8	54	12.6	20	8.6	34
1979	9.5	50	12.7	17	8.3	33
1978	9.2	45	13.7	18	7.5	27
1977	6.1	29	10.2	14	4.4	15
1976	5.2	26	8.0	12	4.0	14
1975	4.5	21	6.3	9	3.1	12
1974	4.6	21	4.1	5	4.7	16
1973	2.8	12	6.0	7	1.6	5

Table II-3: Fall 1981 Enrollment of Graduate Students in the Six Areas of the EECS Department

Area	Number of graduate students: Total	Number of graduate students: Women	Percentages of total who are women
Area I (Systems, Communication, and Control)	97	9	9.3 %
Area II (Computer Science)	149	13	8.7
Area III (Electronics, Computers, and Systems)	120	12	10.0
Area IV (Energy and Electromagnetic Systems)	55	6	10.9
Area V (Materials and Devices)	70	8	11.4
Area VII (Bioelectrical)	55	9	16.4
Other (Operations Research)	14	3	21.4
Other (Technology Policy Program)	5	1	20.0

III. Appendix - Contributions by Other Members of the Community

The following four subsections present reactions by members of our community at MIT. Prof. Peter Elias is Associate Head for Computer Science of Department of Electrical Engineering and Computer Science. Dr. Mary Rowe is Special Assistant to the President. Prof. David Reed is on the Computer Science faculty of the Department of Electrical Engineering and Computer Science. The final contribution is by a men's discussion group that is one of the outgrowths of the activities chronicled in this report.

III.1 Peter Elias -- The Department

When I saw the report written by the women graduate students and technical staff I was surprised and dismayed at the extent of the problems they had found in our environment, but felt that other members of the community would share my surprise and concern, and that the report could make a great contribution to producing a more satisfactory environment for women in computer science at MIT. I invited my colleagues to read the report and discuss it at a lunch meeting of computer science faculty and research staff on April 1, 1982. In the memo announcing the lunch I wrote:

> It is tempting to shrug off some of these problems as merely showing oversensitivity on the part of the women involved. I don't think we can afford to do that, however, for three reasons.
>
> First, many of our women graduate students heard before they came that MIT was a difficult place for women. Others, who did not apply or did not come, may have been frightened off by such reports. The percentage of women in graduate work is roughly the same in Area II as in the rest of EECS, although we have almost twice the percentage of undergraduates.
>
> Second, the women note in their letter that many women graduate students feel uncomfortable enough here to avoid their research group or laboratory. They thereby lose a principal component of graduate education.
>
> Third, a larger number of complaints of this general character arise from Area II than from the rest of EECS. This may be due in part to our distinctive geography and workstyle. Whatever the cause, it gives us a greater incentive to take the problem seriously.

The lunch was very well attended, discussion was intense and largely sympathetic and interest was sufficiently great that we agreed to have a second meeting with Mary Rowe present, to give us a better MIT context within which to place the situation here. That meeting, on April 29, 1982, also drew a large and very vocal audience, including some of the women faculty and research staff. The women's group then held what I believe was the first meeting for all of the members of the two

laboratories, The Laboratory for Computer Science and the Artificial Intelligence Laboratory, including students, research staff, support staff and faculty, on May 20, 1982. Again discussion was intense and revealing.

Certainly the net result of all this activity will not make the problems faced by women in computer science at MIT all disappear. However I do believe that there was a significant increase in the sensitivity of many of us among the students, faculty and staff to many of those problems, and that the report and the following activities were a useful and important first step.

III.2 Mary Rowe -- Subtle Discrimination

I believe that subtle discrimination is a major barrier to equal opportunity -- and can cause serious damage, for the following reasons.

- Subtle discrimination often leads to more explicit discrimination. Thus, ignoring women is a habit that may lead to overlooking a woman who might be the best-qualified person for a job or promotion or to underpaying women.

- Because the provocation for discrimination -- one's gender -- cannot be changed and has nothing to do with one's work, one inevitably feels helpless.

- Subtle discrimination takes up the victim's time. Sorting out what is happening and dealing with one's pain and anger take time. Extra time is also demanded of many women and men to help other women deal with the pain caused by subtle discrimination.

- Discrimination prevents people from doing work that is as good as they are capable of doing. If a secretary or graduate student is unreasonably overloaded with menial work for a supervisor, the overloaded person may be prevented from doing the kind of excellent work that prepares her for promotion. Subtle forms of discrimination can cause much damage before it is recognized.

- Subtle discrimination is particularly powerful as negative reinforcement because it is hard to identify. This means that these inequities are hard for a victim to "turn off." It also means that frequent victims, like women, experience a range of emotions from legitimate anger to paranoia. The experience of being uncertain about whether one was insulted causes displaced and misplaced anger. It also causes one to ignore some real insults, so that they persist.

- Subtle discrimination often is not *intentional*, even when objective observers would agree that it exists and that an injury really took place. This is another reason it is hard for a victim to respond to it. We are all socialized to believe that *intent* to injure is an important part of injury, and it is certainly critical to our dealing with injuries at the hands of others. Faced with a subtly discriminatory act, the victim may not be certain of the motives of the aggressor and may be unwilling to start a fight where none was intended. When uncertain about motives, most victims at times do not get angry when they should, which perpetuates the injuries and may weaken the victim's self-image. At other times, they protest when no injury was *consciously* intended, even though it occurred. The latter situation can be salutary for all concerned, especially if the aggressor reacts by acknowledging an unconscious intent to injure. However, sometimes the aggressor is so totally unaware of aggressing that, even though observers agree that an injury took place, he may respond with anger, feelings of betrayal or bewilderment, or worse.

- Subtle discrimination seems petty, in a world where redress by the less powerful often seems heavy-handed or too clumsy. Unionization, going to court, and appeal to the President's office may seem heavy weapons against subtle discrimination. The perceived lack of *appropriate* weights of redress helps perpetuate subtle discrimination.

- Subtle discrimination of some types may have a negative Pygmalion quality. That is, the expectation of poor performance, or the lack of expectation of good performance, may by

itself do damage because students and employees have a strong tendency to do what is expected of them. As Sartre noted throughout his book on anti-Semitism, the anti-Semite creates the Jew.

The question is frequently raised whether subtle discrimination does not just "happen to everyone?" Are we not just describing the general inhumanities of large organizations? Frequently, I will talk with a powerful white male who openly says "I harass everybody, Mary. I don't discriminate." Let me raise here hypotheses as to why subtle discrimination might be worse for women in paid employment (especially for women in traditionally male employment), than for the average white man. Some hypotheses as to why subtle discrimination may do more damage to women are analogous to the hypotheses as to why they do damage at all.

- "General" harassment often takes specifically sexist forms when applied to women. One might say to a man "Your work on this experiment has been inexcusably sloppy; you'll never make it that way!" When addressed to a woman, the same criticism might come out as "My God, you think no better than my wife; go home and have babies!" The harassment of women piles up in allusions to sex roles. Like the dripping of water, endless drops in one place have profound effects.

- Discrimination often is perpetuated by more powerful people -- most of whom are male -- against less powerful people -- most of whom are female. Since less powerful people by definition have less influence, it is difficult for them to stand up against discriminators who happen to be their supervisors or advisors.

- Some traditional white, male environments support and reinforce certain kinds of discriminatory behavior, like the telling of aggressive and humiliating dirty jokes in a lab.

- Men may overlook some sexist behavior because it is so "normal." Many male supervisors are acutely uncomfortable around secretaries and consequently ignore them, but neither they nor male bystanders notice this. Pornography on walls, sexist jokes, and the use of sex in advertisements and announcements are so ubiquitous that many people do not consciously notice it.

- Women in non-traditional positions have a more acute role-modeling problem, because they witness subtle discrimination against others like themselves. Disproportionately more women see people "like them" put down or ignored by their superiors. In most work environments, the principal, same-sex role models for women are clerical and hourly workers, who are the groups that most frequently report subtle discrimination. This inadvertent role-modeling is made stronger because nearly all women are at one time or another assumed to be clerical workers (or waitresses or saleswomen, depending on the situation). A young female engineer says "I am constantly being taken for what I am not. I constantly feel a struggle to develop my own self image, but it is not affirmed by most of the world around me, as it is for my male colleagues."

- It is harder for women to find mentors to help them deal with subtle discrimination. There are so few senior women in most organizations that junior members of most communities cannot find as many high-status, same-sex mentors as white males can find. Sometimes,

higher-status women try to compensate by spending extra time as same-sex mentors. However, it is inevitable that the burden of dealing with discrimination falls on women who are already disproportionately drained of energy by caring for others.

- It is particularly difficult to find an *appropriate* mentor when one has been the victim of sexist discrimination. Listeners of the opposite sex may not understand. Listeners of the same sex may be so discouraged, angry, or full of denial that they are worse than useless. I believe that it is often more difficult for women to find adequate help in dealing with the minutiae of sexism than for average members of the community to deal with "general inhumanities."

I believe there are many reasons why the problem of subtle discrimination for women goes beyond the *general* inhumanities of large organizations. This point may become clearer to male readers if they imagine being a child-care worker in a large, conservative, inner-city, day-care system. The "general harassment" might include questions and comments about your sexuality. You might hate always being asked by visitors why you are there. Other white males might find you odd. Women might distrust your skills, simply because you are male. You might find the constant assumption that women care for children better than men to be very oppressive -- the advertisements, the jokes, the pictures on the walls, the fathers deprived of custody. Since you might in fact *be* inept in some ways at the beginning, this criticism might hinder your professional development. You might be very sensitive to the just run-of-the-mill anger of your cross-sex supervisor. You might have no one like yourself to turn to.

In summary, I believe that subtly discriminatory behavior causes pain and, for women, the pain often occurs in an environment they cannot easily control, evade, or ameliorate. Continued experience of destructive situations which cannot be improved can start unhappy cycles of behavior ranging from declining self-esteem to withdrawal, resignation, poor work, fantasies of violence, and so on. At the very least, it takes a lot of energy to deal with an environment perceived as hostile, or to continue to deny the difficulties.

III.3 David Reed -- One Man's Reaction To The Report

When I read an early version of this report, and encountered the reactions it engendered among the faculty, staff, and students in the area, I wrote the following paragraphs to the reports' authors. I think they bear repeating, as one man's reaction to the report. I would only like to add that I am proud of the effort put in by both men and women here in discussing these problems openly and honestly. There are complicated and deeply held feelings at the root of these issues. The old rules of "correct" behavior between man and woman are based on assumptions of inequality. As we destroy these old assumptions, the rules change for all of us, and we must examine even our most fundamental instincts.

I am very glad that you put in the effort you did. It is always hard to speak up when you feel oppressed, harassed, or beaten down--you wonder whether it is all your fault (especially when there are those who will imply that it is), or whether it is worth exposing yourself to more of the same, or whether it will do any good.

Certainly the reaction has been mixed, and with the extended distribution you will continue to get reactions. However predictable such reactions seem to be, and however defensive, denying, misunderstanding, insensitive, or uncaring, it is clear that you have had a significant effect. I have attended both faculty lunches where these issues have been discussed, and it is clear that most men there have learned a lot, as I have, about how individual women may perceive their actions--e.g., that discomfort at being an object of undesired attention is not just a "minor" problem to be solved when the women "adjust" to the norms of M.I.T.

Personally, I feel that your list has broken the ice between women and men who work here. These problems will not be solved quickly, and some men will say in a defensive reaction "these women don't deserve to work here if they have such thin skins." That these men are so defensive is a good sign of sorts--they used to feel it unnecessary to defend such behavior.

As for me, I learned a lot. I am not a woman, so I have not always been sensitive in the way I have behaved (I remember one time in anger sending a system message containing graphic language it embarrasses me now to recall, and I am sure that I have said things that could be heard as imputing that women could not be as successful as men [though I don't believe that]). I know now about some situations that have occurred that I might be able to help prevent in the future by expressing my disapproval as a faculty member and group leader. I will never be able to neuter myself (nor should any man) at work, but I hope that I can learn from you to listen with some understanding of how it feels to you.

I have heard a rumor that several of the women involved in preparing the report are planning now to leave after their S.M. because of their feelings about the things in the list. I feel sad that some of you find that necessary after making a strong contribution towards improving life here. One of the reasons I am writing this is to let you know that there are those who care that you stay. M.I.T. need not be inhuman to be excellent.

Thank you all.
David P. Reed

III.4 Another Male Perspective on Discrimination

This section was written by a group of male lab members who have been been meeting regularly to discuss the problems and issues presented in the main body of this report. Our group has included students, faculty and staff members. Several of the women responsible for the report have also shared their perspectives with us.

Due to the sensitive issues addressed by the women's original report, reactions ranged from defensiveness to joking belittlement to astonishment that women here face the problems they do. Some men expressed similar frustrations in their own professional lives, and were surprised that the women considered their situation different. But as a result of publication of the report, many people here have begun to think more seriously about discrimination in our workplace based on racial, cultural and educational differences as well as on gender. Thus we see reason to hope that this report will be a step toward a better working environment for all.

In discussing the specific problems which occur here, we came to the realization that sexism encompasses more than active, intentional discrimination. Women can be inadvertently discriminated against without anyone being consciously aware of it. For example, a subliminal assumption that men are generally more technically competent can hurt women because men will tend to approach other men for technical discussions. As a result, women find themselves separated from the main flow of professional ideas, their professional development becomes more difficult, and their professional opportunities are subtly restricted.

The longer we discussed such issues, the more obvious it became that their solution involves more than the adoption of new departmental or laboratory policies. We concluded that neither formal institutional change nor individual changes in behavior and attitudes alone can fully address these problems.

As it became clear that personal change was a significant issue, we began to consider what kinds of changes in our own attitudes and behavior were most important. The following list of priorities, arrived at after some effort, is far from definitive but was useful as a starting point.

- We need to recognize the legitimacy of other people's feelings. The high value we place on aggressiveness and the willingness to engage in intellectual combat should not lead to a lack of respect, understanding or empathy among us. The attitude that "It doesn't bother me, so why should it bother anyone else?" is especially inconsiderate and counterproductive. Professional competence is not always associated with a high degree of assertiveness and a confrontational style of discussion.

- We need to take responsibility for our own actions. Although it is difficult to be constantly on guard against saying or doing something which is offensive to others, we have no one to blame but ourselves if we do so. We specifically reject the idea that men must be provided a list of dos and don'ts in order to be held accountable for their behavior -- sensitivity should come from within and not depend on criticism from others. If one carries a positive attitude toward others, the temptation to do something inappropriate is diminished, and far less "watchfulness" is necessary.

- We need to take a stand. When one of our colleagues engages in inappropriate behavior, it is all too easy to look the other way. But it is everyone's responsibility to speak out about what he or she feels is right, even though it may feel awkward or offend one's friends.

Discrimination is a severe and deep-rooted problem. No place is immune from its occurrence, and no amount of denial or superficial dismissal will make it go away. In reacting to the women's report and talking with each other, we are learning to perceive gender-based biases and other prejudices more clearly. The obstacles women face here reflect wider societal patterns, and the explicit rejection of traditional role models is critically important in changing these patterns.

We appreciate the time and commitment the women have invested in developing their report.

Steve Berlin
Dan Carnese
Oded Feingold
Walter Hamscher
Chris Reeve
Sunil Sarin
Mark Shirley
Jon Sieber