PERGAMON

Personality and Individual Differences 28 (2000) 813–820

PERSONALITY AND INDIVIDUAL DIFFERENCES

www.elsevier.com/locate/paid

Sex differences in general intelligence defined as *g* among young adolescents

Anton Aluja-Fabregat[a,*], Roberto Colom[b], Francisco Abad[b], Manuel Juan-Espinosa[b]

[a]*Facultad de Ciencias de la Educación, Departemento de Pedagogía y Psicología, Universitat de Lleida, Complejo de la Caparrella s/n, 25192, Lleida, Spain*

[b]*Facultad de Psicología. Universidad Autónoma de Madrid (UAM), Madrid, Spain*

Received 4 February 1999; received in revised form 13 May 1999; accepted 25 May 1999

Abstract

The *g* factor is common to all cognitive abilities and to measures of academic performance. An important question in the research on cognitive sex differences is whether, on average, females and males differ in *g*. This question is technically the most difficult to answer. Furthermore, it has been the least investigated. In the present study, two samples of young adolescents solved several cognitive and scholastic (achievement) tests. The samples were a total of 1565 young adolescents (797 girls and 768 boys). Sex was considered to obtain separate *g* factors. The congruence coefficients between the *g* vectors extracted for each sex suggested a near identity. Then the sex difference in *g* was represented on each of the subtests in terms of a point-biserial correlation. These correlations were included with the full matrix of subtest intercorrelations for factor analysis. The results reveal the factor loading of sex on *g*, which in the present study suggest a null sex difference. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Cognitive sex differences; Young adolescents; General intelligence; *g* Factor

1. Introduction

In a comprehensive review Lynn (1994) found an overall (although small) sex difference

* Corresponding author. Tel.: +34-73-702300; fax: +34-73-702305.
E-mail address: aluja@pip.udl.es (A. Aluja-Fabregat).

PII: S0191-8869(99)00142-7

favoring males in general intelligence. However, the difference was calculated averaging the standardized sex differences in several cognitive tests. As Jensen (1998) stated that an overall difference on a collection of tests, even if significant, has questionable generality across batteries and cannot answer the question concerning a sex difference in general ability defined as *g* (see Colom, Juan-Espinosa, Abad & García, submitted for publication). General intelligence defined as *g* rests on the correlations among test scores rather than on their summation. Therefore, other more fine grained methods must be used to answer the question concerning sex differences in general intelligence (defined as *g*).

The dimensions found in the factor analysis of the correlations among a variety of mental ability measurements can be arranged hierarchically according to their generality. The *g* factor is the most general of all and is common to all mental abilities. The *g* factor can be extracted from the correlation matrix of a battery of mental ability tests by a number of different methods of factor analysis. The *g* factor is found to be remarkably invariant across all the various methods of factor analysis and relatively invariant across different batteries of diverse tests of mental ability (Jensen & Weng, 1994).

Group differences in general intelligence defined as *g* can be considered after McArdle's (1996)statement of equality of factor loadings across the groups. If factor loadings are not the same for the groups being compared, then the psychological constructs may be qualitatively different for the groups. Several studies of factorial similarity have been conducted for cognitive ability (Carreta & Ree, 1995; DeFries et al., 1974; Humphreys & Taber, 1973; Loehlin, Lindzey & Spuhler, 1975; Michael, 1949; Ree & Carreta, 1995). These studies have found no differences in factor structure across groups. Thus, for instance, Carretta and Ree (1995)have found that the correlation of the *g* loadings for males and females for the hierarchical *g* factor was +0.97. Carretta and Ree (1997) found that the correlation between the male and female factor loadings on *g* was +0.999. Colom et al. (submitted for publication) found congruence coefficients of +0.978 and +0.995 between the male and female factor loadings on *g*. Therefore, according to these results, the structure of cognitive abilities is nearly identical across sex.

However, the subjects' age must be taken into account. There is some agreement that, in young adolescents, girls outperform boys. Jensen (1998) and Lynn (1994) among others, have suggested that this female advantage could be explained, at least in part, by their faster maturation rate (see Halpern, 1997). If this is correct and if *g* is related to brain maturation rate, then the null sex difference in *g* in adulthood (found by Jensen, 1998 and by Colom et al., submitted for publication) must turn out to be significant in samples of young adolescents (in favor of female performance).

2. Method

2.1. Participants

We studied two independent samples. First sample: the participants were 678 volunteer students from primary school of whom 315 were boys (mean age = 13.22, S.D. = 0.59) and 363 were girls (mean age = 13.17, S.D. = 0.48). Second sample: the participants were 887 volunteer