

Gender, culture and authority in a university life sciences laboratory

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ABSTRACT. Many studies document the disproportionately high attrition rate of women in science, especially at early points in their careers. This ethnographic and conversational analytical study of a university life sciences laboratory group goes beneath statistical findings to explore one reason often cited by women who have dropped out of science: a 'bad lab experience'. A detailed analysis of the interactional patterns or culture of the laboratory group suggests that discursive practices reinforce a conflation of gender, culture, and authority creating a climate that may be experienced as 'chilly', or even 'hostile', by some female members.

KEY WORDS: conversation analysis, culture, discursive practices, gender, institutional discourse, language, science, socialization

Government-sponsored and private research initiatives continue to address the situation of women in the sciences (National Science Foundation, 1988–1989, 1990–1991, 1994; NECUSE, 1996; Reskin et al., 1996) and to document the status of women in various scientific disciplines in the United States. Despite increased attention to and support for women in the sciences, studies reveal that women's attrition rates remain disproportionately high, especially at earlier stages of their scientific careers (Barinaga, 1992, 1993; Rayman and Brett, 1995; Seymour, 1992, 1995a, 1995b; Sonnert and Holton, 1996). In order to improve the retention rate more information is needed about why so many women feel unwelcome, drop out or do not succeed as well as they could. While broad sociological studies and statistical surveys offer a valuable overview of institutional practices, in-depth qualitative analysis is needed to complement these large-scale studies. The present study goes beyond and behind statistical generalizations to explore one reason often cited by women who have dropped out of science: a 'bad lab experience' (Conefrey, 1993). By carrying out an ethnographic and conversational analytical study on a university laboratory group and offering a detailed analysis of the interactional patterns or social 'climate' of the group, this study identifies discursive practices which may be viewed as contributing to the negative experience of some female laboratory members.

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The intention behind the study is less to prescribe change than to open up discussion among scientists, policy-makers and others of the ongoing ways in which routine everyday conversation constructs and reconstructs inequalities of gender, culture and authority in science.

Belonging to a university laboratory group is a complex experience in part, because the social and interpersonal interaction among laboratory members is complex (Morell, 1996). In addition, as the studies cited here suggest, one might expect male and female students to evaluate and interpret their experiences in this shared space differently. Put another way, gender—as expressed, constructed, and mediated through language—appears to influence the experience of laboratory membership. For example, two decades of research on language and gender (Cameron, 1985; Crawford, 1995; Lakoff, 1975; Tannen, 1996; Thorne and Henley, 1975; Thorne et al., 1983; Treichler and Kramarae, 1983) suggest that women have more difficulties and feel less comfortable than men in negotiating the verbal dynamics of institutional settings. Some studies assert that science in general and science laboratories in particular are male domains (Harding, 1986, 1991; Keller, 1985, 1991; Longino, 1988). Traweek (1988: 16) writes, ‘The lab is a man’s world, and I try to show why that is particularly the case in high energy physics: how the practice of physics is engendered, how laboratory work is masculinized’. She underlines the stereotypically male character of the talk and stresses its significance in contributing to a successful career: ‘The preferred style is confident, aggressive, and even abrasive if one suspects that another’s ideas are wrong’ (Traweek, 1988: 90). Keller (1983) outlines a similar situation in the life sciences, documenting in her biography of Barbara McClintock that the Nobel Prize recipient’s most significant theories were ignored by her male colleagues for most of her career and that she never had the same opportunities for advancement. Some researchers have claimed that the paucity of women in science is due to this phallogocentric bias (Keller, 1985; Rossiter, 1982; Tobias, 1990). Writing in 1992, Tobias asserts, ‘The point is that while many women scientists are succeeding in what is still a male-dominated environment, many are not’ (Tobias, 1992: 276). Now, at a time when prospects for young scientists in general are more uncertain than ever, it is even more important to understand why talented young women are leaving.

Interviews with women scientists and women academics who have left science provide information on these points (Conefrey, 1993). Several women in my study expressed discomfort with the verbal dynamic of the laboratory groups of which they were a part, commenting that they had to ‘play by men’s rules’, or that science was a ‘male ball game’. One woman, for example, with excellent academic credentials, had intended to pursue a career in science; she left after a laboratory experience as a post-doctoral fellow led to severe self-doubt. She said she had felt hostility from some laboratory members and that they had colluded to make her feel that ‘anything that went wrong’ in their previously all-male group was her ‘fault’. Another woman explained that she had felt excluded, not because of any ‘overt discrimination’, but because the laboratory group’s male leader al-

ways directed his comments to her male co-worker and this made her feel 'invisible.' Similarly, a professor in the humanities said that an unfortunate laboratory experience in chemistry had played a central role in her decision to leave the sciences. She said that the male professor in charge of the laboratory never gave top grades to female students and frequently told her and other female laboratory members they were 'stupid and incompetent'; as a result, she lost confidence and felt insecure about her ability. She concluded: 'If I couldn't survive or feel comfortable in a lab in my undergrad courses, how would I ever manage the experience in graduate school or beyond?'

Feelings of self-doubt and insecurity were also reported by women who persisted in the sciences. In the leading scientific journal *Science's* first special issue on women in the sciences in 1992, many female scientists expressed discomfort with their past and present experiences in laboratory groups. And in Seymour and Hewitt's (1994: 330) extensive survey of factors contributing to high attrition rates among science, mathematics and engineering undergraduate majors, one female student responded:

They just don't know how to act with women students. They don't know what to do with you. Their whole attitude, and facial expression and body language says, 'You belong in the kitchen. What are you doing here?'. They're not allowed to say it, but you overhear it in conversations.

If a newcomer, whether male or female, wants to be accepted by the laboratory group and to become a productive member of it, he or she has to show a willingness to fit in with the existing group culture (Collins, 1979). As Schieffelin (1990: 18) suggests, 'much of socialization takes place simply through recurrent participation in interactions with knowledgeable members'. However, since each laboratory group has its own character, there is no easy guide for the novice to quickly discover the rules and norms. As I suggest in the research reported here, some laboratory group norms are explicitly taught, others are learned by observing what is prized by the group, and some emerge when they are transgressed. In any case, central to the social dynamics of all laboratories is language, since it plays a significant role in the acquisition and transmission of sociocultural information (Ochs, 1993; Schieffelin, 1990). The process of becoming a competent member of society is realized to a large extent through language—by acquiring knowledge of its functions, social distribution, and interpretations in and across socially defined situations (Ochs and Schieffelin, 1984).

Laboratory life, then, is jointly constructed through talk and technical practices, that is, members of the laboratory group are socialized in and through talk into significant aspects of laboratory life. As Latour and Woolgar (1979: 27) note, 'many aspects of science ... depend on the routinely occurring minutiae of scientific activity'. Jacoby and Gonzales (1991: 151) remind us that to learn a language, such as the language of the science laboratory or the language of presenting scientific papers, involves more than learning a self-contained linguistic system: it is to learn a culture, 'because culture and interaction are the only contexts in which language has

meaning'. Yet there has been little detailed study of verbal interaction in laboratories. What analysis there has been, has tended to focus on the role of verbal interaction in the production and reproduction of science rather than scientists (Gilbert and Mulkay, 1984; Knorr-Cetina, 1981; Latour and Woolgar, 1979). In addition (with the exception of Lynch, 1985; Ochs et al., 1994), many of the examples of scientists' talk given have been composites rather than transcriptions of recorded talk and they have been used in support of other claims rather than as data to be examined for their own sake.

If the experience of working in a laboratory exerts a significant influence on whether a woman decides to continue in the field and if talk is very much part of this experience, and indeed a determinant of success in science in general (as suggested by anecdotal and ethnographic evidence), then it would seem advantageous to further our understanding of the character of this talk. The present research is offered as a step in this direction. Using conversation analytic techniques to describe and explicate the knowledge that speakers use and rely on in participating in intelligible, socially organized interaction (Heritage and Atkinson, 1984), supplemented by ethnographic information (gathered by participant observation in the laboratory and interviews with members) to supply the necessary biographical and technical information, I analyze the verbal interactions of a university neuroscience laboratory group. I show how one new female undergraduate member attempts to negotiate group norms in order to chair the group's weekly meeting. I demonstrate that the rules, rights, and obligations of science labs are far from straightforward, and not readily accessible to newcomers—who instead must negotiate a complex and complicated stream of laboratory practices and policies to acquire the sociocultural knowledge and verbal competence that more senior members rely on. In addition, following the discussion section, I supplement my analysis by reporting feedback from the participants in the study, whom I invited to comment on my findings.

THE SITE

This state- and nationally-funded laboratory, one of several neuroscience laboratories at a major midwestern research university, comprises a Principal Investigator (P.I.), a senior scientist and full professor; a laboratory technician; a postdoctoral fellow; and about 12 students. The students in the laboratory come from a variety of campus departments; they are at various stages in their academic studies and embody many levels of expertise (see Figure 1 in the data section). In this particular group, all members of the laboratory, from the newest undergraduate to the P.I. to the laboratory technician, take turns leading the weekly laboratory meeting. In addition, the laboratory's meetings function in some respects as a 'journal club', a standard format in the sciences for reading and critically evaluating recently published research. Typically, members choose a topic they are interested in or, particularly if a conference is coming up, they present some piece of their

work in progress. Though any topic can be chosen for a given week, interviews with senior members reveal that journal papers are expected to be selected so as to form a coherent whole and build toward some ultimate teaching point. Once the chair selects relevant papers, he or she photocopies them and distributes them several days before the meeting. Usually two people are assigned the same paper and share the task of presenting it. In addition to a copy of the paper they will be critiquing, laboratory members also receive packets prior to the meeting with the paper titles, main figures and tables and sometimes the abstracts of all the articles that are to be discussed. At the meeting, which usually lasts about an hour, the designated chair provides a rationale for the topic and then introduces each paper, inviting those who have been assigned it to present a summary and critique.

THE DATA

The data are drawn from a meeting held in July 1995, after I had been taping the meetings for approximately 17 months, on a day when most of the regular graduate and new undergraduate members, who had joined the laboratory about two months earlier, were present (Figure 1). I chose this meeting because it was led by Lilly (all names are pseudonyms), a new undergraduate member. Her chairing experience on this date was representative of the kinds of problems I had observed undergraduate members displaying in exerting and commanding leadership, problems which more senior laboratory members generally did not exhibit. Although I am not suggesting that one could or should generalize from the experience of one female undergraduate science student at one weekly meeting of one university life sciences laboratory, I believe, following Sartre (1981), that no individual is ever just an individual, but is also a single instance of more universal social experiences and bears traces of his or her historical moment. In the words of Sartre (1981: ix), each individual is 'summed up and for this reason universalized by his epoch, he in turn resumes it by reproducing himself in it as a singularity'. Similarly, following Fiske (1994), exploring the 'particularity of experience', is one way of ascribing a human face to statistical studies and as noted by Psathas (1995: 50), this 'method of instances' constitutes 'the methodological and epistemological position of conversation analysis'.

The meeting started at about 8 am; with Lilly as chair, seated beside the P.I. at one end of the table, the rest of the laboratory members sat along the sides (Figure 1).

As with other meetings, this particular meeting begins with casual conversation. A lively discussion of 'housekeeping' matters takes place over how often the trash is being collected. After about two minutes of this discussion and following a brief pause, the P.I.'s 'okay' (line 2), cues Lilly to segue into the formal part of the meeting. In the interests of data integrity, I analyze transcript segments sequentially. (See Appendix for transcription conventions.)

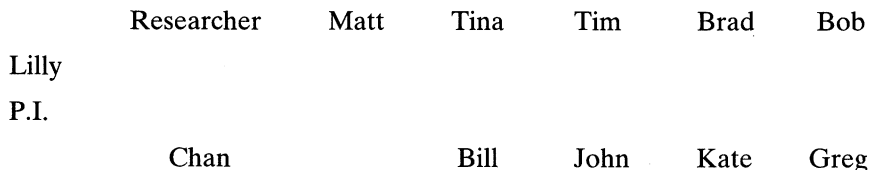


FIGURE 1: Seating positions around seminar table at weekly meeting, July 1995

KEY:

- P.I. (Tom Walker): Principal Investigator (P.I.), administrator, white male
 Bob Jones: Medical student, has PhD, white male, 2 years with group
 Matt Gavigan: Medical student and PhD candidate, white male, 5 years with group
 Tim Brown: Medical student and PhD candidate, white male, 4 years with group
 John Johnson: Medical student and PhD student, white male, 18 months with group
 Greg Smith: PhD student, white male, 3 years with group
 Chan Shim: MA student, Premed, Asian-American male, 2 years with group
 Brad Baker: MA student, white male, 2 years with group
 Lilly Wang: Undergrad, Premed, Asian-American female, 2 months with group
 Bill Bodescu: Undergrad, Premed, Hungarian male, 2 months with group
 Tina Lang: Undergrad, Premed, white female, 2 months with group
 Kate Taylor: Laboratory technician, white female, 2.5 years with group
 T. C.: Researcher

- 1 (4.0)
 2 P.I.: ((Softly to Lilly)) Okay
 3 Lilly: Okay
 4 (1.2)
 5 Tim: Wait a second- (.) Lilly?
 6 Lilly: Uhuh?

In line 3, Lilly signals her agreement, but as she is preparing her notes, Tim requests her to delay starting. He then, as the next sequence shows, diverts the group's attention from Lilly's introduction of the scientific topic to a negative assessment on behalf of the group of her cover-page. Tim's interjection has the effect of disorganizing Lilly's topic construction and undermining her right to the floor:

- 7 Tim: In light of this spread, all I'm gonna say about the cover page is=
 8 [
 9 All: ((Soft laughter)) Heheheheh
 10 [
 11 Lilly: ((Giggling softly)) Hehehe
 12 Tim: =we're really upset (.) An' we'll just leave it there.
 13 [

- 14 Lilly: Hehehe ((Starting to laugh more and more loudly))
 15 All: ((Laughter))

In line 7 ‘spread’ refers to Lilly’s beyond-the-usual breakfast treats as compensation for failing to comply with the group ‘norm’ of a cover cartoon. Tim has barely started his utterance, before other group members begin laughing, demonstrating their insider knowledge of the group’s customs—one of which is that the cover page of each packet of papers should have some kind of drawing or cartoon. Tim’s choice of ‘we’re really upset’ (line 12) rather than ‘really mad’ or ‘really angry’ possibly softens his criticism and renders it less face-threatening. His use of the plural pronoun ‘we’ implies that he is voicing a group concern, rather than merely speaking for himself. Lilly laughs but does not respond verbally, until—as the following sequence indicates—the P.I. begins to speak about her but then self-corrects, inviting her to speak for herself. Although the P.I.’s utterance is phrased as an invitation, it functions as a directive. Lilly is compelled to supply the requested information:

- 16 P.I.: She- Do you wanna relate what you told me this morning in the elevator
 17 when I saw? you with all this?
 18 Lilly: Well yeah. Chan said it might be a good idea if I just baked a lot of
 19 stuff because I didn’t have a cartoon heheheh on the front page hehehe
 20 hehehe ((Laughing loudly))
 21 [
 22 All Heheheheheh
 23 [
 24 Tim: Hehehe I’m just gonna leave it there.
 25 [
 26 Lilly: ((Laughing loudly)) Hehehe

Tim’s utterance had drawn attention to Lilly’s failure to follow the accepted group norm in designing the cover-page. Lilly relates that Chan, who has been with the group for over a year, informed her that she could make amends by making an extra effort with the breakfast food. Lack of opposition by Lilly, the P.I., or other group members, to Tim’s interjection, Tim’s use of the pronoun ‘we’ (line 12) and the P.I.’s encouragement of Lilly to repeat what she had told him earlier, suggest a tacit sanctioning of Tim’s behavior. Lines 18 and 19 suggest that Lilly had anticipated that attention might be drawn to her cover page. Tim, again, reassures Lilly that he’ll drop the matter, but Brad, in the following sequence, suggesting that Lilly got off lightly, prolongs the digression:

- 27 Brad: I tell you what (.) You oughta bake him something extra=
 28 [
 29 P.I.: Well
 30 Kate: We all learn
 31 [
 32 Brad: =because he railed me::
 33 Lilly: Hehehe ((Laughing loudly))
 34 [
 35 All: ((Laughter))
 36 [
 37

- 37 Matt: A good strategy
 38 [
- 39 P.I.: This is- This is better than a Gavigan or a Dillon cover
 40 [
- 41 Kate: That's right
- 42 Tim: Oh yea::h
- 43 All: ((Laughter))
- 44 Kate: Let's see if we- Let's see if we get a Lilly as a dork=
 45 [[
- 46 All: ((Laughter))
- 47 [
- 48 Tim: Well Gavigan is a little rat ()
- 49 Kate: =for Tim's next lab meeting heheheh hehehehh heheheh=
 50 [
- 51 Tim: = () ((spoken very softly))
- 52 [
- 53 All: ((Laughter))
- 54 Kate: ((Laughing loudly)) hehehe heheh hehehe
- 55 [[
- 56 Brad: (Did you see what he calls me on the)
 57 [
- 58 Tim: Exactly
- 59 All: ((Laughter))
- 60 Kate: Heheheheh I said let's see if we get a picture of Lilly as a dork for
 61 Tim's next lab lab meeting heheheh
 62 [
- 63 All: ((Laughter))
- 64 Lilly: Okay well we're going to be:: (0.8) discussing=

In lines 27 and 32, Brad protests that he was treated more harshly by Tim than Lilly was. Kate's comment in line 30, 'We all learn', and Matt's in line 37, 'a good strategy' make explicit the role of group censure in socializing new members. Group members' behavior (first in their silence, then in their failure to defend Lilly or reproach Tim, and later in their extended discussion of other cover-pages that did not meet the group's expectation) indicates an awareness and acceptance of this norm. The P.I. seems to defend Lilly by suggesting that other group members' (Matt Gavigan and Tom Dillon) cover pages had been worse. This remark may be encouraging to Lilly, but is also a put-down of Matt, which is then endorsed by another member (line 41) and followed by an additional derogatory comment (line 48). Once Lilly has been diverted from starting the paper presentation, the talk reverts to chit-chat and banter. Tim's comment triggers an extended detour, which launches the meeting with an evaluation of Lilly's command of chairing, even before she can or does assert any control. Lilly waits for the laughter to die down a little before attempting to continue with the meeting:

- 64 Lilly: Okay well we're going to be:: (0.8) discussing=
 65 [
- 66 Tim: (Well, I did tell her) ((Spoken very softly to Brad))
- 67 Lilly: =and uhm (.) the differences=
 68 [
- 69 Brad: Uhum (she'll improve the cover) ((Very softly to Tim))

- 70 Lilly: =between uhm (.) the isophorms of gad gad sixty-five and gad sixty-
 71 seven? uhm At first we'll look at uhm two forms of the aminobutyric acid
 72 s-synthetic enzyme. Well- glutamate decarboxylase have distinctive
 73 interneuronal distributions and conductor interactions and that's the-
 74 Should be the first page of your packet? (.) uh::m=
 75 [
- 76 Kate: ((aside spoken softly)) That was my (paper) [

Finally, in lines 64–74, Lilly states the topic of the meeting: the differences between two isophorms of glutamate decarboxylase (GAD), GAD₆₅ and GAD₆₇, which catalyze the production of glutamate aminobutyric acid (GABA), an important neurotransmitter. Once Lilly begins introducing the paper, a different kind of conversational style emerges. Instead of the shorter turns that were characteristic of the chit-chat and joking sequences, the turns are longer and there are longer pauses and more fillers ('uhm's and 'and's, etc.). This kind of conversational style, which tended to occur in the context of papers being presented, could be called 'report-talk'. However, as Tim and Brad continue the banter as side-talk, there is still evidence that a transition out of repartee or chit-chat is not yet complete. Just as Lilly attempts to move to the presentation of the first paper, the following sequence shows that she is again delayed, this time by the P.I.:

- 76 Kate: ((aside spoken softly)) That was my (paper)
 77 [
- 78 P.I.: Before you do that
 79 [[
- 80 Brad: ((Aside spoken softly)) It's okay
- 81 Kate: That was my paper ((Aside spoken very softly))
- 82 P.I.: I think virtually everyone but just for completeness sake tell us what=
 83 [
- 84 Tim: I'm not () ((Very softly))
- 85 P.I.: =gad sixty-five and gad sixty-seven are. I mean (.) other than an=
 86 [
- 87 Oh
- 88 P.I.: =abbreviation and why you're interested (.) in those two
 89 [
- 90 Lilly: Okay

The P.I. requests that Lilly define her terms and state her personal interest in the topic. His utterance is different in nature from the asides of Tim, Brad and Kate in lines 76, 80, and 81. It is louder and functions again to disrupt Lilly's topic construction. By conveying the professional lesson and sociocultural laboratory-meeting knowledge that terms should be defined and individual interest stated, the P.I. constitutes Lilly as a novice and himself as an expert. He also presents himself as a teacher by giving Lilly guidance as to what is expected rather than waiting for her to make a mistake. As indicated in the following sequence, Lilly begins to respond to his request:

- 91 Lilly: Uhm well, they're synthetic uhm enzymes that make the
 92 uhm the neurotransmitter gaba? and uhm and as y'all know (.)
 93 there's a connection between the gaba in the posterio

- 94 -Caudal hypothalamus and uhm (.) uhm hypertension? And what
 95 John and I are working on? is the molecular? work of that? and
 96 we'll be looking at relative levels of gad sixty-five uhm (0.6) the (0.4) m R
 97 N A? of that uhm to see:: whether or not there is a difference between
 98 uhm spontaneous hypertensive rats and W K Ys (0.4) at a younger age I
 99 believe than uhm cases shown as had previously done uh:m so:: that's
 100 why I decided to do gad? and then I hadn't realized heheheh ((smiling
 101 voice begins))that Bob was doing this for his research and now I feel like=
 102 [
 103 Tim: (Third paper) ((Spoken softly))
 104 Lilly: =a total putz because hehehe he's gonna know way more heheheh
 105 ((Laughing loudly))
 106 [
 107 Bob: Maybe not
 108 P.I.: No maybe he'll feel like a total putz when you start talking
 109 hehehehe
 110 [
 111 All: ((Soft laughter))
 112 [
 113 Matt: As he says (.) I wouldn't
 114 [
 115 Lilly: So uh:m-
 116 John: The morning is young
 117 (1.4)

The P.I.'s request that Lilly define her terms operates as both an invitation for a demonstration of her knowledge and also a test of it. Lilly's discomfort is displayed in the hesitancy of her speech; its rising intonation displays her uncertainty. In responding to the P.I.'s request, she volunteers the unrequested information that she had not been familiar with the research of another group member, Bob, and that she was feeling uncomfortable because he, as a more senior member, is sure to know more about her topic than she does. Bob, Matt, John and the P.I. are quick to offer reassurances. Lilly then makes a third attempt to get started on the first paper beginning in line 115, is cut off, waits 1.4 seconds and finally succeeds in line 118:

- 118 Lilly: So, the f-first article we have there is the one I just mentioned and we'll
 119 be looking at (0.4) As it did- As it did- As the title mentions the (.) intraneuronal
 120 distribu?tions uhm (.) and uhm (0.4) the cofactor uh how it- Gad sixty-five
 121 and gad sixty-seven react with uh cofactor pyri::doxal phosphate (.)
 122 uh:m=

Once Lilly begins talking about the article, the conversational style segues from chit-chat back into report talk. Lilly does not get very far, however, because Brad takes advantage of her hesitation to ask a question:

- 123 Brad: Can I ask a quick question before we jump- before we jump into this? (.)
 124 Just 'cause I don't know- How well known is the location of these two
 125 known? 'cause my paper? According to this abstract an what my papers=
 126 [
 127 Lilly: Mhm
 128 Brad: =say? which is two years later (.) they're in completely different spots
 129 John: The location (.) within the neuron
 130 [
 130

131 P.I.: Within the neu?ron
 132 []
 133 Matt: Within the neur?on
 134 Bob: Within the neuronal
 135 []
 136 Chan: Within the (0.4) brain
 137 []
 138 Bob: Within the cell
 139 Brad: Within the cell
 140 []
 141 Tim: Within the cell membra?ne
 142 [] []
 143 Brad: Within the cell
 144 []
 145 Lilly: Because strangely- Well it's mentioned-
 146 Actually quite a few- Quite a bit of this information is mentioned in uh
 147 (0.8) In two of the other articles as introductory m-material so:
 148 []
 149 Brad: Where are
 150 those-
 151 []
 152 John: Seems to be pretty consistent I think
 153 Bob: Well-yeah okay (.) Pretty well okay
 154 Tim: You're supposed to fight it out (.) an' see who's right
 155 (0.4)

Brad begins his question with a pre-question, which functions as a request to be allowed to ask his question. This device operates as an attention-getter and as such is more common in the speech of children than adults (Blum-Kulka, 1994). This usage possibly reflects Brad's junior status vis-a-vis the more senior members. By the time he finishes his turn, his question has mutated into a statement. Turning a question into a comment seems to be a way of mitigating its threat to negative face, that is, its degree of imposition; whereas questions beg answers, comments can more readily be ignored (Brown and Levinson, 1987). His 'before we jump-before we jump into this?' (line 123) further flags his recognition of his utterance as a sidetrack and, again, displays his recognition that Lilly has the floor. Brad appears to be jumping the gun, and revealing his ignorance of the topic, since what he is asking is a central focus of that day's meeting, i.e. a point that Lilly or another member would most certainly have covered at a later point. Brad's interjection leads to other members taking a turn at talk as they collaboratively seek to clarify Brad's question and Lilly loses the floor once more. In reference to the controversy over this issue already hinted at by Brad, Tim jocularly suggests that the matter be settled not by academic argument, but 'fighting it out' (line 154). Eventually, there is a brief pause, then Tim and Lilly begin speaking at the same time, both advocating that the group move on. In the following segment, Lilly then makes a fourth attempt in line 158 to move to the first paper. She names the persons who have been assigned it, laughing hesitantly and cutting herself off, as if reluctant to state which of the two should begin:

- 156 Tim: Let's go (.) You passed out my paper (before) ((Voice trails off))
 157 []
 158 Lilly: Okay so we'll start with Bill and Chan, uhm hehehe ((Laughing
 159 softly)) I don't know who hehehe hehe ((Laughing softly))
 160 []
 161 Bill: Shall I? do it
 162 Chan: Yeah go ahead go ahead

In her laughter and indecision in lines 158–9 'I don't know who ...', Lilly displays hesitancy and uncertainty. She also demonstrates her awareness that decisions about who should present are complex. In this group, decisions are not usually made ahead of time but rather arrived at in the course of the meeting. However, more senior members tend to be more influential than junior members in deciding who should present and generally encourage the undergraduate members to summarize the paper unless it is exceptionally difficult, in which case the more senior member takes over. Demonstrating an awareness of this practice, Bill, who is the more junior of the two, offers to present and Chan, who is the more senior, invites him to continue. Moving to the first paper is, however, delayed once more, this time by the P.I. Just as the negotiation about who should present has been completed, he interrupts Bill's presentation to raise a further problem:

- 163 Bill: Like Lilly said this paper looks at uhm (0.4) the location of uh=
 164 []
 165 P.I.: Wait
 166 before we (.) go on (.) it just dawned on me we have uh something we
 167 have to resolve uh (.) in the fall there may be so-some of the old
 168 undergraduates will be back an' if any of the current undergraduates
 169 continue in the fall an' the- one of the old undergraduates and one of the
 170 current undergraduates get assigned to a paper, who's the senior per?son
 171 there

With the utterance, 'Wait before we go on' (lines 165–6), the P.I. signals his talk as an interruption to the forward progress of the meeting. The P.I.'s question about how to determine seniority among undergraduate members draws explicit attention to the hierarchical nature of the group, though his laughter indicates that his question is not to be taken too seriously. Framing this issue jocularly also hints at its delicate nature (Crawford, 1995; Pizzini, 1991). As with earlier jocular comments, the talk reverts to chit-chat and repartee:

- 172 Kate: O::?::h
 173 []
 174 P.I.: Hehehehehehheh
 175 []
 176 John: Whoever has spent the most time in the lab? hehehe
 177 [] []
 178 Matt: Good question
 179 []
 180 Tim: Well, if it comes down
 181 to Mark and Tina let's have them race for it
 182 All: ((very loud laughter and clapping))
 183 Matt: Good idea

184 [[]
 185 Brad: Yeah
 186 [[]
 187 All: ((Laughter))
 188 Tim: I like that
 189 [[]
 190 Kate: I like that
 191 [[]
 192 All: ((Laughter))
 193 P.I.: Hehehehe That takes care of it okay we can continue heheheh=
 194 [[]
 195 ((Laughter))

John offers the traditional academic response (line 176); Tim, again, proposes a more physical solution (lines 180–1). The banter continues for several turns, with members seconding each other's turns. Finally, in line 193, the P.I. moves to get the meeting back on track. Again, he marks the beginning (line 165) and the end (line 193) of his turn as an insertion or side-track to the main flow. Kate, however, elaborates on Tim's jocular solution (in line 181) that Mark and Tina, both on the university's track team, should race to decide who is the more senior and so the diversion continues in the segment that follows:

196 Kate: =Don't worry we'll fix it We'll do it after a cat day ((To Tina))
 197 [[]
 198 All: ((Laughter))
 199 John: After a cat day
 200 Kate: The morning after a cat day
 201 [[]
 202 Tim: Bet-better start training Mark
 203 Matt: We won't feed him the day before
 204 All: ((Laughter))
 205 [[]
 206 Tim: Yeah
 207 Brad: We won't just feed him no breakfast That'll be enough
 208 All: ((Laughter))
 209 P.I.: He- he did a nice job at dinner at the Britains' house when
 210 (he was) back up
 211 [[]
 212 Matt: Did he? Two helpings? Or he held himself back
 213 P.I.: Oh no no he-
 214 Matt: No?
 215 P.I.: He didn't hold himself back
 216 ((laughter))
 217 Tim: Was the table still there after he was done

In the repartee that follows the P.I.'s turn at line 193, the more senior members of the group, again, build collaboratively on each other's responses. In line 196, Kate suggests that the race should be held just after Mark has spent an exhausting day carrying out research on cats. To tip the odds further in Tina's favor, senior members suggest holding the race in the morning and depriving Mark of food. The undergraduate members do not respond except to laugh, forming an audience for the jokes and banter of

the senior members. Even Tina, who is being spoken about in the third-person, takes on the role of spectator, laughing but not participating. This passage is also rich in what it tells us about the group's culture and values. The issue of seniority is explicitly raised, suggesting that it is a relevant feature of the group dynamic and as such, oriented to by group members. The senior members' talk displays insider knowledge of the extracurricular activities of the group. There is also reference to running and an admiration of those who can run the fastest, displaying the culture of sports that is a characteristic of this group. As in line 154, there is further reference to competition, and more particularly, physical prowess. Kate, the most senior woman in the group, demonstrates her solidarity with another woman, by suggesting that she would 'fix' the race. (Of course, implicit in this suggestion is the assumption that Tina could only win if the race were fixed.) Once the laughter dies down, as the following sequence indicates, the most senior members of the group urge Bill to continue with his presentation:

- 218 John: (We're being forced) ((Softly))
 219 Bill: Okay ((Softly))
 220 Tim: Just jump in
 221 Matt: Go ahead - jump in
 222 Bill: Okay
 223 Bob: Serious work there
 224 Bill: Uhm (1.0) =
 225 Bob: (Everybody's gonna be thinking of Mark and that table) ((aside))
 226 [
 227 Bill: (=They used an anti-serum for gad sixty-seven that they made themselves
 228 (.) uh by using a cDNA first code for gad sixty-seven and the cDNA
 229 was something they had also also made- previously uh to code for gad

Lilly as chair has attempted to further the progress of the meeting, but (as in line 156) it is a more senior member who finally gets the meeting back on track. Once this procedural matter is 'resolved', and after numerous attempts to get the first paper off the ground, the presentation finally gets underway as the conversational style segues back into report talk. Bill continues uninterrupted for 64 lines until he says, 'That's pretty much it right?'. This conclusionary mark functions as a signal for Chan, the more senior of the two, to add anything he feels has been left out. Following the paper presentation, there is a brief discussion and a return to chit-chat until the talk tapers off and then Lilly proposes moving to the next paper. The pattern for the remaining four papers is similar. In each case Lilly exhibits problems in managing the floor, moving through the papers, and keeping the meeting on track and finally, during the fifth and final paper, the floor is so intently contested by male group members that the meeting dissolves into chaos. This pattern is representative of an undergraduate chair. In meetings chaired by more senior members, the dynamics are different. Their hesitations are not constituted as opportunity spaces for repartee or side-sequences by other group members (with the exception of the P.I. who tends to speak as and when something relevant occurs to him). Such differential behaviors (depending upon the meeting chair) are suggestive of

power differences among group members, a dynamic which all newcomers have to be aware of and fit themselves into and one which Foucault (1980b) suggests is implicated in all discourse.

DISCUSSION

Although brief (in the interests of space requirements), the segment of the group meeting presented embodies many typical characteristics of the group's interactional dynamic that Lilly, as a new member, has to negotiate. In this particular group, the productivity level is high, but members also like to have fun, often at each other's expense. For Lilly, this can be a problem. Part of her job as chair is to keep the meeting on track but senior group members readily take advantage of any opportunity to engage in joking and teasing and when they start, Lilly seems to have difficulties asserting herself and moving the meeting from chit-chat to the paper presentations. In the discussion that follows, I comment first on what can be learned by analyzing what was available to all participants in the interaction, namely the few minutes of talk transcribed here. In a separate section following, I supplement this analysis with information from discourse-based interviews with Lilly and other laboratory group members, whom I invited to comment on my analysis. As in Treichler et al.'s (1984) analysis of language and power in medical encounters, I treat power and authority as products of face-to-face interaction which can be derived from detailed conversational analysis of transcripts, and like them, I believe that the resulting analysis is strengthened by interweaving the insider perspective of the participants themselves (Blakeslee et al., 1996; Borland, 1991; Brueggemann, 1996).

Analysis of transcript

Based on previous research, I predicted that gender would be a salient factor affecting a newcomer's laboratory group experience. The transcript presented here reveals that academic status also plays a significant role. Bill, a new male undergraduate member, does not talk at all except to present his paper, and just as he is getting started, he, too, is interrupted (line 163). The same is true for the other undergraduate member, Tina. Junior members have no choice but to participate in the paper presentations; however, they tend not to take part in the follow-up discussions except to provide an audience for the banter of some of the more senior members. Similarly, though any member is free to comment, ask questions, joke and otherwise engage in chit-chat, junior members tend to remain silent unless presenting; even when Tina is talked about in line 181, she does not respond. In general, junior members tend to display problems managing the meeting or holding the floor that more senior members do not. What this pattern seems to imply is that despite the appearance of equality in that everyone takes a turn at presenting, and that anyone can contribute to the discussion, actual

patterns of talk break down according to status. Indeed, starting in line 165, the P.I. explicitly draws attention to this salient feature of the group.

I therefore first discuss how status is indexed and constituted in the group, then I will turn to gender-related aspects of the discourse, and, finally, I will address the conflation of status and gender that appears to be operating to Lilly's disadvantage. According to ethnographic data gathered in the laboratory (and as suggested by John in the transcript in line 176), status is largely determined by length of time with the group. (Other possible factors affecting a person's status in the group include academic standing, gender, and his or her own individual histories of interactional experiences with the group.) Once the meeting begins, however, persons also assume contextual identities derived from ad hoc roles such as chair, or paper presenter, or audience member. Sometimes, these identities can be in conflict. Lilly is in an awkward position because her context-derived status as chair is high, but as an undergraduate, her status in the group hierarchy is low. Even though she has been assigned the role of chair, there is no guarantee that she will be ratified as such. Her authority or contextual status as chair is subject to contestation by those with higher extra-contextual status or seniority. In conflict, the latter wins out. The P.I. and the senior members present themselves as experts, control Lilly's self-presentation, and undermine her authority as chair.

Various textual devices can be identified as being used to instantiate these power differences among members. For example, in this group, an important device of control is the right to utter directives. The right to utter on-record directives is exercised only by the P.I., for example in lines 78–87, where he asks Lilly to define her terms and explain why she's interested in the topic—this move also constitutes the P.I. as an expert and Lilly as a novice because it functions both as an invitation for her to display expertise as well as an opportunity for him to test her knowledge (Jacoby and Gonzales, 1991). The P.I. is also the only one who interrupts; all others at least wait for a pause before taking the floor away from the current speaker. Most of the admittedly jocular but nonetheless on-record put-downs (e.g. lines 39 and 109) are also initiated by the P.I.

Senior members employ similar strategies—strategies which are notably absent from the speech of junior members. For example, like the P.I., senior members present themselves as experts vis-a-vis other members. When Tim criticizes Lilly's cover page, he sets himself up as one who is expert in group norms, and his use of the pronoun 'we' suggests that he presumes to speak on behalf of the group. In line 48, Tim offers another put-down, this time of Matt. Similarly, in lines 180–1, Tim demonstrates his expertise in group norms by suggesting that Mark and Tina should race for senior status and, again, in making this proposal, presumes to speak for the rest of the group. Although senior members do not technically interrupt, since they wait for a pause or ask before taking the floor from the chair and changing the topic, the effect is the same. In each case they start a digression and Lilly loses the floor. Like the P.I., senior members also take it upon themselves to issue directives such as when Tim, Matt and Bob, all en-

courage Bill to continue with his presentation (lines 220–3). In general, then, the P.I. and the other more senior members constitute themselves as experts by issuing directives, controlling the topic, and disagreeing with and evaluating the comments and performances of others. Finally, both the P.I. and the other more senior members exert authority by the quantity of their talk.

It is noteworthy that many of the displays of expertise by the P.I. and other senior members are mitigated by their manifestation as kidding or teasing behavior. In this way they are not bald on-record directives (Brown and Levinson, 1987), criticisms, disagreements, etc., but are ambiguous and indirect and can later be retracted as kidding. They could also be seen as ‘hedges’, behavior that is called negative politeness in Brown and Levinson’s framework (1987), and deference politeness in Scollon and Scollon’s (1983). Humor can be employed to save face and protect the speakers from the consequences of having conveyed their intentions more directly (Crawford, 1995; Yedes, 1996).

The various behavior characteristics depicted here as indexing and constituting status may also be viewed as exemplifying more stereotypically male rather than female discursive practices. Some researchers have extended Gumperz’ model (1982) to posit that as a result of playing as children in single-sex play groups, men and women develop different preferred communication styles, each with its own rules, norms and ‘cultural patterns’. Research by Goodwin (1990) and Maltz and Borker (1982) suggests that boys use language to assert dominance, attract and maintain an audience, and assert themselves when someone else has the floor. Girls, in contrast, are said to use talk to create and maintain interpersonal relationships, criticize others in less direct ways, exert leadership less directly, and respond to the speech of others. The talk cited here seems to conform to these gendered stereotypes quite closely, for example where the males are putting each other down (lines 39, 48, 108), alluding to physical competition (lines 154, 181), or taking the floor away from the current speaker (lines 5, 78, 123) and the females are using the floor to provide conversational support (note Lilly’s back-channel type responses, e.g. lines 6, 127) and Kate’s collaborative contributions to the male-initiated teasing sequences. Problems in cross-sex communication have been attributed to misinterpreting communication according to the speech community rules of one’s own gender (Maltz and Borker, 1982; Tannen, 1990, 1996). Such a theory would suggest, then, that Lilly loses the floor because she is not expecting it to be taken from her, or that she is expecting responses to build on rather than detract from her topic development; similarly, that males seize any opportunity to take the floor from Lilly because this is what they normally do in conversations with each other. Thus, the talk can be seen to fit well with the ‘difference’, or ‘two cultures’ paradigm of male–female interaction.

The interactional dynamics observed also mesh well with the characteristics of the other main paradigm for male–female conversational interaction, ‘dominance’. Early studies (West and Zimmerman 1983; Zimmerman and West, 1975) pointed to the high incidence of men interrupting women

in cross-sex conversations and suggested that these interruptions serve to disrupt the talk, disorganize topic construction, and violate the speaker's right to hold the floor. For example, research by Eakens and Eakens (1978), Edelsky (1981), Spender (1985), Swann (1988) and Treichler and Kramarae (1983) found patterns of males interrupting females in academic settings, and taking more and longer turns, as did research by West (1984) in medical settings. More recent studies have identified this pattern in work environments (Woods, 1988) and in families (Ochs and Taylor, 1995; Taylor, 1995).

The talk under analysis also follows the pattern described here. With one exception, all the speakers who disrupt turn-taking rights are males taking the floor from females. Male dominance could also be seen to be operating in the teasing sequences. True to research on gendered uses of humor (Crawford, 1995; Mulkay, 1988; Pizzini, 1991), the women in the group use humor to support others and to establish intimacy, and the men use it to maintain control and dominate others. For a speaker to succeed in telling a joke, other participants have to cede the floor and collaborate in the telling. We see this in lines 209–17, where Matt and Tim collude in the P.I.'s telling of an amusing anecdote. Kate, however, receives no support in her attempt to tell a joke and finally resorts to making the same jocular remark twice (lines 46–9 and 60–1). Thus, whether the laboratory talk is viewed from a 'difference', or a 'dominance' paradigm, Treichler and Kramarae's (1983: 183) comments still seem applicable:

The university can be viewed as a subculture that women and men experience and relate to differently. This sub-culture typically fosters interaction patterns more compatible with men's established interaction patterns than with women's, and it is this fundamental inhospitality to women's talk that helps account for the continuing 'chilly climate' that significant numbers of women on campus experience.

Fully characterizing the dynamics of talk in the laboratory as either gender-related or status-related is problematic, however, because of the conflation of these two variables. In this laboratory group, as in most laboratory groups, the most senior members are male and so it is not clear whether those who dominate do so because they are male or because they are more senior. Research by Eakens and Eakens (1978) in academic settings suggested that status for males and females was salient in not being interrupted. However, Edelsky (1981) found gender more important in a similar setting, and research by West (1984) in medical encounters demonstrated that male patients interrupted female doctors more often than they did male doctors, suggesting that gender was the more important variable. In the interaction analyzed here, it seems likely that given women's traditionally low status in academia, and in science in particular, both gender and status contribute to the dominance of senior, male laboratory group members and the disempowerment of Lilly—a junior, female member.

In any case, it is also important to note that all participants are complicit in the ongoing construction and maintenance of gender and status distinc-

tions. As Foucault (1984) and Solin (1995) remind us, power should not be seen as unidirectional, as a fixed attribute of certain persons who direct it at others who are incapable of resisting. Instead it should be viewed as dynamic and multidirectional (such as the contextual authority as chair). If it is thought of as an open, dynamic set of relations, it becomes possible to conceptualize the power balance of a discursive event in terms of changing roles and identities, thus moving beyond the powerful–powerless dichotomy. In the words of Foucault (1980a: 426), ‘power is neither given, nor exchanged, nor recovered, but rather exercised and ... it only exists in action’. However, whether as a result of her gender, or because of her low status or both, instead of adopting some of the strategies here, which would bolster her power, Lilly seems to give it away. She presents herself as inexperienced and often speaks hesitantly. And, whereas more senior members put others down, Lilly puts herself down. Similarly, she cedes the floor, allowing digressions, rather than using her ad hoc authority as chair to take control of the meeting. In other words, Lilly’s power as chair is usurped because it is not exercised. Much of Lilly’s hesitancy, laughter and silence fit Lakoff’s early (1973, 1975) description of women’s speech style as characteristically hesitant, ingratiating, deferential and weak, and O’Barr and Atkin’s (1980) characterization of ‘powerless’ talk. Moreover, though attempting to support Lilly, Kate’s underhand plan (line 196), reinforces the notion that Lilly could not succeed by fair means. Likewise, the chivalrous responses of male members to Lilly’s admission that she is not well-prepared (lines 108–16), even if well-intentioned, index and constitute the cultural stereotype of the ‘feeble female’.

Herein lies a possibility of empowerment for Lilly (and other female undergraduates). By her verbal behaviors, Lilly can co-construct her identity as more powerful or less powerful. If she hesitates in getting the papers started and allows digressions, she will be seen as less authoritative, whereas if, from the outset, she can act in a more authoritative manner, she will probably be treated as though she had more authority. As demonstrated in the transcript, at each turn in an interaction, Lilly is presented opportunities to display behaviors which either shore up or undermine her power, and set the stage for subsequent encounters. In a sense, performance at this meeting is a rehearsal for a science career, with all its competition, display of knowledge, alignment formation and one-up-manship. As Traweek (1988: 87) notes, ‘The desired presentation of self [in science] can be characterized as competitive, haughty, and superficially nonconformist’. Mildred Dresselhaus, a solid-state physicist at MIT, claims that changes come only very slowly and that at least for one more generation, women are going to have to play by male rules. She trains her students to do well in the current system; only when women reach a critical mass and have ‘more input into what the rules really are ... will [the system] become more friendly to women’ (cited in Barinaga, 1993: 391). However, for some women, the schism between who they are and whom they feel they need to become in order to succeed at science is too great and they switch to other fields. Whether this was the case with Lilly is not clear, obviously, from the

transcript of a single laboratory meeting; yet the data here are certainly open to such an interpretation.

Follow-up interviews with laboratory members

It is not always possible to gain additional information and insights from the participants in a given sample of talk. In this case, however, the longitudinal nature of the research provides some degree of ongoing access to laboratory members. To check and supplement the perceptions raised by the analysis, I carried out supplementary interviews with the participants. I showed Lilly the transcript and spoke to her during the early stages of writing this paper (about 12 months after the laboratory meeting had taken place) and at various stages of revision. She said she remembered the meeting well and did not have pleasant memories of it. She explained that although in the transcript of the meeting she appears not to know she was expected to have a cartoon on the cover page (lines 5–63), in fact, she had known, but had decided that it was better to omit the cartoon than to risk the group not finding her choice amusing. Since she did not feel comfortable revealing this to the group, she felt her only alternative was to laugh when the issue was brought up, as if not including a cartoon had been an oversight. Lilly also said that she was aware of the need to state the significance of the topic and her personal interest in it (lines 82–8). However, when she was asked to lead the meeting, she had started her research less than two months earlier, had chosen the topic at the suggestion of another laboratory group member rather than because she was personally interested in it, and because she was so new to the research, had not felt competent to judge the significance of it. She added that since she thought this would quickly become obvious to everyone anyway, she decided she might as well admit it (lines 101–4). Similarly, Lilly said she was aware of the importance of sport and competition in the laboratory's culture (lines 180–217); since she was not particularly interested in sports, she felt that socially she had little in common with group members. She added that she believed it was much easier for undergraduate males, who effortlessly followed the various sports, to fit in and quickly become part of the group. In general, Lilly said she had felt dissatisfied with her performance as chair and uncomfortable with the interactional dynamic of the group. In particular, she said, she felt she should have maintained more control, but because she did not believe the more senior members would stop talking at her request, she had elected to wait for digressions to exhaust themselves naturally, rather than more assertively trying to steer the meeting back on track.

Follow-up discussions with other laboratory members are also illuminating. I spoke with them briefly during the early stages of preparing the transcript and then later, as I was writing the paper itself. Commenting on draft versions, members acknowledged that the analysis had captured something of the dynamic of the group's meetings. As scientists trained in the positivist tradition, however, the methodology concerned them. Predictably they asserted that variables in the study needed to be controlled and more

instances of group interaction needed to be examined before the hypothesis of the study could be said to have been supported. One member said that while he agreed with my analysis, he disagreed with my conclusion that gender was salient. Alluding to the confounding variables of status and gender, some members suggested that I should have compared and contrasted the experience of new male and female undergraduates chairing their first meeting, and included material from weekly meetings at other campus laboratories. John suggested that comparing the responses to new male and female undergraduates chairs could provide 'fairly compelling evidence that even if junior males are treated the same way, socially, they may be better suited to slough it off and not let that affect their choice of career'. Noting that including transcripts from some of their meetings chaired by new males or from meetings of other laboratory groups would not increase the sample size significantly, nor render it necessarily any more 'objective', I asked how many additional and different laboratory meetings I would need to consider before I had a 'representative' sample. On all these points, responses led to discussions of epistemological and ontological issues in the 'hard' and 'soft' sciences. Other comments concerned the format or layout of the paper and its departure from traditional papers in life-sciences journals.

Given the way prior feminist research has been received, it is not altogether surprising that more senior members of the group, all male, were especially resistant to the possibility that gender was a significant factor in the interaction. They asserted, rather, that personality was the most important variable in constructing and sustaining the culture of this particular laboratory. When I commented that dominant personality traits in the group (competitiveness, verbal assertiveness or, athleticism, etc.) mapped more closely with traditionally male, rather than female interactional patterns, there was disagreement—again, of a predictably anecdotal or impressionistic nature. Tim, for example, said that he had observed young girls at play, jostling for leadership in the same manner as young boys do. There was also general agreement that competition is necessary and is more of a human than a male characteristic. One member asserted that competition had fueled western science and enabled it to become the successful engine of scientific progress that it was. In response to my questions about the possibility of a collaborative rather than competitive model for science, Greg said he knew a laboratory group that was more 'laid back' but still productive, but other members said they had no knowledge of laboratories run collaboratively rather than competitively, and suspected that if they existed, they would fail. Senior male members noted that the best scientists were 'driven'. Another cited appreciatively the example of a laboratory where three researchers were set to work on the same problem with the built-in assumption that two would 'fail', and only one would 'get published'. Asked about the human toll of such enterprises, he shrugged his shoulders. Other members described students they had known as 'too competitive', though no agreement could be reached on the ideal amount of competitiveness. Members also commented that they were aware of changes in how science and medicine are being taught and so they could

imagine that laboratories might operate differently some day, but they agreed with the research cited in this paper suggesting that change is slow in coming.

Other discussions revolved around the importance of laboratory experience. One member commented that Lilly's problems resulted from her inexperience with science and with laboratory group procedures. He and others commented that all new members had to deal with criticism from senior members. Several members mentioned a new male member who had received more than his fair share of criticism but had not taken it to heart as much as Lilly, and had instead verbally fought back. After my citing some examples of research on gendered responses to personal attacks, this member agreed that there might be a gendered element to such responses. Later, however, in naming female newcomers whom he felt had been insecure and male newcomers who had been able to verbally defend themselves or were competitive, he highlighted personality rather than gender as salient. Another member commented that he had not noticed the emphasis on sport but suspected that a knowledge and interest in it might have helped a new male member fit in more quickly than he might otherwise have done. One member felt that Lilly had not fitted into the group but could not articulate why.

CONCLUSION

In Sonnert's study of an elite group of scientists, one female scientist observed, 'There's always a sense, especially in a group that does not include many women, that you're not one of the guys, and that works against you, and that is impossible to fight' (Sonnert, 1995: 54). Through this fine-grained study of discursive practice in a life-sciences laboratory, my intention has been to substantiate such anecdotal evidence on the experience of women in the sciences. By encouraging analysis and discussion of discursive practices (Fairclough, 1989, 1995; Van Dijk, 1993), I hope to help understand why talented young women drop out of the sciences. In this particular analysis, I have sought to illuminate aspects of routine laboratory practices that help constitute the 'lab group experience' and hence are potentially significant in identifying the nature of the 'bad lab experience'. Although status and gender are conflated in this laboratory study (as they are in most laboratories, where the most senior members are male), I have suggested that some aspects of the discourse can be distinguished as gender related. These include references to physical competition, chivalrous male reassurances to Lilly, and praise for her home-made cookies. The segment also suggests that the conversational style, with its put-downs, directives and interruptions, is more compatible with men's patterns of talk than with women's. In short, an analysis of the interactional patterns or culture of the laboratory group suggests the probability that discursive practices reinforce a conflation of gender, culture, and authority and create a climate

that may be experienced as 'chilly', or even 'hostile', by some female members.

We see this speculation supported in Lilly's follow-up commentary. In particular, what passed for unexceptional, business-as-usual banter among the more seasoned, male laboratory group members was felt by Lilly as uncomfortable, and, indeed, presumptive evidence that she did not belong in science. My analysis suggests that a strong subtext marks the laboratory experience as masculine and that this will not change unless and until the number of women in a field, department, or laboratory has reached a 'critical mass'. At that point, perhaps, women can influence the social climate and question whether 'the rules' of laboratory interaction are really necessary to do good research or merely norms of male socialization. In either case, women need more information and better preparation about what to expect. As Fox (1991: 194) argues, in science, as in other professions, 'men share traditions, styles, understandings about the rules of competing, bartering, and succeeding. They accept one another, support one another, and promote one another'.

The suggestion that women need to be better prepared may be viewed as contributing to 'woman-as-problem' thinking (Crawford, 1995); however, this research suggests that in the absence of significant structural and attitudinal change, laboratory work remains 'masculinized' (Traweek, 1988: 16) and 'the culture of the scientific world is a male milieu' (Fox, 1991). At the same time, however, this research provides crucial insight into 'the rules' themselves, and suggests that senior and male scientists can be better prepared for the responsibility of training women as well as men to be future scientists and can perhaps consider ways of helping female laboratory members to feel more comfortable without necessarily compromising the acquisition of scientific training and knowledge (Koritz, 1992). Certainly, the current study of talk in a life sciences laboratory challenges the widespread conviction among scientists that 'the mind has no sex' (Poullain, 1673, cited in Schiebinger, 1989: 1). Rather, though they may question its significance, scientists can be shown that gender marks many day-to-day interactions in the laboratory, including an emphasis on sport and competition, a reinforcement of sex-role stereotypes and a conversational style which is in several respects more compatible with men's than women's forms of talk. Language serves as an important means of expressing, mediating and manipulating power relations. The discursive practices associated with science laboratories are not merely social window dressing but establish the interactional conditions within which women must learn, and learn to 'do', science. As Van Dijk (1993: 254) notes, 'dominance may be enacted and reproduced by subtle, routine, everyday forms of text and talk that appear "natural" and quite "acceptable"'. If, as I am suggesting, a 'bad lab experience' can have a lasting effect on whether a woman continues in the field, and verbal interaction is pivotal to this experience, then it is important that further research is carried out to examine everyday talk in science laboratories.

APPENDIX

Transcription conventions are derived from Sacks et al., (1974).

(0.8)	A roughly timed period of no speech.
(.)	A pause of less than 0.2 seconds.
CAPITALS	Capital letters indicate speech that is noticeably louder than surrounding speech.
.	The period indicates falling intonation.
,	The comma indicates continuing intonation.
?	A question mark denotes rising intonation (not necessarily a question).
[This symbol indicates the start of overlapping talk.
(guess)	Material within parentheses represents a guess at unclear speech.
()	Empty parentheses capture the length of inaudible speech.
((softly))	Material within double parentheses describes character of speech.
=	The 'equal' sign denotes utterances that run on.
Hehehe	Laughter syllables with some attempt to capture general quality and duration.
<u>under</u>	Underlining indicates emphasis.
This is	A capital letter at the beginning of a word denotes the start of an utterance.
This is- This	The hyphen indicates a sharp cut-off.

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