Individual Differences Research, 2004, *2(2)*

ISSN: 1541-745X

www.idrjournal.com

Sex and Culture Differences in the Estimates of General and Multiple Intelligence: A Study Comparing British and Egyptian Students

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ABSTRACT - Differences in sex and culture between Egyptian and British university students in self- and parental estimations of IQ was examined using Cattell's (1971) list of twenty multiple intelligences. A total of 151 British (59 male and 92 female) and 118 Egyptian (54 male and 64 female) students participated in the investigation. Males tended to estimate their overall intelligence and various multiple intelligences (verbal, aiming, numerical, originality and mechanical abilities) higher than females. Egyptians tended to estimate their overall IQ lower than the British, but not significantly so, but when it came to the multiple intelligences they gave significantly higher self-estimates on verbal abilities, auditory abilities, spelling, word fluency and perceptual speed and accuracy. Conversely the British appeared more modest, and were only significantly higher in mechanical ability and idea production. Egyptian students tended to rate their parents' intelligence higher than did British students. Egyptian more than British students believed in sex and race differences in intelligence. Implications of these results are considered.

Intelligence has been the subject of controversy amongst academics and lay people for some time, with no unanimously, universally-agreed, definition or mode of measurement being established (Deary, 2000; 2001; Vernon, 1961, 1979). Lay people, particularly parents of school aged and university graduates as well as HR and recruitment specialists have become more and more interested in IQ with books on the topic and organisations such as MENSA becoming ever more popular (Eysenck, 1998; Paulhus, 2000; Paulhus, Lysy & Yik, 1998).

There is, however, an extensive and growing literature on lay theories of intelligence which has been conducted for over half a century (e.g. Sternberg, Conway, Ketron & Bernstein, 1981; Sternberg, 1990). These have included parents, teachers, students and childrens views about intelligence (Furnham, 2000; Hogan, 1978). Researchers have also made cross-cultural comparisons for instance, showing how the concept of intelligence is much more inclusive in some societies compared to others (Furnham, Fong & Martin, 1999a). Many investigations have also compared attitudes about intelligence between the sexes (e.g. Petrides & Furnham, 2000; Raty & Snellman, 1992).

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More recently researchers have attempted to investigate lay beliefs about intelligence by examining self-estimated scores on the bell curve (Beloff, 1992; Bennett, 1997, 2000; Furnham, 2001; Rammstadt & Rammsayer, 2000, 2001). Arguably a person's understanding of intelligence is partly determined by their self-estimations of their own IQ (Furnham, Baluch & Shahidi, 2002a). This study will focus on self and parental estimates of intelligence on a undergraduate student population from London, England and Cairo, Egypt. It is one of a series of programmatic cross-cultural comparisons in the area (Furnham, Baluch & Shahidi, 2002a).

There has also been a variety of studies looking at cross-cultural differences on intelligence spanning most of the continents: Africa (Wober, 1973), Asia (Azuma & Kashiwagi, 1987), Europe (Faria & Fontane, 1997) and America (Sternberg, 1990). These studies illustrated two main points (Dasen, 1984). The first is that lay people tend to have a much broader understanding of intelligence when compared to experts and secondly, that there are important differences cross-culturally. For example Asians tended to associate speed of thought with higher intelligence as opposed to many Africans who generally see no correlation between the two factors and tended to emphasize social knowledge and skills. In addition the more educated the sample the better the knowledge of IQ was, and thus the less culturally specific in their ideas (Furnham et al, 2002).

Self Estimate Intelligence

A number of studies have looked at self-estimates in relation to general intelligence (e.g. Hogan, 1978; Beloff, 1992) and a trend soon emerged. It became apparent that there was a consistent and significant gender difference, with males estimating their IQ higher than their female counterparts. Studies done in different countries and on different populations tended to show the same consistent result (Furnham, 2001). For example, Furnham and Gasson (1998) found, in a British adult population of parents, that men estimated their IQ three points higher, and women three points lower, than one standard deviation above the norm. Furnham, Reeves and Budhani (2002b) found much the same result in a similar sample with the difference between the estimates being three IQ points. Studies done on student populations show both that they give themselves higher estimates than a non-student adult population but also that the differences between the sexes is higher; usually between 5 and 8 IQ points. Males always give higher estimates of overall intelligence than females.

These studies were then extended to look at self-estimates of multiple intelligence based on Gardner's (1983;1999) definitions of multiple intelligence. The number of multiple intelligences varied between studies due to Gardner expanding his model over the years. Bennett (1996) used six, Furnham et al (1999abc, 2002ab) used seven and Furnham et al (2002c) utilised Gardner's new list consisting of ten "possible" multiple intelligences. It was found that the higher self-estimates for males came almost exclusively from a higher estimation in mathematics and spatial awareness (Furnham, Clark, & Bailey, 1999b), but not the social intelligences.

Various other studies asked participants to consider not only their own intelligence, but also other family members. Examinations of estimated intelligences of grandparents (Furnham & Rawles, 1995), parents (Beloff, 1992; Byrd & Stacey, 1993; Furnham & Rawles, 1995), siblings (Byrd & Stacey, 1993; Furnham, Fong & Martin, 1999a) and offspring (Furnham & Gasson, 1998; Furnham, Reeves & Budhani, 2002b; Furnham 2001) have been carried out. Furnham and Gasson's (1998) found that parents had a tendency to give a higher estimate for their sons' IQ in comparison to their daughters (109.11 vs. 102.70 IQ points). Regressional analysis showed that the child's sex was the largest pre- determining factor, more so than their age, and accounted for about 20% of

the variance. Furnham (2000) found parents tended to estimate boys IQ higher than girls (115.21 vs. 107.49 IQ points) particularly with reference to mathematical and spatial intelligence.

Furnham (2001) argued that studies on estimations of relatives IQ can help to answer two central questions. The first is to what extent they can illuminate *whether* or *why* there has been a sudden increase in intelligence in the past half a century (Flynn, 1987; Lynn, 1994; Macintosh, 1998). The second is that they shed light on whether the hubris-humility effect found in the self-estimates will generalize the estimation of others.

This study

This study will be unique in three ways. First, it will be an Anglo-Egyptian comparison. Second, Cattell's, not Gardner's, list of multiple intelligences will be used. Third, self and parent estimates will be made. Cross-cultural studies on self-estimates of intelligence have grown over the past decade. Furnham and colleagues have collected a wide range of data, based on university students, from four continents: Africa (Uganda and South Africa), America (United States), Asia (Hong Kong, Japan and Singapore) and Europe (Britain, Slovakia and Belgium). Table 1 shows that studies have been done in nearly 20 countries.

Table 1
Details of Self-Reported Studies

Country	Reference*
1. America	Furnham, Fong & Martin, (1999); Hogan, (1978).
2. Argentina	Furnham & Chamorro-Premuzic, (2003).
3. Belgium	Furnham, Rakow, Sarmany-Schiller, De Fruyt, (1999).
4. China	Zhang & Gong, (2001).
5. Germany	Rammstedt & Rammsayer, (2000, 2001, 2002).
6. Great Britain	Beloff, (1992); Furnham, (2000, 2001).
7. Hong Kong	Furnham, Rakow & Mak, (2002).
8. Iran	Furnham, Shahidi & Baluch, (2002).
9. Japan	Furnham, Hosoe & Tang, (2002).
10. Namibia	Furnham & Akande, (2003).
11. Poland	Furnham & Petrides, (2003).
12. New Zealand	Byrd & Stacey, (1993); Furnham & Ward, (2001).
13. Singapore	Furnham & Fong, (1999).
14. Slovenia	Furnham, Rakow, Sarmany-Schiller & De Fruyt, (1999)
15. South Africa	Furnham & Mkize, (2003).
16. Uganda	Furnham & Baguma, (1999).
17. Zimbabwe	Furnham & Akande, (2003)
18. Zambia	Furnham & Akande, (2003).

* Full references and or copies of any or each of these papers may be obtained from the first author of this paper directly.

Egypt has had somewhat of a turbulent history for the past century, overthrowing 74 years of British rule in 1922; fighting in World War I and II; seeing the fall of their monarchy in 1952; the Suez Crisis in 1956 and having various conflicts with Israel such as those in 1967 and 1973. This has undoubtedly taken an emotional, financial and social toll on the country with adult literacy as stated by the United Nations being 55.3% and still it being classed as a developing country. It can be assumed that during these politically volatile times that less emphasis was placed, both in terms of governmental funding and public opinion, on education and more was placed on the military or social stability.

Yet Egypt has one of the oldest universities in the world, El Azhar, founded in 970 and boasts the largest universities in the middle east, namely the University of Cairo. Education is important to all Egyptians who are justly proud of their education and inheritance. In a country with an estimated 95% of the population being Muslim, Islam undoubtedly has a huge effect on the culture in Egypt. It is not forbidden in Islam for women to be educated or to work and this is reflected by current university admissions. In fact, with reference to the American University Cairo, admittance of students in 1999 showed that more females were accepted than males (2166 male vs. 2449 female). However, it is believed that a woman's role is to primarily care for her husband and to raise her children once she is married, so although she maybe educated and intelligent her intellectual skills may not be necessarily developed. This may mean that, with reference to the Egyptian sample, her children will not know the full extent of her crystallized or fluid intelligence and underestimate it. Conversely, a great deal of emphasis is placed on respecting ones mother in Islam, with a saying from the Quran that heaven is at the feet of your mother. This may lead to a tendency for the Egyptians to give a higher estimate of their mother's IQ than the British students.

In Islam, although the arts are appreciated, special emphasis is placed on science. There is an Islamic saying, a Hadith, which states there are three things which a person can do to receive great rewards from God. One is to have a child who is a scientist. The Arabs have been pioneers in respect to many scientific discoveries. This may result on emphasis being placed on more scientific aspects of intelligence, such as numerical and mechanical ability.

In light of the evidence reviewed a series of hypotheses will be tested in this study. Firstly, it is predicted that both Egyptian and British males will tend to believe that they are more intelligent overall than their female counterparts and will estimate their overall IQ score statistically higher than the women (H_1) (Furnham, 2001). This should also be seen when considering multiple intelligence with particular reference to numerical and spatial abilities also being significantly higher for the males (H_2) (Bennett, 2000). It is also hypothesized that the Egyptian males will rate mechanical and numerical abilities higher than British males because of the emphasis which is placed on science in the Egyptian culture (H_3).

A fourth hypothesis is that because of the huge role parents play in their children's lives in Egyptian culture and the respect that the children have for their parents, it is hypothesized that they will tend to give higher parental estimate than the British students (H_4).

Finally it is predicted that although there will be no sex difference in estimates for fathers' IQ with both Britons and Egyptians estimating their fathers' IQs higher than mothers' (H_5), illustrating the frequently observed gender stereotyping affect. Finally intelligence estimates will be higher for the Egyptian compared to British fathers because of the more dominant role they plays in the household (H_6).

Method

Participants

A total of 151 British (59 male and 92 female) and 118 Egyptian (54 male and 64 female) undergraduate university students participated in the investigation. The mean age for the British was 24.83 years old (SD= 7.33) and 22.85 years old (SD= 0.98) for the Egyptians. All the students were permanent residents in their respective countries and were currently at university in either Cairo or London. Although the students were all undergraduates they came from a variety of different subject courses.

Questionnaire

Participants were asked to complete a single paged questionnaire which included instructions on how to proceed (although verbal instructions were given when necessary). A normal distribution graph was shown with a mean and three positive and three negative standard deviations. Next to each standard deviation there was a typical IQ score and a description of that ability. Thus -3 was labelled 55, mild retardation; - 2, 70, borderline retardation; -1, 85, low average; 0, 100, average; +1, 115, high average; +2, 130, superior and +3, 145 gifted. Participants were asked to estimate their and their parents' IQ initially and then were asked to complete a table consisting of 20 rows and three columns. The columns represented your, your mother and father's IQ. Rows were taken from Cattell's (1971) list of multiple intelligences and by each type of intelligence was a short description of what each intelligence meant. Thereafter each subject was asked to answer some 'yes' or 'no' questions including whether they had taken an IQ test before and whether they think they measure intelligence well, as well as all of the standard demographic data. These questions have been used in around 10 published studies in the area (Furnham, 2001).

Procedure

The questionnaire was not translated into Arabic because all of the Egyptian students were highly proficient English speakers, but in the event that they did not understand something a bilingual translator (second author) was there to clarify any discrepancies. A similar principle was applied for the Britons, where if any of them needed clarification on anything a verbal explanation was given (none was required). The questionnaires were administered to small groups varying from 2 to 8 people at a time. The subjects were subsequently debriefed and thanked.

Results

A preliminary analysis of the data showed the British participants to be significantly older ($F(1,267 = 43.78$, $p<.001$) and coming from a more middle class background than Egyptian participants. Hence these factors were co-varied out in all subsequent analyses.

A. Self Estimates.

An ANCOVA was initially run on the overall estimates for self and parents. The results for this can be seen in table 1 which shows there were two significant differences. The first is between sexes. It was found that the male mean self-estimate (115.98 IQ points) for overall intelligence was significantly higher ($F= 6.30$; $p<0.05$) than that of females (110.54 IQ points). This confirmed H_1. It was also found that there was a significant sex x nationality interaction when it came to estimating mothers' intelligence. It was found that although both Egyptian and British women had similar perceptions about their mothers' IQ differing only by 0.49 of an IQ point the men had a significantly different

opinion. It was found that the Egyptian males rated their mothers' intelligence significantly lower than did the British males (F= 3.97; p<0.05).

Table 2

The Overall Estimates (g) of British and Egyptian Students for Their Own Intelligence as Well as Their Parents

	British		Egyptian			ANCOVA	
IQ Estimate (Overall)	Male	Female	Male	Female	Sex	Nationality	Sex x Nationality
Self	118.69	110.70	113.27	110.33	6.30*	1.77	1.35
Mother	118.15	111.18	108.22	111.67	0.45	3.26	3.97*
Father	117.50	111.84	116.14	118.47	0.42	1.05	2.43

*p<.05

Table 3

The Self Estimates of the British and the Egyptian Students on the 20 Multiple Intelligences

	British Students		Egyptian Students			ANCOVA	
	Male	Female	Male	Female	Sex	Nationality	Sex x Nationality
Verbal Ability	115.96	110.61	119.38	115.40	4.52*	11.45**	0.01
Numerical Ability	111.42	103.09	114.42	102.14	13.11***	0.75	0.75
Spatial Ability	114.91	105.23	106.00	108.47	2.17	0.77	7.07**
Perceptual Speed and Accuracy	112.55	108.49	114.16	115.61	0.18	6.70**	1.24
Ability to Finish Patterns	110.36	107.25	109.62	111.84	0.12	0.89	1.16
Reasoning from the Specific to the General	111.90	105.73	106.70	110.40	0.06	0.57	5.28*
Rote Memory	111.27	109.29	113.92	113.09	0.83	0.61	0.03
Mechanical Ability	108.91	96.63	103.50	91.73	23.48***	5.03*	0.05
Perceptual Flexibility	111.36	107.20	104.63	106.94	2.41	0.14	1.23
Memory Span	104.64	104.72	108.46	108.47	0.00	1.46	0.02
Spelling	111.00	108.74	114.50	114.39	0.03	4.38*	0.10
Meaningful Memory	116.73	108.43	112.70	112.96	3.00	0.38	3.56
Auditory Ability	110.00	106.03	115.38	116.33	0.09	1.44***	0.78
Aesthetic Judgement	109.67	107.64	104.34	108.88	0.25	0.40	1.44
Spontaneous Flexibility/Creativity	117.80	110.22	108.82	110.00	1.02	0.93	3.21
Idea Production	115.45	110.06	103.04	101.84	1.15	10.72***	0.36
Word Fluency	103.55	101.35	105.10	108.16	0.24	5.27*	0.69
Originality	110.69	103.45	109.40	102.55	10.59***	0.01	0.00
Aiming	112.09	105.84	112.70	103.37	9.58**	0.01	0.54
Representational Drawing	106.40	105.11	100.00	104.39	0.19	1.82	1.10

***p<.001 **p<.01 *p<.05

Subsequently the Cattellian multiple intelligences were analysed for both the Egyptian and British students using a MANCOVA then ANCOVAS. Table 3 shows that there were five significant sex differences; verbal (F (1,242) = 4.52; p<0.05), aiming (F (1,242) = 9.58; p< 0.05), numerical (F (1,242) =13.11; p,0.001), originality (F (1,242) = 10.59; p<0.001) and mechanical ability (F (1,242) =23.48; p<0.001). This confirmed H_2. Males tended to rate themselves significantly high on all of these abilities.

Table 3 also shows significant differences between nationalities. The results showed that Egyptians rated themselves significantly higher than the British in verbal abilities (F (1,242) = 11.45; p<0.001), auditory abilities (F (1,242) = 11.44; p<0.001), spelling (F (1,242) =4.38; p<0.05), word fluency (F (1,242) = 5.27; p<0.05) and perceptual speed and

accuracy (F (1,242) =6.70; p<0.01). However the British rated their abilities higher in mechanical ability (F (1,242) = 5.03; p<0.05) and estimated themselves to be superior in idea production (F (1,242) =10.72; p<0.001). Thus H_3 was not confirmed.

There were two significant sex x nationality interactions showing that British males believed that their spatial ability was superior to the Egyptian males (F (1,242) = 7.07; p<0.01). Both British men and women believed their abilities to be better than their Egyptian equivalent in reasoning from specific to the general (F (1,242) =5.28; p<0.05).

B. Estimates of Parents.

Tables 4 and 5 show the analyses of self-estimates of parental intelligence. For estimates of mothers intelligence there were 2 significant sex, 4 culture and 5 interactions. Significant differences were in aiming (F (1,242) = 4.07; p= 0.05) and ability to finish patterns (F (1,242) =10.80; p<0.001) with daughters estimating higher than sons in both categories.

Table 4

The Estimates of the British and Egyptian Students for Their Mother on the 20 Multiple Intelligences

	British Students		Egyptian Students		ANCOVA (F Values)		
	Male	Female	Male	Female	Sex	Nationality	Sex x Nationality
Verbal Ability	110.58	110.40	111.22	112.7	0.25	1.14	0.52
Numerical Ability	101.90	102.50	105.57	105.4	0.01	2.14	0.08
Spatial Ability	101.34	101.32	98.27	105.81	3.15	0.68	1.89
Perceptual Speed and Accuracy	104.19	106.59	109.61	113.88	2.46	8.07*	0.06
Ability to Finish Patterns	104.13	106.25	101.63	113.16	10.80***	1.79	4.09*
Reasoning from the Specific to the General	106.17	104.49	105.41	107.66	2.40	3.36	5.41*
Rote Memory	106.54	104.77	109.24	111.63	0.03	4.60*	0.53
Mechanical Ability	94.04	93.26	89.65	94.39	0.65	0.43	1.33
Perceptual Flexibility	104.81	102.15	100.88	110.20	1.96	0.51	6.82**
Memory Span	103.08	101.36	105.73	108.27	0.06	4.44*	0.93
Spelling	110.00	109.66	105.20	107.24	0.12	1.60	0.22
Meaningful Memory	106.54	104.56	108.37	115.30	1.24	7.02**	4.13*
Auditory Ability	106.25	102.34	104.69	129.49	1.22	1.60	2.26
Aesthetic Judgement	112.02	105.84	101.12	115.10	2.40	0.11	16.78***
Spontaneous Flexibility/Creativity	107.65	108.30	108.42	131.73	2.00	1.40	2.21
Idea Production	106.83	107.98	107.86	110.20	0.52	0.15	0.18
Word Fluency	104.62	104.85	105.45	108.88	0.52	0.77	0.49
Originality	102.98	101.60	102.14	108.16	1.13	1.36	3.36
Aiming	98.65	99.60	95.43	102.45	4.07*	0.44	1.10
Representational Drawing	104.72	102.50	102.65	104.43	1.01	2.00	3.28

***p<.001 **p<.01 *p<.05

Nationality differences showed Egyptians rating their mothers as significantly higher in all of the following areas compared to the British: Perceptual speed and accuracy (F (1,242) = 8.07; p<0.01), rote memory (F (1,242) = 4.60; p<0.05), memory span (F (1,242) = 4.44; p<0.05), meaningful memory (F (1,242) = 7.02; p<0.01). Significant sex x nationality interactions were found on five of the twenty intelligences. These included ability to finish patterns (F (1,242) = 4.09; p<0.05), perceptual flexibility (F (1,242) = 6.82; p<0.01), meaningful memory (F (1,242) = 4.13; p<0.05) and reasoning from the specific to the general (F (1,242) = 5.41; p<0.05) showing Egyptian females rating their mothers significantly higher than the British women. There was also a hugely significant result in aesthetic judgement (F (1,242) = 16.78; p<0.001) showing Egyptian males rating

their mothers lower than the British males but the Egyptian females rating their mothers higher than the British girls.

Table 5
The Estimates of the British and Egyptian Students for Their Father on the 20 Multiple Intelligences

	British Students		Egyptian Students		ANCOVA		
	Male	Female	Male	Female	Sex	Nationality	Sex x Nationality
Verbal Ability	116.81	113.15	121.12	116.94	3.08	5.61*	0.15
Numerical Ability	116.11	114.70	124.06	120.92	0.84	7.47**	0.09
Spatial Ability	113.06	111.96	106.55	111.73	0.58	2.80	2.20
Perceptual Speed and Accuracy	107.31	109.26	113.98	116.22	1.19	12.12***	0.06
Ability to Finish Patterns	107.96	108.49	105.20	111.73	2.70	0.01	2.05
Reasoning from the Specific to the General	110.96	105.36	116.31	114.58	3.60	8.70**	0.11
Rote Memory	112.13	109.35	111.41	115.10	0.00	0.76	1.82
Mechanical Ability	113.89	114.89	116.67	122.45	1.33	2.82	0.82
Perceptual Flexibility	106.57	103.73	106.37	111.93	0.19	1.90	3.40
Memory Span	108.15	105.06	114.41	108.57	3.13	4.89*	0.44
Spelling	112.04	110.18	108.14	108.76	0.40	0.70	0.19
Meaningful Memory	112.56	109.88	114.18	119.69	0.25	5.87*	4.12*
Auditory Ability	110.93	100.81	116.93	102.86	0.40	0.23	0.10
Aesthetic Judgement	102.59	103.75	99.3	107.55	2.56	0.02	1.83
Spontaneous Flexibility/Creativity	110.54	108.27	111.67	117.65	0.72	5.08*	3.17
Idea Production	108.80	111.01	112.96	112.96	0.21	1.69	0.30
Word Fluency	108.11	105.20	111.37	113.37	0.09	6.04*	0.76
Originality	110.80	106.19	112.18	113.37	0.84	1.96	2.10
Aiming	109.31	110.51	111.02	110.51	0.00	0.00	0.09
Representational Drawing	105.50	103.21	96.84	103.52	4.17*	0.25	9.48*

***p<.001 **p<.01 *p<.05

Results shown in Table 5, examining the students' estimations of their father's IQ revealed only one significant sex difference. Representational drawing ($F(1,242) = 4.17$; $p<0.05$) with daughters estimating it higher than the sons. In all eight significant nationality different estimates Egyptians estimated their fathers' intelligence higher than the British. The areas included: Verbal ability ($F(1,242) = 5.61$; $p<0.05$), numerical ability ($F(1,242) = 7.47$; $p<0.01$), perceptual speed and accuracy ($F(1,242) = 12.12$; $p<0.001$), reasoning from the general the specific ($F(1,242) = 8.70$; $p<0.01$), memory span ($F(1,242) = 4.89$; $p<0.05$), meaningful memory ($F(1,242) = 5.87$; $p<0.05$) spontaneous flexibility/ creativity ($F(1,242) = 5.08$; $p<0.05$) and word fluency ($F(1,242) = 6.04$; $p<0.05$).

There were two sex x nationality interactions. The first one came from differences in perceptions about meaningful memory ($F(1,242) = 4.12$; $p<0.05$). The British and Egyptian males essentially agreed on the IQ scores for their fathers (112.56 vs. 114.18 respectively) but the British and Egyptian females disagreed (109.88 vs. 119.69 respectively) when it came to estimating this intelligence for their father. The second significant difference came in representational drawing ($F(1,242) = 9.48$; $p<0.01$). It was found that females tended to agree but the Egyptian males estimated their fathers' ability lower than that of the British (105.5 vs. 103.21).

Next a t-test was run to see if there was a significant difference between how the students from both countries estimated their mothers' and fathers' intelligence in terms of overall intelligence and on the 20 multiple intelligences laid out by Cattell (1971).

Table 6

The Mean Estimates of Intelligence by Students for Their Mothers and Fathers in Terms of Overall Intelligence and in Terms of Cattell's (1971) List of Multiple Intelligences

Intelligence Category	Mean Estimate for Mother	Mean Estimate for Father	Difference between Mean estimates for Mother and Father	t-test value
Overall	112.56	114.20	-1.65	-1.43
Verbal	119.96	113.97	-4.01	-4.47***
Numerical	103.03	115.74	-12.72	-11.34***
Spatial	101.81	110.41	-8.60	-8.04***
Perceptual Speed	107.27	110.24	-2.97	-3.36**
Pattern	104.80	107.75	-2.95	-3.72***
Reasoning	105.99	108.91	-2.92	-3.32**
Rote Memory	107.79	110.15	-2.36	-2.32*
Mechanical	93.20	114.64	-21.44	-18.57***
Flexibility	104.02	105.61	-1.59	-1.71
Memory Span	103.65	106.79	-3.13	-3.12**
Spelling	109.86	109.43	0.43	0.47
Meaningful Memory	107.26	111.71	-4.45	-5.45***
Auditory	107.04	102.75	4.29	1.44
Aesthetic	107.12	103.01	4.11	3.86***
Spontaneous	110.18	109.66	0.52	0.20
Idea	107.03	109.75	-2.72	-3.00
Word	105.77	107.45	-1.68	-1.93
Originality	102.57	108.97	-6.39	-7.42***
Aiming	99.64	109.79	-10.15	-11.34***
Representational	104.10	103.70	0.42	0.36

*p<0.05 ** p<0.01 ***p<0.001

Table 6 shows the mean estimates by males and females the difference, between the two means and the t-test results. Table 6 shows considerable differences between the how students view their mothers' and fathers' intelligence. Out of the 21 categories examined it was found there were fourteen significant differences between the estimates for the mother and father, thirteen of which showing that fathers' IQ was estimated significantly higher than mothers'. These areas were: verbal ability (t= -4.47; p<0.001), numerical ability (t= -11.34; p<0.001), spatial ability (t= -8.04; p<0.001), perceptual speed and accuracy (t= -3.36; p<0.01), ability to finish patterns (t= -3.72; p<0.001), reasoning from the specific to the general (t= -3.32; p<0.01), rote memory (t= -2.32; p<0.05), mechanical ability (t= -18.57; p<0.001), memory span (t= -3.12, p<0.01), meaningful memory (t= -5.45; p<0.001), idea production (t=-3.00, p<0.01), originality (t= -7.42, p<0.001) and aiming (t= -11.34; p<0.001). The only area where mothers were rated significantly higher than fathers were in aesthetic taste (t= 3.86; p<0.001).

C. Factor Analysis

Doing an analysis on so many variables, however, risks the likelihood of type II errors. Hence the data was treated to a factor analysis (VARIMAX rotated) and the resultant factor scores used in one-way then two-way ANOVAS.

Factor analysis showed five interpretable factors arose accounting for nearly 60% of the variance. The first was labeled *verbal memory*, the second *creativity*, the third *scientific/mechanical*, the fourth *art/aesthetic* and the fifth *patterns*. In terms of other factor analyses in their area, as well as reviewers and meta-analyses, these factors make sense. A two-way ANOVA looking at sex and culture differences in self-ratings showed the various significant effects but with a constant pattern. There was a significant main

effect for sex only for factor 3 (scientific/mechanical) ($F(1,261)= 27.68$, $p<.001$) with males rating themselves higher than females. There was a significant nationality effect for factor 1 (verbal/memory) ($F(1,261)=11.87.p<.01$) and factor 5 (patterns) ($F(1,261)=6.63,p<.05$) with Egyptians giving higher self-ratings than Britons. None of the interactions were statistically significant.

Table 7

Results of the VARIMAX for Rotated Factor Analysis Showing Loadings >.40, Eigenvalue, Variances and ANOVAs on Factor Scores

Memory Span	.76				
Spelling	.73				
Rota Memory	.73				
Word Fluency	.55				
Meaningful Memory	.52				
Verbal Ability	.50				
Reasoning	.47				
Spontaneous Flexibility/Creativity		.83			
Idea Production		.80			
Perceptual Speed and Accuracy		.47			
Mechanical Ability			.76		
Numerical Ability			.66		
Spatial Ability			.65		
Originality			.55		
Representational Drawing				.83	
Aesthetic Judgement				.74	
Auditory Ability				.48	
Perceptual Flexibility				.44	
Aiming					.78
Pattern completing					.48
Eigenvalue	6.47	1.65	1.34	1.09	1.00
Variance	32.36	8.25	6.72	5.48	5.01
ANOVA	13.45***	7.18**	1.70	0.27	6.07**

Table 8

Responses (% saying yes) of Sex and Age Groups on Each of the Six Questions

Questions	British		Egyptian	
	Male	Female	Male	Female
Have you every taken an intelligence test?	55	42	47	49
Do you believe they measure intelligence fairly well?	43	45	38	49
Do you believe that males are on average more intelligent?	17	07	64	19
Do you believe intelligence is primarily inherited?	55	58	52	65
Do you believe IQ tests are useful in educational settings?	39	48	72	62
Do you believe some races are more intelligent than others?	15	18	47	66

D. Views about intelligence

As in previous studies participants were asked 6 questions about intelligence. These were first subjected to a 2 sex x 2 nationality analysis. Results are shown in Table 8. The results show a significant sex effect only for Q3 ($F(1,242) = 5.06,p<.001$). There were 3 nationality effects: Q3 ($F(1,242) = 3.36$, $p<.001$); Q5 ($F(1,242) = 5.03$, $p<.001$) and Q6 ($F(1,242)= 4.94$, $p<.001$). There was also a significant interaction for Q3 ($F(1,242=2.01,p<.05$).

After this, a series of regressions were performed with overall self-estimated IQ being

the dependent variable. In the first regression the answers to six questions onto the overall estimate. This was significant ($F(6,173)=2.35, p<.05$; Adj R square=.04). Those that answered yes to Q1 (Beta = .18, t=2.35, p<.01) and Q4 (Beta = .17, t=2.23, p<.05) were more likely to give higher self-estimates. A second regression added few demographic variables (sex, age) to the six questions. This was not significant. A third regression added nationality to the about 10 predictor variables but this too was not significant.

Discussion

The results from this study confirm several sex differences in self-estimated intelligence that have already been established by other studies. It was shown that males estimated their overall intelligence significantly higher than the females. Nearly all other studies examining sex differences also previously found this (e.g. Hogan, 1978; Furnham, 2001). This confirms the first hypothesis (H_1) that males will estimate their IQ significantly higher than that of females. Other sex differences were also found on the twenty multiple factors of intelligence: verbal, aiming, numerical, originality and mechanical abilities, all of which showed higher estimates for the men. Differences on multiple intelligences were however mainly expected in numerical and spatial abilities as various other studies have shown (e.g. Furnham, 2000, 2001; Furnham & Baguma, 1999). Clearly although there are a variety of significant sex differences, including numerical, spatial is not one of them. Thus the second hypothesis, (H_2), is rejected as no significant difference was found between the sexes on estimates of mathematical and spatial abilities.

Many ($^{13}/_{20}$) sex differences were also observed when it came to comparing estimates for mothers and fathers. This was also to be expected as many previous studies have shown this to be the case in terms of gender stereotyping (e.g. Furnham et al, 2002b). Participants tended to believe that their fathers were more intelligent then their mothers. Although this was not reflected on the overall score, with no significant difference occurring, it was more than evident when the multiple intelligences were considered. Thirteen out of twenty factors were significantly in favour for the father being more intelligent including: verbal ability, numerical ability, spatial ability, perceptual speed and accuracy, ability to finish patterns, reasoning from the specific to the general, rote memory, mechanical ability, memory span, meaningful memory, idea production, originality and aiming. The only area where mothers were rated as significantly higher was aesthetic judgement. This confirmed the fifth hypothesis (H_5) that father's IQ will be estimated higher than mothers showing gender stereotyping.

There were also cultural differences which were expected in light of other related literature in this field (e.g. Furnham et al, 1999c). With reference to the self estimates it was found that in overall intelligence Egyptians tended to estimate their IQ lower, but not significantly so, than the British but when it came to the multiple intelligences they were statistically higher in many of the categories such as verbal abilities, auditory abilities, spelling, word fluency and perceptual speed and accuracy. Conversely the British appeared more modest, and were only significantly higher in mechanical ability and idea production. This maybe accounted for by social comparison processes whereby many more young people go to university in England as opposed to Egypt. In this sense the latter may see themselves as comparatively more able rather than privileged.

A similarly comparatively more "modest" approach was adopted by the British when they were asked to estimate their parents' IQ. It was found that when it came to estimating fathers' intelligence out of the 20 multiple intelligences eight significant differences occurred. All of these differences (verbal ability, numerical ability, perceptual speed and accuracy, reasoning from the general the specific, memory span, meaningful memory, spontaneous flexibility/ creativity and word fluency) were in favour of the Egyptian

fathers being perceived as more intelligent than the British fathers. A analogous result was found when it came to perception of mothers' intelligence. Once again in all areas which were significant, (perceptual speed and accuracy, rote memory, memory span and meaningful memory), the Egyptians tended to rate their mothers as higher than did the British. This confirms the fourth hypothesis (H_4) that Egyptians will tend to estimate their parents as having a higher IQ than did the British. These differences can be assumed to have occurred because of the level of respect that Egyptians have for their parents. In Egyptian society the parents' role is far more active than in the British culture. For example, parents will have more influence in life decisions, such as marriage or education which British parents may not. Some of the students may have seen it as disrespectful to give a low estimate for their parents' IQ who both conceived them and who strongly influence their lives.

The fact that the Egyptians tended to rate their fathers' intelligence significantly higher than did the British participants confirmed the sixth hypothesis (H_6). This was hypothesized because of the roles that men tend to play in Egyptian society. Men and women tend to have much clearer and distinct roles in the Egyptian culture, partly attributed by religion, than they do in the Western culture. The students may view their father as the sole provider for them. He is also the one who will make all of the major family decisions and indisputably, more often than not, plays the more dominant role in the family structure.

There were also several significant sex x nationality differences. The first of which was seen on overall estimates of IQ. Here it was found that there was an inconsistency in how Egyptian males tended to rate their mothers. Although it was found that between nationalities that Egyptians tended to rate their mothers' intelligence higher than the British this was reversed when British males and Egyptian males were compared. It was found that British males tended to rate their mothers' IQ significantly higher than did the Egyptian males. This tendency was also true for aesthetic judgement.

When it came to the female estimates for mothers a different result was found. In all significant results, which were on ability to finish patterns, perceptual flexibility, meaningful memory and reasoning from the specific to the general it was found that Egyptian females rated their mothers higher than did the British. It was also found that on self-estimates there was a significant difference between Egyptian females and British females. Egyptian females tended to rate their abilities higher in reasoning from the specific to the general and spatial ability. This suggests although there is a definite cultural difference between perceptions of male and female intelligence, with the Egyptian male being viewed intellectually superior, the Egyptian female has considerable confidence in her ability.

Interestingly, the same confidence is not exuded by Egyptian males. They were found to significantly give lower estimates than the British in spatial ability, and when estimating their fathers' representational drawing skills they also believed it to be worse than the British. Arguably these factors are not viewed as important for the Egyptian male as they are more concerned with art, maps and patterns, not science and they may spend more time in scientific pursuits. As an emphasis is placed on science in Islam. Regardless of this the third hypothesis must be rejected as the Egyptian males did not appear to rate their intelligence higher in terms of mechanical and numerical abilities, despite the emphasis which is placed on science in Egyptian culture.

Studies on self-estimated intelligence have now been done on every continent, and this is the first from North Africa. The results show that there are clearly universal patterns in sex differences for self-ratings, beliefs about generational differences as well as ideas about which of the different multiple intelligences best predicts overall intelligence. There

are of course interesting differences between cultures at the multiple intelligence level but most differences concern the level of the estimates (high vs low). The fact that there are no salient cross-cultural differences in the relationship between gender and estimated abilities would emphasise the importance of explaining this effect. Are stereotypes about intelligence universal? Are women always more modest than men? Is it possible to change people's belief about the nature of their intelligence, as well as their perceptions of others' intellectual abilities? Given the likelihood that self and other perceptions may have an impact on actual performance (in the way self-fulfilling prophecies do), and considering that it may be easier to change a person's perception of his/her abilities (rather than his/her abilities itself), it is important that future research continues to address these questions (Beyer, 1990, 1998). This is particularly the case for "outliers" who significantly under or over-estimate their psychometric intelligence.

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Received 07/23/2003; Revision Received 10/27/2003; Accepted 10/27/2003