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Multivariate effects of gender, ownership, and the frequency of use on computer anxiety among high school students

Mustafa Baloğlu*, Vildan Çevik¹

Gaziosmanpaşa University, College of Education, Department of Educational Sciences, Tokat, Turkey

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ABSTRACT

Studies that address the problems associated with computer anxiety are abundant; however, fewer studies took into account multivariate nature of the construct. Moreover, studies focusing on high school students are even more limited. Thus, the present study investigated the multivariate effects of gender, ownership, and the frequency of computer use on computer anxiety levels, after controlling for the possible effects of trait anxiety among 715 Turkish high school students. The Computer Anxiety Scale and the State-Trait Anxiety Inventory were used to assess computer anxiety and state and trait anxiety levels, respectively. A 2 X 2 X 3 between-subjects factorial multivariate analysis of covariance was used on three dependent variables that are the three dimensions of computer anxiety: Affective Anxiety, Damaging Anxiety, and Learning Anxiety. Independent variables are gender, ownership (i.e., yes or no), and the frequency of computer use (i.e., everyday, several times a week, or once a week or less). Results showed a significant covariate effect of trait anxiety, significant main effects for gender, ownership, and the frequency of computer use on the dependent variables. No three-way or two-way interaction was detected. After the descriptive and comparative analyses, specific suggestions were provided based on the results.

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* Corresponding author. Tel.: +90 356 2521616/3415; fax: +90 356 2521546.

E-mail addresses: baloglu@hotmail.com, baloglu@gop.edu.tr (M. Baloğlu), vildancevik@gop.edu.tr (V. Çevik).

¹ Tel.: +90 356 2521616/3415; fax: +90 356 2521546.

1. Introduction

With the more extensive use in all levels of education (Durnell & Haag, 2002; Imhof, Vollmeyer, & Beierlein, 2007), issues related to computers are more focus of interest among researchers. It is predicted that the higher number of people use computers in their daily lives, the more will face difficulties with them (Beckers & Schmidt, 2001). In this context, the construct of computer anxiety has been studied since the beginnings of the 80's, mostly focusing on the non-cognitive factors such as attitudes, previous experiences with computers, trait anxiety, or personality-related factors.

Even though the construct of computer anxiety has been studied for an extended period of time, there is still no consensus in the literature regarding its definition (Beckers, Wicherts, & Schmidt, 2007). However, according to a commonly used definition, computer anxiety is the fear and apprehension felt by an individual when considering the utilization of computer technology or when actually using computers (Maurer, 1983). A review of the literature showed that most definitions of computer anxiety include a fear component (Chua, Chen, & Wong, 1999). Computerphobia (Rosen, Sears, & Weil, 1987), computer apprehension (Anderson, 1996), computer resistance (Bohlin & Hunt, 1995), or technophobia (Brosnan, 1999) are some of the other terms used interchangeably with computer anxiety.

Regardless of the term, there is evidence that a large number of students hold negative attitudes towards and experience high levels of computer anxiety (e.g., North & Noyes, 2002). Bozionelos (2001) found that as high as 40–50% of students experience computer anxiety. More specifically, there is evidence that high school students may experience higher levels of computer anxiety than college students (Loyd & Gressard, 1984).

Recently, computer anxiety has been conceptualized as a multi-dimensional construct, including psychological, operational, and sociological components (e.g., Beckers & Schmidt, 2001; Beckers et al., 2007). Owning a personal computer (PC) at home (ownership) and the frequency of computer use were found to be two of the operational components of computer anxiety (e.g., Brosnan, 1999; Kesser, 2001; Rosen & Weil, 1995; Üstündağ, 2001). Arkan (2002) found that those individuals who owned a PC at home showed less anxiety related to computers. Similarly, Chua et al. (1999) and Chou (2003) found that computer usage was negatively related to computer anxiety. In a relatively earlier study, Selwyn (1997) found that, out of 530 students, 68.5% had a PC at home; but there was no relationship between ownership and frequency of computer use. With a group of Turkish college students, Namlu and Ceyhan (2002) found that 19.8% of the students had a PC at home and those who had a PC showed significantly lower levels of computer anxiety. In addition, they found that as the frequency of computer use increased, computer anxiety levels decreased. This meant that students who used computers more often showed lower levels of computer anxiety compared to those who used computers less frequently.

Gender may be the single most widely investigated sociological variable in computer anxiety research (Mcilroy, Bunting, Tierney, & Gordon, 2001). Generally speaking, men have more positive attitudes toward computers than women (Bovee, Voogt, Meelissen, 2007; Dupin-Bryant, 2002). In addition, women show higher levels of computer anxiety than men (e.g., Abdelhamid, 2002; Durnell & Haag, 2002; Mcilroy et al., 2001; Todman, 2000). However, other studies failed to find significant differences between men and women on computer anxiety levels (e.g., Colley, Gale, & Harris, 1994; Rosen & Weil, 1995; Scott & Rockwell, 1997; Tekinarslan, 2008). On the contrary, a few earlier studies found that men showed higher levels of computer anxiety than women (e.g., Brosnan & Lee, 1998; Lever, Sherrod, & Bransford, 1989; Siann, Macleod, Glissov, & Durnell, 1990). Rosen and Maguire (1990) concluded that although some studies have found gender differences, such differences were minimal. Emphasizing the interaction between gender and computer usage, Scott and Rockwell (1997) argue that gender differences on computer anxiety are a function of different levels of computer experience (i.e., the frequency of computer use).

Current literature is inconsistent regarding the factors of computer anxiety. In addition, fewer studies have investigated computer anxiety levels among high school students. Chua et al. (1999) reported 15 studies that investigated college students' computer anxiety levels, whereas, only five studies focused on high school students. A recent search of the literature between 2000 and 2008 on PsycINFO with "computer anxiety" as a descriptor revealed 47 studies, 35 peer-reviewed articles and 12 dissertations. Of the studies, 44 focused on college students or adult populations whereas, only two studies

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