Assessing "Readiness to Embrace Diversity": An Application of the Trans-Theoretical Model of Behavioral Change

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Abstract

We apply the Transtheoretical Model of intentional behavioral change to the behavior of "embracing diversity" at a major research University. We use survey methods to ask individuals questions about the existence of a problem in their environments, whether their units are investigating ways to solve the problem, and whether their units have taken action. We then aggregate the responses of individuals to create a department-level measure of "readiness to embrace diversity" in the department. We find that faculty at this University appear to be taking action on problems of gender and racial/ethnic diversity in their departments, even while denying the existence of the problems. Women faculty appear to be more aware of diversity-related problems in their departments (both for women and for minorities), and they are less optimistic than men that their units are investigating the problems or taking action. Humanities and Social Science departments appear to be farther along towards "embracing diversity" than are departments in the Biological and Physical sciences, and all departments appear to be more aware of issues surrounding racial/ethnic diversity than gender diversity on the dimensions about which we asked (hiring, climate, and leadership.) Limitations of the methods used are discussed, as well as future directions for research.

Introduction

Despite advances, women and members of racial and ethnic minority groups continue to be underrepresented in almost all science and engineering (S&E) fields, nationally (CAWSMET 2000; Vetter 1994; George et. al. 2001; NSF 2003). In 1999, women constituted 36% of life scientists, 23% of physical scientists, 9% of engineers, and 27% of computer scientists, and 85% of the S&E workforce was of white, non-Hispanic race and ethnicity (National Science Foundation 2003). In many areas of science and engineering (e.g., biology), women make up a sizeable proportion of the undergraduate population, but this percentage decreases as one moves up the academic pipeline to the graduate, postdoctoral, and faculty levels. In other disciplines (e.g., engineering, computer science), women are still under-represented at the undergraduate level. Under-represented minorities (URMs) have not even begun to enter the undergraduate levels of these fields in any appreciable manner; their presence in the tenured ranks is extremely rare, and not at all in proportion to their presence in the general population (in 1997, 11% of tenured professors are racial or ethnic minorities, compared to 24% of earned doctors in S&E awarded to non-whites/non-Hispanics (1997 figures: NSF 2003; Trower and Chair 2002).

The National Science Foundation (NSF) is concerned about the lack of diversity in the science and engineering workforce (National Science Foundation 2003), and has initiated a number of innovative programs designed to address some of the problems in the academic pipeline. For URMs, the NSF has two programs that use an alliance model to address the presence of URM students at the undergraduate level (the LSAMP program) and the graduate/postdoctoral level (AGEP) in the sciences and engineering. A newer program is the NSF ADVANCE program, which was designed to address *institutional* factors affecting the

presence of women in the academic science and engineering faculty and administration (National Science Foundation 2001). The University of Wisconsin-Madison was one of the first nine recipients of an ADVANCE grant. In this paper, we present results from research supported by this grant regarding the attitudes and actions of faculty and their departments on diversity issues.

A Theory of Behavioral Change

The goal of the NSF ADVANCE grant is to create "institutional change" such that gender equity is assured through institutional policy, a positive campus climate, and ultimately gender parity in numbers, salary, resources, and career progression between women and men in the sciences and engineering (S&E). Taking the numerical lack of women in the faculty ranks in S&E as evidence that institutional transformation is required, we began to consider the changes that must occur at our institution in order for gender parity to be woven into the very fabric of the University.

At the individual level, considerable research has been done on effecting intentional behavioral change in health risk behaviors, particularly smoking cessation (Zimmerman, Olsen & Bosworth 2000; Prochaska, DiClemente & Norcross 1992). Prochaska and DeClemente (1983) put forth a useful paradigm based on the observation that individuals generally go through a series of five stages as they prepare for and then engage in a new behavior. They call this "stages of change" concept the *Transtheoretical Model* (TTM) because it incorporates aspects of several theories of behavioral change (Prochaska & Velicer 1997). As used in smoking cessation, these five stages are:

1. Pre-contemplation. Smokers at this stage are unaware that a problem exists for them personally with smoking.

2. <u>Contemplation</u>. Smokers at this stage are aware that a problem exists, and are thinking about making a behavioral change in the future.

3. <u>Preparation</u>. At this stage, a smoker is feeling confident that making a change is possible and planning to make such a change in the immediate future. Actions such as setting a quit date, purchasing a nicotine patch kit, or cutting down on the number of cigarettes smoked would indicate a smoker at this stage.

4. <u>Action</u>.   The smoker has engaged in the desired action of quitting.

5. <u>Maintenance</u>.   Smokers continue to engage in the new, desirable behavior and avoid relapse. In former smokers the experience of improved health and well-being after cessation facilitates successful maintenance. One goal is to change social norms so that reinforcement for the desired behavior surrounds us, and undesirable behavior (smoking) becomes socially unacceptable (Fiore and Baker 1995).

Not everyone follows a linear path through these changes and the direction is not always forward (Prochaska, DiClemente & Norcross 1992). Nevertheless, since its introduction, this framework has been applied extensively to modify both positive and negative health risk behaviors (Prochaska et. al. 1994; Keller et. al. 2001; Nigg et. al. 1999; Levesque, Gelles & Velciver 2000; Marshall & Biddle 2001; Rakowski et. al. 1998). Several basic tenets of this model can be applied to any intentional behavioral change. Specifically, before engaging in a purposeful action an individual must feel competent to do so (self-efficacy) and believe that the "pros" favoring an action outweigh the "cons" of such action (Bandura 1977; Velicer et. al. 1985). Velicer et. al (1985) refer to the latter as a change in "decisional balance." To promote

self-efficacy and stimulate a shift in decisional balance, certain strategies to promote change appear to be more effective at different stages (Rakowski et. al. 1998).

Because organizational behavior is the aggregation of the behavior of individuals within that organization (Porras & Robertson 1992; Prochaska, Prochaska & Levesque 2001), we expect that changing the institution is predicated on changing the behavior of individuals and in this regard the Transtheoretical Model has much to teach us (Prochaska et. al. 2001). This framework has effectively been adapted and used to effect institutional change in at least one organization (Prochaska 2000; Levesque, Prochaska & Prochaska 1999), and we use this model in our assessment of the University in its readiness for change in adapting to creating a more diverse faculty.

Applying the TTM to Diversity Issues in Academia

In our view, the lack of a diverse faculty in S&E is an unhealthy situation for a University, much like smoking is an unhealthy behavior for an individual. A diverse faculty (in terms of gender, race/ethnicity, sexual orientation, parenting status, discipline, method, religion, degree-granting institution, or any other category) provides a richer learning environment for all—students, staff, and faculty—and fosters innovation in ways that a homogeneous group cannot (Turner 2000, 2002; Smith 1997). We see parallels between the way smokers move along the five stages of change and the ways a person, department, or University might change their attitudes as they begin to embrace diversity.

As with behavioral change for smokers, we theorize that faculty, departments, and the University will go through five stages of change as they progress towards embracing diversity among their faculty:

1. Pre-contemplation: Little attention is given to diversity issues, and faculty, staff and administrators do not see a problem with a lack of diversity amongst their ranks. In many cases, they do not even "see" that they have no female or non-white colleagues, or if it is pointed out, they do not see anything amiss in the situation.

2. Contemplation: The lack of diversity is now "seen", and is perceived as a problem.

3. Preparation: Now that the problematic aspects of homogeneity to the organization are recognized, faculty, staff and administrators begin making plans to address the situation. They may hire experts, read books, ask for advice from administrators, or make other preparations to make change.

4. Action: Active steps to address the identified diversity problem have been made. For example, recruiting efforts have changed to address diversity; changes have been made that will positively affect departmental climate for women and/or minorities; steps to move women and/or minorities into leadership positions have been taken.

5. Maintenance: Once action has been taken on a diversity issue, vigilance must be maintained in order to prevent "relapse"; i.e., a movement back to the old customs and habits that caused the gender/racial disparity to appear in the first place.

Several features of the TTM make it attractive for use in our mission to "transform" the UW-Madison. First, in the absence of major change in the numbers of women or URMs in the S&E faculty, it allows us to gauge whether progress has been made (that is, have we at least advanced from "pre-contemplation" to "contemplation.") Second, if we can categorize an individual or a department into one of the five stages, then we can create a more appropriate intervention for the individual/department, based upon their readiness to change.

Evaluating the TTM at the UW-Madison

A planned survey of all faculty in the sciences and engineering at UW-Madison gave us the opportunity to evaluate whether we could apply this model, and assess the readiness for change of *departments* in embracing a diverse faculty. We chose to focus on departments as our unit of analysis because (1) we wanted to look at organizations rather than individuals as per our goal of making institutional change; (2) departments were the smallest unit we could reasonably measure that would be meaningful; (3) using what we know about certain departments based on interview and anecdotal data, we could ascertain whether there is face validity to our results.

We provided statements designed to assess stage of change in three key areas—recruitment, climate, and leadership. We asked the questions first about women in a department, and then "faculty of color" (i.e., faculty who are members of racial and/or ethnic minority groups.) The questions are reproduced as Figure 1. Many faculty expressed their displeasure with these questions, and difficulty in answering them, especially in departments with many women and/or minorities. The reason for this is that the survey instrument was specifically designed for faculty in the Biological and Physical sciences only; these departments have few women faculty, and even fewer faculty of color. Just before going into the field, the Office of the Provost expanded the survey to all faculty. Although we knew that many faculty in Social Studies and Humanities departments would have difficulty with the questions, we opted to keep the questions in the survey because they are addressing an important evaluation question for our program, even at the risk of alienating respondents from these non-S&E departments.

Previous researchers have found that for a desired behavioral change, the numbers of people along the pre-action stages of change tends to decrease as the stage increases. So, approximately 40% of individuals are at Pre-contemplation and Contemplation stages, while

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20% are at the Preparation stage (Velicer et. al. 1995; Laforge et. al. 1999). Although progression through the stages is not linear (Prochaska, DiClemente & Norcross 1992), we would expect that if a department is at the Action stage (for example), it would also have at least passed through the lower stages in the model (Contemplation and Preparation.) Referring to Figure 1, we expected that those who disagree with items a, d, and g would be highest; those who agree with a/d/g would outnumber those who agree with b/e/h, and those who agree with c/f/i would be the fewest in number.

Results

Sample & Response Rates

The *Study of Faculty Worklife* questionnaire was mailed to a total of 2,254 faculty (including 38 clinical faculty in the School of Veterinary Medicine.) Of these, 33 surveys were non-sample cases (undelivered with no forwarding address; away for the duration; or not eligible respondents), leaving a total sample size of 2,221.

As shown in Table 1, 1,340 faculty and clinical faculty returned surveys, giving an overall response rate of 60.3%. Faculty and clinical faculty had similar response rates; thus, when clinical faculty are removed from the sample, the response rate of tenure-track faculty remains the same at 60.3%. In the following report, all clinical faculty are included in the sample.

Except for finding that women are more likely to respond to the *Study of Faculty Worklife at UW-Madison* questionnaire, and male tenured faculty of color are less likely to respond, it does not appear that the sample of responders to our survey is biased in any significant way based on differential response rates by several basic demographic categories.

Where differential response does arise, however, these patterns must be kept in mind while analyzing the survey data. (Details are available upon request.)

Aggregate Results: Percent Agreeing With Statements

Table 2 reports results from all diversity items, comparing responses of women and men, and minority and majority faculty. The results for the whole sample ("All Faculty") are reported as well. An asterisk indicates a significant difference between men and women, and/or between white and non-white faculty responses, at the *p*<.05 level. Regarding the *Recruitment of Women/Minority Faculty* (survey items 54a, 54b, 54c, 55a, 55b, and 55c), we expected to see many faculty agree that there were too few women/faculty of color in their departments; a fewer number agree that their departments have identified ways to recruit women/faculty of color; and even fewer to agree that their departments are actively recruiting women/faculty of color.

What we found instead is an inversion of our expectations. Half of faculty agree that there are too few women in their departments; two-thirds (66.3%) agree that their departments have identified ways to recruit women faculty, and four-fifths (81.2%) report that their departments are actively recruiting women faculty. Although not quite the same pattern (many more faculty report that there are too few faculty of color in their departments—79.8%), we still see that fewer faculty agree that their departments have identified ways to recruit faculty of color (47.0%) than are actively recruiting (61.3%).

Women are significantly less likely than men faculty to agree with every statement, except that they are more likely to agree that there are too few faculty of color in their departments than are men[1]. Faculty of color are less likely than majority faculty to agree that

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[1] It may seem strange that women are less likely to agree that there are too few women in their departments, until one remembers that women tend to be concentrated in departments with large numbers of women in them, while

there are too few women in their departments, and are also less likely to agree that there are too few faculty of color in their departments. Faculty of color are significantly less likely to agree that their departments are taking steps to recruit faculty of color, compared to majority faculty.

Climate for Women and Minority Faculty

Next, the statements about climate for women and minority faculty (survey items 54d, 54e, 54f, 55d, 55e, and 55f) show some similar patterns to those of the recruitment questions, although not as striking. We reverse-coded questions 54d and 55d so that "agreement" indicates that a problem exists. Overall, the responses to the questions were also unexpectedly "inverted" (that is, fewer faculty thought the climate was not good; more felt their departments had identified ways to enhance climate; and even more felt their departments had taken action on climate.) These questions were difficult for many faculty to answer, because if they felt that the climate in their department was good, then to answer that no steps have been taken to improve the climate makes the department look "bad" when in fact things are good to begin with. In retrospect, perhaps we should have asked whether the department has ever assessed the climate for women/faculty of color, rather than asking a question that appears to assume the climate is bad.

Most faculty agree that the climate for women and minority faculty in their departments is good—84.9% feel the climate for women faculty is good, and fewer agree that the climate for faculty of color is good (73.8%). Women faculty are significantly more likely to indicate a gender climate problem in their departments compared to men (26.9% vs. 9.8%); still, almost three-fourths of women feel their departmental climate is good. Faculty of color are more likely to disagree that climate for faculty of color is good in their departments compared to majority

many men are found in departments with only one or two women. Looking only at departments with 35% women or fewer, significantly more women agree with the statement than do men.

faculty (33.3% of minority faculty think there is a bad climate for minorities in their departments, compared to 24.6% of majority faculty).

Almost equal percentages of respondents report that their departments have both identified ways to enhance climate for women/faculty of color, and have taken steps to enhance climate for women/faculty of color. Again, women are less likely to agree to either of these statements compared to men—both for climate for women, and climate for minority faculty. Faculty of color are not significantly different from their white counterparts, however, in their evaluation of the steps their departments are taking to address climate issues for women and minorities.

Finally, survey items 54g, 54h, 54i, 55g, 55h, and 55i address leadership opportunities for women and minority faculty in departments. Again, we see a pattern of responses that is "inverted" from what we expected to see. Less than half of faculty respondents feel that there are too few women in leadership positions in their departments (42.4%); more than half agree that their departments have identified ways to move women into leadership positions (59.2%), and about two-thirds (67.9%) agree that their departments have actively promoted women into leadership. Except for the large numbers of faculty who agree that there are too few faculty of color in leadership positions in their departments (71.0%), again we see that fewer faculty agree that ways to move faculty of color into leadership have been identified (38.2%) than agree that their departments are actively recruiting faculty of color into leadership positions (45.9%).

Once again, women faculty have different views on these issues than do men faculty. More women faculty than men agree that there are too few women and faculty of color in leadership positions in their departments, and significantly fewer women faculty agree that ways have been identified to promote women and minority faculty to leadership, or that women and

faculty of color have actively been recruited into leadership positions. No statistical differences between minority and majority faculty in agreement on the leadership items was observed.

Assigning Departments to Stages of Change

Our goal in preparing these questions was to be able to aggregate responses for a department, in order to assign departments to one of five "stages of change" as defined above. The results we see at the individual level gave us a hint, however, that this would not be the straightforward task we thought it might. The finding that many more faculty (especially men faculty) think that their departments are taking action on problems that they do not agree exist in their departments indicate that either (1) the problems really don't exist and all departments are at the "action" and/or "maintenance" levels, or (2) the problems exist and the departments are imposing solutions without the buy-in from rank-and-file faculty.

In order to assign "stages" to a department for the six different areas, we first aggregated results for departments with five or more faculty respondents (N=98 departments.) Next, we created a pattern code for each of the six areas, indicating the ordering of % agreement on each of the three indicators for each areas. As an example, the % of all department faculty agreeing with the three items that make up the "recruitment of women faculty" area (54a, 54b, and 54c) were computed, and rank ordered; four possible combinations resulted (a-c-b, b-c-a, c-a-b, and c-b-a.) Then, these codes were merged with information about the actual percentage of women in each department, an "objective" measure of whether the department has made progress in the area of "recruitment of women faculty." These two pieces of information were combined to place departments into the four different stages (we did not assign any departments to the Maintenance stage.)

Departments who were assigned to the "precontemplation" stage generally follow a pattern whereby the percentage of faculty who acknowledge a problem for a given area in their department is less than the percentage of faculty who say the department is actively doing something about the problem, *given the existence of a problem based on other evidence[2]*. Departments assigned to the "contemplation" stage generally follow the pattern of having the highest percentage of faculty agree there is a problem in a given area, and fewer agreeing that the problem has been investigated or acted upon. Departments assigned to the "preparation" stage generally have the highest percentage of their faculty agreeing that the department is investigating the problem. Finally, departments assigned to the "action" stage generally show high levels of taking action in a given area, and closely-following agreement that there is a problem in that area or outside evidence that the problem is less in that department.

Using these guidelines, we were able to assign our 98 departments to the four different stages of change; results are shown in Table 3. Departments are grouped into four divisional levels, to keep the individual assignment of departments confidential. Table 3 shows interesting patterns of assignment. First, biological and physical science departments appear to be more highly concentrated in the pre-contemplation/ contemplation categories than are departments in the social studies and humanities divisions. Second, all departments appear to be somewhat more along the stages of change for minorities than for women, with the exception of climate issues. In the case of climate, departments are more often at the pre-contemplation stage when the issue is departmental climate for racial and ethnic minority faculty, rather than women faculty. Finally, departments appear to be farther along on issues of leadership than they are on issues of either recruitment or climate for women and minority faculty.

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[2] The "objective evidence" for both recruitment and for leadership is the % of women/minorities in a department. For climate, it is the % of women/minorities disagreeing that climate for women/minorities in their department is good.

Next Steps

Although the assignment of departments to these "stages of change" may be useful in our development of gender equity interventions in S&E departments, we also hope to use these assignments as possible explanatory variables in models assessing other measures from our climate survey. For example, we would like to know whether being in a pre-contemplation department in regards to gender climate significantly affects women's job satisfaction or consideration of leaving the University. We would like to know whether being in a pre-contemplation department significantly affects the mental health of faculty in that department, or whether faculty in departments at the action stage feel more respected by colleagues and less isolated. These analyses are forthcoming.

Limitations of the Method

The assignment of stages to departments depends to a great deal upon the "objective" measures we chose for each of the six areas. The "percentage of women/minorities" measure chosen for both the recruitment and the leadership questions leaves something to be desired. For recruitment, a better measure might be to compare the actual percentage of women/minority faculty in the department to the number expected based on the composition of PhDs offered in the discipline. For leadership, a measure of women/minority leaders in the department compared to the numbers available for such positions would be a better measure. Finally, using the answers of women/minorities on the climate answers as a basis for comparison to men/majority faculty answers was problematic because of the low numbers of women/minorities in many departments, leading to a great deal of missing data. In future work, these problems must be addressed.

Second, there were many 'ties' in the actual data, and decisions had to be made about which item to prioritize in these conditions. For example, there were some departments for whom the percentage of faculty agreeing with all three items in an area was exactly the same for each item. What pattern do we assign the department in such a case? The decisions we made affected which stage of change the department was assigned. We made a rule and applied it uniformly; still, the consequences of these decisions have not been adequately tested.

Discussion

The results we obtained in our attempt to ascertain the "readiness for change" in regards to diversity issues at the UW-Madison were unexpected, yet surprisingly illuminating. The most striking finding is that the percentages of faculty agreeing with the statements (designed to represent increasing commitments to diversity along the 5 stages of change) did not decrease as the stage of change increased, but rather increased. Our interpretation of these findings is that departments are being pushed to move ahead with actions that should increase the diversity of faculty in their departments before they are ready to make those changes. It is common wisdom in organizational management sciences (Winum, Ryterband and Stephensen 1997; Conner 1992; Prochaska, Prochaska and Levesque 2001) that organizational leaders are almost always ahead of the rest of organizational members in the initiation of organizational change; indeed, an industry of consultants has appeared that will go into an organization and assess the rank-and-file employees' readiness to make a change that the management wants to make; they make recommendations to management about how to go about change based on how ready the employees are to adopt the new practice or technology. Perhaps that is what has happened at UW-Madison. Departments have been pushed to create more diverse faculties, and faculty have implemented the recommended changes without truly believing in the change; little thought is

given to whether the change is needed in the department, or what the optimal strategy to creating the desired outcome would be.

Another finding of great interest in these data is that women faculty are much less optimistic about the changes occurring in their departments regarding the recruitment of, climate for, and leadership of women and minority faculty than are men faculty. Aside from the question of numbers ("there are too few women faculty in my department"), women consistently agree less than men that diversity measures are identified in their departments, and that diversity measures are implemented in their departments. This is true both when the "diversity" in question refers to women, and to faculty of color. The reverse is not true, however. Faculty of color are not less likely to agree with these statements compared to majority faculty when the statements refer to women; they do not consistently agree less than majority faculty to the statement when they refer to faculty of color, either.

Finally, we have been able to use these data to assign departments to a stage of change as we had planned. The distribution of departments appears to have some face validity, and more work will have to be done to assess the relationship between a department's "readiness to embrace diversity", and other important measures from our survey instrument.

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Figure 1.

Diversity Issues at UW-Madison

54. With respect to the recruitment of, climate for, and leadership of women faculty, how much would you agree or disagree with the following statements about your primary department/unit?

Circle one number on a scale of 1 to 4.	Agree Strongly 1	Agree Somewhat 2	Disagree Somewhat 3	Disagree Strongly 4	Don't Know
a. There are too few women faculty in my department.	1	2	3	4	DK
b. My department has identified ways to recruit women faculty.	1	2	3	4	DK
c. My department has actively recruited women faculty.	1	2	3	4	DK
d. The climate for women in my department is good.	1	2	3	4	DK
e. My department has identified ways to enhance the climate for women.	1	2	3	4	DK
f. My department has taken steps to enhance the climate for women.	1	2	3	4	DK
g. My department has too few women faculty in leadership positions.	1	2	3	4	DK
h. My department has identified ways to move women into leadership positions.	1	2	3	4	DK
i. My department has made an effort to promote women into leadership positions.	1	2	3	4	DK

55. With respect to the recruitment of, climate for, and leadership of faculty of color, how much would you agree or disagree with the following statements about your primary department/unit?

Circle one number on a scale of 1 to 4.	Agree Strongly 1	Agree Somewhat 2	Disagree Somewhat 3	Disagree Strongly 4	Don't Know
a. There are too few faculty of color in my department.	1	2	3	4	DK
b. My department has identified ways to recruit faculty of color.	1	2	3	4	DK
c. My department has actively recruited faculty of color.	1	2	3	4	DK
d. The climate for faculty of color in my department is good.	1	2	3	4	DK
e. My department has identified ways to enhance the climate for faculty of color.	1	2	3	4	DK
f. My department has taken steps to enhance the climate for faculty of color.	1	2	3	4	DK
g. My department has too few faculty of color in leadership positions.	1	2	3	4	DK
h. My department has identified ways to move faculty of color into leadership positions.	1	2	3	4	DK
i. My department has made an effort to promote faculty of color into leadership positions.	1	2	3	4	DK