IQs of Men and Women and of Arts and Science Students in Libya

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Results are reported for a sample of 800 university students tested with the Standard Progressive Matrices in Libya. Science students obtained a significantly higher average IQ than arts students. There were no significant differences between men and women. Women had greater in variance than men.

Key Words: Intelligence; Science students; Progressive Matrices; Libya; Sex differences; Variability.

It has been reported that among university students men obtain higher average IQs than women, and that science students obtain higher average IQs than arts students. The higher IQ obtained by men students was reported in a meta-analysis of 22 studies by Irwing & Lynn (2005), in which men obtained a 4.6 IQ points advantage. This difference has been confirmed in a sample of 1001 students at the University of Khartoum tested with the Standard Progressive Matrices, in which the men students obtained a higher average IQ than the women by 4 IQ points (Khaleefa, Amer & Lynn, 2010).

The higher average IQ of science students than of arts students was reported for the students in Britain on the AH5 test, on which science students obtained a higher IQ than arts students by 8.5 IQ points (Heim, 1968, p.16). On the AH6 test, science students obtained a higher IQ than arts students by 16.7 IQ points (Heim, Watts & Simmonds, 1983). This difference has also been reported among students at the University of Khartoum in which students studying science (Electrical Engineering, Medicine, Dentistry, and Pharmacy) (n=349) obtained n average IQ approximately 30 IQ points higher IQs than students studying primary education (n=125) (Khaleefa, Amer & Lynn, 2010). In the United States also, science students

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obtained higher average IQs than arts students in a study by Templer & Arikawa (2006). The American data consist of scores on the analytic test of the Graduate Record Examination (GRE) obtained by over 1 million students applying to graduate schools in the years 1994-1997. The analytic test is a non-verbal reasoning test measuring the same ability as the SPM. In this study students studying Electrical Engineering scored approximately 11 IQ points higher than students of Primary Education.

In this paper we examine whether the results summarized above are present for university students in Libya.

Method and Results:

The Standard Progressive Matrices test (SPM, Raven, Court & Raven,1998) was administered in 2007-2008 to a sample of 800 students at the University of Omar Al–Mukhtar, which is situated in two cities; Al-Beida and Al-Marj, Libya. There were 400 men and 400 women. Half of the sample were studying science and the other half were studying arts. The test was administered without time limits. The sample was obtained by random sampling and was aged between 18 and 21.

Descriptive statistics for the results are summarized in Table 1. This gives the mean scores obtained by the science and arts men and women students, followed by the standard deviations, t values for the difference between males and females in each academic discipline, t value for the difference between males and females in the total sample, and t value for the difference between science and arts in the total sample, level of significance, the variance ratios (VR, i.e. the squared variance of the men divided by the squared variance of the women). VRs greater than 1.0 indicate that males had greater variance than females, while VRs less than 1.0 indicate that females had greater variance than males. The last column gives the percentile equivalents of the means of the men and women on the British norms for the Standard Progressive Matrices collected in 1992 and given in Raven, Court & Raven (1998).

Table 1 Scores on the Standard Progressive Matrices of university students in Libya

Discipline	Gender	N	Mean	SD	t	sig	VR	Brit PC
Science	Male	200	42.90	7.99	1.30	.193	0.78	9.0
	Female	200	41.78	9.07				7.8
Arts	Male	200	39.62	7.79	1.37	.171	0.96	5.5
	Female	200	40.70	7.94				6.7
Total	Male	400	41.26	8.05	.030	.976	0.89	7.3
	Female	400	41.24	8.53				7.3
Total	Science	400	42.34	8.56	3.75	.001	-	8.4
	Arts	400	40.16	7.88				6.1

Discussion:

The results show four interesting features. First, for both men and women the science students obtained higher average scores than the arts students. The difference is quite small at approximately 2 IQ points but is statistical significant ($t = 3.75$, $p < 0.001$). This difference is much smaller than the large differences between science and arts students reported in previous studies in summarized in the introduction. Probably the reason that this result differs from that in the University of Khartoum is that the science students in Khartoum were in the prestigious departments of Electrical Engineering, Medicine, Dentistry, and Pharmacy that require high academic qualifications for entry, while the arts students were in the much less prestigious department of primary education. The Libyan students were more widely drawn, with the science students including those taking Biology, and arts students including those taking History and languages. A further reason for the relatively high female scores, and for the discrepancy with typical findings in western countries, could be differences in the selectivity of the female and male samples. In most of the advanced countries, females are more likely than males to enroll in

university. Therefore they tend to be a less selected group than the men. There is a widespread perception that in many Muslim countries, females are less likely than males to enroll in university. If this is so, we can expect that females are more selected and that they score higher. According to the Human Development Report (2005) the female/male ratio for tertiary enrolment is 1.27 in the UK and 1.09 in Libya. Thus, females are likely more selected in Libya than in the UK and other western countries.

Second, there is no statistically significant difference in the scores obtained by the men and women students. This differs from the results in the meta-analysis of sex differences in university students by Irwing & Lynn (2005) and at the University of Khartoum.

Third, the variance ratios (VRs) show that women had greater variance than men in both the science and the arts students and in the total sample. It has frequently been contended that males have greater variability than females from the early years of the twentieth century, e.g., by Havelock Ellis (1904), Thorndike (1910) and Terman (1916), Eysenck (1981, p. 42) and recently by Deary et al. (2007). However, not all studies have found greater male variability, including a meta-analysis of the performance of college students on the Progressive Matrices by Irwing & Lynn (2005). The inconsistency in the present results confirms the position of those who have questioned the universality of the greater variance of men.

Fourth, the British percentile equivalent of 7.3 of the means of Libyan students is equivalent to a British IQ of 78. No Flynn effect correction is required because British means on the SPM for those aged over 13 years and have remained stable between 1979 to 2008 (Lynn, 2009). The British IQ of 78 seems low for university students in Libya. It is the same as the IQ of Libyan school students reported by Al-Shahomee & Lynn, (2010), and it might have been expected that the British IQ of university students would be higher. Possible explanations for this are that university students in Libya are not selected for intelligence, or more probably that IQs decline among older age groups in Libya, relative to those in Britain, as the test becomes more cognitively demanding.

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