Chapter 2
Women and Men in Computer Science:
The Role of Gaming in their Educational Goals

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ABSTRACT

Playing digital games is described as a pathway to computer science (CS) classes and majors, but not all gamers want to study CS. The goal of this chapter is to explore which gaming motivations and practices are most strongly related to an interest in studying computer science, and whether the connection between gaming and computer science is similar for men and women. The data are from 545 male and female gamers taking an introductory computer science class at one of 15 community colleges in the US. Survey responses were analyzed to provide a picture of what, how often, and why they play, and interviews from 39 of the most avid gamers were analyzed for why and how they play. The results show that, on average, men play more frequently than women, and there are gender differences in the type of games they like to play and why they play them. However, playing more frequently was not associated with greater interest in studying CS for either gender. Interest in CS was highest among men who were motivated to play in order to increase skills, be with friends, connect with the game features, and by the art or graphics. However, CS interest was highest among women who consider themselves to be more serious gamers, play racing and puzzle games, play on a game console, and are motivated by fun, relaxation and social interaction. The results can inform efforts to increase the number of women that pursue computer science. The chapter concludes with recommendations for future research on how game play and interest in CS are related.

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BACKGROUND

Women's enrollment in computer and information sciences (CIS) majors and completion of CIS undergraduate and graduate degrees has declined in the US over the last 20 years (National Science Foundation, 2013). Prior research has suggested that enrollment and retention in college-level computer science is related to students' experience and interest in digital gaming. In particular, women's underrepresentation is widely believed to be due, in part, to a lack of computer game play (Carter, 2006; Lynn, Raphael, Olefsky, & Bachen, 2003). Until recently, males reported more frequent game play and were more likely to cite that as a source of motivation and preparation to pursue a computer science (CS) major (Margolis & Fisher, 2002; Natale, 2002; Tillberg & Cohoon, 2005). A recent quantitative study of community or 2-year college students found that intention to pursue computer science studies was predicted by computer gaming, for both women and men (Denner, Werner, O'Connor, & Glassman, 2014). However, other studies have challenged the connection between gaming and CS.

In order to understand how playing computer games is related to educational goals, it is important to understand students' motivation to play certain types of games--whether it is for entertainment, to learn something, or to reduce stress (Sherry et al., 2006). More recent and in depth studies of gaming are needed to understand how and why students play, as well as whether there are gender differences in the role that computer game play has in students' interest in a computer-related major. The next section includes a review of relevant research on what male and female gamers play, why they play, and the implications of this research for understanding the connection between gaming and interest in studying computer science.

Different Types of Game Play

Talking about gaming in general is like talking about sports—there is great variation in the kinds of games that are available, and a range of play experiences is available both within and across game genres. In this chapter we are talking about all kinds of digital games, including what the Entertainment Software Association refers to as video games (those using game consoles) and computer games (those playable on personal computers including mobile multi-purpose devices). In 2012, the best selling video game genres were: action (22%), shooters (21%), sports (15%) and adventure (8%), and the best selling computer game genres were role playing (28%), casual (27%), and strategy (25%) games (Entertainment Software Association, 2013). Action games include a range of play experiences, from fighting games (Mortal Kombat) to platform games (Super Mario Brothers), but usually involve completing discrete levels, having limited lives, and scoring points. Shooter, otherwise known as First Person Shooter (FPS) games (the player's view is through the eyes of their character) such as Call of Duty include discrete local campaigns or storylines for the player to complete, and online cooperative and battle modes. Sports games such as the Madden NFL series are often played on a game console, and there are options to play online with or against other people. Adventure games such as Tomb Raider and Assassin's Creed include exploration, solving environmental puzzles and collecting objects. Role playing games include the Final Fantasy series and World of Warcraft games which include developing characters actions and abilities through experience and training while completing a long range storyline. Casual games are usually played on a personal computer or mobile device and require little time to learn and complete; they are often puzzle games, which involve problem