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Estimates of Self, Parental and Partner Multiple Intelligences in Iran: A replication and extension

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Two hundred and fifty-eight Iranian university students estimated their own, parents', and partners' overall (general) intelligence, and also estimated 13 'multiple intelligences' on a simple, two-page questionnaire which was previously used in many similar studies. In accordance with previous research, men rated themselves higher than women on logical-mathematical, spatial and musical intelligence. There were, however, no sex differences in ratings of parental and partner multiple intelligences, which is inconsistent with the extant literature. Participants also believed that they were more intelligent than their parents and partners, and that their fathers were more intelligent than their mothers. Multiple regressions indicated that participants' Big Five personality typologies and test experience were significant predictors of self-estimated intelligence. These results are discussed in terms of the cross-cultural literature in the field. Implications of the results are also considered.

Keywords: *Intelligence, Iran, Parents, Partner, Self Assessment*

$\mathbf{T}$his study is about self-estimated intelligence as opposed to psychometrically evaluated intelligence which is one of the core concepts in differential psychology. The latter is variously defined as the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. There is considerable evidence that intelligence is a powerful predictor of professional and personal life success as well as mental/physical health and longevity (1).

Over the past three decades, the literature on lay beliefs about intelligence and its estimates has grown dramatically (2-4). On the one hand, studies have examined how, and to what extent, lay understandings of intelligence differ from expert opinion, as well as the practical implications of such differences (5-7). On the other hand, a growing body of work has examined the way in which groups of individuals in different cultural contexts perceive their own and others' intelligence (8, 9). Perhaps the most important outcome from the latter research is the finding that, when asked to estimate their own intelligence, men tend to give themselves higher scores than women (10, 8, 11). Various research groups have been working in this area including those associated with Ackerman in the U.S., Furnham in England and Rammstedt in Germany. Specifically, (8) observed that, with very few exceptions, male self-estimates are higher than female self-estimates for overall intelligence and several multiple intelligences (particularly mathematical and spatial intelligence). Therefore, consistent and robust is this finding that (12) termed it a 'male hubris-female humility' effect in self-estimated intelligence.

Moreover, this sex difference is not limited to self-estimate of intelligence: similar studies have shown that people believe their father to be more intelligent than their mother (10), their grandfather more intelligent than their grandmother (13), and their brother more intelligent than their sister (14). Even parents believe their male children to be more intelligent than their female children (15-17).

Nor is this phenomenon limited to particular cultures or nationalities: numerous studies have documented a male hubris-female humility effect for estimates of self and parental intelligence in East Asia (18-20), Southeast Asia (14, 21), the Middle East (22, 23, 24), Africa (25), North America (14); South America (26), Australasia (27), and Europe (28, 14, 29, 11).

In the present study, we sought to extend the available cross-national literature by examining self, parental and partner estimates of intelligence in Iran. In a previous study with Iranian participants, (19) failed to observe a male hubris-female humility effect, in that there were no sex differences in ratings of overall and multiple intelligences. By contrast, women rated their own inter-personal intelligence as being significantly higher than that of men. To examine the reliability of these findings which runs counter to the extant literature, the present study sought to examine self- and parental intelligence in Iran. However, the present study also extends the work of (19) in additional ways .

First, (19) only asked their participants to provide estimates of their overall (general) and Gardner's seven multiple intelligences (object-related, object-free and personal intelligences). There are various theories of multiple, as opposed to general, intelligence but by far the most famous and well established is that of Gardner. The present study included estimates of these

intelligences plus three more mentioned intelligences in (30) book as well as the three mentioned by (31), making ten intelligence types in total. Previous work has documented sex differences in all these types of intelligences (overall intelligence, Gardner's multiple intelligences, and Sternberg's multiple intelligences; e.g., 21), although significant differences are typically restricted to overall, mathematical and spatial intelligence (18).

Second, this study differed from earlier studies in the inclusion of measures of participants' personalities. Specifically, we measured participants' personality based on the Five Factor Model or Big Five personality dimensions (32), and sought to examine whether differences in these types would explain differences in self-estimates of intelligence. By including different measures, it was possible to examine various demographic and personal variables that may predict estimates of self and other intelligence. In short, this study examined self and other estimates of overall and multiple intelligences in Iran, and sought to examine what were the best predictors of such estimates.

Materials and Method
Participants
The participants of this study were 258 Iranian university students in Tehran; of whom, 80 were female (mean age 19.98yrs, SD=1.63), and 178 were male (mean age 21.13yrs, *SD*=2.94). The majority of participants were single (95.3%), and the remainder were married. Most participants were educated to an undergraduate level (91.9%), with others having been educated to a postgraduate (4.7%) or secondary (3.5%) level. Mean religiosity on a 5-point scale (1=Not at all, 5=Very) was 3.33 (*SD*=1.10) and mean political orientation on a 7-point (1 =very left wing, 7 = very right wing) scale was 4.04 (*SD*=0.93). All participants were born and raised in Iran, and spoke Farsi as their mother tongue.

Instruments
Estimates of intelligence: All participants completed a questionnaire based on the one developed by Furnham and Gasson (1998). A normal IQ distribution was shown (*M*=100, *SD*=15), and under each standard deviation, a typical IQ score was given plus a descriptor (e.g., '+1, 115 high average'). Participants were then shown a grid with 14 rows and 5 columns. The first row was labelled as 'Overall Intelligence' and the remaining 13 rows were labelled with (30) multiple intelligences plus (33) creative, emotional and practical intelligences. A short description was provided for each intelligence type (Table 1). The columns were labelled: *"you, your father, your mother, your partner* (an opposite-sex romantic partner)". Thus, each participant was requested to make 56 IQ estimates. This questionnaire has been used in several previous studies in many different countries (12, 18)

Big Five questionnaire: Participants completed the abbreviated Big Five questionnaire (34, 35), which consists of 15 items (e.g., 'I try to be courteous to everyone I meet'). Each item was rated on a 5-point scale for agreement (1=*strongly disagree*, 5=*strongly agree*). Some items were then reverse-coded, and scores for each Big Five personality type (Neuroticism, Extraversion, Openness, Agreeableness and Conscientiousness) were computed by summing up certain items for each type. Alpha coefficients were as follows: openness (α=.65), conscientiousness (α=.60), extraversion (α=.61), agreeableness (α=.51), and neuroticism (α=.54). Although this questionnaire has been extensively used in other studies, it was not previously used in Iran.

Beliefs about intelligence and intelligences tests: Participants were asked to respond on a bimodal scale (Yes/No) whether they (i) had ever taken an intelligence test (Yes=70.0%); (ii) believed that intelligence tests measure intelligence fairly well (Yes=31.8%); (iii) believed that intelligence is primarily inherited (Yes=73.3%); (iv) believed intelligence tests are useful in educational settings (Yes=71.3%), and; (v) believed some ethnicities are more intelligent than others (Yes=73.3%). The questions used in these questionnaires were identical to those in previous studies (Furnham et al., 1999, 2002, 2005)

Procedure
All participants were presented with a two-page questionnaire, and requested to complete it in the presence of an experimenter. The questionnaire was translated into Farsi, using the back-translation technique. Initially, the questionnaire in English was translated to Farsi by an independent, professional translator in London, and this version was subsequently back-translated to English by an independent bilingual translator in Tehran. Minor differences between the original and the back translation were adjusted at this stage. Participants were recruited by the help of lecturers and post-graduates at a university. Most of the participants (over 90%) gladly completed the test, though it should be pointed out that this was not necessarily a random sample of students who themselves are certainly not a representative sample of the people of Iran.

Results
Initial analyses showed estimates of intelligence unrelated to age, educational level or religious and political beliefs which may have been confounding factors.

Sex differences
Table 1 shows the mean scores for self, parental and partner multiple intelligences. A multivariate analysis of variance (MANOVA) was used to examine whether

there were significant sex differences in self-estimates of overall and multiple intelligences. The results showed a significant effect of sex, F(14,243)=3.67,

p<.001, ηp2=.18, with men providing higher self-estimates than women on logical, F(1,257)=18.29, p<0.001, ηp2=0.06, spatial, F(1,257)=6.92, p<.05, ηp2=.03, and musical intelligences, F(1,257)=4.65, p<.05, ηp2=02. By contrast, women provided higher self-ratings of emotional intelligence, F(1,257)=6.63, p<.05, ηp2=.03. The same MANOVA was also conducted for estimates of partner intelligence, but no significant effect of sex was observed, F(14,57)=.35, p>.05 .

A MANOVA of estimates of maternal, F(14,243)=1.22, p>.05, and paternal intelligence, F(14,243)=1.30, p>.05, likewise showed no significant effect of sex.

Generational and self-partner differences
A series of paired *t*-tests with Bonferoni corrections were performed to examine generational and self-partner differences in estimates of intelligence (see Table 2). We also did a series of ANOVAs with repeated measures with sex as a between factor, but the results were essentially the same. In terms of self-partner ratings, participants rated themselves as being more intelligent than their partners on logical-mathematical, intra-personal, spiritual, naturalistic, and emotional intelligences.

In terms of parental ratings, participants rated themselves as more intelligent than both parents on overall, logical-mathematical, and musical intelligences. They also rated themselves as more intelligent than their mothers on spatial, body-kinaesthetic, naturalistic, and creative intelligences, and more intelligent than their fathers on intra-personal, existential, spiritual, emotional, and practical intelligences. By contrast, participants rated their fathers as being brighter than themselves on verbal intelligence. Finally, participants rated their fathers as more intelligent than their mothers on overall, verbal, logical-mathematical, spatial, body-kinaesthetic, naturalistic, and creative intelligences. Mothers were only rated as more intelligent than fathers on emotional intelligence.

Multiple intelligence predictors of overall intelligence
In order to find out which of the different intelligences were the best predictors of overall intelligence estimates, multiple regressions were computed with the overall intelligence estimate for self, partner, mother and father being the criterion variable, and each of Gardner's ten and Sternberg's three intelligences, respectively, the predictor variable (see Table 3).

Table 1. National and sex differences in estimates of self, patental and partner intelligence

	Sex	You		Your partner		Your mother		Your father		
		M	SD	M	M	SD	M	SD	M	SD
Overall intelligence	Women	116.85	12.68	116.84	16.32	111.80	19.40	117.04	15.61	
	Men	119.52	14.98	113.67	22.83	111.08	15.52	114.47	17.91	
Verbal intelligence (the ability to use words)	Women	109.25	18.13	119.23	18.69	108.19	19.28	116.40	20.03	
	Men	111.98	18.34	113.94	20.00	111.55	16.16	115.05	18.14	
Logical-mathematical intelligence (the ability to reason logically or solve numerical problems)	Women	110.63	18.75	117.19	15.28	107.88	19.65	114.46	17.83	
	Men	120.48	16.35	111.98	20.05	106.84	18.10	114.76	18.21	
Spatial intelligence (the ability to find your way around the environment and form mental images)	Women	111.10	20.30	115.28	16.93	110.31	16.15	115.16	21.91	
	Men	117.48	16.89	110.74	20.88	109.24	17.11	116.13	17.62	
Musical intelligence (the ability to perceive and create pitch and rhythm)	Women	101.87	22.70	112.52	21.49	96.45	21.61	97.68	25.57	
	Men	108.63	23.53	111.72	20.21	100.69	21.21	102.02	20.72	
Body kinaesthetic intelligence (the ability to use bodily functions or motor movements)	Women	109.71	23.24	105.68	19.88	102.44	20.31	111.35	25.83	
	Men	111.69	19.58	110.40	20.38	102.61	17.71	111.47	49.82	
Inter-personal intelligence (the ability to understand other people)	Women	115.66	23.69	117.88	16.56	118.24	17.94	114.23	18.22	
	Men	114.20	18.50	112.82	20.78	115.25	16.42	115.43	19.72	
Intra-personal intelligence (the ability to understand yourself and develop a sense of your own identity)	Women	115.40	21.55	116.50	18.21	114.25	16.77	111.81	20.26	
	Men	117.96	18.13	110.96	20.09	121.16	82.83	114.71	18.04	
Existential intelligence (the ability to understand the significance of life, the meaning of death and the experience of love)	Women	114.38	22.87	118.65	18.25	114.63	18.55	110.81	21.52	
	Men	117.94	17.89	115.78	20.21	115.13	16.24	115.19	18.17	
Spiritual intelligence (the ability to engage in thinking about cosmic issues, the achievement of a state of being, and the ability to have spiritual effects on others)	Women	111.96	20.19	109.81	17.92	113.10	18.90	108.34	22.47	
	Men	116.12	18.80	108.82	21.01	114.49	15.03	113.87	18.21	
Naturalistic intelligence (the ability to identify and employ many distinctions in the natural world)	Women	112.66	18.38	110.00	16.55	109.62	18.87	111.23	19.40	
	Men	112.99	20.89	109.49	21.32	109.88	18.34	111.78	19.47	
Emotional intelligence (the ability to understand and manage your own emotions)	Women	123.15	18.57	120.38	17.37	119.13	17.61	108.00	19.34	
	Men	116.62	19.00	117.10	17.93	118.16	15.27	111.93	15.59	
Creative intelligence (the ability to go beyond what is given to generate novel and interesting ideas)	Women	111.40	20.36	116.69	17.75	107.56	19.75	111.44	22.39	
	Men	113.33	18.56	112.52	20.84	108.20	16.83	111.37	19.86	
Practical intelligence (the ability to find the best fit between yourself and the demands of the environment)	Women	110.31	21.34	114.20	16.87	109.61	19.04	109.00	19.78	
	Men	114.75	18.54	112.10	19.62	112.40	17.20	111.50	17.67	

Table 2. Paired comparisons between estimates

	Means		Df	*t*
1. Overall intelligence				
Self versus partner	119.18	114.71	76	1.83
Self versus mother	118.69	111.30	257	7.68**
Self versus father	118.69	115.26	257	3.22*
Mother versus father	111.30	115.26	257	-3.71**
2. Verbal				
Self versus partner	113.31	115.73	76	-.96
Self versus mother	111.14	110.51	257	.52
Self versus father	111.14	115.47	257	-3.24*
Mother versus father	110.51	115.47	257	-4.39**
3. Logical-mathematical				
Self versus partner	120.05	113.74	76	2.94*
Self versus mother	117.42	107.16	257	8.02**
Self versus father	117.42	114.67	257	2.12*
Mother versus father	107.16	114.67	257	-6.50**
4. Spatial				
Self versus partner	115.44	112.25	76	1.25
Self versus mother	115.50	109.57	257	5.10**
Self versus father	115.50	115.83	257	-.26
Mother versus father	109.57	115.83	257	-5.88**
5. Musical intelligence				
Self versus partner	110.67	111.99	76	-.43
Self versus mother	106.54	99.38	257	5.27**
Self versus father	106.54	100.67	257	4.47**
Mother versus father	99.38	100.67	257	-1.26
6. Body kinaesthetic				
Self versus partner	113.62	110.72	76	1.07
Self versus mother	110.07	102.56	257	7.17**
Self versus father	110.07	109.67	257	.54
Mother versus father	102.56	109.67	257	-2.66*
7. Inter-personal				
Self versus partner	117.51	114.53	76	1.14
Self versus mother	114.65	116.17	257	-1.26
Self versus father	114.65	115.06	257	-.30
Mother versus father	116.17	115.06	257	.94
8. Intra-personal				
Self versus partner	117.50	112.81	76	2.31*
Self versus mother	117.17	119.02	257	-.44
Self versus father	117.17	113.81	257	2.86*
Mother versus father	119.02	113.81	257	1.22
9. Existential				
Self versus partner	120.16	116.75	76	1.73
Self versus mother	116.83	114.97	257	1.51
Self versus father	116.83	113.83	257	2.40*
Mother versus father	114.97	113.83	257	1.35
10. Spiritual				
Self versus partner	116.61	109.16	76	3.03*
Self versus mother	114.83	114.06	257	.72
Self versus father	114.83	112.16	257	2.01*
Mother versus father	114.06	112.16	257	1.96
11. Naturalistic				
Self versus partner	114.73	109.67	76	2.13*
Self versus mother	112.89	109.80	257	2.70*
Self versus father	112.89	111.61	257	1.17
Mother versus father	109.80	111.61	257	-2.13*
12. Emotional				
Self versus partner	122.18	118.22	76	2.06*
Self versus mother	118.64	118.46	257	.16
Self versus father	118.64	110.71	257	6.43**
Mother versus father	118.46	110.71	257	7.68**
13. Creative				
Self versus partner	117.08	113.95	76	1.26
Self versus mother	112.73	108.00	257	3.92**
Self versus father	112.73	111.38	257	.92
Mother versus father	108.00	111.38	257	-3.10*
14. Practical				
Self versus partner	114.53	112.80	76	.69
Self versus mother	113.37	111.54	257	1.50
Self versus father	113.37	110.73	257	2.12*
Mother versus father	111.54	110.73	257	.82

* $p<.05$, ** $p<.001$

Table 3. Regressions of the 13 multiple intelligences onto the overall estimate of intelligence

	Self		Partner		Mother		Father	
	Beta	t	Beta	t	Beta	t	Beta	t
Verbal	.25	4.11**	.29	1.63	.29	4.99**	.22	3.56**
Logical-math	.23	3.93**	.02	.10	.17	3.09*	.38	6.27**
Spatial	.14	2.36*	.43	2.58*	.15	2.30*	.14	2.56*
Musical	.12	2.28*	-.05	-.34	.06	.96	.00	.03
Body kina	.12	2.16*	-.10	-.72	.00	-.02	.02	.36
InterPersonal	.00	-.06	.11	.73	.18	2.94*	.01	.14
IntraPersonal	.00	.06	.26	1.53	.04	.87	.04	.53
Existential	.11	1.81	.15	1.03	-.06	-.85	-.02	-.25
Spiritual	-.09	-1.36	-.36	-2.2*	.01	.10	.18	2.90*
Naturalistic	.11	1.87	-.06	-.38	.11	1.85	-.04	-.64
$F_{(10,257)}$	21.72**		5.96**a		25.65**		33.79**	
Adjusted R^2	.45		.41		.49		.56	
Verbal	.24	3.84**	.33	1.89	.24	3.94	.22	3.42*
Logical-Math	.22	3.65**	.03	.17	.18	3.28**	.36	5.74**
Spatial	.13	2.26*	.54	3.29*	.13	2.06*	.14	2.46*
Musical	.11	2.09*	-.07	-.46	.02	.30	-.01	-.17
Body Kinaest	.12	2.03*	-.19	-1.31	-.01	-.08	.02	.35
InterPersonal	-.02	-.29	.17	1.14	.13	2.07*	.01	.11
IntraPersonal	.00	-.06	.31	1.86	.05	1.06	.03	.40
Existential	.11	1.73	.10	.63	-.11	-1.69	-.01	-.15
Spiritual	-.12	-1.66	-.36	-2.3*	-.02	-.23	.18	2.69*
Naturalistic	.09	1.51	-.12	-.78	.04	.69	-.04	-.66
Emotional	.00	.03	.08	.51	.15	2.43*	-.03	-.57
Creative	.03	.44	-.47	-2.6*	.09	1.21	.07	1.19
Practical	.09	1.52	.35	2.17*	.08	1.29	.00	.06
$F_{(13,257)}$	17.00**		5.76**b		21.74**		26.01**	
Adjusted R^2	.45		.47		.51		.56	

*p<.05, **p<.001; a df=10,76, b df=13,76

Table 4. Regressions of participants' demographic variables, Big Five personality scores, and beliefs about intelligence and intelligence tests onto overall estimates of intelligence

	Self		Partner		Mother		Father	
	Beta	t	Beta	t	Beta	t	Beta	t
Sex	-.09	-1.40	.10	.80	.01	.18	.07	1.09
Age	.01	.13	.14	.99	-.12	-1.62	.04	.61
Marital status	.04	.51	.06	.43	.06	.78	-.04	-.51
Education	.09	1.43	.08	.67	.15	2.22	.07	1.07
Religiosity	.03	.43	.02	.14	.00	.08	.05	.83
Political orientation	.14	2.19*	.19	1.57	-.02	-.28	.07	1.12
$F_{(6,255)}$	1.83		1.10a		1.17		.74	
Adjusted R^2	.02		.01		.01		.01	
Sex	-.10	-1.62	.11	.88	.00	.05	.06	.85
Age	.00	-.06	.17	1.13	-.12	-1.66	.04	.51
Marital status	.04	.59	.03	.22	.06	.81	-.03	-.36
Education	.09	1.31	.08	.58	.15	2.21	.06	.94
Religiosity	.00	-.03	.01	.10	.00	.03	.04	.67
Political orientation	.14	2.19*	.20	1.55	-.02	-.27	.08	1.18
Neuroticism	-.10	-1.64	.03	.22	-.06	-.93	-.16	-2.50
Extraversion	.13	2.05*	.08	.67	.04	.65	-.01	-.18
Openness	.06	.97	-.11	-.89	.04	.67	.10	1.57
Agreeableness	.07	1.14	.04	.32	-.02	-.30	.06	.89
Conscientiousness	-.01	-.22	-.09	-.70	.00	-.03	.01	.21
$F_{(11,255)}$	1.95*		.75b		.78		1.33	
Adjusted R^2	.04		.04		.01		.01	
Sex	-.06	-1.03	.14	1.12	.02	.29	.07	1.12
Age	.01	.08	.17	1.17	-.08	-1.13	.06	.87
Marital status	.02	.30	.00	.01	.02	.32	-.05	-.68
Education	.07	1.02	.07	.46	.13	1.94	.04	.61
Religiosity	-.04	-.57	.00	.04	-.03	-.44	.02	.33
Political orientation	.12	1.86	.18	1.47	-.02	-.32	.08	1.19
Neuroticism	-.11	-1.84	.02	.19	-.06	-.93	-.16	-2.59
Extraversion	.10	1.63	.11	.83	.03	.53	-.02	-.29
Openness	.01	.22	-.11	-.86	.03	.52	.09	1.31
Agreeableness	.07	1.05	.09	.61	.01	.20	.09	1.34
Conscientiousness	.01	.09	-.14	-1.14	.00	-.03	.01	.21
Taken an intelligence test	-.08	-1.27	-.18	-1.40	-.14	-2.17	-.12	-1.94
Intelligence tests measure intelligence well	-.11	-1.74	-.33	-2.57*	.04	.61	-.06	-.96
Intelligence is primarily inherited	.15	2.28*	.04	.27	.19	2.72*	.11	1.58
Intelligence tests are useful in education	.02	.29	.08	.53	.06	.87	.12	1.75
Some ethnic groups are more intelligent than others	-.24	-3.57**	.22	1.45	-.10	-1.49	-.08	-1.14
$F_{(16,255)}$	2.62*		1.23c		1.46		1.50	
Adjusted R^2	.09		.04		.03		.03	

*p<.05; a df=6,75, b df=11,75, c df=16,75

In general, verbal and logical-mathematical intelligence were the best predictors of overall intelligence, although spatial and spiritual intelligence were also good predictors for partner and paternal intelligence. The amount of variance accounted for was between 45% and 56%.

Other predictors of overall intelligence

Finally, we computed multiple regressions to ascertain whether participants' demographic variables, Big Five personality scores, and beliefs about intelligence (the predictor variables) predicted overall intelligence (the criterion variable). Table 4 shows the results of twelve regressions where variables were put in three blocks: 1) demographic and ideological variables; 2) the Big Five facets; 3) beliefs about intelligence. The regressions provided significant results only for self-estimates, but not for partner or parental estimates. Specifically, the regressions indicated that right-wing extraverts gave themselves higher scores, although the best predictors of self-estimates were two beliefs about intelligence (that intelligence is heritable and that there are group differences in intelligence).

Discussion

The results of the present study overturned previous findings suggesting there is no sex difference in self-estimated intelligence among Iranians (16). Rather, the present study revealed that, overall, men provided higher self-estimates of intelligence, particularly on logical-mathematical, spatial and musical intelligence. In general, this set of results is consistent with the extant literature from across different continents (8) and different research groups (2). However, it should be pointed out that there were no significant sex differences on two other intelligences that have previously shown robust sex effects, namely overall intelligence and verbal intelligence. In addition, the present results suggest that there were no sex differences in ratings of parental and partner intelligence. These results are considered in more detail.

First, the present results showed that participants estimated their overall intelligence as being one standard deviation above the norm, which is consistent with findings among university students of different parts of the world (8). More importantly, the present results are in accordance with the postulated self-enhancing bias among men and the self-derogatory bias among women. That is, men awarded themselves higher scores on a number of intelligences, and the one exception to this finding (for emotional intelligence) was likewise consistent with previous reports (36). In addition, participants also rated their fathers as more intelligent than their mothers on overall intelligence and a number of additional intelligences, which is again consistent with previously-reported sex differences. In short, then, the present results support the male hubris-female humility effect in self-estimated intelligence, and the present study's discrepancy with

previous results from Iran (23) may be a function of the latter study's small sample size or systematic errors in sampling.

The present results also suggest that there were no sex differences in partner or parental ratings of estimates, which is consistent with (23) ,but inconsistent with the extant literature (8). For example, previous work has shown that women rated their partners as having significantly higher verbal, logical-mathematical and spatial intelligences (25, 21). In this sense, the present results do suggest that Iranian undergraduates do not fully conform to the established pattern of results in ratings of others' intelligence. Reasons for this might include the greater public role of Iranian women within academic settings (i.e., lower female humility) or decreased male hubris as a function of changing sex roles within Iranian society (16).

Previous research has also shown that estimates of intelligence decline by about half a standard deviation for each generation that is back-sampled (8). In the present study, participants rated themselves as 2 IQ points more intelligent than their fathers and 6 IQ points more intelligent than their mothers. The magnitude of this result is consistent with previous results (26, 21). The most likely reason for this result is that the present sample of students have experienced significantly better and longer education than both their parents, thus affecting perceptions of their own intelligence.

Previous researchers who have regressed the different multiple intelligences onto the overall intelligence have tended to show that logical or mathematical, spatial and verbal intelligences are the only significant predictors of overall intelligence (12). In general, the present results support this conclusion, although there were minor discrepancies depending on the person being rated. It might be suggested, therefore, that there are fewer cross-cultural differences in lay definitions or beliefs about intelligence than has been previously suggested (24, 9, 20). Finally, the present results also extend previous work in showing that participants' personality and beliefs about intelligence were marginally related to self-estimates. The pattern of results reported here is consistent with earlier studies showing that personality facets do relate systematically to both estimated and psychometrically-measured intelligence (37). The power of personality factors, however, should not be overestimated as shown in table 4. Only Extraversion related to overall self-estimates of general intelligence and this accounted for only 2% of the common variance.

In conclusion, the findings of this study are consistent with those of similar studies in different continents and cultural groups (8). In this sense, these results indicate that there are relatively stable cross-cultural patterns of sex differences in self-estimated intelligence, and that there are significant associations between self-estimated intelligence, personality and beliefs about intelligence. Future studies can improve the present research in a number of ways, including the use of

general populations rather than student samples, and the use of more balanced samples in terms of sex. It will also be crucial for future research to more fully explicate the reasons for the sex difference in self-estimated intelligence over and beyond simply documenting its existence. This study had two notable limitations. First, the sample was not representative of the population of the country as it consisted of a sample of students who were younger and more educated than those in the total population of the country. Second, we were not able to obtain actual IQ test scores to determine whether participants were accurate in their estimations of self or others.

Studies on self-estimates of abilities have important implications. For instance, there is consistent evidence to show that actual sex differences in intelligence are either very minor or non-existent. Why then should females be prone to humility and males to hubris about their abilities except that universal differences in gender socialization encourage it. The major concern should be for females who under-estimate their score which could result in a self-fulfilling prophesy and lower female achievement. Equally the same problem could occur if parents under or over-estimate the ability of their children based on false stereotypes. A great deal of both therapy and training is aimed at people having realistic and accurate appraisal of their abilities, preferences and skills. Accurate appraisal would require comparing estimates with actual (psychometrically valid) scores to assess whether people under or over estimate their abilities.

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