Gender and Computer Anxiety

Sue E. Kase
The Pennsylvania State University, USA

Frank E. Ritter
The Pennsylvania State University, USA

INTRODUCTION

Because of their ability to enhance productivity, computers have become ubiquitous in the workplace. By the early 1990s the use of computers in the workplace reached a per capita penetration that the telephone took 75 years to achieve (Webster & Martocchio, 1992). During the past several decades, there has been both speculation and hard research related to the psychological effects of computer technology. More recently the role of attitudes towards computers in influencing the acceptance and use of computer-based management information systems (MIS) has been highlighted by a growing number of MIS researchers. Generally, these studies focus on the negative attitudes towards computers and concerns about the impact of MIS on individual performance in the workplace.

Computer anxiety has been reported to be associated with negative attitudes towards computers. As computers play a pervasive role in MIS and decision support systems, these findings emphasize the need for additional empirical research on the determinants of computer anxiety and attitudes towards computers. Furthermore, with the increasing participation of women in information technology professions, important questions are whether men and women differ with regard to computer anxiety and attitudes towards computers, and what factors explain such differences where they exist, and how to ameliorate anxiety where it occurs.

The Concept and Correlates of Computer Anxiety

Much has been speculated about computer anxiety, both what it is and what to do about it. Computer anxiety is context specific and covers a wide variety of situations in which people interact with computers. Context-specific anxiety tests ask the question: "How do you feel when a specific type of situation occurs?" Commonly, the relationship between a measure of computer anxiety and other variables is examined. For example, the relationship of computer anxiety to computer-related experience has historically been a hotly contested question in MIS research, human-computer interaction (HCI), and educational psychology. Demographic variables posited or found to be related to computer anxiety include gender, age, organizational level, and academic major (Dambrot, Watkins-Malek, Silling, Marshall & Garver, 1985; Gutek & Bikson, 1985; Zmud, 1979). Personality variables examined as potential determinants of computer anxiety include trait anxiety, math anxiety, cognitive style, and locus of control (Howard & Smith, 1986; Igbaria & Parasuraman, 1989; Morrow, Prell & McElroy, 1986). Additionally, several studies have examined the relationship between computer anxiety and academic achievement. For example, Hayek and Stephens (1989) and Marcoulides (1988) reported significantly lower computer anxiety being associated with higher academic achievement.

BACKGROUND

Initially, computer anxiety became of interest during the technological revolution. In 1963 a social psychologist at IBM completed a nationwide study to examine popular beliefs and attitudes about one of the prime symbols of our rapidly changing technology—the electronic computer. Lee's (1970) findings concluded that the American public viewed computers on two independent dimensions. The first dimension, the "Beneficial Tool of Mankind Perspective," described a positively toned set of beliefs that computers are beneficial in science, industry, and business. The second dimension, the "Awesome Thinking Machine Perspective," connoted fear of an incomprehensibly complex machine with capabilities far exceeding those of a human. This perspective, which reflects ignorance about the capabilities and limitations of computers, is one of the generic origins of computer anxiety.

Later, during the 1980s, much of the writing about computer anxiety and attitudes towards computers was concentrated in trade and business publications (e.g., Howard, 1986; Igbaria & Parasuraman, 1989). During this time period uncertainty was often considered the primary predictor of computer anxiety. This uncertainty referred

Copyright © 2005, Idea Group Inc., distributing in print or electronic forms without written permission of IGI is prohibited.

to an individual's ability to learn to use the computer or to the potential the machine had to rearrange traditional office functions and power structures. Sabotage and hostility were sometimes responses to these uncertainties, especially when they were accompanied by fear of replacement by the machine. This particular concern was often voiced by middle managers who viewed their jobs as information conduits or as a mosaic of clerical tasks, all of which could be performed more efficiently by a computer. Managers with longer tenure with a company and those who felt they were currently utilizing their time quite effectively were likely to resist computer adoption and use. Additionally, computer usage required typing skills. Those persons who did not know how to type or considered typing a low-status skill were reluctant to adapt to the new technology.

Collectively two groups displayed the most susceptibility to computer anxiety: individuals without computer experience overestimated the difficulties involved in learning and interacting with computers; and individuals whose jobs appeared threatened resisted adaptation to technological improvements (Gilroy & Desai, 1986). It has been well documented that among individuals demonstrating computer anxiety are significant numbers of women, as examined in the next section.

The Role of Gender in Computer Anxiety

According to feminist technology studies, computers are widely perceived as belonging to the "male domain" of mathematics, science, electronics, and machinery (Beyer, 1999; Cockburn & Ormrod, 1993; Faulkner, 2001). This, coupled with reports of greater prevalence of math anxiety among women than men (e.g., Brown & Josephs, 1999; Chipman, Krantz & Silver, 1992), suggests that women are likely to have a more negative view of computer use than men. It is not surprising that men have been found to display lower computer anxiety, higher computer aptitude, and more positive attitudes towards computers in general than women (Chua, Chen & Wong, 1999; Coffin & Machintyre, 2000; Colley, Gale & Harris, 1994; Whitely, 1997).

The limited empirical research on gender differences in computer anxiety, attitudes towards computers, and computer experiences among working adults reveals conflicting results, however. By the early 1990s, only 25 studies presented sufficient statistical information that could be converted to correlations, and an additional 13 qualitative research reports supported only slight differences between men and women in computer anxiety (Rosen & Maguire, 1990). In contrast, other studies reported no gender differences associated with computer use in the workplace.

More specific studies found stronger correlations and gender differences. One of the most frequently cited studies on computer anxiety is by Rosen, Sears, and Weil (1987). They examined the relationship between computer anxiety and gender role as measured by the Bem Sex Role Inventory (Bem, 1974). This instrument identified individuals as belonging to one of four identity groups: masculine, feminine, androgynous, or undifferentiated. They found that feminine-identity individuals had more computer anxiety and more negative computer attitudes than did masculine-identity individuals, regardless of gender. Another influential instrument employed extensively in early studies on microcomputer anxiety in management is the Computer Anxiety Rating Scale (CARS) developed by Raub (1981). Raub investigated math anxiety, gender, age, trait anxiety, and knowledge of computers as possible correlates of computer anxiety. She suspected a gender effect based on the negative socialization of women toward mathematics, science, and technology and on the resulting production of anxieties. Raub found the relationship between computer anxiety and gender so strong that she ran separate regressions for males and females.

CARS has been used in more recent research as well. Anderson (1996) utilized CARS to determine whether or not perceived knowledge of software, computer experience, overall knowledge of computers, programming experience, and gender were predictors of computer anxiety. Table 1 displays the CARS portion of the Anderson questionnaire. Collaborating Raub's results, Anderson's study showed higher computer anxiety is accompanied by less experience and less perceived knowledge of computers, and that at higher levels of computer anxiety, women are over-represented.

Indirectly, the use of CARS led to the introduction of statistical modeling as a more formal investigation of the psychological mechanisms that trigger computer anxiety and the remedies for it. For example, the work of Howard (1986) is distinctive during the 1980s in its similarity to more recent research on computer anxiety. Howard developed a sequence of models addressing the predictors of computer anxiety and the use of computers in management. In schematic form, Figure 1 shows the possible relationships between psychological variables and the attitudes of managers toward the usefulness of microcomputers as management tools. Howard's study confirmed that computer anxiety is a significant inverse correlate of managers' positive attitudes toward microcomputers.

Similar to Raub, Howard speculated that gender may correlate with math anxiety and possibly with computer anxiety. Gender as a math anxiety correlate reflects psychological differences between men and women with

7 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/gender-computer-anxiety/14421

Related Content

Signal Processing Techniques for Audio and Speech Applications
Hector Perez-Meanaand Mariko Nakano-Miyatake (2009). *Encyclopedia of Information Science and Technology, Second Edition (pp. 3457-3461).*
www.irma-international.org/chapter/signal-processing-techniques-audio-speech/14087

ERP Selection using an AHP-based Decision Support System
Maria Manuela Cruz-Cunha, Joaquim P. Silva, Joaquim José Gonçalves, José António Fernandesand Paulo Silva Ávila (2016). *Information Resources Management Journal (pp. 65-81).*
www.irma-international.org/article/erp-selection-using-an-ahp-based-decision-support-system/164900

R2-IBN: Argumentation Based Negotiation Framework for MAIS-E2 model
Lobna Hsairi, Khaled Ghédira, Adel M. Alimand Abdellatif BenAbdelhafid (2009). *Open Information Management: Applications of Interconnectivity and Collaboration (pp. 144-157).*
www.irma-international.org/chapter/ibn-argumentation-based-negotiation-framework/27793

Defining and Understanding ERP Systems
David Sammonand Frédéric Adam (2005). *Encyclopedia of Information Science and Technology, First Edition (pp. 772-778).*
www.irma-international.org/chapter/defining-understanding-erp-systems/14334

Creation of a Digital Learning Ecosystem Using Research-Based Learning for Future Programming Teachers
Susana Sastre-Merino, José Luis Martín-Núñezand Amparo Verdu-Vazquez (2022). *Journal of Information Technology Research (pp. 1-14).*
www.irma-international.org/article/creation-of-a-digital-learning-ecosystem-using-research-based-learning-for-future-programming-teachers/298324