Theorizing Gender and Information Technology Research

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INTRODUCTION

A fundamental consideration when attempting to understand the complex factors leading to the underrepresentation of women in IT is the choice and use of theory. Theories about women and their relationships to information technology and the IT profession guide the conceptualization of the research problem, the methods of data collection, the basis for analysis, and the conclusions that are drawn. However, a criticism of gender and IT research is that the topic of gender and IT is currently undertheorized (Adam, Howcroft, & Richardson, 2001, 2004).

This undertheorization takes on several different forms. First, there are cases in which there is no theory in evidence to guide the conceptualization of the research project or to inform the data collection and analysis. Rather, the focus is typically on compiling and representing statistical data regarding the differences between men and women with respect to technology adoption, use or involvement in the IT profession. This form of undertheorization can be labeled pre-theoretical research. Second, other research, while not explicitly articulating a particular theory, nevertheless, is guided by a theory-in-use. For example, quite often a theory of inherent differences between males’ and females’ relationships to IT is used implicitly to guide data collection and analysis. This form of undertheorization can be labeled implicit-theoretical research. This approach is considered to be a type of undertheorization in that the lack of explicit discussion of a theory makes it difficult for others to discuss, challenge or extend the research. Finally, the body of research that reflects explicit theory-in-use has been shown to have gaps in the theoretical landscape (Trauth, 2002). That is, an argument has been made that current theories about gender and IT do not fully account for the variation in men’s and women’s relationships to information technology and the IT field. This form of undertheorization can be labeled insufficient-theoretical research. It is this third condition that is addressed in this article: the need for new theoretical insights to guide our effort to understand the underrepresentation of women in the IT profession.

BACKGROUND

Two dominant theoretical viewpoints are currently reflected in the majority of literature about gender and IT: essentialism and social construction (Trauth, 2002). Essentialism is the assertion of fixed, unified and opposed female and male natures (Wajcman, 1991, p. 9). The existence of biological difference between the sexes has led to a tendency to assume that other observed differences between men and women are due to biological determinates as well (Marini, 1990). When applied to the topic of gender and IT, the essentialist theory presumes the existence of relevant inherent differences between women and men with respect to information technology. It uses the observed differences in the participation of women and men in the IT field as evidence of this view. Thus, the causes of gender underrepresentation in IT are attributed to biology. It turns to observed differences in men’s and women’s behavior for explanations of what are believed to be inherent, fixed, group-level differences that are based upon bio-psychological characteristics.

Essentialism underlies research on gender and IT that views gender as a fixed variable that is manipulated within a positivist epistemology (e.g., Dennis, Kiney, & Hung, 1999; Gefen & Straub, 1997; Venkatesh & Morris, 2000). Adam et al.’s (2001) analysis of this perspective points out that focusing on a background literature of psychology, alone, places too much emphasis on individual gender characteristics where a form of essentialism may
Looking only to psychological explanations of observations without giving attention to the influence of context results in a determinist stance with respect to gender.

One inference that could be drawn from an essentialist approach to gender and IT research is that women and men should be treated differently. For example, Venkatesh and Morris (2000) recommend that trainers adopt different approaches toward men and women and that marketers design different marketing campaigns for men and women. Trauth’s critique of essentialist approaches to gender and IT research suggested that one logical extrapolation from this line of thinking to IT workforce considerations would be the creation of two different workforces: a “women in IT” workforce and a “men in IT” workforce. Thus, policies for addressing the gender imbalance would focus on differences between women and men and the equality issue would focus on “separate but equal,” something that was rejected in the arena of racial equality decades ago (Trauth, 2002; Trauth & Quesenberry, 2005; Trauth, Quesenberry, & Morgan, 2004).

The other dominant theoretical perspective focuses on the social construction of IT as a male domain. According to this theory, there is a fundamental incompatibility between the social construction of female identity and the social construction of information technology and IT work as a male domain. This explanation for women’s relationship to information technology looks to societal rather than biological forces. Thus, the causes of gender underrepresentation can be found in both the IT sector and in the wider society.

The literatures of gender and technology in general (e.g., Cockburn, 1983, 1988; Cockburn & Ormrod, 1993; Wajcman, 1991) and that of gender and information technology, in particular (e.g., Adam et al., 1994; Balka & Smith, 2000; Eriksson, Kitchenham, & Tijdens, 1991; Lovegrove & Segal, 1991; Slyke, Comunale, & Belanger, 2002; Spender, 1995; Star, 1995; Webster, 1996) look to social construction theory (Berger & Luckmann, 1966) rather than biological and psychological theories. According to this view, the social shaping of information technology as “men’s work” places IT careers outside the domain of women.

Recommendations for addressing this situation vary. One school of thought based on a multi-year investigation of female underrepresentation in both academy and the workplace in Australia explores the development of strategies to help women fit in to this male domain (e.g., Nielsen, von Hellens, Greenhill, & Pringle, 1998; Nielsen, von Hellens, Pringle, & Greenhill, 1999; Nielsen, von Hellens & Wong, 2000; Pringle, Nielsen, von Hellens, Greenhill, & Parfitt, 2000; von Hellens, von Hellens, Nielsen, & Trauth, 2001; Pringle, Nielsen, & Greenhill, 2000). Another school of thought focuses on the need to reconstruct the world of computing to become more of a “female domain.” For example, Webster (1996) focuses on the social shaping of female gender identity and the implication for women’s relationship to workplace technologies. Based on analysis of women as a social group in cyberspace, Spender (1995) predicted an influx of “female values” into the virtual world that would accompany increased female presence.

Wajcman’s (1991) analysis of the social constructivist perspective on gender and technology reveals several issues. For example, there is no universal definition of masculine or feminine behavior; what is considered masculine in one society is considered feminine or gender-neutral in another. Further, while gender differences exist they are manifested differently in different societies. Hence, addressing the gender gap in IT employment based upon an assumed “woman’s perspective” is problematic. This analysis suggests a gap in current theory and motivates the articulation of new theory to help us better understand the underrepresentation of women in the IT field.

**MAIN THRUST OF THE ARTICLE**

The need for an alternative theory to account for the underrepresentation of women in the IT workforce emerges from consideration of the assumptions underlying the two prevailing theories discussed in the previous section. The initial work on the Individual Differences Theory of Gender and IT resulted from an analysis of this theoretical gap and used empirical data from a study of gender and IT in Australia and New Zealand (Trauth, 2002; Trauth, Nielsen, & von Hellens, 2003) to make the case for an alternative theory to occupy the space between essentialist theory and social constructionist theory. Subsequent
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work has focused on greater articulation of this theory (Trauth & Quesenberry, 2005, 2006; Trauth et al., 2004, 2006) and empirical testing of it (Morgan, Quesenberry, & Trauth, 2004; Quesenberry & Trauth, 2005; Quesenberry, Trauth, & Morgan, 2006; Trauth, Quesenberry & Yeo, 2005).

The Individual Differences Theory of Gender and IT addresses the undertheorization of gender and IT by offering an alternative theory that focuses on individual differences among women as they relate to the characteristics of IT work and the IT workplace. This view finds the causes of gender underrepresentation in the varied individual responses to generalized societal influences. Thus, it represents the middle ground between the essentialist and social constructionist theories. In doing so, it investigates the individual variations across genders as a result of the combination of personal characteristics and environmental influences in order to understand the participation of women in the IT workforce. Hence, the focus is on differences within rather than between genders. The theory also views women and men as individuals who possess different technical talents and inclinations and respond to the social shaping of gender in unique and particular ways that vary across cultures. This individual differences theory takes into account the uniformity of social shaping messages conveyed in a culture. However, it also takes into account the varied influence of individual background and critical life events that result in a range of responses to those messages.

The individual differences theory is comprised of three general constructs that, together, explain women’s decisions to enter and remain in the IT field. The individual identity construct includes both personal demographic items (such as age, race, ethnicity, nationality, socio-economic class, and parenting status) and professional items (e.g., industry, type of IT work, etc.). The individual influence construct includes personal characteristics (e.g., educational background, personality traits, and abilities) and personal influences (e.g., mentors, role models, experiences with computing, and other significant life experiences). The environmental influence construct includes cultural attitudes and values (e.g., attitudes about IT, about women in IT), geographic data (e.g., about the geographical location of one’s work) and economic and policy data (e.g., about the region/country in which one works). The Individual Differences Theory of Gender and IT posits that, collectively, these constructs account for the differences among men and women in the ways they experience and respond to characteristics of IT work, the IT workplace and societal messages about women and men and IT.

CONCLUSION

It is ironic that coincident with a documented need for a deeper understanding of the gender imbalance in the IT field, there is insufficient attention being paid to theorizing gender and IT. Given this need, greater theorization in gender and IT research can contribute in several ways to a better understanding of women’s relationship to information technology. First, it can lead to more theoretically-informed treatments of gender in IT research. Wajcman (2000) has observed that gender is seldom considered a relevant factor in socio-technical studies of IT in context. Second, much of the published work that does focus on gender places emphasis on data analysis rather than theoretical implications and linking these results to the existing body of gender, and gender and IT literature (Adam et al., 2001). Hence, greater explicit use of theory can strengthen the existing body of gender and IT research. Finally, insufficient attention has been paid to the differences among women rather than between women and men with respect to information technology adoption, use and work. The development of the Individual Differences Theory of Gender and IT is intended to address this need by providing additional theoretical insights to help us to better understand the individual and environmental forces that account for the underrepresentation of women in IT. It accomplishes this by focusing on women as individuals, having distinct personalities, experiencing a range of socio-cultural influences, and thus exhibiting a range of responses to the social construction of IT. This, in turn, can facilitate more nuanced studies of gender that explore the multiple identities of women—for example, race and gender, or sexual orientation and gender, or age and gender—and their relationships to information technology.
One stream of future work will explore the role of epistemology and methodology in conducting gender and IT research using the Individual Differences Theory of Gender and IT. Another stream of research will explore the contribution of organizational factors to the underrepresentation of women in IT by focusing on the articulation of workplace factors that enhance and inhibit women’s participation in IT work and women’s varying responses to them. A third stream of research will apply the individual differences theory of gender and IT to an examination of differences in Internet search behavior across a variety of uses.

ACKNOWLEDGMENT

This article is from a study funded by a National Science Foundation Grant (EIA-0204246).

REFERENCES


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**KEY TERMS**

**Essentialism:** The assertion of fixed, unified and opposed female and male natures (Wajcman, 1991, p. 9). This theoretical perspective is used to explain the under representation of women in the information technology field by arguing the existence of “essential differences” between males and females with respect to engagement with information technology.

**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.

**Social Construction:** A theoretical perspective articulated by Peter Berger and Thomas Luckmann (1967) that focuses on social processes and interactions in the shaping of actors. This theoretical perspective is used to explain the under representation of women in the information technology field by arguing that technology—socially constructed as a masculine domain—is in conflict with socially constructed feminine identity.

**ENDNOTE**

1 See Wilson and Howcroft (2000) for an example of how context enriches the analysis of observed differences in behavior toward IT based upon gender.