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Environmental Context and Women in the IT Workforce

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INTRODUCTION

The rise of the network society involves a transformation of employment, in which power relations shift with the flow of capital, leading to downsizing, subcontracting and networking of labor. These processes facilitate flexibility and individualization of contractual arrangements in information work. As a whole, there is an increase in self-employment, temporary work, and part-time work, particularly for women (Castells, 1996). This transformation of employment brings heightened consideration about the characteristics of the labor force. Thus, one need is to examine environmental context and the possible connections between economic and cultural factors of a region and the experience of women in the IT workforce. This article summarizes an empirical study presented in greater detail in Trauth, Quesenberry, and Yeo (2005) that explored the influence of environmental context on women in the IT workforce by using the Individual Differences Theory of Gender and IT (Trauth, 2002; Trauth, Huang, Morgan, Quesenberry, & Yeo, 2006; Trauth, Quesenberry, & Morgan, 2004).

BACKGROUND

Previous research has shown that development of an information economy is highly dependent on environmental context factors (e.g., Benner, 2002; Castells, 1996; Kling & Turner, 1991; Trauth, 2000). Importantly, the development of these information economies has been shown to be the result of more

than just technological infrastructure (Benner, 2002). The information economy in Ireland was the result of four groups of factors: infrastructure, public policy, economy, and culture (Trauth, 2000). Likewise, Kling and Turner (1991) argue that the development of an information economy is dependent on the number of information workers. Increased focus on information workers brings with it increased attention to gender representation in the IT workforce. Thus, it is critical to investigate the experiences of women in information work as their role has an increasing impact on the overall growth and stability of the network economy.

MAIN THRUST OF THE ARTICLE

This article reports on one aspect of a multi-year, multi-site, interpretive qualitative field study of women working in IT whose goal is to investigate the female under representation in IT. The guiding theory for this research is the Individual Differences Theory of Gender and IT proposed by Trauth (2002; Trauth et al., 2004, 2005, 2006) which examines the individual variations among women resulting from a combination of individual characteristics and environmental influences, in order to explain the under representation of women in the IT workforce.

Fifty-seven female IT practitioners were interviewed between October 2002 and October 2004. Eighteen of these interviews were conducted in Massachusetts, 25 were conducted in North Carolina and 14 were conducted in Pennsylvania. These women represent a wide range of ages, backgrounds,

levels of management responsibility, and degrees of technical specialization. The racial make-up of the women includes Caucasians, African Americans, Asian Americans, Hispanics/Latinas and women from Middle Eastern descent. The interview data is also supplemented by participant observation data and by documentary data about gender and the IT sector in the regions involved in the study.

What emerged from the interviews are several themes about environmental context and women in the IT workforce. The following section discusses environmental context themes of economic and cultural factors from the three regions in the study: Boston, Massachusetts; Charlotte and the Research Triangle Park area of North Carolina; and central Pennsylvania. The cultural factors to be examined are: population migration patterns, ties to region, and attitudes towards women and women working.

Massachusetts Environmental Context

The Boston area is one of the wealthiest regions in the U.S. with a large and thriving IT economy. The information sector in this region grew steadily and boomed in 2001 with the employment of approximately 79,900 IT workers or approximately 4% of the overall labor force in the area. However, in 2003, the information sector showed a decline with the employment of approximately 64,100 IT workers or 3.4% of the overall labor force¹ (U.S. Department of Labor, 2004). In 2000, the national median value of owner-occupied housing units in the U.S. was \$119,600 and 66.2% of the population owned a home. Also, in 1999 the national median household income² was \$41,994 and the per capita money income³ was \$21,587. These figures are much higher in the Boston area. In 2000, the median value of owner-occupied housing units in the Boston area was \$221,867 and approximately 55% of the city population owned a home. In addition, in 1999, the median household income was \$54,536 and the per capita money income was \$28,816. It is important to note that these figures are an average of three counties in the Boston area.⁴ When examining statistics of affluent pockets of the Boston area, the figures are much higher (FedStats, 2005).

A noteworthy aspect of cultural context in Boston is the racial and ethnic diversity of its population. Much of Boston's population is comprised of racial

and ethnic minorities including African Americans, Asian Americans, and Hispanic/Latino Americans in addition to Caucasian Americans (U.S. Census Bureau, 2000). The regional diversity is also represented in the interviews with women in this study. A number of participants noted the value placed on diversity and the open mindedness in the Boston region. As a result, many women felt it was easier to be a female IT worker in Boston than it would be in other geographical areas.

Several women also shared stories of how employers are proactive in creating a diverse IT workforce. These companies search for employees with a wide range of backgrounds, attitudes, and demographics in order to bring diverse people and mindsets to the workplace. Many participants also explained how employers value and devote significant amounts of corporate resources to diversity training. Furthermore, several women in the study felt that Boston is less hostile to women than other regions. However, even those women who said they did not personally experience hostility in the workplace did acknowledge that discrimination still exists. The women spoke about the difficulties associated with being a female in the IT workplace and succeeding in their careers. Many women shared stories of the challenges associated with moving into management positions and the need to rely upon characteristics—such as assertiveness—that are often socially defined as masculine.

Women constitute a large percentage of the labor force in the Boston region (U.S. Census Bureau, 2000, 2003). Many women in this study felt that being a female in Boston's IT workforce was not uncommon and therefore was not a central factor in workplace issues. Rather, these women felt that other demographic characteristics that they possessed, such as racial, ethnic and sexual orientation differences were more prevalent when workplace diversity issues arose.

North Carolina Environmental Context

North Carolina is undergoing a major transition from an economy based on agriculture and manufacturing to an economy based on IT and knowledge-intensive occupations. Two regions vital to this transition are Charlotte and the Research Triangle Park area. Charlotte is North Carolina's largest and most popu-

lated city. The information sector in North Carolina grew rapidly and boomed in 2001 with the employment of approximately 49,100 IT workers or approximately 3.6% of the overall labor force in the area. However, in 2003, the information sector showed a decline with the employment of approximately 46,300 IT workers or approximately 3.4% of the overall labor force in the area (U.S. Department of Labor, 2004). The median household income and the median value of owner-occupied housing units in Charlotte and the Research Triangle Park area is lower than the Boston region, but higher than the national average (FedStats, 2005).

Hanchett and Sumner (2003) explain that recruiting talent to North Carolina tends to be easy because of the area's reputation for an outstanding quality of life and a higher standard of living compared with other areas of the U.S. As a result, the population of Charlotte doubled between 1970 and 2000, making it the second fastest growing city in the U.S. with a population of 389,000. In addition, people from all over the country and around the world have relocated to Charlotte, bringing new ideas and customs with them. In Charlotte there are over 34,000 Asians (or 8.7% of the city population) and 60,000 Latinos (or 15.4% of the city population), which is an increase from 6,700 in 1990 (Hanchett & Sumner, 2003).

The move to an information age and the migration of people to North Carolina has occurred alongside the transition from what has been referred to as the "old south" to the "new south" (Hanchett, 1998). A majority of the participants spoke about this transformation in North Carolina. It appears in many ways that North Carolina is at a crossroads as the economic centers of the state transition from a traditional old south to a more progressive new south culture. Many regional norms, values, and attitudes appear to be in a state of flux as the area thrives economically and a new breed of North Carolinian populates the state.

The passing of the old south brings tension to the idea of a true southern belle and southern lady. A southern belle is described as a woman raised in "old-fashion southern values," and is typically associated with a family of social prominence and financial means. A southern belle is a woman with grace, manners, and strong family values. Participants in this study repeatedly discussed the concept of a southern belle and how that perception influences

their lives and careers as women in the IT workforce in the South. Thus, there is a social expectation that southern women should be polite, well mannered, quiet when necessary, and place the highest importance on domestic roles even at the cost of a career outside of the home.

Most of the participants consider themselves to be "new south" women or southern Yankees and did not identify with the southern belle label. The majority of the participants reject the southern belle title because they place an importance on their career in the IT workforce and feel that the two concepts are in conflict. Several participants shared experiences of being treated as inferior or different from men in the IT workplace. Many women also felt that the regional culture contained an expectation that women act differently and more indirect in their workplace behavior. As a result, these women often felt it was a challenge to be assertive or to advance to higher levels of management.

In addition, several women in this study did not identify with the southern belle label because of geographical origin or race. Gina is originally from rural North Carolina, and explained that women from the mountain areas of the state are much different from southern belles. She felt that women from the mountain areas are much more independent and have a strong role outside of the home. Likewise, African-American participants in this study did not identify with the label of southern belles because of the radically different history of African Americans in the south.

Pennsylvania Environmental Context

The landscape of central Pennsylvania is often identified as the middle of the state excluding Pittsburgh and Philadelphia. Central Pennsylvania extends from the Southern Alleghenies along the Allegheny plateau and includes the cities of Altoona, Bloomsburg, Harrisburg, Johnstown, State College, and Reading. The information sector in central Pennsylvania has increased much slower than other areas in the U.S. with an employment peak in 2001 at approximately 46,700 IT workers or approximately 2.5% of the overall labor force in the area. In 2003, the information sector showed a decline with the employment of approximately 40,400 IT workers or approximately 2.3% of the overall labor

force in the area (U.S. Department of Labor, 2004). The median household income and the median value of owner-occupied housing units in central Pennsylvania is much lower than that of Boston and Charlotte/Research Triangle Park (FedStats, 2005).

The women in this study explained that central Pennsylvania has a recent and growing demand for IT workers, but there is a shortage of skilled workers to fill these demands. As a result, many women felt it is easier to find IT work than some other kinds of jobs, so long as they have the necessary skills. Several women explicitly mentioned that their gender did not matter on the IT hiring market—it was technical skills that came first.

Yet, despite the lack of gender barriers to career entry, the women in this study shared stories of the difficulties they face as females in the central Pennsylvania IT workforce once they are hired. Many women felt they are continuously challenged and isolated in the workplace because of their gender. In order to compensate for these feelings, some women attempt to modify their behaviors to become more assertive.

Several participants also elaborated on how female participation in the IT workforce creates tension with regional cultural attitudes towards women working. The women in the study continuously referenced a regional cultural expectation for women to work and raise a family without filling a job intended for a male primary income earner. A few women shared stories of being passed-over for promotions or raises despite their exceptional work performance. Rather, the promotions and raises were given to male coworkers because they were considered to be the primary income earners for their families.

The aging population is a serious problem facing central Pennsylvania. Pennsylvania ranks second in the nation with residents over the age of 65 and ranks number one in the loss of young people aged 25 to 34 (Brookings Institute, 2003). In contrast to Massachusetts and North Carolina, the intransient nature of central Pennsylvania's population appears to create an environmental context in which newcomers feel like outsiders. Participants in the study who are not originally from central Pennsylvania felt like outsiders despite living in the region for several years. These women were attracted to central Pennsylvania because their skill sets were in demand, but

continue to experience difficulties adjusting to regional norms, and building social and professional networks.

FUTURE TRENDS

This article contributes to discourse about the under representation of women in the IT workforce, in order to inform future research as well as diversity enhancement initiatives in the educational and employment arenas. Yet, an important caveat to this discussion of environmental influences is that these results are only an initial finding based upon data from three different geographical regions of the U.S. Future research will involve an additional round of interviews in each region along with continued collection and analysis of environmental context data.

CONCLUSION

These findings bolster an argument in favor of looking beyond the data at hand, to the women *in context*. As this article indicates, context might refer to state, province or region. Other work by Trauth shows that context can also be national context (Trauth, 1995, 2000; Trauth, Nielsen, & von Hellens, 2003). The argument for considering women's experiences in context challenges a prevailing tendency to generalize from one dataset to all women, everywhere.

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KEY TERMS

Individual Differences Theory of Gender and IT: A social theory developed by Trauth (Trauth, 2002; Trauth et al., 2004) that focuses on within-group rather than between-group differences to explain differences in male and female relationships with information technology and IT careers. This theory posits that the under representation of women

in IT can best be explained by considering individual characteristics and individual influences that result in individual and varied responses to generalized environmental influences on women.

Information Economy: Also referred to as the *information sector*, this portion of a nation's economy encompasses the work and workers engaged in the processing of information and the production of information tools. The information economy is divided into two sectors. The *primary information sector* is responsible for producing information processing and communication hardware and software, and information systems and services. It also includes the development of content for these systems. The *secondary information sector* consists of those organizations which process information in the course of accomplishing some other mission (Trauth, 2000, p. 5).

Interpretive Research: Research directed at understanding the deeper structure of a phenomenon within its cultural context by exploring the subjective and intersubjective meanings that people create as they interact with the world around them (Orlikowski & Baroudi, 1991, p. 5).

Qualitative Research: A term used to describe forms of social inquiry that aim at understanding the meaning of human action and that rely primarily on qualitative data (e.g., data in the form of words), including ethnography, case study research, naturalistic inquiry, ethno-methodology, life-history methodology, and narrative inquiry (Schwandt, 2001, p. 213).

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ENDNOTES

- ¹ These figures are based on the Boston Metropolitan Statistical Area (MSA) of Essex, Middlesex, Norfolk, Plymouth and Suffolk counties.
- ² Median household income is the average income of all household members over the age of 15 (Fedstats, 2005).
- ³ Per capita money income is the mean income of an individual for a geographic region. It is determined by dividing the total income of all people over the age of 15 by the total population of the area (Fedstats, 2005).
- ⁴ These figures are based on an average of Middlesex, Norfolk, and Suffolk counties.