Talking Shop and Shooting the Breeze: A Study of Workplace Conversation and Job Disengagement Among STEM Faculty

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Abstract
Past research has examined women’s subjective satisfaction in science, technology, engineering, and math (STEM), but the actual events that correlate with disengagement have not been identified. In this study, workplace conversations of 45 female and male STEM faculty were sampled using the Electronically Activated Recorder, a naturalistic observation method, coded for research or socializing content, and correlated with self-reported job disengagement. Both men and women were less likely to discuss research in conversations with female as compared to male colleagues, and when discussing research with men, women were rated as less competent than men. Consistent with the idea that women in STEM experience social identity threat, discussing research with male colleagues was associated with greater disengagement for women, whereas socializing with male colleagues was associated with less disengagement. These patterns did not hold for men. These findings point to the unique challenges women face in STEM disciplines.

Keywords
social identity threat, job disengagement, naturalistic observation, gender

It is not unusual to walk into a chemistry department and find only one or two female names on the faculty roster. Such an imbalance in science, technology, engineering, and math (STEM) disciplines has clear implications for the challenges of attracting new women to science, but it is also likely to affect the day-to-day experience of women who find themselves in these token positions. Although survey research has established that STEM women are more often dissatisfied with their jobs (Robertson & Bean, 1998; Settles, Cortina, Malley, & Stewart, 2006; Settles, Cortina, Stewart, & Malley, 2007; Singh, Mishra, & Kim, 1998), a nuanced picture of women’s experience in STEM disciplines can only emerge when these self-reported feelings of disengagement are supplemented by objective behavioral data in a multi-method framework (Eid & Diener, 2005). The current study used a novel, naturalistic observation method, the Electronically Activated Recorder, or EAR (Mehl, Pennebaker, Crow, Dabbs, & Price, 2001; Mehl, Vazire, Holleran, & Clark, 2010; Mehl, Vazire, Ramirez-Esparza, Slatcher, & Pennebaker, 2007), to sample the actual (acoustic) work environment of male and female STEM faculty over a period of several days. This technique allows us to identify objective features of workplace conversations that correlate with job disengagement. We focus on two types of conversations that should be particularly relevant to women’s experience in the STEM workplace: research and social conversations.

Workplace Interactions

Research conversations. In academia, research productivity tends to be the most important factor in faculty performance evaluations and tenure decisions (Luke & Doke, 1987). Given the role that colleagues play in fostering collaborations and providing a sounding board for new ideas, faculty members need a collegial and supportive network to thrive as successful researchers (Singh et al., 1998). Thus, the default expectation is that discussing research with colleagues should be associated with greater engagement with one’s work. But in disciplines where women are underrepresented and targeted by negative stereotypes, talking shop could have somewhat different implications for women than for men. On one hand, because women might be susceptible to feeling a lack of belonging in STEM disciplines due to their minority status and experience of social identity threat (Murphy, Steele, & Gross, 2007; Niemann &
Dovidio, 1998; Walton & Cohen, 2007), they might reap additional psychological benefits from research conversations with male colleagues. Discussions of research with male colleagues could uniquely afford opportunities to validate their ideas, helping to shore up feelings of acceptance in the departmental community.

However, it is also conceivable that such conversations could cue negative stereotypes about women’s presumed inferiority in math and science that could interfere with cognitive processing and promote disengagement (Davies, Spencer, Quinn, & Gerhardstein, 2002; Schmader & Johns, 2003; Steele, 1997). Such threat reactions have been shown in situations where women must perform or consider engaging in math-related tasks in the presence of competent men (Inzelicht & Ben-Zeev, 2000; Marx & Roman, 2002; Murphy et al., 2007). If these results with undergraduate participants translate to a sample of actual faculty members, then research conversations with male colleagues might be associated with greater disengagement uniquely among female faculty members. These two alternative predictions were tested.

Social conversations. In any workplace environment, colleagues do not just talk about task-relevant information; they also spend some amount of time socializing. These informal, non-work-related conversations can be essential building blocks for networking and have been linked to greater job satisfaction (Winstead, Derlega, Montgomery, & Pilkinson, 1995). At the same time, socializing on the job can also indicate low interest in work, since—with time being a finite resource—more time spent socializing means less time spent working (Waber, Wu, Aral, Bryjolfsson, & Pentland, 2008). Thus, the default assumption might be that spending a greater percentage of time at work discussing social matters with colleagues might indicate decreased engagement with one’s job. However, given evidence that women in male-dominant fields often report feeling shut out from informal social networks (Lyness & Thompson, 2000), such manifestations of social ties could signify something different for them. Specifically, we hypothesized that having more conversations about social topics with male colleagues would help to counteract the threat to belonging women might experience in male-dominant departments and be related to greater engagement with their work. This finding would be consistent with prior evidence that social ties at work are related to higher job satisfaction for women in particular (Robertson & Bean, 1998) but would establish this effect based on an objective measure of workplace behavior rather than retrospective self-reports that are subject to many alternative explanations.

A Naturalistic Observation Approach to Studying Workplace Interactions

The American Psychological Association named 2000-2010 “The Decade of Behavior,” but the behavioral sciences continue to be criticized for failing to connect self-reports to actual behavior (Baumeister, Vohs, & Funder, 2007), undervaluing research conducted in the field (Cialdini, 2009), and ignoring the real-world experiences of truly unique populations (Rozin, 2009). The present research responds to these critiques by providing the first study to objectively assess workplace conversations and analyze their association to job disengagement in a naturalistic field study of male and female STEM faculty at a large Research I university. To do so, we employed a naturalistic observation methodology—the EAR (Mehl et al., 2001)—to sample the content of conversations between colleagues during three consecutive work days. These audio-files were later coded and correlated to participants’ ratings of job disengagement.

Methods

Participants

Forty-five faculty members from STEM departments at a large public university were recruited for the study. Of the mere 32 female faculty eligible to participate, we successfully recruited 23, along with an equal number of men matched by rank and department (after a female faculty member agreed to participate, a matched male faculty member was recruited). Only six faculty (three males and three females) declined to participate citing concerns about inconvenience and privacy (others were unreachable). Valid EAR and questionnaire data were available for 37 participants (19 female; 87% Caucasian; M age = 43.9, SD = 10.2). We calculated the h-index of each participant using their Web-of-Science records (Hirsch, 2005) and confirmed that males (M = 21.6, SD = 11.64) and females (M = 23.3, SD = 13.00) in our sample were similar in overall productivity and impact, t(37) = .46, p = .65. By matching the samples on rank, department, and research productivity, any differences observed between men and women can more confidently be attributed to the dynamics of gender in the workplace, rather than these possible confounding variables.

Procedure

The study was described as examining the daily work environment of faculty members in the college of science. Participants were asked to wear the EAR over three consecutive work days and were informed that the device would intermittently record snippets of ambient sounds. The EAR is a handheld computer (Dell Axim X50) that participants clipped to their belt or waist-band (Mehl et al., 2001). It was programmed to sample for 50 sec every 9 min between 6 a.m. and 11 p.m. (approximately 10% of the time). When participants returned the EAR, they received a CD with all their recordings to review. One participant asked for 14 sound files to be erased, and another asked for six to be erased.

Compliance

Across all 37 participants, the EAR recorded 11,046 sound files. In 6,910 (63%) of these files, participants were wearing the EAR at work. Per participant, the EAR captured on average
129 sound files (SD = 81) at work, which corresponds to a net workplace recording of about 1 hr and 45 min or about 19 hr of wearing the EAR at work. As a behavioral marker of obtrusiveness, research assistants coded how often the EAR was mentioned with others. On average, participants referred to the EAR in only about 1.7% of their conversations with colleagues (Mmales = 1.8%, SDmales = 1.2% vs. Mfemales = 1.5%, SDFemales = 0.7%), replicating past research showing that the EAR indeed operates rather unobtrusively and that participants show high compliance with the monitoring protocol (Mehl & Holleran, 2007).

**Coding of EAR Sounds**

A team of four research assistants coded acoustically detectable features of participants’ conversations. Of the sound files recorded at work, 1,002 (14.5%, an average of 14.3, SD = 8.56, per participant), were coded as conversations with other faculty (i.e., colleagues, ICC[2,k] = .89) as opposed to those with students (ICC[2,k] = .86) or staff (ICC[2,k] = .69).1 Conversations with colleagues were further coded for gender of the conversation partner and whether they concerned research (e.g., “How is the grant coming?”) or social (e.g., “How was your weekend?”) matters.2 They were then aggregated within person to create an estimate of the percentage of conversations in each coding category (i.e., the percentage of conversations that were research or social conversations with male or female colleagues). Intercoder reliabilities, derived from the double codings and computed as intraclass correlations (ICC[2,k]), were .84 for talking with female colleagues, .74 for talking with male colleagues, .72 for engaging in research conversations, and .67 for engaging in social conversations.

Additionally, two research assistants rated each research and social conversation on three dimensions: participants’ level of competence, likeability, and contribution to the conversation on a 1 (not at all) to 5 (extremely) scale. Sound-file-based intercoder reliabilities (ICC[2,k]) were .70 for rated competence, .58 for rated likeability, and .88 for the relative contribution in conversations with colleagues. The two sets of ratings were then averaged within each participant separately for male and female colleagues.

**Job Disengagement**

As part of a larger set of questionnaires administered before wearing the EAR, participants completed a validated measure of job disengagement (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). This eight-item measure is comprised of statements such as “Lately, I tend to think less during my work and just execute it mechanically” and “I get more and more engaged in my work” (reverse coded). Participants’ responses were averaged to create a composite measure of job disengagement (alpha = .61).

**Descriptive Statistics**

Table 1 reports the descriptive statistics for conversation variables for male and female participants. As was expected given women’s underrepresentation in the participating departments, conversations were generally more likely with male as compared to female colleagues, t(37) = 3.76, p = .001. Furthermore, as would be expected given the workplace context, conversations were generally more likely to be about research than about social topics, t(37) = 3.71, p = .001. In addition, although men were no more likely to talk about research than were women (p > .10), both male and female participants talked more about research when talking with male colleagues compared to female colleagues, t(37) = 2.50, p = .02; t(37) = 2.70, p = .02. There were no significant group differences for social talk (p > .05). In addition, male and female participants did not differ in job disengagement (Mmales = 1.78, SDmales = 0.33 vs. Mfemales = 1.69, SDFemales = 0.38; p > .10).

**How Discussing Research Relates to Job Disengagement**

Although there were no between-gender differences in disengagement and discussing research, our primary interest was whether within-gender variation in research and social conversations would differentially relate to job disengagement for men and women. Some suggestion of this is revealed in Table 2. Specifically, whereas men show an expected relationship whereby they report being less disengaged the more their conversations were about research (τ = −.47, p < .05), women show an inverse pattern and reported being more disengaged...
How Discussing Social Topics Relates to Job Disengagement

Socializing in the workplace might often be a sign of disengagement from one’s work, but we expected such social ties to have some benefit for female STEM faculty. Whereas research conversations (because they cue social identity threat) could relate to greater disengagement for female STEM faculty, we hypothesized that social conversations (because they cue feelings of belongingness) would relate to less disengagement for women. Again, we expected these relationships to be particularly present in conversations with male colleagues rather than with female colleagues, since the threat to belongingness might be most salient in interactions with the advantaged group. Using the same analytic strategy, we observed the predicted Gender × Social Conversations interaction for conversations with male colleagues ($\beta = -0.53$), $t(34) = -3.16$, $p < .004$, $f^2 = .33$ (Panel A, Figure 2). As would be expected, for men, more time spent socializing with male colleagues was associated with greater disengagement with their work ($\beta = .44$), $t(34) = 2.22$, $p = .03$. But consistent with the idea that social ties to male colleagues can buffer against belongingness threat for women, women reported less job disengagement to the degree that they socialized with male colleagues ($\beta = -0.60$), $t(34) = -2.28$, $p = .03$.

We also found a participant Gender × Social Conversations interaction for conversations with female colleagues ($\beta = .40$), $t(34) = 2.39$, $p = .02$, $f^2 = .18$ (Panel 2, Figure 2). Simple slopes analyses revealed that, like men socializing with men, women who engaged in social conversations with their female colleagues were also more disengaged with their job ($\beta = .63$), $t(34) = 2.39$, $p = .02$. In contrast, men who socialized with female colleagues exhibited no relationship between social conversations and disengagement ($p > .05$). Thus, although socializing in the workplace is related to job disengagement for same-sex conversations, women in particular seem to benefit from having social communication with their male colleagues.

Ancillary Analyses

The above results suggest that discussing research with male colleagues might be associated with greater job disengagement among female STEM faculty. If this relationship reflects a greater tendency for women to experience social identity threat in their research conversations with male colleagues, we would expect women to sound less competent in these mixed-sex conversations. Analysis of coders’ ratings yielded interesting differences in perceived competence (see Figure 3). Consistent with a social identity threat interpretation of these data, there was only one situation where female participants were rated as sounding less competent than male participants—when discussing research with male colleagues, $t(34) = 2.75$, $p = .01$, Cohen’s $d = .93$. The fact that this difference did not exist when participants discussed research with female colleagues or when discussing social topics (all $p$s > .40) suggests that it was not simply the case that female scientists were perceived by our
coders as less competent than men either in any mixed-sex conversation (e.g., even when discussing social topics) or whenever discussing research (e.g., even with female colleagues). There were no effects of coders’ ratings of contribution to the conversation or perceived likability, suggesting that women’s negative relationship between research talk with men and disengagement was not likely the result of male conversants being particularly domineering or of women being less warm or friendly during these interactions.

Discussion
This study employed a unique naturalistic observation methodology to study actual workplace conversations among STEM faculty. The findings point to surprising ways in which women’s daily interactions relate to feelings of disengagement with their career. Consistent with our assertion that mixed-sex conversations about research could make gender stereotypes salient and cue social identity threat, results revealed that women who spent more time talking about research with their male colleagues were also more disengaged from their work. For men, talking shop was associated with psychological benefits perhaps because these same-sex conversations are more likely to facilitate collaborations and idea generation. Although future investigation is needed to isolate these specific benefits for men, the present data suggest that women also seemed less competent than men when discussing research with their male peers. In light of the fact that our male and female samples were matched by rank, discipline, and research productivity and impact, such findings are consistent with the idea that talking shop with male colleagues could cue social identity threat among female scientists.

Whereas connecting with male colleagues about research might not have the expected benefits for women in STEM disciplines, connecting with them on social matters has been thought to help foster a sense of belonging essential to those with minority status in an organization (Lyness & Thompson, 2000). In fact, women were more engaged with their job to the degree that they spent time socializing with the opposite sex. In organizations that are traditionally sex-typed, we suspect that this cross-gender socializing might be important for creating a more integrated and relaxed environment, although future research will need to determine if these effects are isolated to male-dominated environments.

This study is highly unique in its measurement of actual workplace conversations and how they relate to psychological outcomes. The findings answer a strident call for greater emphasis on obtaining behavioral evidence from field-based studies (Baumeister et al., 2007; Cialdini, 2009; Rozin, 2009). And in so doing, they point to the challenge that women face in STEM disciplines. Of course, this type of research also carries certain limitations. For example, we were limited to the number of tenured and tenure-track female faculty at the sampled university. Although it is remarkable that our female sample represented 72% of the available female tenure-track STEM population at this location, replication with larger samples is needed.

In addition, to protect participants’ privacy, we sampled only short snippets of conversation that do not provide enough information for more detailed coding of sound files, such as information about conversation partners (Mehl & Holleran, 2007). Perhaps women’s conversations with male colleagues primarily concern the men’s research, leaving the women feeling that their own program of research is inadequate. Unfortunately, we could not test this idea with the current data given.
that coders had no information (and were lacking expertise) about participants’ and conversants’ research programs.

Finally, the correlational nature of these data mean that we cannot rule out the possibility that women who are more disengaged from their job are particularly likely to engage in research conversations with their male colleagues. Given their relatively lower ratings of perceived competence in these conversations, however, such an interpretation seems less plausible than the social identity threat account advanced here. Nonetheless, finer-grained studies, preferably using experimental paradigms, are needed to ascertain what aspects of research conversations causally predict women’s disengagement and, more importantly, how women can discuss research and collaborate with male colleagues without experiencing this threat.

In sum, these results point to unique challenges that women face in STEM disciplines. Their underrepresented status can create a greater need to feel socially integrated in their male-dominated field. At the same time, negative cultural stereotypes might induce threat while discussing research. In an effort to create threat-free workplace environments, faculty and administrators must find ways to encourage social and research-based conversations among colleagues that validate women’s contribution to the organization and the discipline.

**Declaration of Conflict of Interest**

The authors declared that they had no conflicts of interests with respect to their authorship or the publication of this article.

**Financial Disclosure/Funding**

This research was supported by the University of Arizona Commission on the Status of Women, a University of Arizona ADVANCE fellowship seed grant, and the Psychology of Women Hyde Graduate Student Research Award. The authors thank Jessica Corl, Rose Estes, Kyle Keller, and Sara Ziebel for coding the data.

**Notes**

1. Reliability for staff designations were likely lower due to the rarity of such conversations (<1%).
2. Additional coding categories included conversations about administrative topics such as hiring and conversations about teaching or mentoring, but these were infrequent and yielded no notable patterns.
3. Given the relatively fewer number of conversations with female colleagues, estimates obtained from these conversations could be relatively less reliable and in need of replication in future study.

**References**


Bios

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