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Male Versus Female Intelligence among Undergraduate Students: Does Gender Matter?

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Abstract: The study investigated the difference between gender-role identity and intelligence of students at Universities. The samples were 153 participants consisting of 48 females and 105 males' undergraduate Iranian students in Malaysia Universities. All students were given a Catell Culture Fair Intelligence Test (CCFIT). The instrument consisted two subscales, namely, intelligence (Form A) and intelligence (Form B). Each subscale had fifty items. The mean age and SD for female's students (FS) were 22.27 and 2.62, for ages of 18 to 27 and for male's students (MS) mean age and SD were 23.28 and 2.43, for ages of 19 to 27. The sampling method in this study was the simple randomization method. Descriptive statistics focusing on average and t-tests were used to examine differences between male and female students in this study. The CCFIT as a questioner test included 100 items about quantitative the 2 parts of Intelligence (Form A) (50 items) and intelligence (Form B) (50 items). In general, the results were not found significant between female and male students in relation to intelligence. Further research is needed to investigate whether identify factors at the university enviroument influence the development of female and male's intelligence.

Key words: CCFIT, female students, male students

INTRODUCTION

This study attempts to investigate male versus female intelligence among undergraduate Iranian students at Malaysian universities. Although almost period of one hundred years a general agreement has been reached that there is no sex difference in overall general intelligence (Douglas and Rushton, 2006) but several studies have been reported gender differences in intelligence (Furnham et al., 1999). They support gender differences in specific cognitive abilities; some support females and some support males (Hyde, 2005; Lynn et al., 2002) but many of studies find no sex differences in intelligence (Halpern and LaMay, 2000).

In other words, several investigators found gender differences on intelligence (Deary et al., 2003) studied also the cognitive ability distribution in 80,000+ students. There were no significant mean differences in cognitive test scores between genders but there was a highly significant difference in their standard deviations. Boys were more at the low and high extremes of cognitive ability (Douglas and Rushton, 2006).

Douglas and Rushton (2006) found a point of biserial size of 0.12 favoring males on the SAT, which provides a good measure of general intelligence as manifested through school of learned abilities in high school graduating samples.

Researchers have also examined gender differences on intelligence in 20 countries and studies from China through to Germany and Scotland have shown males give significantly and higher estimates

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than females for general overall intelligence (Adrian and Buchanan, 2005). Adrian and Buchanan (2005) stated also this difference is consistent across countries and populations although there are wide differences in level.

Sophie *et al.* (2006) investigated whether sex differences observed on the subtests of the intelligence test were attributable to sex difference in general intelligence. Males outperformed than females on 3 out of the 10 subtests (information, arithmetic and matrix reasoning), while females' performance was better than males only on 1 subtest, called digit of symbol substitution.

Wendy and Johnson (2007) investigates 436 (188 males, 248 females) participants (ages were between 18-79) from Australia, Great Britain and North America. Their result have shown that there was a very small gender difference in general mental ability but males clearly performed better on Visio-spatial tasks while females performed better on tests of verbal usage and perceptual speed.

Rammstedt and Rammsayer (2000) have been investigated on 105 German students and concluded that male self-estimates were significantly higher for logical-mathematical and spatial intelligences, while female estimates were significantly higher for musical and interpersonal intelligences.

Reilly and Mulhern (1995) estimated the intelligence of 125 (45 male and 80 female) of students at Queen's University using the WAIS. They found there was no gender significant difference in their measured intelligence. However, men in the sample appeared to overestimate their intelligence, while the women were quite accurate in estimating their intelligence.

By and large, the studies have indicated a need for further research in gender related differences in intelligence (Wendy and Johnson, 2007). As such, the focus of this study is to examine if gender related differences on intelligence exist among Iranian undergraduates studying in Malaysian Universities by Catell Culture Fair Intelligence Test. Because few researches have been done on the basis of this instrument and previous research used other instruments, we employ this instrument in this research.

Another reason for this study is that the previous research studied in certain cultures and researchers stated the need of study in different cultures and nations and populations. So, due to the lack of research in this field on the basis of CCFIT test, in Iranian population this research addressed this issue in overseas Iranian students by this test.

MATERIALS AND METHODS

Sample

One hundred and fifty three Iranian undergraduate students in Malaysian Universities [N = 48 (31.4%) females and N = 105 (68.6%) males] ranging in age from 18-27 for females and 19-27 for males participated in the study. Mean and SD of females' age were 22.27 and 2.62 and for males were 23.28 and 2.43 (Table 1).

Research Hypothesis

- There would be gender differences on the intelligence (form A) among undergraduate students at Malaysian Universities
- There would be gender differences on the intelligence (form B) among undergraduate students at Malaysian Universities
- There would be gender differences on the intelligence (form A, B) among undergraduate students at Malaysian Universities

Instrument

To evaluate the intelligence, every student was examined by a Catell Culture fair Intelligence Test. Roberto Colom *et al.* (2002) has been reported that this test is a well-known test on fluid intelligence (GF) developed a Catell culture fair intelligence test. Participants completed Cattell's culture fair

Table 1: Descriptive statistics age and gender

Gender	N	(%)	Minimum	Maximum	Mean±SD
Males	105	68.6	19	27	23.28±2.43
Females	48	31.4	18	27	22.27±2.62
Total	153	100.0	18	27	22.96±2.53

intelligence test battery to assess individual differences in fluid intelligence. The test had four timed sets of problems (series completion, odd-one-out, matrices and topology), each using geometric symbols as stimulus materials.

Procedure

Undergraduate students participated in this study. The research questions posed for the study required identifying and analyzing the distributions and correlations of certain Catell culture free intelligence test best addressed in the form of a descriptive study. Intelligence levels were assessed by self-report instruments. They were assessed by result of administration office of universities (described below), divided by gender and calculated by total scores and subscales. The women samples (18-27 years) and men (19-27 years) were selected during the regular course time.

Instructions were given written and orally for all participants and they were ready to answer upcoming questions in the class. Since multiple significance tests were conducted, data were analyzed by t-test. The participants replied the tests and were free to anonymous. Students received no rewards but they were given the results in the form of a self-referenced level of abilities. Scores for intelligence scale's total score, the two subtests, were calculated by the SPSS statistical program.

RESULTS AND DISCUSSION

As Table 2 intelligence (form A) indicates, the males mean score was higher than the females. The standard deviations between females and males for intelligence were also different; the females standard deviations were lower than the males. It ranged from a low (69 = females and 69 = males) to a high (129 = females and 141 = males). As is shown in the Table 2 for intelligence (form B) the males mean score was a little more than the females for intelligence. The standard deviations between females and males were not so high but it ranged from a low of 61 for females and 70 for males to a high of 138 for females and 133 for males.

Table 2 shows also a descriptive statistical intelligence between genders total of intelligence (form A and B). It shows that males mean score was higher than the females' on intelligence (form A, B) but the standard deviations between females and males were a little different (Males = 14.573 and females = 14. 094), ranging from a low (65 = females and 71 = males) to a high (129 = females and 133 = males) for the intelligence (form A, B). However, we had different results about the Intelligence (form A, B) scores; the males' mean scores were more than the females for the generally as well as the Intelligence (form A, B).

As independent sample t-test for eqnality of mean was used to determine whether there was not significant difference between these scores on the basis of gender. Table 3 shows the t ratios for males and females on intelligence (form A). On this overall score, Iranian males and females did not differ significantly on intelligence (form A) (p = 0. 927).

Table 2 also shows the independent samples t-test for males and females on intelligence (form B). On this overall score, males and females did not differ significantly on Intelligence (form B), (p = 0.230). Finally, the independent samples t-test for males and females on the intelligence (form A, B), in this respect, males and females did not differ significantly on the intelligence (form A, B) (p = 0.443).

Table 2: Descriptive statistics intelligence

Parameters	N	Minimum	Maximum	Mean±SD
Measure form A				
Total score	153	69	141	104.549±15.701
Male	105	69	141	104.628±16.345
Female	48	69	129	104.375±14.353
Measure form B				
Total score	153	61	138	99.823±15.8730
Male	105	70	133	100.866±15.919
Female	48	61	138	97.541±15.6930
Measure form A and B (total)				
Total score	153	65	133	102.451±14.406
Male	105	71	133	103.057±14.573
Female	48	65	129	101.125±14.094

Table 3: t-tests for equality of means intelligent

Parameters	t*	df	Sig. (2-tailed)	Mean difference
Measure A				
Intelligence (Form A)	-0.092	151	0.927	-0.253
Measure B				
Intelligence (Form B)	-1.204	151	0.230	-3.325
Measure of total				
Intelligence (Form A and B)	-0.769	151	0.443	-1.932

*p<0.05

In this study we reach the conclusion that there is no difference in mean scores on all aspects of intelligence between the male and female students. We found that although there were no gender differences in intelligence (Form A and B) and the Cattell's culture fair intelligence test between male and female students, we got different results in mean, standard division, minimum and maximum of intelligence between two groups.

The results in Table 3 showed that while there was no significance difference between male and female students in intelligence (in test CCFIT), the result of males showed a little higher than females except in the CCFIT (form A). In form A, the mean was not different but ranged from 69 to 141 for males and 69 to 129 for females. Thus, the deviations for males were greater than the females (Table 2).

Table 2 has been shown that the mean for the males (100.866) was a little higher than the females (97.541) in form B (CCFIT). There was also gender difference in the range of scores, females (61-138) and Males (70-133). Finally, we found gender differences in the range of total scores (CCFIT) for male (71-133) and females (65-129), showing a higher range for males than the females (Table 2).

The sex moderator variable which shows a few differences on the level of the subtests of intelligence is not unusual. Although we found a few subtle differences (not significance) in parameter estimates, we do not expect those differences to undermine general gender invariance in the CCFIT (Rammstedt and Rammsayer, 2000; Wendy and Johnson, 2007) have supported it in their former studies but Sophie *et al.* (2006) reported that some researchers found gender differences on the level of the subtests of intelligence (Colom and Lynn, 2004; Lynn, 1998; Lynn *et al.*, 2005).

These comparisons indicate minor gender differences regarding these measures of intelligence. Furthermore, these results may be a reflection of the greatly different sample size. Present findings may improve our understanding of the CCFIT factorial structure. The meaning of each CCFIT subtest composite in this study is generally identical for males and females. Finally, factor analyses reveal no significance differences in the conceptualization of some of aspect of intelligence in the CCFIT.

The result of this study did not support any major gender differences in general intelligence. Yet there seem to be a recent trend in which the females tend to excel academically more than the male. Further studies on gender differences by level of education, age groups and natiouality may be

undertaken to examine such a trend. In addition, to explore practical implications of these subtle gender differences in intelligence and discover the cultural and social reasons for such difference, it may also be interesting to examine whether such gender difference or non-difference in a nation's highly intelligent cohort is maintained over a number of years.

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