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Video game preferences and their relation to career interests

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ABSTRACT

The current study used an mTURK sample to determine if there is a relation between video game preferences and career interests. Previous research has found that individual (e.g., personality) differences influence gaming preferences (Zammitto, 2001) and we sought to extend these findings to the domain of career interests. In addition, we examined the potential moderating role of gender. Since researchers have found that gender disparities in spatial attention can be reduced by playing certain types of video games (Feng, Spence, & Pratt, 2007), and it has been demonstrated that spatial ability is an important predictor of success in careers where women are typically underrepresented (Blickenstaff, 2005), we predicted that women with a preference for these types of games (versus a general preference) may have more interest in these careers. We found that gaming motivations were differentially associated with career interests. In addition, gender was found to significantly moderate a number of these relations, such that the association between gaming tendencies and career interests was stronger for women than for men. Findings from the current study should help guide future research that aims to increase the representation of women in STEM careers.

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1. Introduction

Some researchers have suggested that gender differences in science, technology, engineering, and mathematics (STEM) careers no longer exist (Hyde & Mertz, 2009). The fact that more women in the United States are graduating with bachelor and doctoral degrees in the sciences than in previous years seems to support this point (National Science Foundation, 2011). However, women continue to represent only 25% of the workforce in STEM areas, despite representing approximately 50% of the general workforce (U.S. Department of Commerce, 2011). In addition, evidence suggests that those women who complete STEM programs tend to receive degrees in biology or premedical sciences, whereas disproportionately fewer women receive degrees in engineering and the physical sciences (American Physical Society, 2011). Taken together, these statistics suggest that female under-representation in STEM careers continues to be a relevant area of research.

Heilbronner (2013) identified a number of internal and external factors that may account for why fewer women enter STEM fields. The internal factors described include *ability*, *self-efficacy*, and *interest*, whereas external factors encompass relevant *mentors*, *academics*, and *workplace experiences*. In this paper we focus on enhancing our understanding of how two internal factors, ability and interests, may impact representation of women in STEM careers.

1.1. Internal factors affecting women's entrance into STEM careers

First, research has demonstrated that *spatial ability* is an important predictor of success in STEM careers (Blickenstaff, 2005). In addition, research suggests that men tend to perform better on tasks of visual-spatial ability than do women (Lubinski & Benbow, 1992), and men prefer activities that involve the manipulation of objects (Maccoby & Jacklin, 1974). For these reasons, it has been proposed that women may be less likely to choose STEM career paths because they tend to perform less well than do men on relevant tasks (Hyde, 1996).

Further support for this hypothesis comes from a study by Wai, Lubinski, Benbow, and Steiger (2010) which found that SAT-mathematics scores significantly predicted the number of STEM patents and publications among a group of individuals working in the field. SAT scores also predicted the rate of tenure track for these professionals. Once again, national statistics in the United States revealed that women tend to perform lower on both the SAT-mathematics and SAT-verbal than do men (College Board, 2010). As such, it

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seems likely that ability continues to play an important role in the gender disparity among STEM careers.

Interestingly, researchers have begun testing if video games can be used to train spatial abilities (Feng, Spence, & Pratt, 2007; Sanchez, 2012). Independent empirical investigations found that participants' scores on a series of spatial abilities tasks increased after playing action (i.e., shooter based) video games. In addition, researchers noted (Feng et al., 2007) that the training effects were more pronounced for those participants with comparatively low spatial scores at pre-testing. If some of the gender disparity in STEM careers can be attributed to spatial abilities as Heilbronner (2013) proposed, the results of these video game studies provide preliminary evidence that video games may be an important tool for reducing gender differences in spatial ability.

Next, Heilbronner (2013) proposed that *interest* is another key internal factor affecting women's entrance in STEM careers. That is, perhaps fewer women pursue STEM studies because they are simply not interested in them. Career interest studies support this suggestion, noting that women consistently report lower interest in physical science, engineering, finance, and mathematics than do men (Schermer, 2012; Schermer & MacDougall, 2011). Furthermore, some researchers propose that fewer women enter STEM areas because they express an interest in pursing careers that are interpersonally oriented and involve helping others, whereas men cite an interest in financial reward and prestige (Feist, 2006; Tillberg & Cohoon, 2005). In general, STEM careers fulfill the interests expressed by men better than those described by women.

As outlined by Heilbronner (2013), if we hope to decrease gender disparity in STEM areas it important to consider how both ability and interest impact women's entrance into these male-dominated fields. Although there is empirical evidence that video games may be one tool for training ability, there is little research examining how interest in video games are associated with career interests. As such, the present study will use a modified version of the Jackson Vocational Interest Survey (JVIS; Jackson, 2000) to examine this relationship.

The JVIS is a popular assessment for studying career interests. Rather than measuring interest for specific job titles, the JVIS consists of 34 basic interest scales, each of which assess a set of characteristics that can describe a variety of occupations. Basic interest scales are organized into two groups: *work roles* and *work styles*. Work roles assess interests that are closely related to a particular class of occupations (i.e., elementary education), while work styles measure an individual's preference for certain types of work environments, or behaviours that are typical for certain occupations. For example, *Stamina* is a work style that would be important for a computer programmer, who frequently works long hours. A description of each basic interest scale can be found in the attached Supplementary materials file.

1.2. Video game preferences and motivations

A national survey conducted by the Entertainment Software Association (ESA, 2013) found that 58% of Americans played video games. As expected, the majority of these players were male (55%), yet these data suggest that a large percentage of video game players are female (45%). Also, the gaming preferences and habits of males and females were found to differ significantly. Importantly, 68% of male gamers reported playing more than two hours of video games each week, while only 21% of female gamers reported doing so (Olgetree & Drake, 2007). In addition, males tended to prefer shooter and role playing games, while women reported playing more arcade and puzzle/word games. These patterns of results have been reported by additional researchers (Homer, Hayward, Frye, & Plass, 2012). In a separate study by Hartman and Klimmt (2006) it was found that the main reasons women do not like certain video games (i.e., first-person shooters; FPS) is because they lack meaningful social interactions, contain violent content, and depict highly sexualized female characters.

Recent research on video game preferences has moved beyond investigations of preferred genres and begun to examine the underlying motivations individuals express for playing video games. Sherry, Lucas, Greenberg, and Lachlan (2006) proposed six distinct reasons someone would choose to play video games: *arousal*, *challenge*, *competition*, *diversion*, *fantasy*, and *social interaction*. An arousal motivation would suggest a desire to play games because they are emotionally stimulating, while someone motivated by challenge plays to get to the "next level" or reach some stage of personal accomplishment. Competition is one of the most frequently cited reasons for playing video games and describes the motivation of an individual who wants to be the best and beat their friends. In contrast, a diversion motivation describes a desire to play because it is relaxing and reduces stress, or to alleviate boredom and avoid other responsibilities. The fantasy motivation reflects a tendency to play games because they allow you to do things that would not otherwise be possible in real life. Finally, a social interaction motivation describes the situation in which an individual plays games to interact with their friends. This motivation is often the main reason children begin to play video games (Lucas & Sherry, 2004).

Lucas and Sherry (2004) investigated gender differences in gaming motivations and found that men scored significantly higher on all motivation types compared to women. However, challenge was ranked as the highest motivation by both men and women. The largest sex differences were found for social interaction (effect size $d = 1.24$), competition ($d = 0.80$), and arousal ($d = 0.70$).

Since previous research has found that individual (e.g., personality) differences influence video game preferences (Zammitto, 2001), the goal of the present study is to extend these findings to the individual differences domain of career interests. In particular, we are interested in assessing how gaming motivation preferences are differentially associated with career interests and work styles, especially as they relate to interest in STEM areas. Specific predictions are discussed below.

First, previous research showed that preference for arousing media (e.g., television, movies, and presumably video games) was positively associated with sensation-seeking and impulsivity (Banerjee, Green, Krcmar, Bagdasarov, & Ruginyte, 2008). Presumably, individuals who are interested in first-responder type medical service careers would also be high sensation-seekers. As such, it is expected that those participants who endorse an arousal gaming motivation will express greater interest in medical services and adventurous work styles. These individuals are also expected to report less interest jobs and work styles that tend to be more stable and predictable, such as finance, accountability, and job security.

H_1: Arousal gaming motivation scores are expected to be positively correlated with medical services and adventure, but negatively correlated with finance, accountability, and job security basic interest scales.

Second, a preference for challenging tasks has been found to be positively correlated with a high desire for control and persistence in the face of difficulty (Burger, 1985). Also, a high desire for control has been positively correlated with academic performance (Burger, 1992) and preference for independence (Evans & Dean, 2002).

H_2: Challenge scores are expected to be positively correlated with interest in academic achievement and an independent work style.

Third, Teng (2008) found that individuals who play video games online with other users (i.e., social interaction gaming) score

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