

A Study of Sex Differences in Intelligence of Somali Refugees in Kenya

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Scores of a sample of 2,440 male and female Somalian school students aged 8 through 18 years on the Standard Progressive Matrices Plus (SPM+) are reported. The sample obtained a British-scaled IQ of 68. There was no statistically significant difference between the scores of the males and females. The variance was greater among the females than among the males.

Key words: Sex differences; Intelligence; Standard Progressive Matrices Plus; Somalia.

IQs for all nations in the world have been published by Lynn and Vanhanen (2012). These national IQs are calculated in relation to a British mean of 100 and standard deviation of 15 and are designated "British IQs" or "Greenwich IQs". These IQs are significantly associated with a number of social and economic

phenomena including educational attainment, per capita income, infant mortality, and democratic institutions. The compilation gives IQs for 197 nations. For 174 nations these are measured IQs and for the remaining 23 nations the IQs are estimated from the measured IQs of neighboring countries with ethnically similar populations. The compilation does not give a measured IQ for Somalia, which is assigned an estimated IQ of 71.8. The objectives of this paper are to report a measured average IQ and sex differences in IQ for Somalis living in Kenya.

Method

The sample consisted of 1,443 male and 997 female Somalian 8-18 year old school students in the Dadaab refugee camps in Kenya. The camps were established in 1991 and subsequent years for refugees from the civil war in Somalia. It is not compulsory for children to attend school. The school attendance rate is known only approximately. It has been estimated at 28% (Immigration and Refugee Board, 2011) and 48 percent (UNFPA, 2015). The greater number of boys than of girls in the sample is indicative of continuing discrimination against girls by parents who regard the education of girls as less important or desirable than that of boys. The study was carried out in 2015 when there were five schools in the camps. All children who were present on the day of testing were tested with Raven’s Standard Progressive Matrices Plus, a new version of the test standardized in the United Kingdom in 2008 (Raven, 2008).

Results

Table 1. Means and standard deviations (SD) of SPM+ scores for males and females among Somalians; * $p < .05$.

Age	Males			Females			d	t	VR
	N	Mean ± SD	British IQ	N	Mean ± SD	British IQ			
8	97	13.7 ± 6.4	73	80	13.0 ± 8.7	71	.10	0.61	0.73
9	69	18.6 ± 8.9	76	84	17.2 ± 9.2	73.5	.15	0.91	0.99
10	105	18.5 ± 9.8	67.5	105	18.2 ± 8.9	67	.04	0.26	1.10
11	86	19.7 ± 8.2	70.5	73	16.7 ± 11.9	62.5	.29	1.79	0.69
12	108	19.7 ± 8.9	67.5	73	20.6 ± 9.3	69	-.09	0.61	0.95
13	148	21.6 ± 10.2	67.5	107	21.9 ± 10.2	68	-.03	0.23	1.00
14	177	24.2 ± 8.7	72	119	22.4 ± 10.7	67.5	.19	1.56	0.81
15	159	23.3 ± 11.0	67.5	104	22.9 ± 10.0	67	.04	0.31	1.09
16	152	24.9 ± 10.9	71	84	21.6 ± 11.5	64.5	.29	2.09*	0.95
17	183	24.0 ± 12.0	60	80	21.7 ± 14.5	55	.17	1.22	0.83
18	159	21.2 ± 12.6	54	88	22.4 ± 12.8	57	-.09	0.66	0.99

The results are given in Table 1. They show for the age groups 8 through 18 years the numbers, mean scores and standard deviations, *ds* (the differences

between the scores of the males and females divided by the averaged standard deviations), the *t* values for the statistical significance of the differences between the scores of the males and females, and the variance ratios (VR) calculated as the standard deviation of the males divided by the standard deviation of the females.

Discussion

There are four points of interest in the results. First, the males obtained a mean British IQ of 67.9 and the females a mean British IQ of 65.6. These can be averaged to 66.8 and rounded to 67 to give the first report of a measured IQ for Somalia. This result is reasonably close to the estimated IQ of 71.8 given by Lynn and Vanhanen (2012).

Second, males obtained a slightly higher IQ than females by 2.3 points. This difference is only statistically significant among the 16 year olds, but is consistent with the meta-analysis of sex differences on the Progressive Matrices by Lynn and Irwing (2004) that found a small male advantage from the age of 16. Note, however, that among the 18 year olds the females have a non-significantly higher IQ. It is not clear whether the small sex difference favoring males is best interpreted as a difference in general intelligence (*g*), abstract reasoning ability, or visualization. Although the more difficult items of the test require abstract non-verbal reasoning by isolating features of simple drawings and recognizing regularities in their permutations, the easiest items require visual pattern recognition and matching. Because the average scores are low (less than 25 out of 60 items correct in all age groups), part of the sex difference may reflect visualization ability rather than abstraction and inductive reasoning.

Third, it has sometimes been argued that in the past in economically developed nations males obtained higher average IQs than females but that in recent decades the male advantage has declined or disappeared. This decline was reported for the male advantage in mathematical ability on the SAT-M in the United States. In a meta-analysis, Hyde, Fennema and Lamon (1990) had estimated the male advantage at the time as 0.40*d* while more recent data showed that this had declined to 0.32*d* (Royer & Garofoli, 2005). Mackintosh (2011, p. 378) has stated that in successive American standardizations of the DAT (Differential Aptitude Test), "there has been a consistent and substantial decline in male superiority on the two spatial tests, and the complete disappearance (or even reversal) of the earlier male superiority on tests of abstract, verbal and numerical reasoning." Mackintosh (2011, pp. 378, 380) concluded his discussion of this issue stating that "at least some cognitive differences have diminished in the past 50 years or more" and attributed this to

"substantial changes in society's attitude to women since the 1960s". Flynn (2012, p. 184) has also contended that the former higher average abilities of males have disappeared in recent decades. He writes: "There is strong evidence that females match males on Raven's Progressive Matrices even at maturity, unless their societies have not undergone modernity, as in developing nations, or women have been shielded from the effects of modernity (like Orthodox women in Israel)."

The present results show that males do not always attain higher average cognitive ability in economically developing countries where there is discrimination against females. Somalia is one of the poorest countries in the world with a per capita GDP of \$US 600 in 2014. It has not undergone modernity, and there is discrimination against women. This has been recognized as a problem that needs to be addressed in the 2010 report of the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW, 2010). The disparity in school attendance in the present sample shows that the same discrimination is present in the refugee camps in which the study was performed. Yet the present results show only small differences between the IQs of males and females.

Fourth, in eight of the eleven age groups females had greater standard deviations than males, as shown by the variance ratios of less than one in Table 1. The average of these is .96. This is an unusual result in view of the frequent finding that variability is greater in males than in females (e.g., Arden & Plomin, 2006), and shows that greater male variance is not invariably present.

The interpretation of the sex differences is complicated by three circumstances. First, girls and boys attended sex-segregated schools. The curricula of boys' schools and girls' schools were the same, but there is nevertheless the possibility that the quality of schooling was different. For example, bias could have been introduced if boys' schools had more male teachers and girls' schools had more female teachers, and there was a systematic difference between the effectiveness of male and female teachers.

Another caveat is that the lower number of females than males at ages above 10 years in our sample indicates lower female than male school enrolment or attendance. It is uncertain whether lower enrolment or higher dropout rates of low-ability females have created an upward bias in the ability level of those females who remained in school. However, the higher female than male standard deviation argues against an elite bias, as selective non-enrolment or attrition of low-ability females would reduce rather than increase the female standard deviation.

A third possible source of bias would be present if either girls or boys who are enrolled in school attended school less regularly, thereby reducing their cognitive ability levels and test scores. We have no information about the frequency of school attendance for enrolled children. However, bias from this source is partially controlled because the data were collected from only those who were attending school on the day of testing.

We also have to wonder whether the results obtained with these Somali refugees in Kenya permit any meaningful extrapolation to conditions in Somalia. The low school attendance shows that the school system in the refugee camps is in dire straits, and certainly worse than in the rest of Kenya, where according to UNICEF data the primary school net enrolment rate has been 84% in 2008-2011. For Somalia, the primary school net attendance ratio has been estimated as 18.5% for males and 15.2% for females (UNICEF, 2015). Thus educational conditions appear to be better in the camps than in most of Somalia. This, together with the likelihood that children who attend school are brighter on average than those who don't, suggests that the scores we have obtained with school-going children in the camps may overestimate the average IQ in Somalia. As for the cultural heritage related to sex roles, this is likely to be similar in the refugee camps and in Somalia. We would therefore venture the guess that future studies in Somalia will show sex differences similar to those obtained in the present study.

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