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The factor structure of the Computer Anxiety Rating Scale and the Computer Thoughts Survey

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Abstract

The Computer Anxiety Rating Scale and the Computer Thoughts Survey were administered to 661 students enrolled on undergraduate programmes in five different universities. A covariance matrix and an asymptotic weight matrix for each scale were computed from the sample data using PRELIS2. Two factor models were specified and estimated by maximum likelihood using LISREL8. The results revealed that the three-factor model of the Computer Anxiety Rating Scale was judged to be a poor explanation of the data. On this basis it may be suggested that the use of the sub-scale scores derived from the Computer Anxiety Rating Scale may lack validity. The three-factor model of the Computer Thoughts Survey was judged to be an acceptable description of the data. The factor analysis further revealed that the factor loadings were positive and statistically significant. The results suggest that the proposed factor structure of the Computer Thoughts Survey was consistent with the sample data.

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Over the last 20 years, rapid developments in information technology (IT) have made a considerable impact upon almost every aspect of society. A working familiarity with IT is becoming increasingly important, particularly in business and educational contexts. Computers are now prevalent on university campuses, businesses, secondary schools and many of our homes, thus computers and technology have become an integral part of our lives.

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Past research on technophobia has been limited, in general, to examining attitudes toward computers and technology on single Likert-type scales (Rosen & Maguire, 1990). The assumption is then made that these attitudes directly represent all aspects of technophobia. More recently, technophobia has come to be known as computer-phobia, and has been defined by Rosen and Weil (1992) as, “anxiety about present or future interactions with computers or computer related technology; negative global attitudes about computers, their operation or their societal impact; and/or specific negative cognitions or self-critical internal dialogues during actual computer interaction or when contemplating future computer interaction” (pp. 7–8). This definition was derived from and based upon much empirical work with university students, business people, high-school students, and from a clinical treatment programme.

Rather than rely on a single measurement instrument to capture all three dimensions, Rosen and Weil (1992) used three separate measures, each examining a single dimension in depth, based on the earlier definition. The Computer Anxiety Rating Scale was developed to assess anxiety about interactions with computers or computer-related technology. The General Attitudes Toward Computers Scale was developed to assess negative global attitudes about computers. The Computer Thoughts Survey was developed to assess negative cognitions relating to computer use. Rosen, Sears, and Weil (1987) subjected each of these computerphobia measures to factor analyses (principal factoring with iteration followed by oblique rotation) using the data from university undergraduate students from 23 countries with the major cohort coming from the United States, Japan, Germany, Australia and Hungary.

Among the issues addressed in the Computer Anxiety Rating Scale questionnaire are: (1) anxiety related to the machines themselves; (2) their role in society; (3) computer programming; (4) computer use and (5) problems with computers and technology. Rosen et al. (1987) reported three factors, which comprised “Interactive Computer Learning Anxiety” which accounted for 42% of the variance, “Consumer Technology Anxiety” which accounted for 10% of the variance, and “Observational Computer Learning Anxiety” which accounted for 5% of the variance. Rosen and Weil (1992) later reported that all alpha coefficients for each sub-scale were in the range of 0.90–0.95 for the university students from the United States cohort. More recently, McIlroy, Bunting, Tierney, and Gordon (2001) found reliabilities of 0.80, 0.70 and 0.60 for the three factors. Although there are differences in the estimates of reliability across these studies this may be due to differences in the total scale score variability.

The Computer Thoughts Survey was originally created to yield assessment and diagnostic information necessary for a clinical treatment program that focused on the technophobes’ cognitions and feelings about their abilities with technology rather than on their anxieties about computers and technological devices (Weil, Rosen, & Sears, 1987). The Computer Thoughts Survey was modelled after the Computer Anxiety Rating Scale with statements responded to on a five-point scale reflecting how often the person had each specific thought when working with technology or when thinking about working with technology. Factor analysis of the

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