

## SEX DIFFERENCES ON THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN—III IN BAHRAIN AND THE UNITED STATES<sup>1,2</sup>

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*Summary.*—Sex differences on the Wechsler Intelligence Scale for Children—III (WISC—III) are reported for children in Bahrain and the United States. The results for the two samples were consistent in showing no significant differences in Verbal, Performance, and Full Scale IQs, higher average scores by boys on the Block design and Mazes subtests of spatial ability, and higher average scores by girls on Coding. There was also greater variability in boys than in girls.

Sex differences in intelligence have been extensively researched and discussed for approximately a century. There is widespread consensus on three conclusions. First, that there is no average sex difference in general intelligence defined as the sum of abilities measured by the Wechsler, Binet, and other intelligence tests. Second, there are sex differences in a number of specific abilities. Third, men have greater variability in intelligence than women.

The conclusion that there is no sex difference in general intelligence was advanced in Britain by Burt and Moore (1912) and in the United States by Terman (1916, p. 69–70) on the basis of his American standardization sample of the Stanford-Binet test. In later decades, this conclusion has been endorsed by many leading authorities. Thus, “it is now demonstrated by countless and large samples that on the two main general cognitive abilities—fluid and crystallized intelligence—men and women, boys and girls, show no significant differences” (Cattell, 1971, p. 131); “sex differences in general intelligence are small and virtually non-existent” (Brody, 1992, p. 323); “there is no sex difference in general intelligence worth speaking of” (Mackintosh, 1996, p. 567); “females and males score identically on IQ tests” (Halpern, 2012, p. 233); and “there is no evidence, overall, of sex differences in levels of intelligence” (Sternberg, 2014, p. 178).

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The second conclusion, that there are sex differences in specific cognitive abilities, has been reviewed by Kimura (1999) who listed the five abilities on which men obtain higher average means than women as spatial orientation, visualization, line orientation, mathematical reasoning, and throwing accuracy; and the five abilities on which women obtain higher average means than men as object location memory, perceptual speed, verbal memory, numerical calculation, and manual dexterity.

The third conclusion, that men have greater variability of intelligence than women, has also been consistently asserted for approximately a century. An early statement of this proposition was made by Havelock Ellis (1904, p. 425): "It is undoubtedly true that the greater variational tendency in the male is a psychic as well as a physical fact." This sex difference in variability was reaffirmed by Thorndike (1910) and subsequently by many authorities, including Penrose (1963, p. 186): "the consistent story has been that men and women have nearly identical IQs but that men have a broader distribution ... the larger variation among men means that there are more men than women at either extreme of the IQ distribution." Others who have asserted this conclusion include Herrnstein and Murray (1994, p. 275), Jensen (1998, p. 537), and Ceci & Williams (2007, p. 223): "all sides in the sex wars agree that there is greater variability in male distributions of many abilities." This conclusion has more recently been affirmed once again by Deary, Penke, and Johnson (2010): "Males have a slight but consistently wider distribution than females at both ends of the range."

These three conclusions on sex differences in intelligence have been based largely on studies in the United States, Britain, and other economically developed countries. In this paper, data for sex differences in intelligence in Bahrain are reported to examine how far these results are cross-culturally consistent.

#### METHOD

The Wechsler Intelligence Scale for Children-III (WISC-III) was designed as a test of general intelligence for 6- to 16-yr-olds and was standardized in the United States in 1989 on a sample of 2,000 (Wechsler, 1992). The test was translated into Arabic and standardized in Bahrain in 2000 by Khalifa and Almotawaa (2002). The sample in the standardization in Bahrain was based on 473 boys and 545 girls ages 6-16 years and was drawn from representative urban and rural schools. The Arabic standardization required some changes to the verbal subtests but the non-verbal (performance) subtests were unchanged.

#### RESULTS

Table 1 gives the scores of the boys and girls on the subtests and IQs of the Bahrain sample on the American WISC-III. The column headed *d*

TABLE 1  
SEX DIFFERENCES ON THE SUBTESTS AND IQs ON THE WECHSLER INTELLIGENCE SCALE FOR  
CHILDREN-III IN BAHRAIN (NEGATIVE SIGNS DENOTE HIGHER SCORES BY GIRLS)

Subtest	Sex	<i>M</i>	<i>SD</i>	<i>t</i>	VR	<i>d</i>	U.S. <i>d</i>																																																																																																																																																																
Picture completion	Boys	9.98	3.90	0.25	1.02	0.02	0.17*																																																																																																																																																																
	Girls	9.92	3.84					Information	Boys	9.91	3.25	-1.26	1.07	-0.08	0.25†	Girls	10.16	3.03	Coding	Boys	7.56	4.14	-1.92*	1.04	-0.12*	-0.53†	Girls	8.05	3.98	Similarities	Boys	9.08	3.97	-2.91†	.99	-0.18†	0.10	Girls	9.81	4.03	Picture arrangement	Boys	8.61	3.64	0.88	1.02	0.06	0.09	Girls	8.41	3.56	Arithmetic	Boys	9.19	3.54	1.95*	1.01	0.12*	0.11	Girls	8.76	3.49	Block design	Boys	8.50	3.17	2.46†	.96	0.16†	0.23†	Girls	8.00	3.30	Vocabulary	Boys	11.64	6.32	-0.97	1.55	-0.06	0.08	Girls	11.97	4.09	Object assembly	Boys	9.13	3.35	1.30	1.04	0.08	0.21†	Girls	8.86	3.23	Comprehension	Boys	9.89	4.17	-0.45	.97	-0.03	0.03	Girls	10.01	4.32	Symbol search	Boys	6.81	3.68	0.55	.97	0.04	-0.09	Girls	6.68	3.81	Digit span	Boys	8.55	3.18	-2.88†	.75	-0.18†	-0.05	Girls	9.22	4.23	Mazes	Boys	8.79	4.64	4.27†	1.18	0.27†	0.16*	Girls	7.63	3.92	Verbal IQ	Boys	98.76	17.71	-1.52	1.03	-0.10	0.14	Girls	100.43	17.23	Performance IQ	Boys	91.19	16.55	0.69	1.03	0.044	0.061	Girls	90.48	16.05	Full Scale IQ	Boys	94.81	15.99	-0.54	1.02
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\* $p < .05$ . † $p < .01$ .

gives the sex differences in standard deviation units. The column headed U.S.  $d$  gives the sex differences in standard deviation units on the American standardization (Wechsler, 1992).

Table 1 also shows the  $t$  values for the statistical significance of the differences between the means of the boys and girls, and the variance ratios (VR) as a measure of the sex differences in variability calculated as the standard deviation of the boys divided by the standard deviation of the girls. Thus, variabilities greater than 1.0 indicate that boys had greater variance than girls.

#### DISCUSSION

There are several points of interest in the results. First, the difference between the Full Scale IQ of 94.81 for boys and 95.35 for girls in the Bahrain sample is not statistically significant, and the IQs can be regarded as virtually the same. This confirms the conclusion that there is no average sex difference in general intelligence defined as the sum of a number of abilities measured by tests like the Wechsler and Binet, based on studies in economically developed countries summarized in the introduction.

There were statistically significant higher means obtained by boys in both the Bahrain sample and the American standardization sample on Block design with  $d$ s of 0.16 and 0.23, respectively, and on Mazes with  $d$ s of 0.27 and 0.16, respectively. These tests are both measures of visual-spatial abilities on which men typically obtain higher means than women in economically developed countries (Voyer, Voyer, & Bryden, 1995).

Higher means were obtained by girls on Coding in the Bahrain and American samples, with statistically significant  $d$ s of 0.12 and 0.53, respectively. Girls also obtained higher scores on Digit span in the Bahrain and American samples with higher means obtained by girls of  $d=0.18$  in the Bahrain sample and of  $d=0.05$  (ns) in the American sample. Although several of the sex differences on the subtests in the Bahrain sample were statistically significant, in Cohen's classification they are all "trivial" at less than 0.20 except for Mazes where the difference is "small."

There were some inconsistencies in the sex differences in the two samples. On Information, there was no significant difference between boys and girls in the Bahrain sample ( $d=-0.08$ ), but boys obtained a significantly higher mean in the American sample ( $d=0.25$ ). There is also an inconsistency in the sex differences on Object assembly, where there was no significant difference between boys and girls in the Bahrain sample ( $d=-0.08$ ), but boys obtained a significantly higher mean in the American sample ( $d=0.21$ ).

Finally, the frequent assertion that men have greater variability of intelligence than women was generally confirmed in the present Bahrain

sample. Boys had greater variability than girls on Verbal IQ, Performance IQ, and Full Scale IQ, and in eight of the 13 subtests. However, girls had greater variability than boys in Similarities, Block design, Comprehension, Symbol search, and Digit span, showing that greater variability was not always present in boys.

## REFERENCES

- BRODY, N. (1992) *Intelligence*. San Diego, CA: Academic Press.
- BURT, C. L., & MOORE, R. C. (1912) The mental differences between the sexes. *Journal of Experimental Pedagogy*, 1, 355-388.
- CATTELL, R. B. (1971) *Abilities: their structure, growth and action*. Boston: Houghton Mifflin.
- CECI, S. J., & WILLIAMS, W. M. (2007) *Why aren't more women in science?* Washington, DC: American Psychological Association.
- DEARY, I., PENKE, L., & JOHNSON, W. (2010) The neuroscience of human intelligence differences. *Nature Reviews Neuroscience*, 11, 201-211. DOI: 10.1038/nrn2793
- ELLIS, H. (1904) *Man and woman: a study of human secondary sexual characteristics*. London, UK: Walter Scott.
- HALPERN, D. (2012) *Sex differences in cognitive abilities*. Mahwah, NJ: Erlbaum.
- HERRNSTEIN, R., & MURRAY, C. (1994) *The bell curve*. New York: Random House.
- JENSEN, A. R. (1998) *The g factor*. Westport, CT: Praeger.
- KHALIFA, O., & ALMOTAWAA, M. (2002) Specific differences in the third edition of the Bahraini version of the WISC-III. *The Journal of Educational & Psychological Sciences*, 3(1), 103-133. [in Arabic]
- KIMURA, D. (1999) *Sex and cognition*. Cambridge, MA: MIT Press.
- MACKINTOSH, N. J. (1996) Sex differences and IQ. *Journal of Biosocial Science*, 28, 559-572.
- PENROSE, L. S. (1963) *The biology of mental defect*. New York: Grune & Stratton.
- STERNBERG, R. J. (2014) Teaching about the nature of intelligence. *Intelligence*, 42, 176-179.
- TERMAN, L. M. (1916) *The measurement of intelligence*. Boston: Houghton Mifflin.
- THORNDIKE, E. L. (1910) *Educational psychology*. New York: Houghton Mifflin.
- VOYER, D., VOYER, S., & BRYDEN, M. P. (1995) Magnitude of sex differences in spatial ability: a meta-analysis and consideration of critical variables. *Psychological Bulletin*, 117, 250-270.
- WECHSLER, D. (1992) *Wechsler Intelligence Scale for Children-III*. San Antonio, TX: Psychological Corporation.

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