

Gender Differences in Adolescents' Attitudes about IT Careers

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INTRODUCTION

Adolescents are the fastest growing segment of computer and Internet users, reporting heavier use than their parents (Lenhart, Madden & Hitlin, 2005). Though the popularity of technology continues to flourish and drive the American economy, recent studies suggest that the revolution may be leaving females behind at later ages (Cooper & Weaver, 2003; McDonald, 2004). Employment data from the United States (U.S.) Bureau of Labor Statistics show that the U.S. high-tech computer industry employs nearly 5 million workers, making it one of the nation's largest and most lucrative industries. Yet the number of women earning computer science degrees in the U.S. has plummeted over the past two decades, causing women to be vastly underrepresented in the information technology (IT) workforce (McDonald, 2004; National Science Foundation, 2004).

BACKGROUND

After high school, the majority of young women make academic choices that steer them away from IT careers (Stabiner, 2003). Early gender differences in computer attitudes may be a precursor for later academic choices. Guided by Eccles and colleagues' (1998) expectancy-value model of achievement motivation, this article provides an analysis of gender differences in adolescents' attitudes about IT careers. The expectancy-value model of achievement motivation suggests that adolescents' expectations for success and interests predict career plans. Findings from past empirical research in the domains of mathematics and science corroborate this model and suggest that individuals base their educational and career plans on expectations for success and value/interest (Eccles, Wigfield, & Schiefele, 1998).

Expectations for Success in IT Careers

Although female college freshmen have significantly closed the gender gap in computer use, there are still overwhelming gender differences in adolescents' expectations for success in the IT domain (Dickhauser & Stiensmeier-Pelster, 2002). The gender gap in computer-related ability beliefs first appears in the elementary school years and widens as students move through high school, into college and beyond. By the time adolescents graduate from high school, the gender gap in computer attitudes is striking, with males reporting more positive attitudes toward computer technology than females (Kirkpatrick & Cuban, 2000).

While the gender gap in computer confidence has always favored males, the gap among the 2000 college freshman class was actually the largest in the history of the University of California—Los Angeles' (UCLA) ongoing survey of students. First-year college women and men reported almost equal computer use, but female freshmen were only half as likely as men to rate their computer skills highly (Sax, Astin, Korn, & Mahoney, 2000). Females are also more likely to consider themselves "not the type to do well with computers," and less likely to say they "could handle a more difficult computer course" (Young, 2000). This gap in self-confidence may contribute to the fact that men are significantly more likely than women to pursue careers in computer programming.

Interest in IT Careers

In addition to expecting less success with computers, girls also report less favorable computer value and interest, especially during adolescence. Most studies report minimal gender gaps in computer attitudes during elementary school; however, by the time students graduate high school, the gender gap in computer attitudes is significantly larger, with males

revealing more interest in technology, even when computer experience is controlled (Kadijevich, 2000; Kirkpatrick & Cuban, 2000). Male students are also more likely than female students to enroll in high school computer classes, perhaps indicating higher levels of interest for boys than girls (AAUW Educational Foundation, 1998; Bleeker, 2005).

As females reach adolescence, they often begin to attach their career interests to people-oriented social contexts and become most interested in jobs that will allow them to make a difference in society (Eccles et al., 1998; Margolis & Fisher, 2003). Not surprisingly, most young women who choose to major in computer science typically enter the field because of applied purposes, rather than a passion for programming or technology (Stabiner, 2003). Unfortunately, young girls often fail to see the high-tech industry as a key to helping others or making a contribution to society.

Moreover, many adolescents choose to pursue occupations other than those in technology because they are unable to relate their everyday interests in computers to IT careers (see Dryburgh, 2000). Lack of interest in pursuing computer science degrees may be related to stereotypical perceptions of computer scientists (McDonald, 2004). Even though some adolescents spend more than 16 hours each week in front of a computer (Bleeker, 2005), many express negative views about programming work and have a general aversion to the field of computer science. Computing careers are often perceived as involving little human contact, consisting mostly of keyboard work and lacking in creativity. These job characteristics seem to be especially unattractive to girls (Gilbert, 2002).

CURRENT STUDY

Much past research has failed to look closely at adolescents' perceptions of *different types* of careers within the broad field of IT. Based on past work (see Eccles et al., 1998) showing the importance of girls' valuing of "people-society job" characteristics, it seems likely that females may value certain IT careers (Web development, technology assistance) more than others (programming). Most past studies (e.g., Kadijevich, 2000), however, have asked adolescents to report attitudes only about

computer science careers, or have simply asked adolescents to estimate how often they might use computers in their future careers. This article moves beyond these limitations and attains a more complete picture of adolescents' levels of interest and efficacy for IT careers. By assessing adolescents' attitudes about various IT careers rather than simply asking about computer science, this study investigates possible gender-based trends in attitudes within the broad IT workforce.

During the fall semester of 2004, 460 student participants (213 girls, 247 boys) were recruited from two public high schools (grades 9-12) in the northeastern U.S. At both high schools, an identical Web-based survey was administered to students during class time in a computer lab. The majority of students enrolled in the high schools were European-American and from middle- to lower-middle-class households (National Center for Education Statistics, 2004; U.S. Census Bureau, 2000).

Adolescent participants were asked to answer questions about seven different IT jobs, indicating their *expectations for success* and *level of interest* in the occupation. The list of seven jobs was created using the IT occupations listed on the U.S. Department of Labor's computer science Web page (Bureau of Labor Statistics, 2003; see Table 1). To help participants assess their beliefs about each occupation, a short description of each job was included, based on descriptions provided by the U.S. Department of Labor (Bureau of Labor Statistics, 2003). Items were answered using seven-point response scales, ranging from "not very" to "very." Thus, higher scores represent more interest and greater expectations for success with IT careers.

Table 1. List of IT careers (provided on student survey)

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| <ul style="list-style-type: none"> • Computer scientist • Computer systems analyst • Database administrator • Webmaster • Web developer/designer • Computer support services • Computer teacher |
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