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A Good Place to Do Science: An Exploratory Case Study of an Academic Science

Department

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A Good Place to Do Science: An Exploratory Case Study of an Academic Science Department

Executive Summary

Purpose
We studied an academic science work environment that has been conducive to the advancement of female and male scientists to identify factors that have facilitated cooperation, high quality science, and inclusion.

Methods
We conducted this study using several qualitative methods including document & archival research, direct observation, and 29 interviews of departmental members (faculty, staff, post-docs, and doctoral students).

Findings
The basis of the cooperative, inclusive productive aspects of this department's culture appears to be a set of values and beliefs about scientists and the goals of science that are reflected in the types of interactions that occur within the department. Most scientists in the Science Department valued doing high quality science and valued doing science in an interactive way. Three widely held beliefs included:

1. Good science is the pursuit of meaningful, significant advancements of knowledge.
2. Scientists achieve good science through interactions that provide and generate resources.
3. Anyone can do high quality science if they can learn quickly, are well trained, can communicate their ideas, are creative and willing to work hard.

Constructive interactions support processes that foster cooperation and produce high quality science and inclusion. We list them here in increasing order of complexity, trust level required, and work impact:
- Collegial Interactions – extending respectful, civil and congenial behaviors towards others
- Tacit Learning Interactions – information sharing and modeling behaviors that convey work norms, processes, practices, and other undocumented knowledge about work.
- Relational Interactions – taking personal interest in others, expressing concern and caring for others emotionally and in support of their work
- Generative Interactions – Interactions, through which important resources are provided, received and or generated between individuals and for the group.

Participative departmental activities initiated or explicitly supported by the chair, facilitated constructive interactions:
- Team teaching with participation across faculty ranks.
- A variety of department social events, some of which occur after hours and others, which are family friendly.

- Participative faculty meetings in which information important to all faculty members is shared and the opportunity for decision-making input is provided.
- Participative faculty recruiting through which all faculty members have input into the selection of new faculty. Broad support for the new faculty member is established through this activity.
- Regular applicable research presentations and seminars that stimulate ideas and provide feedback and modeling of approaches to research and effective presentation of ideas.

Department wide learning and inclusion processes stimulated and supported wide influence in decision-making, engagement, learning about one another, and disseminating, comparing and creating a shared understanding of the external environmental factors surrounding the department. These processes also play an important role in embedding norms, behaviors, values, and beliefs into the culture of the department. These processes included:
- Transparent decision-making
- Engagement of faculty across ranks
- Dissemination of information important to work
- Creation and or sharing of resources important to work
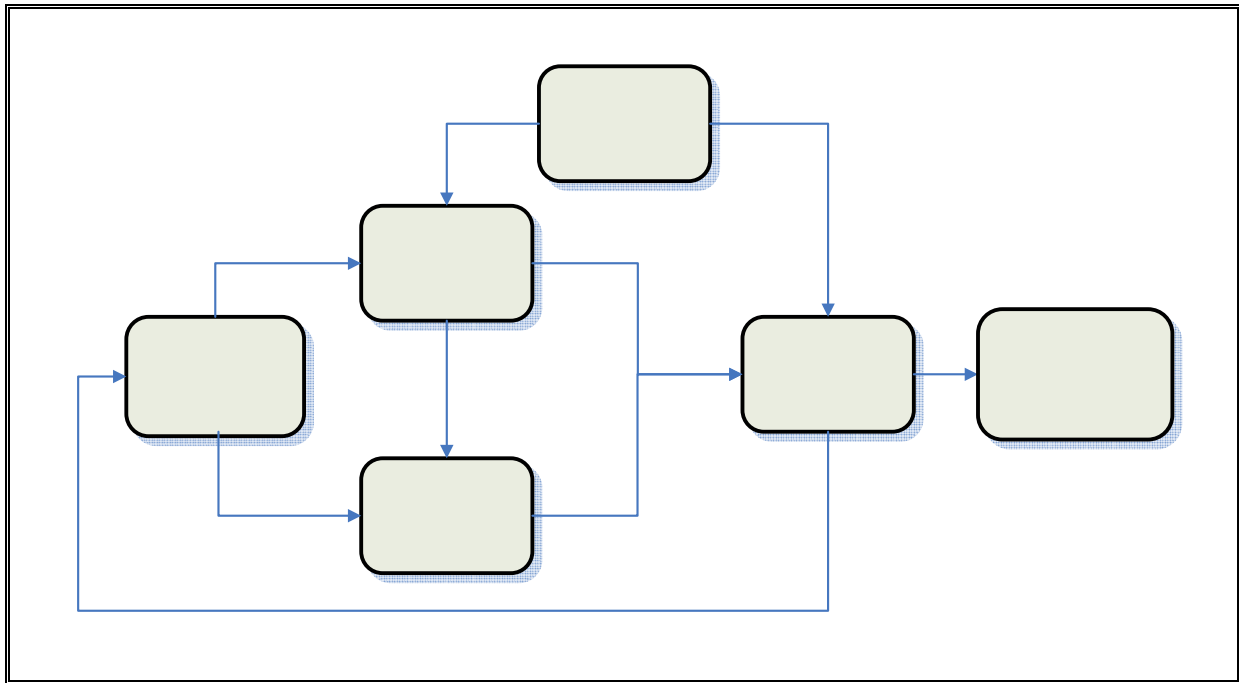- An open faculty selection process

Cooperative leadership practices of the chairs facilitated the development of the culture of the department. Most of these practices were also evident among faculty.
- Supporting the creation and advancement of good science, regardless of who is developing it.
- Seeking input from all affected in decision-making
- Promoting meaningful opportunities for interaction
- Treating everyone fairly and equitability
- Using the role of chair in service of the scientific community within the department

Conclusions
This study identifies conditions and factors that facilitate the development of a cooperative inclusive and productive work culture. The foundation of such a culture is values and beliefs that support high quality science, inclusive, productive interactions and outcome focused criteria for whom can do science. These values and beliefs foster constructive interactions and participation in a range of department activities. Several of these activities provide the context for constructive interactions. Leadership practices influence the creation of some department level activities and or provide sponsorship of others. The chair may initiate these practices, but support and ongoing leadership can come from the faculty. Leadership practices are also important facilitators of department learning and inclusion processes. With the context provided by activities and behaviors derived from constructive interactions, department learning, and inclusion processes support norms, practices and processes supportive of a cooperative, inclusive, productive department culture. Over time, these processes embed values and beliefs held by a majority of department members as shared values and beliefs of the department, which sustain the overall culture creating process.

A Model of a Cooperative, Inclusive, Productive Academic Culture

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Values & Beliefs

Constructive
Interactions

PURPOSE OF THE STUDY

This case study of a science department at a Tier 1 research institution is a component of the NSF ADVANCE program with the objective of institutional transformation that will effect tangible change for women in science and engineering. The proposed case study description from the NSF ACES (Academic Careers in Engineering and Science) grant proposal document is as follows:

"[Conduct] a case study examination of the [Science Department][1] as an example of a department with a history of strong participation and advancement of women faculty. The goal will be to identify the departmental conditions that foster full participation of women at all academic ranks. The Science Department is nationally ranked in the 7th percentile. It has 19 faculty, 5 of whom are women, 2 at the full professor level. The female department chair was recently elected to the National Academy of Sciences. Although the department has no defined policies in this area, it provides an excellent case study site for examining the working environment conducive to the advancement of women faculty and students."

Our research questions were:

- How does a work environment, conducive to the advancement of women at all levels, work?
- How do people interact with each other in such an environment?
- What do people do to create inclusion, productivity, and high quality science?
- What cultural processes and practices operate in this academic science environment?

METHODS

We conducted this study using several qualitative methods after obtaining IRB approval.

Document & Archival Research
We collected basic information about the department such as the department structure, activities, and formal policies and processes from the university's archive, the schools' website, and documents provided to me by department members. We also obtained published copies of faculty members' bios and published department rank data.

Direct Observation
Observation allows the researcher to collect data on relevant behaviors or environmental conditions (Patton, 2002; Yin, 2003). We observed several department-wide presentations, two candidate job talks, a student's dissertation defense, and post-defense celebration gathering. We also observed a faculty meeting at which faculty members discussed a candidate for a tenured faculty position. We visited all the primary faculty labs at different times of the day and week in

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[1] We will refer to the department studied as the "Science Department" in this report.

order to understand the work setting and routines. See direct observation guide in Appendix 1

Interviews
We conducted semi-structured, one-on-one interviews (Knight, 2002), of about 1 hour in length, with all of the primary faculty and a willing sample of active secondary faculty, doctorial students, post-docs and staff. The focus of these interviews was participants' personal experience within the work environment, their perceptions of the environment and the impact of this environment on their work and careers in science. See the sample interview guide in Appendix 1.

Data Collection and Analysis
Following Yin (2003), we bounded the sampling frame of this case by department membership or direct affiliation. We conducted interviews with all 16 primary faculty members, three of whom were women. We interviewed four secondary faculty members based on willing participants from among the seven who had an active role in the department. "Active" secondary faculty members were those faculty members who were training students from the department, were involved in teaching, supported recruiting and attended department presentations. However, secondary faculty members were not directly involved in department decision-making. The secondary faculty participants consisted of two women at the associate rank and two men, one at the associate rank and the other at assistant rank. We audio recorded and transcribed all but four of the interviews. Four participants did not want to be audio recorded, so we took written notes doing their interviews.

Of the administrative staff and laboratory staff within the department, we interviewed three staff members. They provided their observations about how the department operated and observations of faculty behavior and interactions. We also interviewed six students and post-docs.

The interviewer took notes after each interview regarding ideas, emerging concepts and open questions. These notes guided framing of the open-ended questions in subsequent interviews. These notes also guided the initial coding of a subset of transcribed interviews into topic areas, ideas and examples or "analytic categories" (Knight, 2002). Next, we analyzed the remaining interviews to elaborate concepts and confirm or test emerging concepts or relationships. We used the direct observation data and archival data to provide examples of concepts and identify relationships. Finally, we provided all quotes used as examples of concepts to participants for review and comment. This practice increased the accuracy of the participants' comments and ideas and provided confirmation of the link between examples and concepts.

BACKGROUND – CASE STUDY SETTING

The focus of this case study was a basic science research department at a Tier 1 research university in the United States. The Science Department was about 15 years old at the time of the study. The department formed in the late 1980's during a time when an unprecedented number of women were entering the science programs and the science workforce. The women's movement had made its mark on U.S. culture. Thus, for the first time in U.S. history, women

were becoming visible in fields that had been dominated by men. Amid these societal changes, the Science Department developed in response to the emergence of a fast growing area of scientific inquiry.

There have been two chairs of the Science Department over the course of its history, both female. The Science Department achieved top program and NIH funding rankings among departments in its field during the tenure of the first chair. It maintained its high rankings as it continued to grow in size under the second chair. (Annual Report, 2000)

The department was ranked above average in terms of number of women faculty and number of female students (Department Presentation, 2004). Two women faculty members joined the department at tenure ranks. One woman has advanced from assistant (junior) to associate rank. Of eight faculty members who joined the department as junior faculty, including one woman, only one male did not advance to tenure. Women comprise about 56% of the students in the graduate program, which awards masters or PhD degrees. The department attracts top students as indicated by higher than average student GRE scores for the field. (Department Presentation, 2004)

FINDINGS

Values and Beliefs which Support Cooperation and Inclusion

Members of the Science Department professed and acted consistently with several values and beliefs that appear to support cooperative and inclusive behaviors.

The two core values mentioned consistently are high quality science and interaction. Department members often stated that doing good science or high quality science was the main goal of their work.

> "I cared more about just doing good science and I figured if I was able to do good science I'd probably get tenure, so the main goal was to do good science, and I figured everything else would flow from that." (male associate professor)

Departmental members also valued a work environment rich in high quality peers who were willing to contribute to the pool of available resources to do science. For most department members, a scientist is not a "lone wolf", "in his or her own world competing with the outside world to get a paper published or get more money" (female associate professor). Interaction is important to creating the resource rich environment that enables member to produce high quality science.

> "You know, I think the environment is really important throughout one's entire career, especially these days where it takes many different methodologies to complete a research project. For example, there are certain methodologies that I don't know how to do, but my research would benefit from it. If I'm in an environment where that methodology is

not available, I'm out of luck. But if I have a strong environment that's relevant to my research, I may be able to go to go down the hall and ask someone to help me interpret data or help me to use a method that I don't know how to use, to help advance my research." (male associate professor)

"I think he or she has to be an interactive person to make the group better. You know they can't just sit in their labs and be great scientists and never talk to other people. It is good scientists that participate in group activities that have a broader impact on the department and university, because they transmit their ideas to students, post-docs, and other faculty members in the department." (female associate professor)

In the Science Department, women were included in social networks that support the work of scientists. Every female professor recounted multiple stories of networking with men or men mentioned cases of networking with women in their stories. This, indicated that a range of scientific resources, from knowledge and ideas to research and cross-lab collaboration were available to women and men. The founding members of the department valued cooperation and high quality science.

Thus, most scientists in the Science Department valued doing high quality science and valued doing science in an interactive way.

In addition to shared values, the interviews with members of the Science Department point to three widely held beliefs.

4. Good science is the pursuit of meaningful, significant advancements of knowledge.
5. Scientists achieve good science through interactions that provide and generate resources.
6. Anyone can do high quality science if they can learn quickly, are well trained, can present their ideas, are creative and willing to work hard.

Constructive Interactions

We identified four types of interactions that appeared to support the development and maintenance of a cooperative, collegial work environment. Regardless of gender, tenure, rank, or nationality, participants reported a variety of supportive, useful, and/or instructional interactions with peers, post-docs, and students. These interactions led to positive feelings about faculty peers and/or advanced people's work in some way. We used the term "constructive interactions" to identify the interactions related to these positive experiences. Constructive interactions are interactions (both emotional and task related) that facilitate doing high quality science in a cooperative work environment.

Constructive interactions involve exchanges of resources starting with what Isabelle Bouty termed "common resources". Common resources include information on published papers, general scientific/technical information, or "non committing services" such as the giving of

names or addresses of other contacts. They require little effort to provide and are a very small part of what a person can offer another. Exchange of common resources may mark the beginning of interactions leading to the exchange of "strategic resources". Strategic resources consist of tools, techniques, samples, specimens or personal services that directly assist a scientist in advancing his or her work. Both common and strategic resources are instrumental in nature. They facilitate or directly support work outcomes (Bouty, 2   00).

However, other interactions in the department occurred around another key resource, emotional support. Emotional support consists of "counseling, friendship, and role modeling (Kram, 1988), that helps participants develop self-esteem and professional identity (Thomas, 1993 p. 170)" (Gersick, Bartunek, & Dutton, 2000, p. 1028). These interactions are "characterized by minimal hierarchy, ease and freedom to be one's offstage self, and mutuality" (Gersick et al., 2000, p. 1037)   These interactions make work more enjoyable and the environment more congenial. These interactions also build strong ties between colleagues (Gersick et al., 2000).

Faculty members exchanged both instrumental and emotional resources, through constructive interactions. We will describe the four types of constructive interactions in the following sections.

Collegial Interactions
Collegial interactions are congenial, social civilities that occur between scientific peers in formal or informal settings. These interactions indirectly relate to work outcomes. In the Science Department, collegial interactions included polite exchanges of greetings and courtesies, providing general information or "common resources" and or getting-to-know-you type conversations that could lead to instrumental and emotional exchanges. These interactions took place during day-to-day encounters in passing, and at social venues such as before academic presentations or faculty meetings. They also occurred at scheduled social events such as the department's beer hour or the department picnic. Faculty mentioned their initial experience of the collegial interactions during their early visits to the department.

> "There was no one that had some sort of negative agenda going on, and people were friendly. People were collegial." (male associate professor)

Generally, collegial interactions are introductory interactions that form the basis for more complex and productive interactions. They also maintain connections between departmental members, who may not otherwise have a need to interact. Both men and women in the department reported these social interactions. We also observed such interactions at department meetings and events. A female student observed:

> "I kind of got the feeling that people here at least spoke to each other as opposed to being locked up in their labs all day and not getting along or having time to socialize."

Tacit Learning Interactions

Tacit learning interactions occur around formal work roles and activities associated with faculty obligations. These reported interactions include formal mentoring of junior faculty to the extent that it occurs, serving on student committees, and activities that are a part of the graduate program such as teaching, advising, and weekly scientific presentations. Tacit learning interactions provide important opportunities for faculty to observe and learn from each other. Faculty in the Science Department modeled and reinforced cooperative norms and behavior through these interactions. This was particularly important for junior faculty since there was little formal ongoing mentoring that occurs in the department. The participation of faculty in tacit learning interactions across ranks also distributes the department's teaching workload, which is important to junior scientists trying to establish their labs.

Participants also reported that the way people went about these interactions made the required tasks more pleasant. One male professor noted that even as a small group of faculty wrestled with a difficult workload obligation, they maintained open and honest communication about the situation, concern about the welfare of all involved, and awareness of the potential impact on the department as a whole.

Relational Interactions

Relational interactions are interactions that help form, maintain, or strengthen professional and or personal relationships. These interactions consist of taking interest in others, providing care and providing emotional support in the context of professional or personal friendship or colleagueship.

> "He [A male full professor] genuinely sounded interested in his research, which is usually the case, but he was also interested in what I had to say. And, he asked me how I felt about the idea of coming to work in the lab. I thought he seemed very interested in me and how I was, not just telling me what the lab is about, and finding out about my resume. He was just very upbeat, and overall just gave me the sense that it was a happy lab. You can tell, if you're paying attention, if somebody's really got a happy lab going on." (female staff researcher)

> "But this environment is so much more like family than it is like work-mates who you don't talk to or care about or see much outside of the work space." (female post-doc)

There are several faculty members, both male and female, who came into the Science Department with prior knowledge of or established relationships with faculty in the department. However, other faculty members, for whom relational interactions began in the department, initiated relational interactions around shared, similar, or related research interests. Such relational interactions appeared to be an outgrowth of collegial and tacit learning interactions.

We gathered reports and observations of several events of emotional support. We observed at a meeting as faculty members offered condolences to a colleague about a research setback. The other was a story around support as a group of faculty grappled with a difficult administrative situation.

> "It's been interesting to me that many of the faculty have come up to me and said, "I'm really sorry this is a situation and if we can help, let us know". That's community." (male full professor)

A male faculty member, who at the time was junior faculty member, reported how the encouragement of a more senior professor in the department sustained him through rejection of his first grant. A female faculty member reported how the interest of more senior faculty in her ideas and their willingness to share their ideas made the department a stimulating, enjoyable environment for her.

Several faculty members perceived that, as a whole, people were interested in each other's success in doing good science. Several faculty provided examples of celebrations that highlighted the separate accomplishments of a male and a female peer.

Men reported personal informal relational interactions that occurred after hours over beer. These informal personal talks are reportedly open to all faculty members. However, only men reported attending these gatherings. Women did not report attending these meetings nor did they report feelings of exclusion from any informal gatherings.

The majority of reported relational interactions, for both men and women, consisted of informal, sometimes lengthy conversations about science. Most female faculty and two male faculty members reported relational interactions, involving discussions of work-life balance, with students and or post-docs, in the context of mentoring relationships.

Social, role, and relational interactions support more complex, riskier, and high yielding interactions that we will discuss in the next section.

Generative Interactions
Generative interactions are the most overtly interdependent and complex of all interactions. These interactions fill the pool of resources available within the group. Generative interactions may start with a one-way provision of resources in response to a request from a peer. However, as people respond to receiving a resource by providing a different resource to the giver, responding generously to others, or joining together to secure resources for the group, more resources become available to the department. The more resources are shared and passed along, the more resource rich the environment, thus the term generative.

Generative interactions appeared to occur in the Science Department as part of ongoing relationships within groups. They require trust that a peer will not use these resources to directly compete with or "scoop" each other. A male associate professor reported that this kind of competition was "not a factor" within the Science Department.

While most reported generative interactions were directly related to work outcomes, two faculty members, one male and one female, retold the "ladder story" that exemplified the relational and productive nature of generative interactions:

> "So when I came here, when I interviewed here – a professor told me a story of the department's ladder. It turns out, that three or four of the faculty got together and bought an extension ladder for cleaning their gutters. And every fall they'd drive it around to their different homes and help each other do their gutters." (male associate professor)

The message that he took away from this story was that we have our separate labs, but in this department, we gather and share resources that support the success of everyone's lab. He reported this was a very different orientation to department life than he had experienced in graduate school.

Faculty members provided many other examples of generative interactions. One reported example was between a female faculty member, who was an assistant professor at the time, and a senior male faculty member. A mutual question about a particular organism led an exchange of a specimen and knowledge, which supported the male professor's research and lead to a funded stream of research for the female professor and subsequent employment of a graduate student from the male professor's lab. In another example, a female full professor requested and received technical and material assistance from a male associate professor. She then provided him with useful data from her use of the resources he provided her. In a third example, three junior faculty members cooperatively secured a shared equipment grant necessary to replace a vital but outdated piece of equipment which provided a resource to the entire department. There were also several examples of cross-lab research exchanges that stimulated ideas across research areas and provided a forum for student and post-doc development.

Faculty members talked about how important this access to resources was to their scientific work, as exemplified by this statement:

> "Here in the Department, everybody is working on completely different projects and topics. I think where we try to help each other is with the techniques. So if I see somebody is doing, let's say [name of a technique] and I can't do this. I go to him, and I try to learn it there. There are a lot of techniques in the Department, which are available, (and) that you could use and gather. That's what a Department is for." (male assistant professor)

Other types of generative interactions involved steering funding opportunities to other labs, and helping peers, even those in other departments, to obtain funding. One female professor referred to these activities as "looking out for each other". Being "looked out for" appears to promote a kind of reciprocity in the receiver that encourages her or him to pass along resources to others who are seen as part of the Science Department community. Since these interactions generate new capacities and capacities for work and people do not limit sharing of these resources to a single individual or group, the resources available to all department members grow.

Some scientists had also come to believe that going it alone was a bad idea competitively. They actively supported interactions that maintained the autonomy of labs while leveraging different resources available across labs to create new resources. Some faculty members viewed these interdependent interactions as central to survival and success in the increasingly competitive environment of science.

"The thing that makes the department different from being 16 independent entities is that there's interaction and there can be guidance. There can be support between these self-contained laboratories. To some degree, that's forced by the system, because you have to have other faculty involved with training your students. Usually you have other faculty involved in teaching courses… and there are more and more cases. I think the better the department is, the more cases there are of faculty working together on things that benefit the department but not necessarily an individual faculty member exclusively." (male associate professor)

"Also, right now, the way the NIH is funding things, I think it becomes more important to have these cross interactions. They're [NIH] really pushing these interactions. It's going to be hard for any lab to survive for a long period of time all by itself, without interacting with other labs, because no lab can do every technique or has expertise in all areas of a particular field. It just doesn't work anymore…. They're going to have to find their interactions among their colleagues. (female full professor)

Many faculty members recognize that these generative interactions are important to providing the knowledge and resources needed to compete with larger labs, while still maintaining their own laboratories and pursuing their unique ideas.

The congenial environment of this department depends on the first three types of interactions we have presented here. However, generative interactions specifically help advance a scientist's work and career. These generative interactions increase the knowledge, resources, and capabilities of scientists across labs, and even across departments. While it is possible to develop these interactions outside of the university, like many scientists do, when they occur in a department or within an institution, the efficiency of interactions is improved (walking down the hall vs. phone calls, emails, and papers sent across country), and the capabilities of that department are improved as a whole.

Over the years, both chairs of the Science Department, with the support of faculty, introduced several department level activities appear that appear to promote constructive interactions. We will discuss these activities in the following section.

Participative Departmental Activities

Several types of department activities were conducted in the Science Department. Departmental activities provided the context for constructive interactions. These activities also supported ways of doing work and running the department that promoted inclusion of the entire faculty. All activities required the support, involvement, and leadership from the faculty. Some activities were also open to and supported by students, post-docs, and staff. We will discuss these activities in more detail in this section.

Team Teaching across Faculty Ranks
Team teaching of courses within the graduate program has been part of department practice since the days of the first chair. A senior faculty member provided leadership of this activity. Various faculty members, across ranks, participated in teaching parts of the graduate program.

> "So I give some of the lectures in the course [graduate level science course], but I also organize everything like the exams and the handouts and grading, etc. Quite a few people in the Department cooperate. About six different people give lectures that have to be coordinated. It's a very positive experience. People are very willing to do it and they meet deadlines that I set for them and do their best. And the students seem to like the course." (male full professor)

Advantages of this approach mentioned by faculty included:

- A manageable teaching load for all faculty
- A lower load for junior faculty, thus giving them time to devote to lab start up
- Opportunities for junior faculty to learn from more senior faculty
- Opportunities to interact with faculty that one might not normally interact with

A junior faculty member discussed the advantages of team teaching as follows:

> "Doing the teaching, I found to be quite a lot of fun, because it was a team-taught course. So I actually interacted with people that I wouldn't normally have interacted with. Getting an insight into what they do every day was interesting. I hadn't had that perspective before…It was just good to actually talk to them in a setting that was more of a work environment, rather than necessarily say a social environment because sometimes you discuss things that are more work related if it's a teaching environment. Where if it tends to be a social environment, then you don't always find out as much about the work they're doing at that time." (male assistant professor)

Since the department does not provide ongoing formal mentoring of junior faculty, these built-in interactions like team-teaching provide an important means of informal socialization and development of junior faculty.

Department Level Social Events
As the department has grown, the opportunities for spontaneous, informal social exchanges have diminished. The current chair initiated department wide activities to afford faculty, students and post-docs opportunities to interact outside of their labs. Faculty members have supported these initiatives by participating in and rotating the leadership of activities. These activities include a weekly beer hour, which is sort of a "science happy hour". Beer hour rotates between labs, the faculty, and students. Rotating beer hour between laboratories gives each lab visibility and enables different labs to put their own twist on the event. For example, one laboratory used a chili theme thus focusing the event more on tasty food. Thus, all of the laboratories are involved. The chair also introduced a department picnic and retreat. The picnic in particular provides a more family friendly context for interactions. These events provide opportunities for a range of constructive interactions between faculty members, students, post-docs, and staff.

Participative Faculty Meetings

The current chair used faculty meetings to keep faculty informed and engaged in decisions that could affect their work. The participative style of the chair, the interpersonal skills of the faculty, and mutual respect demonstrated by all participants kept these meetings constructive and on task. We noted that participants took the time to elicit and consider multiple views and information in decision-making. A faculty member later commented on a meeting we observed as follows:

> "But you have to have the respect for each other. When you get that, then you listen to what other people say in the meeting...You may not agree with them because you realize they're looking at something in a different way than you would look at it, but you can't just say, "Well, that doesn't count." Or "That's not important." (female full professor)

Participative Faculty Recruiting

Group recruiting of new faculty members was an activity initiated by the current chair. All faculty members participated in this process as interviewers, hosts, evaluators of presentations, and decision makers (or advisors if they were secondary faculty or had had minimal contact with the candidate due to schedule conflicts). This process not only gave faculty the opportunity to provide feedback on the candidate, but also encouraged faculty to think as a group about how this person fit into the department, what the candidate could contribute, what the candidate's developmental needs were, and whether department members were able and willing to help that person develop as a scientist.

We observed a seminar, "chalk talk", and faculty meeting surrounding one candidate for a junior faculty position in the department. We noted that a significant portion of the discussion about a candidate was about both fit with the department, in terms of the person's research direction, and his or her ability to interact with others. Faculty looked at the strengths and weakness of the candidate's science. Strengths were areas that the candidate could leverage into funded research and capabilities the candidate could provide to departmental peers. Faculty assessed weakness in terms of likelihood that people in the department were willing and able to help the candidate develop as a faculty member and if the candidate might be receptive to that help. A faculty member referred to the same meeting as follows:

> "You could listen to the conversation and you could see people were thinking about how this person would contribute. This was particularly true in the meeting that you were sitting in on. But also, "We have to mentor them". So, are they [the candidate] in a position where they can be well mentored? Or are they so far back that the faculty will be spending a lot of time, too much time, doing the mentoring? You want to see that, if you put in the mentoring, it's really going to pay off. So I think everybody sees how the whole thing affects him or her." (female full professor)

The result of this process was a candidate people felt good about, which provides the new person with a cache of social credit needed to weather any initial setbacks that may be part of the new faculty experience.

"And that's why I think the recruiting as a group is important because you want to bring in people that everybody feels good about." (female full professor)

Feeling good about a person promoted interest in that person's success and encouraged acts of inclusion.

"But I think the strength of the department is that it's got a large group of faculty that has been involved in hiring the people. [These faculty] are now invested in many people in the department because they played key roles in their recruitment. And so we're trying to work on ways, through the infrastructure of the department, to expand the circle. To have people more interconnected with other labs, so we're trying to find ways to have the labs that aren't involved in this central cluster of faculty be more involved in having them on students committees, having them on exams. Try and reduce the ability of people to be really isolated." (male associate professor)

Regular Meaningful Seminars and Presentations
Many faculty members mentioned the importance of department seminars and presentations in stimulating ideas, helping them to fashion their own projects and making contact with peers with mutual interests. Two students also indicated that the interactive, interesting, and well-attended research seminars attracted them to the department. The faculty emphasized the importance of these seminars for the development of young scientists by making the sessions mandatory for graduate students. Faculty, both primary and secondary, attended the sessions we observed. The room was abuzz with conversation among faculty before the presentation. Faculty members were responsive to the presenters. Some faculty nodded their heads in response to the speaker. Others asked questions that helped the presenter clarify points or consider new angles or ideas about the research. Afterward, some faculty lingered, talking with peers and students. Thus, seminars and presentations were an important means for constructive interactions.

Departmental Learning and Inclusion Processes

Department wide learning and inclusion processes stimulated and supported wide influence in decision-making, engagement, learning about one another, and disseminating, comparing and creating a shared understanding of the external environmental factors surrounding the department. These processes also play an important role in embedding norms, behaviors, values, and beliefs into the culture of the department.

Transparent Decision Making Processes
All faculty members had the opportunity to be a part of important decision-making processes. The faculty meetings and, in particular, participation of the entire faculty in recruiting, were the means to transparency. These activities removed the mystery around important questions, such as who was involved in the selection of a new faculty member or how a newcomer fit into the department. Also important was that a single individual or sub-group (e.g., senior professors, professors of certain status or standing in the field, or by age or gender sub-group) did not monopolize decision-making power. Thus, transparency was an important tool for creating inclusion.

"So in general, for the recruiting, I think that everybody knew their input counted. In the end, we did go the way that the group decided for all the positions." (female full professor)

"So there aren't any politics, and nobody's being forced to do things. People are genuinely interested in teaching or are certainly interested in the job search. And so it's sort of a team effort, which makes it rewarding. I think that there is not very much of a hierarchy in the Department, between the junior faculty and the senior faculty. And, to some extent, the students feel like they're part of the process. So people feel empowered. People's opinions are asked and they receive feedback." (male full professor)

Engagement of Faculty across Ranks
Faculty engagement in a variety of activities from team-teaching to the department picnic demonstrated their desire and ability to interact. This reduced the chances for isolation, and increased the chances of finding opportunities to generate and share new resources. Furthermore, by cross rank sharing in the activities of recruiting and teaching, the academic workload of the department was more evenly distributed. This non-hierarchical distribution of the service and teaching responsibilities appeared to have a status-leveling effect within the department. Joint recruiting also distributed decision-making power and responsibility throughout the department.

Dissemination of Information Important to Work.
Faculty meetings, team teaching and high quality research seminars and presentations provide department members with the knowledge and information they need to advance their work. These activities support the department level process of dissemination of relevant information, which is strategic resource.

> If you had questions, you could go talk to one another very freely. You could ask people for advice, people that were more senior to me. I found it be very harmonious and productive in a cooperative environment." (male associate professor)

Creation and or Sharing of Resources
In the Science Department, people reported access to role models for approaches to the work, peers they could generate ideas with, and access to important new techniques and methods being available for the asking. Faculty described their peers as "friendly", non-competitive and the department as having "no slackers".

The cooperative environment of this department was not a gender-specific goal. Most faculty members regarded a cooperative environment as a valuable and highly effective way of doing science.

> "You know, I think the environment is really important throughout one's entire career, especially these days where it takes different expertise, methodologies to complete a

research project. For example, there are certain methodologies that I don't know how to do, but my research would benefit from it. If I'm in an environment where that methodology is not available, I'm out of luck. But if I have a strong environment that's relevant to my research, I may be able to go to go down the hall and ask someone to help me interpret data or help me to use a method that I don't know how to use, to help advance my research." (male associate professor)

Overall, participant's characterized relations in the department as "cooperative", "supportive", and "smooth".

> "So I would say the one thing that's very clear in this Department, as opposed to some places where I've been, is that people get along with each other and that makes everything a lot easier." (male full professor)

The Open Faculty Selection Process
The faculty selection process did not always involve significant faculty participation. The first chair exercised wide leeway in recruiting new faculty. Many faculty members, both primary and secondary, recall being invited to join the department by the first chair. Several participants recall that the chair's main criteria, aside from high quality science, was "no prima donnas" or jerks (several faculty both male and female). Several faculty members reported that they continue to use this criterion in selection of new faculty. In discussing this criterion, some faculty acknowledged that it is not fool proof. While six males and one female did advance to tenure, one male did not advance due to reported "style" differences (anonymous informants). The second chair opened up the selection process from the recruiting dinners and meetings to the decision-making discussion about the candidate. A strategic directive to diversify the research areas and techniques within the department (Department Annual Report, 2002) guided the open process. Everyone has the opportunity for input. Both male and female faculty, recruiters, and recruits, who discussed the open process, expressed satisfaction with the outcomes. While still not foolproof, and subject to a final decision by the chair, the process does serve to provide a means of influencing the direction of the department, securing peers who support, and or complement, the work and norms of the department.

Cooperative Leadership Practices

Leadership also played a key role in the development and maintenance of the department's culture. The current and past chairs employed very different leadership styles, but both shared the goal of a high quality, cooperative science department. First, both chairs supported a workplace environment of people energized by the work itself – the advancement of science. They valued good science, regardless of the gender, nationality, or age of the scientist. Next, faculty perceived both chairs to be fair, equitable, and supportive of the advancement of science regardless of whose lab produced it. Several faculty members, both male and female, noted the fairness and forthrightness of the current chair. No one reported either chair as having favorites or supporting cliques. Both chairs sought the thoughts and opinions of the faculty before making decisions. When the department was small, the first chair did so by talking to faculty one-on-one. The second chair employed more group-level activities. Both provided the faculty with a
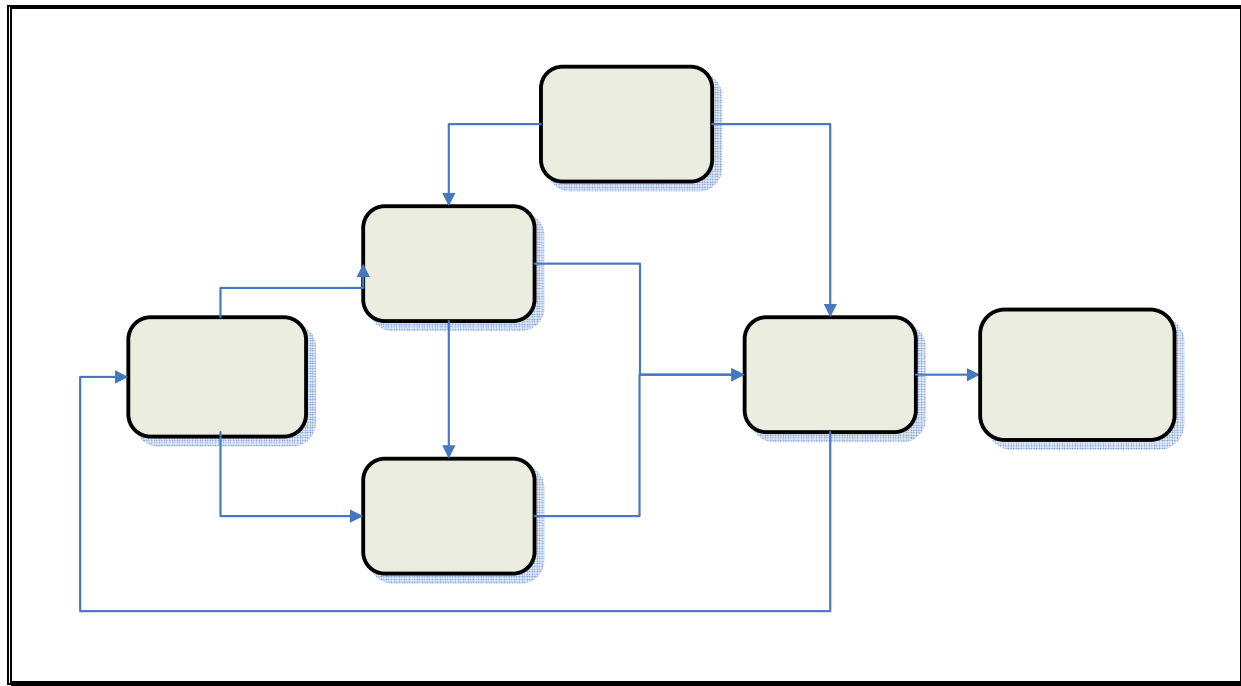
sense that a wide range of opinions mattered, not just the desires of the chair or a privileged subgroup. Both chairs created opportunities for faculty members to engage meaningfully across ranks, through the various activities that we have described in this report. Neither chair treated the department as an extension of her self or her own work by monopolizing resources and recognition for their own ends. They did not use their status to demand unwarranted resources, authorship, or access. Instead, they created and shared resources to support others' labs, particularly those of junior faculty, both among primary and secondary faculty. Participants cited many instances of the chairs securing funding for new faculty, including one story of the current chair allowing a junior faculty member primary authorship of work that the chair's lab had supported. Thus, both chairs viewed their role in terms of doing a service to the department and advancement of a scientific community, not as a reward to leverage.

CONCLUSIONS

(Etzkowitz et al., 2000) conducted a study to determine the characteristics of graduate departments that showed the most and least improvement in recruitment and retention of women and conferring of the Ph.D. degree. The study employed 1974-1990 statistical data from the National Research Council. They found that the vast majority of science and engineering departments reflected "negative attitudes towards women in science". These departments they termed: "instrumental". They also found a few departments with a: "collegial and cooperative atmosphere that provides the safety to take the risks necessary for innovative work and the collaborations necessary for networking" (Etzkowitz et al., 2000, p. 181). They termed these departments "relational". A characteristic of relational departments was their attractiveness to "a number of tenured women faculty who had struggled for recognition and status in prestigious graduate schools and post doctoral programs that were highly competitive and hierarchal" (Etzkowitz et al., 2000). Other researchers have also suggested that cooperative or collaborative departments are better environments for the development and advancement of women scientists (Etzkowitz et al., 2000; Rosser, 1999; Sonnert & Holton, 1995). The findings of the present study support the findings of prior research. In addition, we identified specific interactions, activities, processes, and practices that facilitate the development of a cooperative science culture within a department. Such an environment can be appealing and advantageous to both female and male scientists.

The Figure below represents our conceptual modeling of the relationship between the major constructs that emerged from the data.

Figure 1   **A Model of a Cooperative, Inclusive, Productive Academic Culture**

The foundation of a cooperative, inclusive productive academic culture is values and beliefs that support high quality science, interaction between scientists and outcome focused criteria relating to who can do science. These values and beliefs foster constructive interactions and participation in a range of department activities.

The most readily observable factor in the development of the culture was constructive interactions between faculty, staff, and students. This day-to-day contact helped department members build social connections and that supported engagement in more complex giving and exchanges of strategic resources. Constructive interactions ranged from collegial departmental interactions to generative interactions that gave rise to synergistic connections. We found evidence of constructive interactions across dimensions of diversity like academic rank, sex, age, and nationality. This indicates wide spread inclusion of scientists in these interactions, which are important to work and career advancement (Bouty, 2000; Gersick et al., 2000; Zuckerman, Cole, & Bruer, 1991).

It is through constructive interactions that departmental members contributed and received valued resources to and from colleagues in the work environment. For most faculty, giving, receiving and, for an active subgroup, generating these resources through interactions were viewed as essential to their work, their identity and their feelings of engagement in science.

The number and frequency of departmental activities was also readily observable. Several of these activities provide the context for constructive interactions. Some of these events were social in nature, which helped to establish and maintain relationships. Other activities directly supported the work and transmission of tacit knowledge to new members.

The constructive interactions as they occurred in the context of departmental activities, created the ground for departmental learning and inclusion processes. These processes promoted networks of relationships and access to influence in decision-making. Pelled, Ledford, and Mohrman defined inclusion as " the degree to which an employee is accepted and treated as an insider by others in a work system" (Pelled, Ledford, & Mohrman, 1999, p. 1014). They then identified three indicators of workplace inclusion: decision-making influence, access to sensitive information, and job security (Pelled et al., 1999, p. 1015). The departmental processes we identified from this case appeared to provide members with influence and access to information that supported their work and or advancement to tenure. We viewed the department's success rate at advancing junior faculty to associate faculty rank, seven out of eight, including one woman, as indicative of high job security. The transparency of decision-making processes, participative decision and information dissemination processes and the resulting stake of faculty in the success of others, supported inclusion into existing social networks in the department as well. In other research studies, women have reported feeling excluded from informal relational interactions. They perceive that men share important information and make important decisions during such interactions. Thus, women perceived their influence in decision-making and access to information to be diminished (Etzkowitz et al., 2000). In the Science Department, there are open channels of communication through inclusive processes like transparent decision-making. Thus, members have access to alternative means of information and influence. This may explain why women in the Science Department did not indicate feelings of exclusion or lack of influence due to gender. Last, departmental learning and inclusion processes also serve to create and embed norms, practices, and processes supportive of a cooperative, inclusive, productive department culture.

Finally, the leadership practices of the two chairs appear to play a key role in promoting and supporting department wide activities, and processes into the culture as norms, rituals, and shared values. The first chair promoted the idea of a "strong department" by recruiting high quality scientists interested in working in a cooperative, collegial environment. The second chair added activities like faculty meetings and wider scale social gatherings that enhanced workplace inclusion in a growing department. With a core of scientists who valued a cooperative environment in place, the team recruiting activity, initiated by the second chair, became the means to continue to bring in scientists with similar goals and values who were willing to contribute to the resources of the work environment.

One male faculty member noted that science chairs, in some institutions, have the reputation of treating the department as an extension of their own labs and using their power to advance their own work or reputations. In contrast, both chairs used the role of chair in service to the department and the surrounding scientific community within the institution. Both chairs were active in establishment and or advancement of junior faculty. Both supported activities that helped the work of all scientists. Both championed high quality science. While the establishment of a cooperative culture certainly required support of the faculty, leadership has a special role in establishing what is important, modeling, allocating resources and bringing in new members in ways that establish the department culture (Schein, 1992). Faculty also exercised cooperative leadership practices, both in their own labs and in assuming leadership of department

wide activities. Thus, distribution of leadership appears to be important to sustaining activities and processes important to the work environment of a department.

Academic departments often produce high quality science in competitive, isolating, and male-dominated work environments. However, the academic science department studied for this report demonstrated that scientists could achieve high quality science in a cooperative, inclusive, and interactive environment that facilitates the advancement of all scientists, regardless of gender. In the words of a male associate professor, the cooperative science culture made the Science Department simply "a good place to do science".

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Observation Guide

Questions to guide observations of researcher during direct observation activities

Physical Space & Equipment

- What is the overall physical space of the department like and where are its members located?
- What are the workspaces like (Labs, offices, meeting areas?)
- What are the differences and similarities in workspaces? (Labs and offices)

The Work in the Department

- What is the work of this department and its members?
- Where do people typically spend their day?
- What kinds of work and ways of working appear to be rewarded or acknowledged in the department?
- What is the purpose of this department? What seems to be important based on what people send their time doing?

Work Norms

- When do people work?
- What are norms about group and one on one time?
- What dynamics occur around equipment? (Access, how much to use it, who uses it?)

Interpersonal Interactions

- Are people working with each other or individually?
- What kind of work requires interaction?
- What interactions are occurring here? (tasks, relational, informational)
- How and when do people interact with and or respond to each other? Who participates? Who doesn't? How do people respond to non-participants?
- What are the styles of interaction?
- What kind of access to faculty do students and post-docs appear to have?

Groups

- What kinds of group meetings take place?
- Where do they take place?
- What are these meetings like?
- What is the purpose (information, idea generation, decision making)
- What kind of decisions made, and information conveyed.

- What is the structure (formal or informal agenda) and process (how is the meeting conducted?)?
- How are agreements reached or disagreements handled?
- What are the interactions in such meetings (norms about speaking, order of speaking, who speaks and who does not)?

Leadership

- How do people display and respond to leadership? (Chair, program heads, committee heads, student leaders (if any))
- Are women "followers" or "leaders" in this environment?

Climate

- What do classes, research presentations and other broader group gatherings feel like?
- What is the overall tone or emotional feel of the department under various circumstances?
- Do people look comfortable?
- Are there indications that people support each other?
- Does the environment feel non-threatening?
- What do you observe about competitiveness in this environment?
- What do you observe about hierarchy?

Integration and Socialization

- How are new members brought into the department? What are the criteria? How are they selected? How are they introduced and socialized?
- What is expected of a scientist in this department? What do people appear to expect of each other?
- What are the observable rituals or some habitual behaviors in this department?

Sample Interview Guide

(Review Informed Consent, answer any remaining questions, sign forms to formalize agreement to participate)

This interview consists of three questions about your experiences in the department and three open-ended questions about work-life and science. I will ask questions for clarification and detail and I will monitor the time. So here is the first question.

(1) What brought you to this department? (Secondary faculty: How did you become affiliated with this department?)
        Prompts:
        What appealed to you about this department before you joined?
        How has your actual experience matched those observations or impressions?
        For faculty here since department founding: How is the department the same now as it
        was when you joined? How is it different?

(2) Thinking back over the last 6 months to a year you have been in this department (or working with the department), can you tell me about a time that you felt positively engaged, happy or perhaps pleased with an activity that is part of your work.
        Prompt:
        This can be in research, teaching, service or department related administration.
        Use adjective "satisfied" if participant does not relate to engaged, excited or interested

(3) Please tell me about a time that members of this department helped you develop as a scientist.
        Probe:
        What role did the chair play?

        Clarification questions for questions 1-3 are:
        What were the circumstances?
        What was your role?
        Who was involved? Not asking for names, just roles
        What happened?
        What was the outcome?
        Aftermath, if any?

        Closing probes:
        In what ways do you feel you are valued or recognized?
        For your work in this department?
        As a person in this department?

(4) When have you had to make the choice between your career and other personal demands or important aspects of your life?
        Prompts:
        What can you tell me about the situation?

How was it resolved? (// phrasing: What was the outcome?)
What did you learn about your priorities through this experience?
What did you learn about the department through this experience?

Probes:
What kind or forms of support are readily available?
What kind or form of support were you offered from department members?
What kind or form of support did you request?

Note: An added question follows:

(5) What has been different about having women, married students or students of color in the department/lab vs. your experience in other departments/ labs (as a student or post-doc)?

Follow-up question:
Do you have a sense of how differences like gender, cultural or social background, or age have contributed to either the Science Department or the Institution?
> *Probe if needed:*
> *What about gender or cultural background?*

(6) To sum up: What is a "good scientist"?
> *Prompts:*
> *Who is this person? (What characteristics?)*
> *What are concrete things this person does to be good? Successful?*
> *What kinds of skills and abilities does this person have?*
> *What kinds of contributions does this person make?*
> *What kinds of resources or support does this person need?*
> *What is it like for you and others to be around (work with) this person?*
>
> *Probe for detail on factors related to personal characteristics, lab management, mentoring, funding, and or training.*

Enhancing Department Climate

A Guide for Department Chairs

Campus Climate: Behaviors within a workplace or learning environment, ranging from subtle to cumulative to dramatic, that can influence whether an individual feels personally safe, listened to, valued, and treated fairly and with respect.[1]

Climate: The atmosphere or ambience of an organization as perceived by its members. An organization's climate is reflected in its structures, policies, and practices; the demographics of its membership; the attitudes and values of its members and leaders; and the quality of personal interactions.[2]

What is Climate? Why Does it Matter?

There is no simple definition of departmental climate, yet research shows that "climate" plays an important role in people's satisfaction, effectiveness, productivity, engagement, and decisions to remain in or leave a department or area of study. A recent survey of 4,500 tenure-track faculty at 51 colleges and universities found that faculty place great value on departmental climate, culture, and collegiality and that these qualities are critical to faculty retention.[3]

Discussions with and surveys of university faculty, staff, and students reveal 8 common concerns about department climate:

- Lack of respect/consideration/politeness
- Insufficient sense of community or belonging
- Lack of recognition/visibility/value
- Ineffective communication
- Lack of support/inequitable access to professional development opportunities
- Difficulties achieving balance between work and family or personal life
- Illegal behaviors and demeaning, sexualizing, or condescending language and behaviors
- Retention/tenure of women and minority faculty, staff, and students

For each of these areas, this document provides practical advice department chairs can use to foster climates in which everyone feels welcome, respected, and valued.

When addressing these concerns, remember that though issues of climate may be common to all departmental members, the solutions or remedies for specific groups may differ. It is also important to recognize that though members of various minority groups may experience less welcoming climates than their majority peers, particular concerns may be of greater or lesser salience to specific groups. Efforts to improve climate must take into account both the nature of the department and the uniqueness of its members' concerns.

Promote Basic Manners—Respect/Consideration/Politeness

- ☐ Issue a policy statement establishing the expectation that all members of the department should treat each other with dignity and respect and that inequitable treatment will not be tolerated.
- ☐ Promote these policies by personal example. Be sure to include the following:
  - ☐ Greet faculty, staff, and students pleasantly in the hallways or in other chance encounters.
  - ☐ Make requests politely and thank faculty and staff for work performed—even when it is part of their job expectations.
  - ☐ Address individuals by their appropriate titles. Program Administrators or Managers, for example, may prefer that you not refer to them as secretaries.

"Hostility and rudeness of one or more faculty within the department detract most from [my] satisfaction at [work]." [4]

- ☐ Hold department members accountable for violating basic standards of respect, consideration, and politeness by assessing these factors during annual performance evaluations and by relying on these assessments when making committee assignments, recommendations for awards and honors, etc.

Build an Inclusive Community

- ☐ Include all groups in department governance. In addition to faculty, include representatives of staff, postdoctoral scholars, and graduate students in departmental meetings and give them voting rights when possible.
- ☐ Examine departmental committees and ensure that leadership and membership are diverse with respect to age, gender, nationality, race and ethnicity, etc. Assess whether departmental teaching assignments are appropriately and equitably distributed. Consider creating a worksheet or rubric to track committee and teaching assignments and ensure equity.

- ☐ Examine departmental events such as seminar series and sponsored conferences and make sure that they include presenters of various ages, genders, nationalities, races, and ethnicities.
- ☐ Establish the expectation that all faculty, graduate students, and postdoctoral students attend departmental seminars/colloquia (those delivered by guests and by colleagues) and that they show respect to speakers by not engaging in other tasks such as grading papers, reading, and responding to e-mail, etc.
- ☐ At departmental meetings, ensure that everyone has a chance to voice opinions or concerns. Acknowledge and attribute ideas, suggestions, and comments accurately. Women and minority department members often report that their remarks are ignored or unheard.

"I have noticed that sometimes after I speak there is a small pause and the conversation just picks up again as if I had not said anything. I don't notice this happening to men." [5]

- ☐ Promote inclusive language by example. Avoid using only male pronouns when referring to groups composed of both sexes. Avoid language that makes assumptions about marital status and/or sexual orientation, i.e., consider using "partner" rather than "spouse."
- ☐ Encourage faculty and staff to welcome and collaborate with new department members.
- ☐ Personally introduce new faculty and staff to department members with shared interests. Encourage new faculty to seek out colleagues in other departments and offer to make introductions.
- ☐ Host regular social events and ensure that they are open to all departmental members when appropriate.
- ☐ Create a communal space—coffee room/lunch room.

Recognize and Value the Work of Departmental Members

☐ Publicly recognize and praise faculty, staff, and students who perform work on behalf of the department. Be sure to attribute credit accurately.

"The professor I work for … is always careful to acknowledge the contributions that I make and to thank me for the work that I do. It is amazing how these small comments make a difference in my day." [6]

☐ Make public announcements regarding awards/recognition departmental members (faculty, staff, postdocs, or students) have received. Evaluate departmental recommendations for honors and awards and ensure that bias is not inadvertently playing a role.

☐ Develop and enforce departmental standards regarding authorship, or enforce standards established by your academic discipline.

☐ Encourage respect for varied research methodologies, for interdisciplinary research, for mainstream and "non-mainstream" research. One method of doing so is to ensure that invited guest lecturers and seminar/colloquium speakers represent a wide range of research areas and/or methodologies.

☐ Encourage all faculty and students to become aware of the academic contributions of their colleagues in the department and the university and, when relevant, to cite these contributions in their publications and presentations.

☐ Conduct regular pay equity reviews to ensure that women and minorities receive fair compensation.

Communicate Effectively

- ☐ Clearly and honestly communicate departmental values, intentions, expectations—and act in accordance with them.
- ☐ Clearly communicate departmental policies and procedures, in written form.
- ☐ Provide written clarification of conditions of employment to all departmental employees.
- ☐ Provide informational documents to students that specify all aspects of their graduate education. Distribute written announcements about position openings, fellowships, awards, etc. to all students—don't rely on word of mouth announcements that may only reach certain students.
- ☐ Clearly define qualifications and application processes for all faculty and staff position openings and promotions.
- ☐ Provide new faculty with clearly written guidelines and standards for achieving tenure in your department. Provide information on both departmental and university-wide standards.
- ☐ Ensure that all departmental members—faculty, staff, and student employees—receive annual performance evaluations.
- ☐ Provide open and honest communication about how you and your department make decisions and allocate resources.
- ☐ In communicating, consciously solicit perspectives from diverse groups of people.
- ☐ Become aware of cultural and gendered differences in styles of communication, and about culturally conditioned expectations regarding styles of communication.

Promote Professional Development

- ☐ Consider giving faculty, academic staff, and classified staff time to attend courses/workshops/national meetings.
- ☐ Consider providing financial support for faculty, staff, postdocs, and graduate students to attend or present at workshops/courses/national meetings.
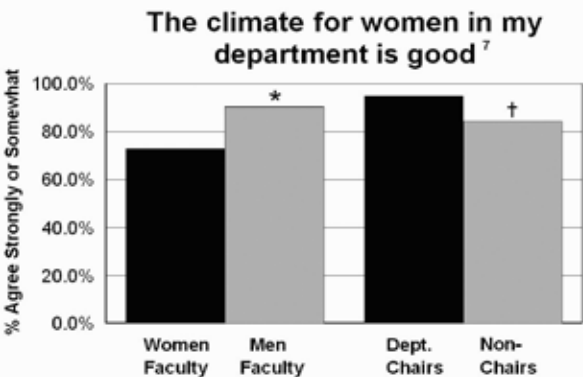- ☐ Encourage faculty to invite staff/students to present lectures in their areas of expertise.

□ Ensure that new faculty and staff have at least one mentor in the department and encourage them to seek mentors outside the department as well.

□ Recognize the importance of providing new faculty members with a mentor who does not also serve as an evaluator who will play a role in decisions about tenure and promotion. Encourage new faculty to take advantage of formal mentoring programs that your campus may offer.

Encourage Balance between Work and Family/Personal Responsibilities

□ Foster inclusiveness in scheduling departmental meetings and events. Recognize that parents may not be able to attend early morning or late afternoon meetings and events.

□ Develop creative and flexible solutions to accommodate family and personal responsibilities. Invite faculty and staff to suggest solutions and find out about accommodations other departments have made. Consult with relevant campus offices and/or individuals.

□ Budget for lecturers and other staff members needed for family and/or medical leave.

Develop Sensitivity

□ Do not rely solely on your own perception of department climate. Rather, become aware of others' perspectives.

The climate for women in my department is good [7]

* Significant t-test between women and men faculty at $p<.01$.

† Significant t-test between dept. chairs and all other faculty at $p<.05$.

- ☐ Become aware of how unconscious biases and assumptions can influence interactions between departmental members.
- ☐ Listen respectfully to complaints and concerns about treatment or policies in the department. If the complaint concerns another member of the department, hold a separate meeting with that individual to address the issue and, when possible, avoid identifying any individual/s who complained. In your discussions with both parties, focus on solutions and means of improving the situation instead of dwelling on blame and ill treatment.
- ☐ If the complaint regards harassment or other illegal behavior, your response will have to differ—refer to the section below on "**Respond to Illegal Behaviors.**"

Respond to Illegal Behaviors and Complaints about Demeaning, Sexualizing, or Condescending Language and Behavior

- ☐ Develop and clearly state a zero tolerance policy for discrimination, harassment, and unreported instances of conflict of interest in a consensual romantic or sexual relationship.
- ☐ Learn about your campus' policies and procedures for responding to and reporting complaints about such behavior.
- ☐ If approached with a complaint of such behavior do not dismiss the complaint. Rather, immediately recognize the complaint, acknowledge the courage needed to approach you, and quickly determine what the individual approaching you wants. Respect his/her decisions and avoid imposing what you think you would do in the same circumstances.
- ☐ Consult early and often with campus personnel knowledgeable in the area of responding to complaints about sexual harassment.
- ☐ If the complaint requires action, act swiftly and fairly. Be prepared to deal not only with the principals involved, but also with the influence any actions may have throughout the department.

Retention/Tenure of Women and Minority Faculty, Staff, and Students

Numerous surveys and studies conducted in colleges and universities across the nation show that individuals who are members of a minority group—whether the minority status derives from race, ethnicity, sex, gender, sexual orientation, religion, physical ability, or even area of research specialization—feel less welcome, respected, and valued than their majority peers.[8] Working to enhance departmental climate can help retain women and minorities and increase the tenure success of women and minority faculty. To retain women and minority faculty members and to ensure that they achieve tenure, be aware of the following:

❑ Ensure that the isolation and alienation that many women and minority faculty members experience is not mistaken or criticized as "not being collegial" or "not being a team player," particularly when they are evaluated for tenure by departmental colleagues.[9]

❑ Ensure that women and minority faculty members are not subject to higher expectations for number and quality of publications than men and majority faculty members. Be aware that inadvertent biases and assumptions may influence the evaluation of women and minority faculty members.[10]

Concluding Advice

Rely on resources your campus provides to help you in your efforts to enhance department climate. These may include experts and services provided by your Office of Equal Opportunity; Office for Equity and Diversity; Chief Diversity Officer; Office of Human Resources; Office of Quality Improvement; Employee Assistance Programs; Work/Life Programs; and various organizations and committees for women and/or minority groups.

RECOMMENDED READING

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For more readings see: http://wiseli.engr.wisc.edu/office_library/Climate.htm

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For full references see: http://wiseli.engr.wisc.edu/initiatives/climate/BrochureRefs.pdf

WISELI

Women in Science & Engineering Leadership Institute
University of Wisconsin-Madison

http://wiseli.engr.wisc.edu

Prepared for WISELI by Eve Fine and Jennifer Sheridan.

To order printed copies of this brochure, please see:
https://charge.wisc.edu/wiseli/items.asp

Pre-Reading: FAQ on Coaching
<http://www.coach-federation.org/aboutcoaching/about.asp>

Session 1 – Overview and Introductions

I.   Introductions and Coaching Relationship
- Introductions
- Goals of NSF ACES grant
- Roles – who am I and how do we establish mutual trust? How can I support you? What is your experience with coaching?
- Mutual expectations – What can we expect of each other?
- Overview and broad agenda of future coaching sessions

II.   Background Review
- Career history; experience with department and field, experience with leadership of department
- Areas of work focus as department chair
- What does your typical workday look like?
- Description of departmental work environment

III. Leadership Highlights
- What have been some of the high points of your leadership?
- What have been some of the disappointments of your leadership?
- Enjoyments/challenges in current work role
- Enjoyments/challenges outside current work role

IV.   Current Areas of Interest/Concern – immediate, mid-term, long term
- Leadership issues
- Departmental management issues
- Resource creation and allocation issues
- Work performance issues – research, teaching, service
- Work-life balance issues

V.   Assignments – Complete Prior to Next Session
- Describe your strengths as department chair. What distinguishes your specific leadership?
- What have you learned as the department's chair?
- Describe your current level of visibility and influence in your department? In the university? In your field? What are your desired levels?
- Read article:
    - "Leadership That Gets Results" by Daniel Goleman, *Harvard Business Review*, March-April 2000.

Session 2 – Academic Leadership Effectiveness

I. Review Learnings from Homework Assignments
- What are the implications, and what new decisions or actions need to be taken?
- Priorities: personal/professional, life stage, time management, balance

II. Definitions of Leadership Effectiveness
- How do you define great leadership as a department chair?
- What do you expect from yourself? Explore all dimensions of your academic job.
- Whom do you know who is a successful leader? Why do you admire them?

III. Indicators of Leadership Success
- What are indicators of success for your position – personal indicators, departmental/institutional indicators?
- What are the most important measures of your effectiveness?

IV. Increasing Your Impact and Contributions to Your Department and School/College
- What would increase your influence and contributions?
- What would increase your effectiveness in junior faculty development?
- What would be the personal consequences of doing this?
- How can you effectively challenge the status quo?
- How can you take risk more effectively?

V. Doing Your Leadership Job More Effectively
- How can you do your job more creatively? What would be some bold steps to take to increase the results of your leadership? New strategies/approaches?
- What are some resources that you are not recognizing or under-utilizing?

VI. Mentoring Committees For Your Women Faculty
- Meet individually with your women Assistant and Associate Professors about setting up Mentoring/Development committees. Brainstorm with each of them about 3 people that you can invite to serve on their mentoring committees for the next 2 years: one departmental member, one university member (outside the primary department), one member from your field (outside the university)
- Plan to attend the ACES Mentoring Skills workshop that is coming up

VII. Assignments – Complete Prior to Next Session
- Pick a role model for leadership in your field. Observe this individuals' style, behavior, presence, influence. If possible, interview him or her about their journey, choices, advice, etc. Make a list of why you admire them.
- Identify your personal vision of leadership excellence based on identified role models.

Session 3 – Vision and Goals

I. Review Learnings from Homework Assignments
- What are the implications, and what new decisions or actions need to be taken?

II. Development Successes and Challenges
- When have you developed yourself successfully? What happened to make it work?
- What were the challenges you faced?

III. Leadership Vision and Aspirations over Your Career
- What are your aspirations for leadership over your career?
- What are the immediate challenges? Long term challenges?

IV. Goals
- Immediate Objectives
- Short Term Goals
- Mid Term Goals
- Long Term Goals

V. 360 Degree Feedback
- Overall process of 360 degree feedback data collection and feedback
- Feedback report will be provided in Session 5 but the data collection process should start now
- Contact feedback assessors to alert them about emails they will be receiving shortly
- Self-assessment deadline

VI. Mentoring Committee Follow Up
- Have you worked with your women faculty (Assistant and Associate Professors) to finalize their mentoring committee members? Have you connected with the Full Professor women to offer them assistance for their development?

VI. Assignments – Complete Prior to Next Session
- Review your leadership vision.
- List your personal goals – immediate, short term, mid-term, long term
- Determine what you need to change/improve to reach your goals
- Complete online self assessment of 360 degree feedback.
- Read article on emotional intelligence for next session:
    - "What Makes a Leader?" Daniel Goleman, *Harvard Business Review*, November-December 1998.

Session 4 – Emotionally Intelligent Leadership

I.   Review Learnings from Homework Assignments
- What are the implications, and what new decisions or actions need to be taken?

II.   Leadership and Emotional Intelligence
- Concept of emotional intelligence
- Link to leadership
- Personal triggers
- Examples of stress-inducing situations
- EI competencies – self awareness, self management, social awareness, relationship management skills

III.   Strategies and Tools
- How to handle stress
- Conflict management
- Taking initiative and risk
- Optimism in the face of administrative constraints
- Role plays

IV.   Assignment – Complete Prior to Next Session
- Ensure that all deadlines have been met for completion of your 360 degree survey
- Read article:
  - "Managing Oneself" by Peter Drucker, <u>Harvard Business Review</u>, March-April 1999

Session 5 – 360 Degree ECI Feedback Report

I.   Review Learnings from Homework Assignments
- What are the implications, and what new decisions or actions need to be taken?

II.   ECI Feedback Report
- Overview and explanation of Emotional Competence Inventory (ECI)
- Guidelines to analyze ECI feedback report

III.   Discussion of Feedback
- Reactions to feedback
- What is confirmed for you? What surprised you?
- Overall patterns and trends in the data

IV.   Assignments – Complete Prior to Next Session
- Review ECI feedback report following suggested guidelines for analysis of data
- Complete Self-Analysis Guidebook
- Read book:
    - Deryl R. Leaming, Academic Leadership: A Practical Guide to Chairing the Department (Anker, 1998)

Session 6 – Development Planning

I. **Review Learnings from Homework Assignments**
- What are the implications, and what new decisions or actions need to be taken?
- ECI Follow-up Activities – Interpretations of ECI feedback
- Implications in NSF ACES related areas (pertinent to the advancement of women faculty and the creation of a departmental climate of inclusion and respect)

II. **Identification of Professional Strengths**
- Discussion of EI competencies that are strengths
- Other strengths
- Create a personal balance sheet of competency assets and liabilities

III. **Professional Development Needs in Light of Goals (immediate, short-term, mid-term, long term)**
- Discussion of competency gaps
- Opportunities for development

IV. **Creating an Action Plan**
- Tasks/actions to achieve goals – immediate, short term, mid-term, long term
- Strategies for developing targeted competencies
- Time log/allocation

V. **Assignments** – Complete Prior to Next Session
- Create your Personal Development Plan (use template provided)
- Search the web for insights about the development of key competencies of interest. For example, conflict management or emotional self-control or initiative or leadership.
- Practice new behaviors related to targeted competencies
- Read ACES REC reports on website in preparation for discussion about gender issues in academia: http://www.cwru.edu/menu/president/resourcequity.doc

Session 7: Gender Implications for Department Leadership

I. Review Homework Assignments
- What new behaviors were experimented with, and with what results?
- What are the implications, and what new decisions or actions need to be taken?

II. Departmental Climate For Women
- What is the overall departmental climate for women faculty?
- How can you improve data gathering about the women faculty members' perceptions of the departmental climate and community
- Women graduate students?

III. Recruitment, Retention, and Advancement of Women Faculty
- Current issues and challenges
- Possible solutions

IV. Assignments – Complete Prior to Next Session
- Practice new behaviors related to targeted competencies
- Talk to your department's women faculty (as a group) about their experiences in the department. Initiate regular meetings with this group.
- Read:
    - Chapter 1 of Valian, V. 1999. *Why So Slow? The Advancement of Women*, Cambridge, MA: The MIT Press.
    - "A Modest Manifesto for Shattering the Glass Ceiling" by Debra E. Meyerson & Joyce K. Fletcher, *Harvard Business Review*, January-February 2000.

Session 8 – Leveraging Leadership Impact and Contributions as Department Chair

I.   Review Learnings from Homework Assignments
- What are the implications, and what new decisions or actions need to be taken?

II.   Departmental Vision and Goals
- Create a process for determining/revisiting departmental vision and goals
- Begin/revisit a process of strategic planning for the department – 7-10 years out
    - Utilize SOAR model: strengths, opportunities, aspirations, results
- Initiate process for examining key resources and key constraints in the future

III. Develop an Improved Departmental Communication Plan
- Does the departmental web site need new energy? How can you assist department faculty in improving their web pages?
- How can you improve on current methods to update faculty about events, activities?
- How can you improve on current methods for communicating with graduate students?
- How can you improve on current faculty and staff awards and recognitions?

IV.   Departmental Culture
- Create a process to re-examine the departmental culture
- Create mechanisms to enhance the quality of the academic community.

V.   Increase Your Impact in the School/College and the University
- What will increase your contributions to your school/college?
- What opportunities will help showcase your talents at the university level?
- What conferences/activities can your department host that will bring national attention to the university?

VI.   Assignments
- Continue clarification and implementation of Personal Development Plan
- Practice new behaviors related to targeted competencies
- Read book:
    - Ann F. Lucas, Leading Academic Change: Essential Roles for Department Chairs (Jossey-Bass, 2000)

Session 9 – Enhancing Interpersonal/People Skills

I.   Review Learnings from Homework Assignments
- What are the implications, and what new decisions or actions need to be taken?

II.   Negotiating More Effectively With Higher Administration and other Funders
- Role play/practice asking for resources

III.   **Learning to Deal with Different Styles**
- Concepts around personal styles
- Consider doing Learning Styles Inventory (LSI) or Myers-Briggs Type Indicators (MBTI) instruments

IV.   Closure of Coaching Relationship

V.   Future Assignments
- Continue clarification and implementation of Personal Development Plan
- Continue to practice new behaviors related to targeted competencies
- Read book:
    - Deryl R. Leaming, <u>Managing People: A Guide for Department Chairs and Deans</u> (Anker, 2003).

Resources for Chairs

Estela Mara Bensimon, Kelly Ward, and Karla Sanders, <u>The Department Chair's Role in Developing New Faculty into Teachers and Scholars</u> (Anker, 2000).

Mary Lou Higgerson, <u>Communication Skills for Department Chairs</u>. Anker 1996.

Ann F. Lucas, <u>Leading Academic Change: Essential Roles for Department Chairs</u> (Jossey-Bass, 2000)

Ann F. Lucas, <u>Strengthening Departmental Leadership: A Team-Building Guide for Chairs in Colleges and Universities</u> (Jossey-Bass, 1994).

Deryl R. Leaming, <u>Academic Leadership: A Practical Guide to Chairing the Department</u> (Anker, 1998)

Deryl R. Leaming, <u>Managing People: A Guide for Department Chairs and Deans</u> (Anker, 2003).

Susan A. Holton (ed.), <u>Mending Cracks in the Ivory Tower: Strategies for Conflict Management in Higher Education</u> (Anker, 1998).

Robert M. Diamond, <u>Aligning Faculty Rewards with Institutional Mission: Statements, Policies, and Guidelines</u> (Anker, 1999)

Robert M. Diamond, <u>Serving on Promotion, Tenure, and Review Committees: A Faculty Guide</u>, 2nd ed. (Anker, 2002).

Cathy A. Trower (ed.): <u>Policies on Faculty Appointment: Standard Practices and Unusual Arrangements</u> (Anker, 2000).

Coaching Questions

If you could design your ideal world, both professional and personal, what would it look like? Where would you spend your time? Create 2 pie charts 1) how you currently spend your time and 2) how you would like to spend your time

Rank your professional priorities - what is most important to you, next most important? etc. What won't you live without professionally?

How will you balance your professional and personal life? What resources do you need to make this balance possible? From whom? What can you do to create the desired balance?

What would be the ideal scenario here for you at Case? (Dream big, don't censor your answers based on practicality or plausibility.)

What do you hope to have accomplished 1 year from now? 2 years from now?

What do you hope to achieve through your leadership of the department?

What does your department hope to have accomplished 2-3 years from now? What is your department's vision and mission?

What is your plan for the next 2-3 years? How will you move your department agenda forward?

What resources do you currently have to draw on? What resources do you need to develop in order to attain your goals?

What can you do to make this an excellent place for your faculty to do their 'best' science?

What can you do to make your department an inclusive and friendly place for all faculty and students?

Personal Development Plan Template

The objective of this assignment is for you to create a <u>living document</u> that motivates and guides your actions as you embark on your journey of career and personal development.

Here is a description of the major components to include in your plan:

Part 1: Statement of your Personal Career/Life Vision

- Your career and life vision or goal over the next 5-10 years – Where will you be in your career? What will be your responsibility? What will you find exciting and challenging in your career? What kind of results will you be achieving?
- Describe the relationship between your vision and your values

Part 2: Discussion of your Strategy to Develop your Emotional Intelligence Competencies

Using what you have discovered about your abilities through the Emotional Competence Inventory, describe which competencies are important to you as you create your desired future.

- Identification of abilities that have high developmental priority for achieving your career and life goal
- Discussion of overall strategies for developing chosen abilities—how do you plan to learn and develop these abilities?
- Linkage of these abilities and strategies to the goals and sub-goals in Section 4—how will your development plan provide you with opportunities to develop the high priority abilities?

Part 3: Goals, Sub-Goals, and Action Steps (SMART)

This section can be written in outline form. Remember to construct goals, sub-goals, and action steps that fit the SMART criteria: Specific, Measurable, Attainable, Relevant, and Time-bound.

- 2-4 Goals: In one sentence, describe an outcome that is concrete, specific, personally meaningful, affirmative, challenging but attainable, and tied to a timeframe.
- Sub-goals (2 or more per goal only if your goal is more than 5 years into the future), using the same criteria as above for goals.
- Action Steps (2 or more per goal or sub-goal): In one sentence, these should be concrete and specific and address the "when, how, who, what, and where" of the action. These are the steps that you will complete to accomplish each sub-goal/goal.
- For each sub-goal (or goal if you don't have sub-goals), discuss how you will <u>monitor</u> your progress along the way towards accomplishing it.
- Potential helping and hindering forces for achieving your goals (what will help you get there? what might stand in your way?)

Protecting the Investment
Understanding and Responding to Resistance

Mark A. Chesler

Protecting the Investment
Understanding and Responding to Resistance

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A recent Conference Board report, "Diversity: Business Rationale and Strategies," cites the following as the most common barriers to successful implementation of diversity and culture-change efforts:

- existing corporate culture;
- attitudes that are resistant to change and differences;
- lack of understanding of diversity issues;
- integrating diversity into business strategy;
- competition with other pressing business issues; and
- middle- and senior-management resistance.

The report suggests that while awareness of diversity issues tends to be high in companies, a lack of understanding is still prevalent.[1]

U.S. organizations are making significant investments of both time and money in "managing diversity" and other culture-change initiatives. They are justifiably concerned that those investments pay off—that the goals are met, and the issues resolved.

Too often they find that awareness has not translated into real change. As more and more people are brought into the process, the stakes are raised—and those who are fearful of what the changes may bring begin to resist.

In this article, Professor Chesler provides those executives and managers who have made a commitment to a culture-change process with the information necessary to recognize and confront this resistance.

One measure of the importance of a change effort is the degree of resistance which it generates. Where the effort addresses institutionalized forms of racism, sexism and classism, resistance is inevitable, vigorous and persistent.

The kind of multiculturalism I advocate is likely to engage such resistance, since it is not focused on acknowledging or celebrating differences, per se, but on challenging the domination of white-male and eurocentric cultural standards and the political, economic and social injustice and inequality that accompany them. While I believe that this is the only interpretation of multiculturalism (or diversity) that is likely to challenge the injustice, it is also the definition most apt to engender vigorous resistance from those whose privileges and interests are threatened. This challenging vision of multiculturalism is also sometimes avoided by those who generally support the agenda but feel we must approach it more gently.

Those who are working to change the culture of American organizations must anticipate and plan for these reactions, just as we anticipate and plan for resistance to any far-reaching program that aims to upset the status quo.

The purpose of my analysis here is not to eliminate dissent but to learn to meet it effectively. Only when we understand and appreciate the power of the resistance can we overcome it. The change tactics we use must be tuned to the nature of our goals, the character of the local institutional environment and culture, and the types of resistance we encounter.

Frames of reference

The literature on social and organizational change suggests at least four different ways to conceptualize resistance to change, each at a different level of analysis: individual, organizational or political. The approaches are by no means mutually exclusive; they overlap at various points.

• **Resistance in the heart and mind.** According to D. Katz, the attitudes people hold satisfy one or more of four functions: intellectual ordering of the world, preserving a sense of moral integrity, defending the ego or sense of self, and fulfilling material interests and needs.[2]

These functions are apparent in negative reactions to diversity and multiculturalism. For example, people who view the racial or gender playing field as level may resist an effort at affirmative action or multiculturalism because they believe—or want to believe—that society is already fairly ordered.

They may feel that their sense of moral integrity is compromised by being asked to think of people in terms of identifiable groups or categories, when they believe strongly in "treating each person as an individual." They may even view multiculturalism and diversity concerns as somehow reflective of "a moral breakdown" in our nation, schools and colleges.

The kinds of changes that are imagined as being demanded by diversity initiatives often generate a high degree of anxiety and insecurity—whether about change or competence in general, or about racial and sexual interaction with "the other." In such cases, resistance to the change is synonymous with defending one's ego, or sense of self.

Finally, people who resist change often feel (consciously or unconsciously) that their own status and privilege—their very way of life—is in jeopardy.

All four of these attitudinal functions protect different kinds of self-interest (intellectual, cultural, psychic and material), and are given particular shape and legitimation by the prevailing racist and sexist culture and structures of our U.S. society and most of its institutions.

• **Resistance by powerful members of organizations.** While much of the literature on this topic focuses on middle management, it could also apply to top leaders resisting initiatives from below or outside the organization. Change efforts generated from below may be perceived as threats to the power and decision-making privileges of those in authority—rather than as legitimate concerns about racial or other issues.

On the other hand, middle management often feels squeezed from both above and below; and less powerful white and male employees frequently displace their anger at their alienation and marginality from those who exclude them (powerful white males) onto women and people of color.

Two tactics that are commonly used in organizational resistance are **absorption** and **intimidation of change efforts**. R. Leeds points out that people who advocate organizational changes that are more extreme than those management will support may be invited to solve the organization's "minority recruitment or retention" problem, or to plan a conference to explore the issues of sexual harassment.[3] Thus "absorption" not only seeks to "eliminate the pocket of

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People who resist change often feel (consciously or unconsciously) that their own status and privilege—their very way of life—is in jeopardy.

nonconformity but also strengthens the organization by providing it with the services of an energetic, devoted group."[4]

Management may also use various kinds of intimidation to slow the change process. "Indirect intimidation" includes nullification or invalidation of change efforts, and the separation, transfer or isolation of change agents from their peers or necessary resources.[5] The hope here is that multicultural advocates will voluntarily cease their activities.

"Direct intimidation" includes active defamation of the character or motives of challengers, their dismissal from the organization, and negative sanctioning of multicultural or diversity programs, policies and personnel. Here, more active coercion is employed.

Another form of intimidation is exploitation of traditional cross-race or interethnic tensions and setting people of color and white women in competition with one another and frustrating the development of coalitions across race, class or gender groupings.

• **Response to social movements.** Zald and Useem suggest that "movements of any visibility and impact create the conditions for the mobilization of countermovements. By advocating change, attacking established interests, mobilizing symbols and raising costs to others," others are pressed to react.[6]

Those who react negatively to the multicultural agenda must, to be effective, generate resources, particularly ideational or ideological; slogans such as "multiculturalism is balkanization," or "affirmative action is reverse discrimination" are currently familiar and popular.[7]

Material resources to promote such ideological responses are easily generated and used, since control of such resources remains in the hands of white-male constituencies who often feel threatened by the prospect of culture change or multiculturalism.

• **Culture and structure of institutionalized discrimination and oppression.** This body of work argues that racism, sexism and other forms of discrimination are built into the very core of our society.[8] Sometimes discrimination is operative in direct ways, via overtly unfair treatment; and at other times it operates indirectly, through apparently fair treatment that passes over or reproduces prior inequalities.

This system works, and has worked historically, to benefit upper-middle- and upper-class white men. However, most white people are not consciously aware of the ways they have benefited. Most have accepted the cultural myth that it is their hard work and talent that has privileged them.

Naturally, then, challenges to these cultures and structures are seen as attacks on the things that people have worked hard to obtain and that they merit, and the challengers themselves often are seen as wanting to get things without working hard for, or deserving, them.

The major contributions of this last approach to the problem of resistance are threefold: since racism and sexism are institutionalized throughout our social institutions, we can expect resistance to be just as universal; one need not be personally prejudiced to resist challenges to institutionalized privilege; and organizations (and individuals) do not need to engage in overtly discriminatory or resistant actions to "pass along" resistance to change.

These four "frames" are not independent of one another—theoretically or practically. Individual hearts and minds exist within and are shaped by the larger culture; and organizational dynamics and social movements are not separable from the individuals involved in them or from the larger society.

"I've never said this to a woman before, but here goes: We're not paying you enough."

Shanahan

Resistance to change may be overt or very subtle. Depending on resistors' organizational positions and the nature of the local struggle, very different tactics may be used. As D. Klein points out, "In a process of orderly and gradual change, the defender role may be taken by a well-established, respected member of the system whose at least tacit sanction must be gained for a new undertaking to succeed. In a situation of open conflict, where mistrust runs high, the defender role may be assumed by those

of excluding people from a fair share of social opportunities, resources, privileges and power and of maintaining social injustice.

It is important to remember that almost none of the categories are "either/or." Race is not a question of black and white; religion is not just Christian or Jewish or Islamic. Further, individuals hold different roles depending on their relationships with individuals in other groups. A white woman is a member of a "dominant group" as a white person, a "sub-

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In many organizations today, efforts at culture change are generating a high level of confrontation and conflict— and few members of the organizations have the skills necessary to institute positive processes of conflict engagement and resolution to respond effectively to these challenges.

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able to ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮ become more openly and perhaps irrationally vitriolic in their opposition."[9]

In many organizations today, efforts at culture change are generating a high level of confrontation and conflict— and few members of the organizations have the skills necessary to institute positive processes of conflict engagement and resolution to respond effectively to these challenges.

Sources of resistance

The wealth of books and conferences promoting multiculturalism, culture change and diversity attest to the current interest in the topic.[10] Its importance is further demonstrated by a range of opposing publications suggesting ways to resist the change agenda.[11]

There is, of course, a great deal of variety in why people choose to "resist" diversity and multiculturalism. Most of us who are proponents of multiculturalism also carry some of this resistance within ourselves, since we also have grown up in this society and have been subjected to its racist and sexist cultures and structures. Fuller exploration of the resistance we sometimes find within ourselves should help us understand others' resistance and find ways of countering it.

In this discussion, I will focus primarily on resistance to race and gender concerns, but diversity and multiculturalism—and the resistance to it—include class, ethnicity, religion, sexual orientation, ability and any other social identity grouping or categorization that is used as a means

ordinate group" as a woman. A white man may be "subordinate" in his status in an organization, but "dominant" in relation to a person of color. A person with a disability may have an intellect which puts her at the top of her profession, while her physical limitations render her dependent on more able-bodied individuals for assistance.

The following list helps to identify and isolate resistance which appears in organizations that are attempting a multicultural or diversity change program:

• **Substantive ideological and philosophical disagreement with regard to the goals and content of multiculturalism or diversity.** There are certainly legitimate and important intellectual and ideological disagreements about the meaning of multiculturalism, what a more diverse and just organization might look like, and how to create communities of common value and interest across identity groupings.

Such legitimate questions, however, can also be transformed into resistance tactics, especially when the diversity or multicultural strategy aims at the root causes of discrimination and injustice. Some typical "diversionary strategies" are arguments that "things won't be the same around here" if larger numbers of white women and people of color are recruited and promoted; or concerns about maintaining institutional excellence, upholding moral and cultural traditions, rewarding merit, continuing appropriate methods of supervision, maintaining productivity or service standards, and so forth.

Discussion and debate should more often center around just what are appropriate methods or standards, and what

is merit and fair play. These terms, which have always been unclear in practice, have been and continue to be employed as a cover for white male privilege through the establishment of standards that purport to be "neutral" but are based on white-male norms and histories.

While it is important to acknowledge the existence of real value differences and not replace the orthodoxy of racism and sexism with new forms of "political correctness," we must not be soft about the disagreements. We must be

nizational change processes. It is difficult for all of us to understand what the new organization—or the new society— might look like or how we can create it. Fortunately, some writers have begun to generate images of truly multicultural or diverse and just organizations, but we need more and more detailed images and more examples of how to get there.[13]

Moving a large organization requires complex skills in planning change—skills which are not generally part of the portfolios of institutional leaders. An effective culture-

Fear is the greatest barrier to culture change:
fear of the unknown, of making a "mistake," of alienating colleagues, of being seen as "catering" to people of color, of reprisals for emphasizing "relationships" over productivity, of being labeled "politically correct."

able to identify where resistance of other types is hiding under the banner of reasonable ideological difference.

• **Concern about loss of power and privilege.** Multicultural and diversity programs challenge many established ideals, beliefs and practices, and are likely to alter some of the organizational power and control currently exercised primarily by white men. Then we can expect resistance to the threat to these powers and privileges; this resistance may be expressed consciously or unconsciously.

Conscious resistance is evident when managers react with hostility to challenges that their styles or procedures are overly monocultural and oppressive (thus expressing their defense of the privileges associated with autonomy and authority).

Less obvious resistance lies behind broader social claims that "white-male college graduates no longer can anticipate good jobs," or "only women and people of color can be hired these days," or "our Western way of life is being destroyed."

• **Ignorance** may stand in the way of the effort to lead, administer, or teach in new ways or with new content. Ignorance appears in lack of knowledge of the need for change or of the cost of the status quo; of the fact that there are other cultures present, with different needs and styles of managing and working together; or of what is required in order to change and support others' change efforts. Some ignorance is obviously a "refusal to know;" in other cases, the lack of knowledge is real and can be overcome with information.[12]

• **Lack of a clear vision** of the future and of orga-

change effort requires both the generation of a strategic plan and the ability to respond productively to spontaneous crises and opportunities generated by internal cadres and organized movements for change.

• **Disagreement about procedures.** A common form of resistance is embodied in arguments that the change effort is using inappropriate strategies. Large-scale organizational change is often reflected in administrative mandates, internal caucus demands, or market feedback— which may be challenged as being "authoritarian" or "anarchic," rather than a product of rational planning. When it is people of color and white women who are the prime movers on the diversity agenda, resistance may use the rhetoric of upholding institutional authority (located primarily, of course, in white and male hands). Debates about proper procedures for a multicultural change effort may be proper and useful, but often they are simply a delaying tactic.

Abusive programs that "trash" opponents are appropriately resisted. Such abuses, though extensively covered by the media, are rare—but their existence feeds the forces of resistance.

• **Comfort with the status quo.** Managers who are comfortable with current ways of working, leading and providing services and support are naturally reluctant to try new ideas, even when they profess an interest. Especially when the "something new" is unclear or untried, or the manager has little experience with alternative ways of working and managing, this "fear of the unknown" may prevent or forestall innovation.

Most people in leadership positions in our organizations

were socialized, trained and habituated in a more or less monocultural environment. Where there were people who were "different," they were expected to assimilate to a system dominated by white and eurocentric cultural values. Life in a multicultural organization will require different behaviors, different modes of operation, and different skills.

• **Emotional barriers.** Fear is the greatest barrier to culture change: fear of the unknown, of making a "mistake," of alienating colleagues, of being seen as "catering" to people of color, of reprisals for emphasizing "relationships" over productivity, of being labeled "politically correct." Related emotional responses are pain or anger about being asked to change, or guilt about past activities or prior insensitivities or discriminatory behaviors. Such emotional insecurities may "leak" in covert ways—sometimes masquerading as ideological or otherwise principled forms of resistance.

• **Fear of conflict.** Closely related to other sources of resistance, such as comfort with the status quo, lack of specific skills, and emotional barriers, fear of conflict also may have a powerful effect. Efforts to diversify organizations often lead to temporarily exacerbated tension; if one's reputation as a good worker or manager is linked to low tension and conflict in the unit, change that upsets the stability of the environment is quite threatening. As previously separated and often mutually distrustful groups are brought into more direct contact with each other, the manager who lacks skill to deal with conflict may ignore or try to suppress it— with the risk that it will eventually explode.

• **Time and energy constraints** may cause organizational members at all levels and in all roles to resist what may be seen as just one more management gimmick. In this era of downsizing, many employees are so overloaded and fraught with bureaucratic tasks and long work days as to reject almost any new duty or innovative task.

• **Inadequate material resources.** A common though not obvious form of resistance is the tendency to underestimate the commitment required in terms of money, materials and assistance. Organizational resistance

to the effort—to reprioritization of the core culture and values, to the financial and human costs involved, and to the provision of a more supportive infrastructure—may frustrate or eventually defeat the change effort.

• **Functional "stovepipes" or narrow departmental structures.** Structural restrictions that limit the range of managerial options may forestall and frustrate change. A multicultural or diversity initiative requires inter-departmental and inter-functional collaboration and teamwork; norms, ideologies, practices and procedures that resist such collaboration limit progress.

• **Concern about public support** from peers and friends, family members, unions or employee associations, and even legislative bodies or government agencies may prevent individuals and organizational units from trying new ideas, particularly when there is no evidence that the work will be valued and rewarded. The current attack on affirmative action and multiculturalism feeds the ideological stance of resistors and makes the effort more difficult even for those organizations which have established "the business case" for a diversity initiative.

• **Personal prejudice and bigotry** continue to be a potent force. Even though many argue that personal racial prejudice is diminishing or taking a "rational" form, there is substantial evidence to the contrary, as attested to both by statistics and by personal experiences of people of color. Further, well-established forms of white racism—at organizational and institutional levels—operate to create, sustain and implement resistance.

• **Embedded white racism (monoculturalism).** A belief that people of color are somehow inferior to white people is still deeply rooted in society at large and is supported by the structure and culture of all our political and economic institutions. Historic white privilege has created educational and financial inequalities in work opportunities and in our elementary and secondary school systems; these inequalities and their results are passed on to colleges and universities, and thence to industrial and governmental agencies—where they come full circle and reinforce the

original racist beliefs. One does not have to be an "active resistor" to effectively resist change—one can simply passively accept or observe the "natural" course of social processes and structures. In the midst of societal resistance to change, not overtly challenging that resistance is tantamount to supporting it.

Resistance in practice

As indicated above, resistance can take many forms. Some efforts attempt to **nullify** multiculturalism through obfuscation or rejection; some try to **incorporate or absorb** it by delaying action, asserting apparent institutional acceptance though little exists in reality, engaging leaders in other tasks, or even by rewarding challengers by "promoting" them or giving lateral, unrelated assignments. **Sabotage** of the diversity initiative is a common resistance strategy—marked by failure to implement good faith agreements for change, or by carrying them out in bad faith. And finally, **direct counter-attack** of the multicultural agenda can be carried out by intimidating or harassing its leaders and members, or by mobilizing and supporting other resistant constituencies.

Here are some specific examples of "resistance in practice":

- Refusal to listen to complaints about racist or sexist or homophobic activities (nullification).
- Denial of the existence of institutional discrimination, or denial that the institution is partly responsible for passing on prior societal discrimination (nullification).
- Failure to hire or admit or promote people of color or white women because they are not "as qualified" as the available white men—without examining the current criteria for "qualified" or determining their relevance for the tasks at hand (nullification).
- Failure to initiate or support (via participation or provision of resources) efforts at diversity training, multicultural organizational development or constituency mobilization and challenge (nullification).
- Invitation to supporters of the diversity or multicultural initiative to invest their energies in helping the organization plan for "incremental" change (absorption).
- Provision of partial (but insufficient and unsustained) funding, in the expectation that the effort will fail to be fully implemented and thus not be successful (absorption).
- Provision of "support" in the form of a non-inspiring speech, a document, or report in favor of non-discrimination—"managing diversity by public relations" (absorption).
- Failure to provide the multicultural or diversity initiative with direct access to business leaders in the organization, and assigning only white women and people of color as diversity managers (nullification).
- "Burying" the multicultural agenda as a minor part of a more general organizational change effort (absorption).
- Creation of a "commission of inquiry" into problems of discrimination, followed up by subsequent, lengthy, "cultural audits" (absorption via delay).
- Implementation of change policies, programs and reforms "to the letter," brooking no flexibility in response or adaptation (sabotage via over-conformity).
- Failure to carry out the full spirit of anti-racist and anti-sexist policies and programs that were generated by senior management or negotiated in apparent good faith with challengers (sabotage).
- Deliberate admission, employment or promotion of obviously "less qualified" people of color or white women just to meet diversity goals...and making it clear that this is what is being done (sabotage).
- Harassment and pressure on change agents to influence them to cease their activity (counter-attack via intimidation).
- Labeling challengers—"hotheads," "racists," "uninformed anti-intellectuals," "do-gooders," "frustrated women," "acting-out post-adolescents," "low-achievers," "sexual deviants," and so forth (counter-attack via defamation).
- Collaboration or collusion with resistors to the multicultural agenda via overt or covert assistance to them—with resources and publicity for their actions (counter-attack via counter-movement activity).
- Direct legal or physical attack or economic sanctioning of multicultural and social justice advocates (counter-attack).

Resistance may manifest itself in forms as mild as denial that any problem exists; as subtle as distracting those who are working for change with prizes, celebrations, or other symbolic rewards; as tedious as endless dialogue or inquiry about the extent of problems; or as blatant as firing or humiliating those who advocate culture change, or allowing police brutality and physical attacks on those who are excluded from the mainstream.

Dealing with resistance

While analyzing resistance is a daunting task, it is even more difficult to understand how to confront it. In part this is because the ways we deal with resistance must be tailored to the local situation, since in each organization resistance has a unique source and shape.

The first step certainly is to expect, understand and plan for resistance—to learn how to use it as leverage for change rather than see it as an insurmountable barrier.

The objective of making multicultural change is not to create homogeneity or do away with conflict. In some circumstances, it may be necessary to make underlying conflict more obvious, in order to get people's attention, impress upon them the level of pain and need for change, and enlist their aid in the change process.

There are multiple tactics that can be used to confront resistance. Some focus on individual change, others on altering organizational incentives, some on mobilizing and applying new forms of power and persuasion, and still others on broad-based cultural and structural change.

Dialogue, an attempt to develop mutual understanding, requires a trusting relationship and context and is most likely to be effective when the sources of resistance include *substantive disagreement*, as long as the disagreement

loss of power and privilege, procedural disagreement, and monoculturalism or discrimination that is organizationally-based. Successful influence and persuasion require some openness on the part of resistors to hear the appeals, and the power of advocates to produce incentives for change.

Bargaining may be necessary when the the source of resistance is *strong and continuing substantive and procedural disagreement, loss of power and privilege, time and energy, inadequate materials and embedded monoculturalism.*

There is no guarantee that any strategy will work, because the resistance is as wide and deep as the multicultural agenda itself. Nevertheless, the resistance is there and must be dealt with— openly and reasonably, when possible, but also firmly and consistently.

is not so strong that it forestalls openness. Dialogue is not the same as debate or effort at persuasion; it requires careful listening to and sharing of views and experiences.

Education as a strategy for dealing with resistance is most effective when the sources of resistance include *ignorance*: recognition of gaps in information or skills, lack of vision, difficulties in conceptualizing and planning, anxieties about the future, and recognition of prejudice. Educational efforts are diverse: direct and indirect instruction, either instructor-oriented or peer-oriented; experiential pedagogies; practice or real-time efforts in the field; and so forth.

Cooperative problem solving may be effective in challenging *organizational or institutional racism or sexism* in situations where everyone agrees that such discrimination exists. Engaging people in working together on a common problem does not necessarily reduce differences, though it may; but it does provide motivation in finding common ground for dealing with the problem. It is most effective when the resistance is based on lack of vision, difficulty in conceptualizing and planning, procedural disagreement, comfort, emotional barriers, and the like.

Influence and persuasion efforts involve applying intellectual appeals (reasoning or argument, and perhaps debates) and political or economic incentives (rewards and sanctions) as ways of altering individual and organizational behavior and modifying resistant acts. They are most likely to be effective where the sources of resistance are *substantive disagreement and concern about*

To be successful, bargaining must involve some common interests between the conflicting parties (such as the sheer preservation of the organization's operating capacity). It assumes less common ground and requires less trust than does cooperative problem solving, but there must be a modicum of "good faith."

There must be some balance of power for bargaining to be effective. Each party must have the capacity to do fundamental good or harm to the other or to the organization.

Contesting or fighting involves developing and exerting sufficient power to require (force) the resistant party to alter its behavior. It is most likely to be necessary when the resistance arises from *substantive disagreement, loss of power and privilege, enduring procedural disagreement, and institutionalized monoculturalism and discrimination.* It does not try to change attitudes but only to control behaviors, and requires that the advocates of change have the power to impose organization sanctions (merit reviews, wage and salary adjustments, promotions or demotions) or mobilize political protests, demonstrations, boycotts, strikes and so forth.

In particular situations, it may be most effective to modify or mix these strategies and to add others. For example, one might start with a consensus-based strategy such as dialogue and proceed to bargaining only when that fails. On the other hand, one might begin with threats and displays of power and then move to cooperative problem solving or education when it appears that there are willing collaborators in the organization who are committed to work for change.

There is no guarantee that any strategy will work, because the resistance is as wide and deep as the multicultural agenda itself. Nevertheless, the resistance is there and must be dealt with—openly and reasonably, when possible, but also firmly and consistently.

Forewarned & well-armed

Changing the culture of an organization, a community, or a society is serious business. Powerful forces support the status quo, and those who would challenge that power—and its attendant privileges—must be realistic about the ability of those forces to retain their status.

In order to help those organizations that see it is in their own self-interest to attend to changing demographics and changing global realities, we must take seriously a political and structural analysis of organizations. We must use all the resources available to us: communication and dialogue, collaborative inquiry and problem solving, and also outright political mobilization of constituencies that support this agenda.

We must form new coalitions and find new allies. But forging new alliances—between organizations and communities, majorities and minorities, rich and poor, men and women, gay and straight—will not be easy. They face not only the resistance from external sources which have been identified above; they also face internal resistance. Interracial, interclass and intergender coalitions include groups with very different experiences, rooted in their different locations in the social hierarchies of organizational status and privilege—but they hold great promise, for learning to work together and for accomplishing the work itself.[14]

While we can anticipate personal and organizational resistance in all their forms, it is important not to overstate the resistance, nor to categorize all non-support as outright resistance. An entire institution does not have to be transformed in order for substantial groups of members to begin the change process—to dramatically improve the quality of work and interaction, and to change the climate of the organization to provide a more equitable and supportive environment for members of all racial, ethnic, class and gender groups. ∎

In preparing this piece I have benefited from the colleagueship, collaboration and reactions of James Crowfoot, Rita Hardiman, Bailey Jackson, Maria Ramos, Beth Reed and Shari Saunders.

End Notes

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units (fig. S9) [paired *t* test, $P < 0.02$, $n = 19$ pairs; median distances from the granular layer were 0.45 mm (source units) and 1.05 mm (target units)].

The present study demonstrated that canonical feed-forward signal flow across cortical layers during sensory coding reverse to the feed-back direction during memory retrieval phase, which suggests flexible recruitment of interlaminar connectivity depending on the cognitive demands in the monkey association cortices (Fig. 4C). We used CSD analysis to estimate cortical layers (Fig. 1, C to E, and fig. S1), and the observed stimulus-evoked CSD profiles were quite similar to those in the primary sensory cortices (*17*, *27*). For some penetrations, we observed that the current sink positioned superficially next to the earliest-sink contact exhibited larger peak amplitudes and much longer durations than that of the earliest current sink. This observation might reflect the cytoarchitectural nature of A36 as a dysgranular cortex (*28*) as well as the direct inputs to the deepest part of the superficial layer, which is consistent with anatomical observations (*29*).

A recent study in the rat primary auditory cortex demonstrated that the direction of interlaminar signal flow depends on the cortical "state": Sensory-evoked responses were initiated in the thalamorecipient layers and then propagated to the superficial and deep layers, whereas in spontaneously active "up-states," neuronal activity was initiated in the deep layers and then propagated to the superficial layers (*27*). These state-dependent changes in the interlaminar signal flows in rats are consistent with our results obtained in monkeys performing a memory task. Together, these findings highlight the flexibility of cortical laminar circuits. Further experiments will be needed to determine whether such flexible interlaminar connectivity is also implemented and used in other cortical areas for other cognitive demands.

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A Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students

Gregory M. Walton[1]* and Geoffrey L. Cohen[1,2]

A brief intervention aimed at buttressing college freshmen's sense of social belonging in school was tested in a randomized controlled trial ($N = 92$), and its academic and health-related consequences over 3 years are reported. The intervention aimed to lessen psychological perceptions of threat on campus by framing social adversity as common and transient. It used subtle attitude-change strategies to lead participants to self-generate the intervention message. The intervention was expected to be particularly beneficial to African-American students ($N = 49$), a stereotyped and socially marginalized group in academics, and less so to European-American students ($N = 43$). Consistent with these expectations, over the 3-year observation period the intervention raised African Americans' grade-point average (GPA) relative to multiple control groups and halved the minority achievement gap. This performance boost was mediated by the effect of the intervention on subjective construal: It prevented students from seeing adversity on campus as an indictment of their belonging. Additionally, the intervention improved African Americans' self-reported health and well-being and reduced their reported number of doctor visits 3 years postintervention. Senior-year surveys indicated no awareness among participants of the intervention's impact. The results suggest that social belonging is a psychological lever where targeted intervention can have broad consequences that lessen inequalities in achievement and health.

An important question facing society concerns the origins of inequalities between socially marginalized and nonmarginalized groups. Among the most consequential of inequalities is the poorer school and health outcomes experienced by African Americans, Latino Americans, and other non-Asian ethnic minorities relative to European Americans. These differences occur at all levels of socioeconomic status (*1*–*3*).

Although many structural factors contribute to these inequalities, the present research examines a psychological factor: concern about social belonging. Social belonging—a sense of having positive relationships with others—is a fundamental human need (*4*, *5*). Social isolation, loneliness, and low social status harm not only subjective well-being (*6*) but also intellectual achievement (*7*) and immune function and health (*8*–*11*). Even a single instance of exclusion can undermine well-being (*12*, *13*), intelligence quotient (IQ) test performance, and self-control (*14*).

Members of socially stigmatized groups, such as African Americans, may be relatively more uncertain about their social belonging in mainstream institutions like school and work (*7*). Because their ethnic group is often negatively stereotyped and marginalized, they may be unsure of whether they will be fully included in positive social relationships in these settings (*2*). As the sociologist Erving Goffman wrote, "The central feature of the stigmatized individual's situation in life…is a question of…'acceptance'" (*15*). Uncertainty about belonging, especially when chronic, can undermine minorities' performance (*7*, *16*) and health (*3*, *17*, *18*). Social belonging may thus constitute a psychological lever where targeted intervention could yield broad benefits.

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Such an intervention is reported here. Critical to its rationale is the insight that it is people's subjective interpretations of the quality of their relationships, more so than the objective number or attributes of those relationships, that strongly affects well-being (5, 19). The present intervention, delivered to students during the challenging transition to college, was designed to encourage nonthreatening interpretations of adversity. During the transition to a new school, students can face frequent social setbacks and feelings of isolation. Their well-being and performance may depend, to a great extent, on whether they construe such experiences as evidence that they do not belong.

Because African-American students experience relatively greater uncertainty about their belonging in school, they were expected to benefit from the intervention more than nonminority students (7). Further if, as we intended, the intervention triggered an enduring perceptual change in the encoding of social experience, its effects might persist over time. Short-term effects might compound into long-term effects through a recursive virtuous cycle, in which early performance gains assure students of their belonging in school, which in turn improves their performance, in a repeating feedback loop (20). Students who feel more assured of their belonging may also initiate more social interactions and form better relationships on campus, facilitating their social integration and further benefiting their well-being, performance, and health (21).

The intervention was delivered to two cohorts of African-American ($N = 49$) and European-American ($N = 43$) students in the second semester of their first year at a selective college (22, 23). To assess psychological responses to adversity, we asked participants to complete daily surveys in the first week after the intervention. To assess their long-term sense of belonging, health, and well-being, we asked them to complete an end-of-college survey 3 years later (completion rate 78.26%) (23). At the end of this survey, participants were asked to authorize the release of their complete college academic transcript (authorization rate 97.22%) (23).

Participating students were randomly assigned to either the belonging-treatment condition or a control condition. In cohort 1, participants were recruited through convenience sampling; in cohort 2, through random sampling (23). An additional campus-wide control group was obtained by collecting the anonymized official grade-point averages (GPAs) of all European Americans ($N = 1362$) and African Americans ($N = 194$) in the same class years as participants but who did not participate in the study (23). This group was included in secondary analyses of GPA.

The intervention provided students with a narrative that framed social adversity in school as shared and short-lived (24). This message encouraged students to attribute adversity not to fixed deficits unique to themselves or their ethnic group but to common and transient aspects of the college-adjustment process. Upon arrival in a research lab, participants read a report of the ostensible results of a survey of more senior students at their school. Most students, the report indicated, had worried about whether they belonged in college during the difficult first year but grew confident in their belonging with time. The survey results were said to be consistent across ethnic and gender groups. For instance, one survey respondent was quoted as saying, "Freshman year even though I met large numbers of people, I didn't have a small group of close friends…I was pretty homesick, and I had to remind myself that making close friends takes time. Since then…I have met people some of whom are now just as close as my friends in high school were" (23). Concerns about belonging were thus represented as common at first, as temporary, and as due to the challenging nature of the college transition.

To encourage participants to internalize the message, several steps exploited the "saying-is-believing effect"—the tendency to endorse messages that one has freely advocated (25). Participants were asked to write an essay describing how their own experiences in college echoed the experiences summarized in the survey. They then turned their essay into a speech, which they delivered to a video camera. These materials, participants were told, would be shown to future students to help ease their transition to college. Beyond facilitating internalization, this procedure averted the potential stigma of receiving an intervention, because it encouraged participants to see themselves as benefactors and not as beneficiaries (24, 26). In the control condition, the procedure was the same but the survey addressed topics unrelated to belonging (e.g., change in social-political attitudes) (23). The intervention lasted about 1 hour.
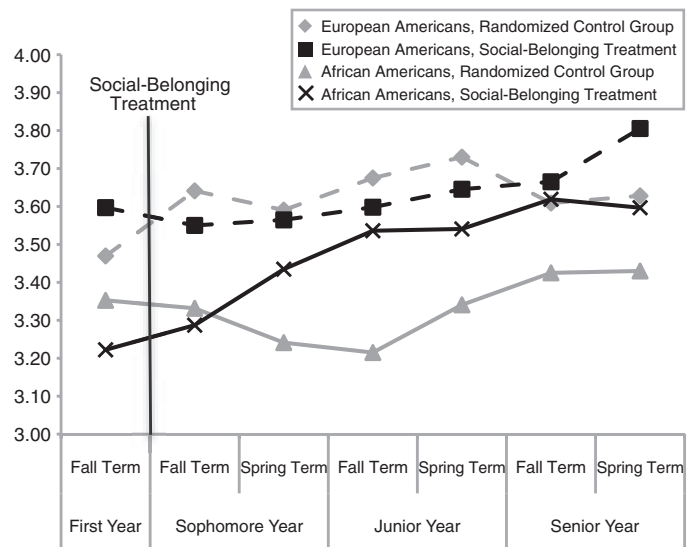
Few analyses were moderated by cohort (i.e., no more than would be expected by chance alone and none involving the primary outcomes of GPA, health, or well-being). Thus, data from the two cohorts were combined to increase statistical power. First, analyses examined the trajectory of students' official GPA over time. In contrast to all other groups, African Americans in the control group showed no improvement in GPA from the fall of their freshman year, the semester before the intervention, through their sophomore, junior, and senior years [linear trend $F < 1$]. By contrast, the GPAs of intervention-treated African Americans rose over time [for linear trend, $F(1,34) = 13.79$, $P = 0.0007$; for time × condition, $F(1,34) = 4.16$, $P = 0.049$]. The GPAs of European-American students also rose over time [$F(1,29) = 6.88$, $P = 0.014$] with no difference by condition [$F < 1$]. As Fig. 1 shows, the intervention set African Americans on an upward trajectory such that the gap between them and their European Americans classmates closed over time. By students' senior year, the gap was cut by 79% (23).

Multiple regression, with student gender controlled, tested the effect of student race and condition (randomized control versus social-belonging treatment) on change in GPA—mean postintervention GPA (sophomore through senior years) minus mean preintervention GPA (fall term, first year) (23). There was no condition effect on preintervention GPA for either racial group [t values < 1] (table S1) (23). However, a significant condition effect on change in GPA emerged for African Americans [$B = 0.30$, $t(65) = 2.54$, $P = 0.014$] with no effect for European Americans [$t < 1$] [race × condition $B = -0.43$, $t(65) = -2.41$, $P = 0.019$]. Virtually identical results were obtained when preintervention GPA was used as a covariate in an analysis of postintervention GPA [treatment effect for African Americans, $B = 0.24$, $t(64) = 2.65$, $P = 0.010$; treatment effect for European Americans, $t < 1$; race × condition: $B = -0.31$, $t(64) = -2.27$, $P = 0.027$]. The intervention closed the minority gap in 3-year GPA (SD = 0.36) from 0.29 points in the control condition to 0.14 points in the treatment condition, a 52% reduction.

Adding the campus-wide sample further supports treatment efficacy. An agreement with uni-

Fig. 1. Raw GPA by student race, experimental condition, and academic term. Means are noncumulative and were combined across cohorts. Ranges in sample sizes and standard errors for European Americans are $N = 25$ to 33 and SE = 0.08 to 0.14; for African Americans, $N = 30$ to 37 and SE = 0.09 to 0.12.

versity officials precludes the reporting of raw or adjusted means in this sample. To honor this agreement but present the results graphically, we performed analyses on residual postintervention GPA with preintervention GPA and gender controlled. Multiple regression on change in GPA and on raw postintervention GPA with preintervention GPA included as a covariate yield virtually identical results (23). As shown in Fig. 2A, treated African Americans had higher residual GPA scores than did African Americans campus-wide [$B = 0.28$, $t(1620) = 3.97$, $P = 0.00008$] and African Americans in the randomized control group [$B = 0.24$, $t(1620) = 2.62$, $P = 0.009$]. The latter two groups did not differ [$t < 1$]. (Fig. 2A) (23).

Illustrating its broad impact, the intervention tripled the percentage of African Americans earning postintervention GPAs in the top 25% of their class, as measured by both residual and raw postintervention GPA, and tended to reduce the percentage of African Americans performing in the bottom 25% of their class on both indices (Fig. 2, B and C) (23).

What accounts for these treatment effects? Daily surveys, collected the week after the intervention, suggest that the intervention buffered African Americans against adversity (23). Among untreated African Americans, feelings of belonging in school rose and fell with the degree of adversity students reported having experienced earlier that day and the day before. As adversity rose, belonging fell (mean within-subjects $R = -0.45$, derived from the average of individual participants' within-subjects correlations, after each was subjected to a Fisher r-to-z transformation) (23). For treated African Americans, this relationship was reduced to nil [mean within-subjects $R = 0.01$], a significant reduction [$t(59) =$

2.99, $P = 0.004$]. In summary, the intervention robbed adversity of its symbolic meaning for African Americans, untethering their sense of belonging from daily hardship (27). Like treated African Americans, European Americans showed little relationship between adversity and belonging [for both conditions, mean within-subjects $R = -0.09$; condition difference, $t < 1$] [race × condition: $t(59) = -2.04$, $P = 0.046$].

These results provide a window into the shift in African-American students' psychology caused by the intervention. This shift benefited their long-term performance. African Americans whose belonging was more robust to daily adversity—whose sense of belonging was relatively independent of their day-to-day adversity—showed greater improvement in their 3-year postintervention GPA [$R = 0.51$, $P = 0.001$] (23). The effect of the intervention in protecting African-Americans students' sense of belonging from daily adversity mediated its effect on their GPA (23). The intervention thus planted a change in social perception that, it appears, accompanied students long after the intervention ended to affect their performance in college.
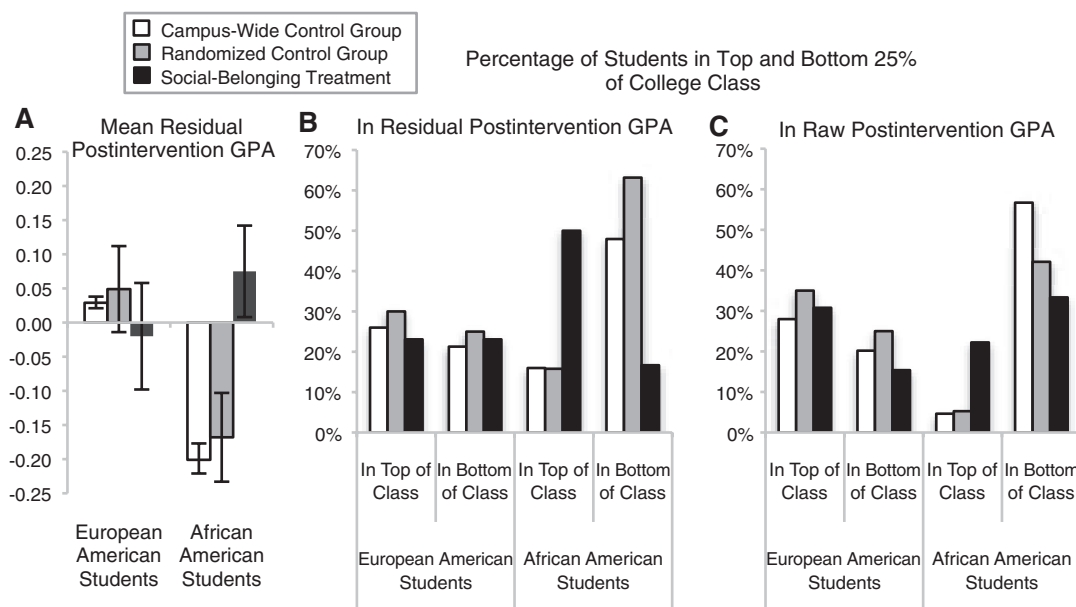
Three years after the intervention, at the end of their college tenure, participants completed a survey to assess long-term effects on psychology, well-being, and health. Also, to assess whether the intervention operated beneath conscious awareness, we asked participants whether they remembered the intervention from 3 years previously, whether they thought it had affected them, and whether they agreed with its message. On no outcome did European Americans differ by condition [t values < 1.35, P values > 0.18]. African Americans, however, showed consistent treatment effects. The race × condition interaction

was not always significant, indicating that the treatment effect was not always larger for African Americans than for European Americans. Degrees of freedom vary because some measures were completed only by participants in cohort 2 (23).

If the intervention lessened how much African Americans' belonging fluctuated with adversity, and if it did so by lessening how much they viewed campus life through the lens of race, then intervention-treated African Americans should (i) report greater stability and less uncertainty about their belonging in school {less agreement with items like, "When something bad happens, I feel that maybe I don't belong at [school name]"} (7) and (ii) exhibit less cognitive accessibility of negative racial stereotypes and self-doubt (23). They did [self-reported belonging uncertainty, $t(36) = -2.01$, $P = 0.052$; accessibility of negative racial stereotypes, $t(66) = -2.01$, $P = 0.049$; accessibility of self-doubt, $t(64) = -2.64$, $P = 0.010$] (Fig. 3) (23).

Given the importance of social belonging for reducing stress and improving immune function and physical health (5, 8–11, 19) and the relatively poorer health experienced by African Americans, even those high in socioeconomic status (3), we examined effects on health. We assessed self-reported health, an important predictor of morbidity and mortality (28), using the five-item general health component of the Medical Outcomes Study Short-Form Health Survey (23). We also asked participants how many times they had visited the doctor in the previous 3 months (cohort 1) or 1 month (cohort 2). African Americans reported being healthier and visiting the doctor less frequently in the treatment condition than in the control condition [$t(32) = 2.48$, $P = 0.019$ and $t(63) = -2.23$, $P = 0.030$,

Fig. 2. Cumulative academic performance from sophomore through senior year. Data were combined across cohorts. (**A**) Residual sophomore-through-senior-year GPAs adjusted for student gender and preintervention (fall term, first year) GPA. Error bars represent ±1 SE. Means represent the degree to which students performed better (positive values) or worse (negative values) than expected after the intervention in GPA units based on their gender and preintervention performance. (**B**) Percentage of students in the top and bottom 25% of their college class in residual postintervention GPA (i.e., postintervention GPA adjusted for student gender and preintervention GPA). (**C**) Percentage of students in the top and bottom 25% of their college class in raw postintervention GPA. For analytic details, see (23). Sample sizes for European Americans are $N_{\text{campus-wide control group}} = 1362$ and $N_{\text{experimental groups}} = 33$; for African Americans, $N_{\text{campus-wide control group}} = 194$ and $N_{\text{experimental groups}} = 37$.

respectively] (Fig. 4, A and B). Whereas 60% of untreated African Americans had seen a doctor recently, only 28% of treated African Americans had [$\chi^2(1, N = 38) = 3.98, P = 0.046$]. The race gap in self-reported health was eliminated in the treatment condition; interestingly, there was no gap for doctor visits (23). Future research should examine whether these patterns generalize to physiological and physical indicators of health (9) to assess the robustness of the effect beyond self-report outcomes and to identify biological pathways (11).

As further evidence of improved well-being, African Americans also scored higher on the Subjective Happiness Scale (23) [$t(35) = 2.61, P = 0.013$] (Fig. 4C). The happiness gap with European Americans higher than African Americans disappeared in the treatment condition (23). The finding of a lasting positive impact on subjective happiness is noteworthy in light of research showing that individual happiness is relatively stable (6).

Participants were unaware of the intervention's effect, suggesting that its efficacy did not depend on conscious awareness. Most students reported that they remembered participating in the study 3 years earlier (79% did). But when asked to describe "the most memorable and important" information they had learned in the study, few recalled the key content of the survey they had read (8% did), and few reported that the study had had "any" effect on their college experience (14% did) (table S3). There was no condition difference on any of these outcomes for African Americans [$\chi^2(1, N = 37$ to $38)$ values < 1.40, P values > 0.20]; treated African Americans ascribed no more effect to the study than untreated African Americans. However, indirect measures of recall and beliefs did show treatment effects. When asked to "guess" the process of change described in the survey they had read, more treated than untreated African Americans wrote that it concerned how students' social experiences in college improve over time (50% versus 20%) [$\chi^2(1, N = 38) = 3.79, P = 0.052$]. Additionally, treated students endorsed this message. When asked to describe their own experiences, more treated than untreated African Americans volunteered that their own social experiences in college had improved over time (50% versus 20%) [$\chi^2(1, N = 38) = 3.79, P = 0.052$]. The subtle nature of this intervention, with its influence occurring outside conscious awareness (29), may contribute to its efficacy. In some cases, conscious awareness may undo the effects of an intervention (30). More overt interventions risk sending the stigmatizing message that the beneficiaries are seen as in need of help. They may also cause resistance and reactance and undermine the sense of accomplishment people take in their success (26).

This study provides an experimental, longitudinal demonstration that a brief intervention to buttress feelings of social belonging can have significant effects on a wide range of important outcomes. The social-belonging intervention im-

proved the academic performance, self-reported health, and well-being of ethnic minority students over 3 years. The results suggest that inequality between marginalized and nonmarginalized groups arises not only from structural factors but also from concern about social belonging.

This concern can be mitigated by using a psychological remedy. The intervention provided students a nonthreatening frame for interpreting the daily challenges of school. By encouraging students to adopt this message as their own, the intervention made this message stick psychologically. Along with other recent research, this study

highlights how the impact of adversity depends on its perceived meaning—how it is subjectively construed (24–26, 31–33). Changing subjective construal is a fruitful avenue for intervention because many events are ambiguous and amenable to multiple interpretations. Moreover, a change in construal can become self-reinforcing. Students who feel confident in their belonging may experience the social world in a way that reinforces this feeling. They may initiate more relationships and thus obtain more opportunities for belonging and growth. Brief interventions that shore up belonging can thus promote performance
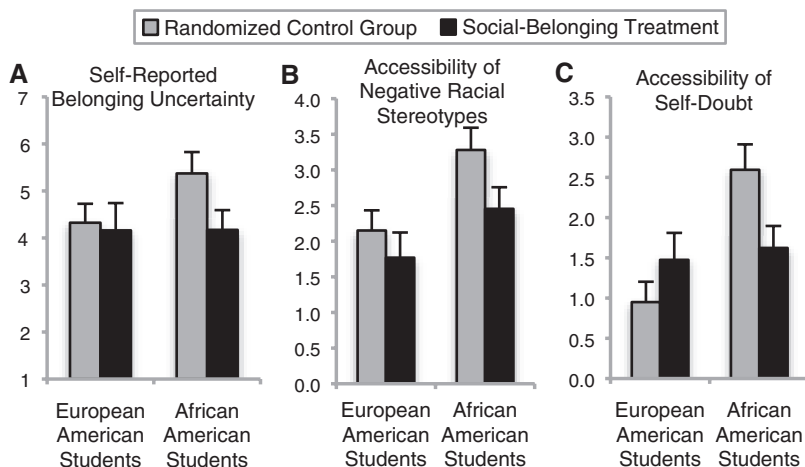

Fig. 3. Self-reported belonging uncertainty and the cognitive accessibility of negative racial stereotypes and of self-doubt 3 years postintervention. Error bars represent ±1 SE. Data were combined across cohorts where measures were completed by both cohorts. (**A**) Self-reported belonging uncertainty (cohort 2). (**B**) Accessibility of negative racial stereotypes (cohorts 1 and 2). (**C**) Accessibility of self-doubt (cohorts 1 and 2). The y axis in (A) represents the full range of the scale. The y axes in (B) and (C) represent about 3.00 standard deviations. Sample sizes in cohort 2 only are $N_{\text{European Americans}} = 20$ and $N_{\text{African Americans}} = 23$. Sample sizes in cohorts 1 and 2 are $N_{\text{European Americans}} = 31$ and $N_{\text{African Americans}} = 38$.
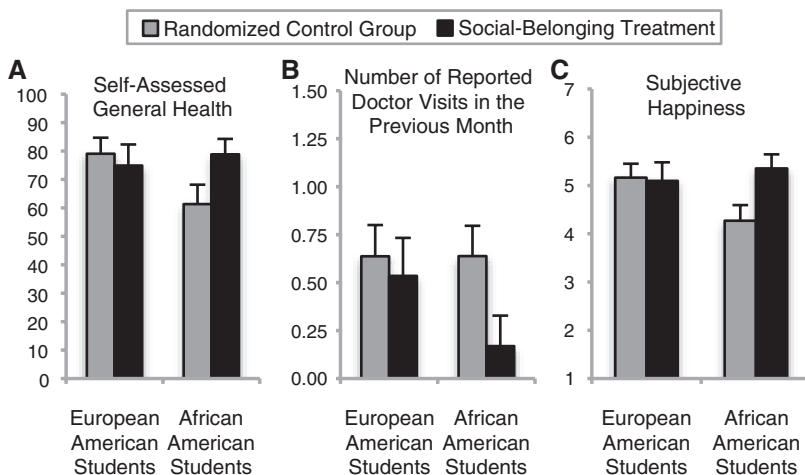

Fig. 4. Self-reported health and happiness 3 years postintervention. Error bars represent ±1 SE. Data were combined across cohorts where measures were completed by both cohorts. (**A**) Self-assessed general health (cohort 2). (**B**) Reported doctor visits in the previous month (cohorts 1 and 2). (**C**) Subjective happiness (cohort 2). The y axes in (A) and (C) represent the full range of each scale. The y axis in (B) represents about 2.00 standard deviations. Sample sizes in cohort 2 only are $N_{\text{European Americans}} = 20$ and $N_{\text{African Americans}} = 23$. Sample sizes in cohorts 1 and 2 are $N_{\text{European Americans}} = 31$ and $N_{\text{African Americans}} = 38$.

and well-being even long after their delivery (*7, 20, 25, 31, 34*).

Importantly, the effectiveness of social-psychological interventions depends on factors in the context. Such interventions are unlikely to be effective in contexts without opportunities for learning. Also, because the present intervention works by changing people's subjective interpretation of ambiguous events, it may be ineffective in openly hostile environments. Lastly, whether this intervention would work among younger or less-select students, or students from other marginalized groups, is an important question for future research (*20, 31, 34*). These qualifications noted, the results underscore the importance of social belonging and subjective construal in contributing to social inequality and show how this insight can inform our collective efforts to promote equality in performance, health, and well-being.

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35. We thank participating students and helpful administrators at an anonymous university for their involvement. We also thank P. Carr, E. Chen, C. Dweck, C. Logel, G. Miller, D. Paunesku, D. Sherman, S. Spencer, C. Steele, and D. Yeager for input and L. Cai, K. Crockett, J. Darwall, L. Egan, A. Master, M. Silverio, and R. Titcombe for assistance. This research was supported by grants from the American Psychological Association, the Society for the Psychological Study of Social Issues, and the Spencer Foundation awarded to G.M.W. and by a grant from the Russell Sage Foundation awarded to G.L.C.

Direct Interaction of RNA Polymerase II and Mediator Required for Transcription in Vivo

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Gene transcription is highly regulated. Altered transcription can lead to cancer or developmental diseases. Mediator, a multisubunit complex conserved among eukaryotes, is generally required for RNA polymerase II (Pol II) transcription. An interaction between the two complexes is known, but its molecular nature and physiological role are unclear. We identify a direct physical interaction between the Rpb3 Pol II subunit of *Saccharomyces cerevisiae* and the essential Mediator subunit, Med17. Furthermore, we demonstrate a functional element in the Mediator–Pol II interface that is important for genome-wide Pol II recruitment in vivo. Our findings suggest that a direct interaction between Mediator and Pol II is generally required for transcription of class II genes in eukaryotes.

Mediator is a large multisubunit complex conserved in all eukaryotes (*1*). It acts as a link between specific protein regulators and the RNA polymerase II (Pol II) transcription machinery (*2*). Mediator is required at most Pol II–transcribed gene promoters for regulated gene expression (*3–5*). In *Saccharomyces cerevisiae*, Mediator is composed of 25 subunits and is organized in four structural modules: the tail, middle, head, and Cdk8 modules (*6*). A direct Mediator–Pol II interaction is indicated by previous copurification, coimmunoprecipitation (CoIP) experiments (*7–9*) and by in vivo formaldehyde cross-linking (*10*). A model of the Mediator–Pol II complex determined by electron

microscopy (EM) at 35 Å resolution suggests that several Pol II subunits (Rpb1, 2, 3, 6, and 11) might contact the middle or the head of Mediator (*11*). It was recently suggested that Rpb4 and Rpb7 could also be implicated in interactions with Mediator (*12–14*). However, the requirement of a direct interaction between Mediator and Pol II for transcription activation has not been demonstrated. Moreover, the identity of the Mediator subunits contacting Pol II is unknown because of the low resolution of the Mediator structure. As a consequence, the mechanism by which Mediator recruits Pol II is poorly understood.

To identify the subunit(s) of Mediator that directly contact Pol II and determine the role of these interactions in transcription regulation, we used an in vivo photo–cross-linking approach based on the incorporation by the cell-translation system of photo-activable analogs of methionine and leucine in proteins [see supporting online material (SOM) text and figs. S1 and S2] (*15, 16*).

Because EM results (*11*) suggested potential interactions of 16 Mediator subunits belonging to the head (Med6, 8, 11, 17, 18, 19, 20, 22) and middle (Med1, 4, 5, 7, 9, 10, 21, 31) modules with Rpb1, 2, 3, 6, or 11 Pol II subunits, we immunoprecipitated hemagglutinin (HA)–tagged proteins after in vivo cross-linking. Among the 80 pairwise contacts that we tested, only Myc-tagged Rpb3 and HA-tagged Med17 cross-linked (Fig. 1). These results demonstrate that the Rpb3 Pol II

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