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## Computer self efficacy and gender: a cross cultural study of Scotland and Romania

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### Abstract

Research has indicated that in West Europe males on average are often found to be more experienced about computing than females, and to have more positive attitudes and self efficacy (self confidence) towards computing than females. Research has also shown that some East Europe countries have had relatively greater female involvement with technology, engineering and computing than West Europe. 200 Romanian and 148 Scottish students completed a computer self efficacy scale. Overall males were more confident than females in advanced and file and software computer skills, but of similar confidence for beginning skills. Scots of both genders were more confident than their Romanian equivalents for beginning computer skills, whilst Romanians were more confident for advanced computer skills. The 3 elements of the self efficacy scale — beginning, advanced and file and software skills — correlated positively with each other. The results were interpreted as showing both similarity and difference in computing self efficacy between Scotland and Romania. © 2000 Elsevier Science Ltd. All rights reserved.

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### 1. Introduction

The role of gender in the dramatic increase in the importance of computers in our lives has

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been researched in a variety of ways, and many questions have been asked about gender variations in the approach to and utilisation of computers. Much, although not all, research finds that males are more experienced about and more positive about computers than females (e.g. Durndell & Thomson, 1997; Whitely, 1997). When North America, particularly the USA (cf. Whitely, 1997) is compared to West Europe, including Britain (cf. Durndell & Thomson, 1997), it would seem to be the case that the extent of gender effects tends to be larger in West Europe. However at the same time there is considerable indication that the size of the effects are actually increasing in the USA, for example if measured by participation rates in computing courses (cf. Holdstock, 1998; Wright, 1997), and this contradicts some of Whitely's (1997) comments about the lack of behavioural gender effects visible in the USA. Research has included the assessment of the use of computers (Durndell & Thomson, 1997), the measurement of computer anxiety (Maurer, 1994) and particularly the assessment of computer related attitudes, broadly defined (Todman & Dick, 1993; Jones & Clarke, 1994; Francis, 1994; Whitely, 1997). A number of scales have been developed, but without any becoming the "standard" in the area.

A fairly complex picture has appeared in response to attempts to understand the causative influence of computer experience, gender identity, computer attitudes, computer anxiety and computer self efficacy. Brosnan (1998a) and Colley, Gale and Harris (1994) found, mainly looking at UK studies, that gender identity (i.e. an assessment of whether the individual identified with stereotyped masculine or feminine behaviours) seemed to be more important than gender itself (i.e. whether the person was actually male or female) per se. Nevertheless, as Colley, Gale and Harris point out, this probably still means that the underlying cause of the gender effects would be gender stereotyping of masculine and feminine behaviour in relation to computers. The relationship between computer attitudes, computer anxiety and computer self efficacy is also complex, and all 3 are sometimes combined as various aspects of attitudes towards computing (cf. Colley et al., 1994).

Bandura's work on self efficacy (Bandura, 1995) has been relatively influential, with a major statement being published recently (Bandura, 1997). Self efficacy can be measured in particular domains, and not surprisingly it has been measured in relation to computing. Broadly speaking computer self efficacy can be seen as a measure of an individual's judgement of their own abilities with computers, an assessment of self confidence. Bandura presents evidence which he argues shows that self efficacy, as well as ability, is able to predict career choice and persistence in education, both in the West and in a number of other cultures, including the former East Germany (Bandura, 1995). Given the research that exists pointing to the frequent identifying of gender variations in relation to computing, it would be expected that computer self efficacy would in general produce a gender effect, with males being more self confident in this area than females. This indeed has been found by Murphy, Coover and Owen (1989) and Torkzadeh and Koufteros (1994), utilising their own computer self efficacy scales. Additionally Brosnan (1998b) argues that computer self efficacy is a major determiner of choice of subject to study and persistence in studying computing.

A relatively small amount of research has looked at these types of questions in relation to the ex communist countries of East Europe (Alting & Brand, 1992; Durndell, Cameron, Knox & Haag, 1995; Durndell, Cameron, Knox, Stocks & Haag, 1997; Martin, Heller & Mahmoud, 1992; Reinen & Plomp, 1997). These countries are of interest because historically their

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