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# Effects of qualitative differences in initial and subsequent computer experience on computer anxiety

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## Abstract

Levels of computer anxiety (CA) and quality of initial computer experience were obtained for a sample of 154 first year psychology students. They also responded to questions about the frequency and intensity of good and bad subsequent computer experiences, and the dimensions along which they varied (relaxed/tense and feeling in control/feeling incompetent). Results indicated that effects of good early and later experiences were additive. There was, however, an inoculation effect of good early experience, providing some protection against effects of frequent bad later experiences, but this effect diminished when at least one of the later bad experiences was of high intensity. There was recovery from initial bad experiences when these were followed by frequent and high intensity later good experiences. The effect of variations in the quality of later experience on CA was greater for the “feeling in control/feeling incompetent” dimension than for the “relaxed/tense” dimension. Implications for the provision of computing experience for first year university students are discussed.

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## 1. Introduction

Some students are apprehensive about computers when they arrive at university. According to Weil and Rosen (1995), about 25% of university students demonstrate

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moderate to high technophobia. These students are not, however, spread evenly across faculties and departments. For example, students on a first year information technology course were found to have significantly lower computer anxiety (CA) scores than students on a first year psychology course (Todman, 2000). It would not be surprising, therefore, if more than 25% of psychology students had some degree of computer anxiety. Data on the levels of CA among first year psychology students over several years between 1992 and 1998 have been published (Todman, 2000) and these data provide some insight into the trends over that period.

Using a slightly modified version of the Likert-type Computer Anxiety Scale developed by Campbell and Dobson (1987), Todman (2000) found a significant linear downward trend in CA over the period. The notional mid-point of the scale was 2.5 and the mean CA scores of all of the groups tested were well below that level. Individual students with scores above the mid-point may be assumed to be at least somewhat lacking in confidence regarding computers and it is encouraging that the percentage of students scoring above the mid-point decreased steadily over the period from 41% in 1992 to 29% in 1998.

When the percentages of students in more extreme high-scoring groups were examined, however, the findings were less encouraging. Over the period, the percentage of students scoring more than two standard deviations above the mean was stable at around 2.5–3% and the percentage of students scoring more than one standard deviation above the mean was stable at around 14–16%. Of course, if the mean had lowered sufficiently over the period and standard deviations were low, a CA score one or two standard deviations above the mean could represent levels of CA that gave no cause for concern. In the event, at the end of the period, when the CA mean was at its lowest, scores one and two standard deviations above the mean were still high (2.85 and 3.55 respectively). The cut-off point for students who were seriously computerphobic was probably somewhere between the one and two standard deviation criteria. Wienberg and Fuerust (1984), using physiological indicators, suggested that about 5% of a sample of college students and business people were severely computerphobic. This is close to an estimate (about 6%) arrived at by Wilson (1999) in a study involving about 250 teacher trainees, in which he used behavioural observation and oral report in addition to questionnaire responses to identify students exhibiting severe levels of computerphobia. It is important to consider the reasons why a proportion of first year students continue to show the high levels of CA associated with severe computerphobia.

One manipulable variable that has been linked with level of CA is experience with computers. Initially, the emphasis was on *quantity* of experience and it was claimed by some researchers (e.g., Dyck & Smither, 1994; Fariña, Arce, Sobral, & Carames, 1991) that higher levels of computer experience are associated with lower levels of CA. Not all studies supported this view, however. Some found CA to increase with computing experience (e.g., Nelson, Wiese, & Cooper, 1991; Rosen, Sears, & Weil, 1987). It is clear, therefore, that lower CA does not invariably follow from high levels of experience with computers. It has become apparent that the outcome depends on the *qualitative* nature of the experience (e.g., Leso & Peck, 1992; McIlroy, Bunting, Tierney, & Gordon, 2001; Rosen & Maguire, 1990). McIlroy et al. found, for ex-

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