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A meta-analysis on the antecedents and consequences of computer anxiety

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Abstract

The purpose of the study is to examine the correlates of computer anxiety, using meta-analytic procedures. Analyses included 38 studies containing 79 correlation coefficients. Significant antecedents of computer anxiety are trait anxiety ($Z = .25$), neuroticism ($Z = .24$) and openness to experience ($Z = -.25$). These relationships are modest in terms of effect size, suggesting that computer anxiety can be reduced through training. The significant consequences of computer anxiety are ease of using computers ($Z = -.39$), and intention of using computers ($Z = -.26$). Computer anxiety did not correlate with perceptions of computer utility, innovation or user performance.

Keywords: computer anxiety; antecedents; consequences; meta-analysis.

1. Introduction

As information technology was booming, individual reactions toward computers ranged from acceptance to suspicion, anxiety and avoidance (Pocius, 1991). Therefore, several researchers investigated variables that predict how one will react to the new technology.

The present paper summarizes results obtained in the research of computer anxiety. Using meta-analytic techniques for quantitative reviewing, the aim of the present review is to identify the main correlates of computer

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anxiety. For a better understanding of these variables, we classified them into three main categories: antecedents, correlates, and consequences of computer anxiety. Because most research studies in the literature are correlational, it is important to mention that this classification is based on theoretical grounds.

1.1. Antecedents of computer anxiety

The antecedents of computer anxiety are variables that, from a theoretical perspective, favor the emergence of this emotion. In the present review, the antecedents of computer anxiety are: previous experience with computers and personality variables.

The relationship between computer experience and computer anxiety is an intuitive one: as users are becoming more familiarized with the computer, they should experience less computer anxiety (Chua et al., 1999). The study of relationships between personality variables and computer anxiety is based on the assumption that stable elements of human behavior can be used in planning and using anxiety reduction techniques (Maurer, 1994). Previous research studies showed that computer anxiety results from the interaction between a trait-anxious user and a computer (Beckers et al., 2007). Regarding the relationships with the variables included in the Big Five Model, previous research studies showed that computer anxiety is experienced by emotionally unstable individuals, with low levels of openness to experience (Korukonda, 2007; McElroy, Hendrickson, Townsend & DeMarie, 2007).

1.2. Correlates of computer anxiety

The term "correlates" refers to variables that are associated with computer anxiety, but lack the theoretical base for considering them "antecedents" or "consequences". In this category, we included computer self-efficacy. Computer self-efficacy is a concept that describes how individuals assess their capabilities to use computers in various situations (Compeau & Higgins, 1995). From the perspective of the social learning theory (Bandura, 1997), individuals with high levels of self-efficacy are more confident in their capabilities and exhibit lower levels of anxiety when facing difficult tasks. Therefore, users with high computer self-efficacy should report lower levels of computer anxiety.

1.3. Consequences of computer anxiety

Computer anxiety is a negative emotional state; therefore it can have a negative impact on how users interact with the computer. Computer anxiety is a strong emotional state that explains different reactions, such as avoidance of computers, caution when using computers, negative perception of information technology, and attempts to reduce the time one has to interact with computers (Bozionelos, 2001). From a theoretical perspective, the consequences of computer anxiety are variables that describe how individuals perceive the computer (perception of computer utility or perceived ease of use), how individuals want to behave, or how they actually behave when are using the computer (how much they innovate when using a computer or the level of job performance when using a computer).

2. Method

We conducted article search on online databases (ScienceDirect, PsychInfo, Proquest, Academic Search Premiere), using "computer anxiety" and "technophobia" as keywords. The search provided approximately 400 abstracts, which were screened for eligibility. In order to be included in the review, a study had to: 1) use questionnaires developed for assessment of computer anxiety; and to 2) report at least the correlation coefficient and the sample size. Following the eligibility analysis, we retained 38 studies that contain 79 correlation coefficients.

Because the research papers included in the analysis had different cultural backgrounds and used different methods for assessing computer anxiety, we assumed that effects will vary randomly from one study to the other. Following the recommendations by Hunter and Schmidt (2004), correlation coefficients were transformed into z scores before computing average effect sizes. To assess the generalizability of the average effect size, we computed the fail-safe N index, to estimate how many studies would be necessary to modify the result of the meta-analysis.