QUALITY OF WORKING LIFE AMONG WOMEN AND MINORITIES IN THE INFORMATION TECHNOLOGY WORKFORCE: A PILOT STUDY

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ABSTRACT

In this paper we present preliminary results of a pilot study aimed at assessing a questionnaire survey on quality of working life and diversity in the Information Technology Workforce.

INTRODUCTION

There is substantial evidence for a critical shortage of skilled IT workers in the United States (Office of Technology Policy 1997; Information Technology Association of America 1998; Freeman and Aspray 1999), and a large subset of this problem is the underrepresentation of women and minorities in the IT workforce. Women and minorities are underrepresented in the IT fields, and as employers struggle to recruit an adequate number of IT skilled workers, large pools of potential talent remain untapped (ITAA 2000). Underrepresented minority status in this study includes American Indian/Alaskan Native, Black and Hispanic IT workers.

Female scientists and engineers in industry are more likely to leave their technical occupations and the workforce altogether than women in other fields. Attrition data on female scientists and engineers show that their exit rates are not only double those of men (25% versus 12%), but they are also much higher than those of women in other employment sectors (CAWMSET 2000). Some preliminary work has been done to identify the key barriers to the entrance and retention of women and underrepresented minorities in the IT workforce (CAWMSET 2000; ITAA 2000). While women and underrepresented minorities tend to share the same types of barriers, there are some differences speculated between the groups. Shared barriers include lack of role models and mentors, exclusion from informal networks, stereotyping and discrimination, unequal pay scales and inadequate work/family balance (CAWMSET 2000; ITAA 2000). Underrepresented minority women, while facing the same obstacles as non-underrepresented women, experience discrimination due to both gender and race, what has been labeled as “the double bind” (CAWMSET 2000).

The emerging question, then, is “How can employers change the culture and environment of the IT workplace to accommodate the needs of underrepresented groups?” Both job and organizational design approaches have been suggested. An Information Week salary survey showed that IT workers ranked “challenge” of their job, “responsibility” and “job atmosphere” as more important than their base salary. QWL, job stability and learning opportunities through job assignments dominated the responses (Meares and Sargent 1999). Organizational design has also been suggested as an important solution component. A multitude of innovative human resource management practices have been put forward as potential and/or partial solutions: mentoring programs, educational opportunities, flexible hours, telecommuting options, among many others (Office of Technology Policy 1997; Meares and Sargent 1999; Carver 2000; CAWMSET 2000; ITAA 2000). However, little is known about what and how job and organizational factors affect women and underrepresented minorities.

QWL has been defined by many researchers in a variety of ways, such as quality of work (Attewell and Rule 1984) and employment quality (Kraut, Dumais et al. 1989). Davis (1983) has defined QWL as “the quality of the relationship between employees and the total working environment, with human dimensions added to the usual technical and economic considerations” (p.80). Using this definition, we examine a range of indicators of QWL: job satisfaction, organizational commitment and perceived stress. The Sociotechnical Systems Theory (SST) (Trist 1981), the Organizational Health Model (Sauter, Lim et al. 1996) and the Balance Theory (Smith and Carayon-Saintfort 1989) provide theoretical
perspectives for examining work systems. The SST emphasizes the interrelatedness of the social and technical systems within an organization and integrates job and organizational design perspectives, through linking the job design theories of human relations, job enrichment and participation. The Organizational Health Model asserts that organizational characteristics (e.g., management practices, organizational values) directly influence organizational health (i.e., performance outcomes and satisfaction outcomes) (Sauter, Lim et al. 1996). The Balance Theory is a theoretical framework that examines job and organizational design characteristics within each component of the work system that interact to influence the “stress load” upon an individual (Smith and Carayon-Sainfort 1989). It identifies sources of occupational stress (stressors or psychosocial work factors) that can influence stress, attitudes and behaviors (e.g., turnover intention).

The organizational/job design and job stress models highlight the importance of a variety of job and organizational factors as predictors of QWL and turnover (Carayon and Smith 2000). The most important job and organizational factors identified in this literature are: job demands, job control, social support, job content, role conflict, and role ambiguity (Cooper and Marshall 1976; Karasek 1979; Theorell and Karasek 1996; Carayon and Smith 2000).

Vandenberg, Richardson and Eastman (1999) examined the impact of high involvement work processes upon organizational effectiveness across 49 life insurance companies. Their analysis supported a model in which a set of organizational practices positively influenced high involvement work processes. In turn, the high involvement processes influenced organizational effectiveness (i.e., employee turnover) both directly and indirectly, through positive influences on employee morale. The work practices assessed were work design, incentive practices, flexibility, training opportunities and direction setting. High involvement work practices were power, information, rewards and knowledge. Findings suggested significant influences of business practices on involvement and influences of involvement on organizational effectiveness. Examining direct associations between organizational practices and effectiveness showed that training opportunities significantly decreased turnover (Vandenberg, Richardson et al. 1999). Huselid (1995) conducted a study of human resource professionals across 3,452 US firms to evaluate the relationships between High Performance Work Practices (e.g., training, promotion criteria, job design, information sharing), the individual-level factors of turnover and productivity and firm performance. Overall, the High Performance Work Practices were suggested to significantly reduce the rate of turnover (Huselid 1995).

The literature on human resource practices highlights a number of factors that, in addition to the job and organizational design factors listed in the previous section, can contribute to QWL and turnover: training, career advancement, development, and rewards (Huselid 1995; Vandenberg, Richardson et al. 1999). The literature on organizational/job design and job stress (Carayon and Smith 2000), as well as the literature on human resource management practices highlight the potential mediating role of QWL in explaining the impact of job and organizational factors on turnover intention (Parasuraman 1982; Vandenberg, Richardson et al. 1999).

Igbaria and Greenhaus (1992) tested a model of turnover intentions among 464 management information systems (MIS) employees using questionnaires. Results indicated that job satisfaction and organizational commitment had the strongest influence on turnover intentions, and the impact of other variables on turnover intentions was mediated by these two variables. Baroudi and Igbaria (1995) studied the role gender plays in career success within the IS occupation. They found that, even when human capital variables (i.e., education, knowledge and skills) were controlled for, women in IT hold lower level positions than men, receive lower salaries than men and have fewer opportunities to interact with peers. There were no significant differences between men and women in satisfaction and commitment, but there was a significant difference in terms of intention to stay. Contrary to predictions, women were more likely to estimate longer continuing employment. There is a need to examine hiring, salary, promotion and personnel practices and check for gender bias, and a need to look at additional factors, such as family constraints, relocation and discriminatory practice at work, to explain the gender differences in quitting (Truman and Baroudi 1994; Baroudi and Igbaria 1995). This research aims at filling in these gaps.

Igbaria and Wormley (1992) examined the relationships between race/ethnicity, organizational experiences, job performance evaluation and career outcomes (advancement prospects, career satisfaction and organizational commitment) among MIS employees in a large telecommunications organization. Compared to white MIS employees, black MIS employees reported less job discretion, less career support and lower levels of met expectations. Additionally, blacks were less satisfied with their careers. The findings from this study suggest a “ripple effect” of mediating factors, driving
black MIS employees further and further away from success: blacks experience less job discretion and career support, and job discretion and career support are positively related to career outcomes. In a study of race, organizational experiences, and career outcomes among a group of 828 lower- and middle-level managers and professionals across three companies (banking, communication and electronics companies), Greenhaus, Parasuraman & Wormley (1990) found that black managers felt less accepted by their organizations, perceived less job discretion, and were rated lower by their supervisors on job performance and advancement prospects than their white counterparts. Additionally, blacks were more likely to have reached a “career plateau” and experienced lower levels of career satisfaction than whites. Both direct and indirect effects of race on career outcomes were examined through hierarchical regression analysis. Results provided only limited support for the mediational processes proposed in the model (e.g., the effects of race on career outcomes mediated by organizational experiences) and suggested a more complex set of relationships. Results did suggest that blacks might be excluded from opportunities for power and integration within organizations.

There is very little research examining a range of job and organizational factors that can affect women and underrepresented minorities in IT work. The research conducted by Igbaria and colleagues provides a useful foundation, but does not provide a systematic test of job/organizational factors for gender and race simultaneously in relation to retention and turnover. Our conceptual framework includes two bodies of literature: (1) job design and stress and (2) human resource management. The study objective is to better understand how the IT workplace can enhance retention, especially among women and underrepresented minorities, and to take the initial steps for transforming this knowledge into practice. Two different models of the role of gender and race are proposed and will be tested (Carayon, Haims et al. 2001).

METHODS

To find out more about the relative importance about work and organizational factors that might influence retention and turnover, and to test the instrument we developed, we conducted a pilot study. Gender and racial biases are so complex and subtle that it was very possible that the initial survey developed for this study did not fully capture the potential causes, effects and interrelationships that lead to employee turnover in women and underrepresented minorities (Greenhaus, Parasuraman et al. 1990; Morrison and Von Glinow 1990; Igbaria and Wormley 1995). A total of 13 IT workers from three different companies were interviewed. The sample consisted of 6 white women, 5 minority men and 3 minority women. An interview guide was developed to evaluate the questionnaire survey. The interviews were recorded on tape. This qualitative data was analyzed, using NVivo. The interview data provided very useful, important information for modifying the questionnaire and adding questions on important concepts such as intention to quit the IT profession (as opposed to quitting one’s company). The aim of the pilot study is to identify specific job and organizational factors related to gender and race (e.g., work/family conflict, discrimination, career advancement) that were not covered or correctly covered (e.g., all “angles” of the issue not captured) in the draft survey instrument. Interview data was used to inform survey revisions.

DATA ANALYSIS AND PRELIMINARY RESULTS

The interview guide was developed to obtain specific feedback on the draft questionnaire survey item sets most relevant to and likely to be affected by gender and/or minority status (Carayon, Brunette et al. 2002). Item sets covering 10 topics were identified by the researchers as important for obtaining feedback from the women and minority pilot study interviewees. The ten topic areas were 1) work/family conflict; 2) training opportunities; 3) development activities; 4) career advancement; 5) discrimination in general; 6) discrimination based on ethnicity; 7) corporate fit; 8) flexible work practices; 9) rewards; and 10) intention to turnover. Three additional draft survey items, specific to IT work, were added to obtain feedback on their appropriateness among IT workers in general: 1) job demands; 2) IT/computer education/training; and 3) IT job title. The final interview question was an open-ended one, allowing pilot study respondents to add any additional comments or suggestions based on the interview or on the questionnaire draft overall. All in all, this led to a total of 14 major interview questions.

All thirteen telephone interviews were conducted between mid-January and mid-February 2002. All interviews began with the researcher reading a consent form to the pilot study volunteer to ensure informed consent for participation in general, to verify acceptance of the tape recording of the interview and to ensure the interviewee was in a private room where no one at work could overhear their responses. (See Appendix D for a copy of the consent form). Each interview was tape recorded using speaker phone, while the researcher was in a private office with the door shut.
Although the interview tapes were to be transcribed, the researcher did take some handwritten notes during each of the interviews to highlight the key points of the discussion. Interview length varied from 45 minutes to 1 hour and 15 minutes.

A node structure was developed and refined to assess the interview data. The final node structure includes 307 nodes that cover all 14 major interview questions.

Major findings of the interview suggested the following survey revisions:
1. Job demands: need to ask questions on need to keep up with new technology
2. Work-family conflict: balancing work opportunities versus family; meeting family expectations
3. Training opportunities: structure of the training (e.g., sponsorship by company, on-company time, off-site)
4. Development activities: need to clarify various activities and to avoid overlap
5. Career advancement: need to clarify various advancement possibilities
6. Discrimination in general: need to identify various types of discrimination (e.g., command of English, religion)
7. Discrimination based on ethnicity: need to identify various reasons (e.g., fluency in English)
8. Corporate fit: alignment with organization, communication, feeling of ‘belonging’, nature and quality of work relationships
9. Flexible work practices: possibility of remote work telecommuting
10. Rewards: positive feedback and appreciation
11. Turnover: various reasons for leaving (e.g., dissatisfaction versus own ambition); intentions after leaving (e.g., leaving IT field)
12. Training and education in IT: training for certifications
13. IT job titles: listing responsibilities versus list of IT job titles

The results of the interview will lead to survey revisions. The next step is to conduct a pre-test using a web-based questionnaire survey.

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productivity, and corporate financial performance."

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