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Estimating One's Own and One's Relatives' Multiple Intelligence: A Cross-Cultural Study from East Timor and Portugal

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This study examined estimates of their own, and their parents' general and multiple intelligences. Three hundred and twenty three students from East Timor, and one hundred eighty three students from Portugal estimated their own, and their parents' IQ scores on each of Gardner's ten multiple intelligences. Men believed they were more intelligent than were women on mathematical (logical), spatial, and naturalistic intelligence. There were consistent and clear culture differences. Portuguese gave higher self, and family ratings than Timorese, as expected. Participants of both cultures rated overall intelligence of their father higher than that of their mother. Implications of these results for education and self-presentations are considered.
Keywords: cross-cultural studies, sex differences, multiple intelligences, parents, self-estimates.

Este estudio examinó las estimaciones de la inteligencia general y de las inteligencias múltiples, tanto la propia como la de los padres. 323 estudiantes de Timor Oriental y 183 estudiantes de Portugal estimaron su propia puntuación de CI y la de sus padres en cada una de las'inteligencias múltiples de Gardner. Los varones creían que eran más inteligentes que las mujeres en inteligencia matemática (lógica), espacial y naturalista. Había diferencias culturales claras y consistentes. Tal y como se esperaba, los portugueses se asignaron puntuaciones más altas a sí mismos y a sus familias que los timoreses. Los participantes de ambas culturas asignaban a sus padres puntuaciones más altas en inteligencia global que a sus madres. Se comentan las implicaciones de estos resultados para la educación y la auto-presentación.
Palabras clave: estudios transculturales, diferencias por el sexo, inteligencias múltiples, padres, auto-estimaciones.

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Intelligence is of considerable interest to academics and lay people alike (Mackintosh, 1998; Sternberg, 1990). Over the past decade there have been a number of studies concerned with self-estimates of intelligence. Although various other studies predated it (e.g. Hogan, 1978), it was Beloff's (1992) study on sex differences in estimated IQ that has provoked most papers since (Bennett, 1996, 1997, 2000; Byrd & Stacey, 1993; Furhnam, 2000; Furnham & Baguma, 1999; Furnham & Fong, 2000; Furnham & Rawles, 1995; Furnham, Clark, & Bailey, 1999; Furnham, Fong, & Martin, 1999; Furnham, Hosoe, & Tang, 2002; Neto, Ruiz, & Furnham, 2008; Petrides & Furnham, 2000). In a sample of 767 Scottish students Beloff (1992) found that women underestimate their intelligence whereas men overestimate their intelligence. She proposed that in females' upbringing there is an emphasis on humility and they receive "modesty training", resulting in poor intellectual self-image relative to males. This area of research is seen as important because it has been demonstrated that beliefs about intelligence have systematic motivational and behavioural consequences (Dweck, 2000). Further, it has been suggested that self-estimated intelligence can have self-fulfilling effects in relation to examination performance (Chamorro-Premuzic, Furnham, & Moutafi, 2004).

These studies can be categorized into various areas. In many studies self-estimates of overall intelligence were investigated as the sole dependent variable (Beloff, 1992; Byrd & Stacey, 1993; Furnham & Gasson, 1998). In other studies, rather than looking at overall intelligence (i.e.*g)*, researchers have looked at measures of specific types of intelligence, such as emotional intelligence, "successful" intelligence, and multiple intelligence as defined in 1983 by Gardner (see Furnham, Rakow, Sarmany-Schiller, & De Fruyst, 1999). Although these researchers have not typically set out to test Gardner's (1983, 1999) original or updated theory for which there still remains little supportive evidence, their measures are nevertheless consistent with the view of most lay people and therefore provide a useful way to explore lay people's understanding of intelligence. Some studies have been particularly concerned with the correlation between psychometric intelligence and self-estimated intelligence, which appears to be around $r = .30$ (Furnham & Fong, 2000; Furnham & Rawles, 1999). The relationship between self-estimates and academic performance deals with the effects of subjective beliefs on real-life outcomes. As Chamorro-Premuzic and Furnham (2005, p. 118) pointed out "although subjectively assessed intelligence may be a considerably worse predictor of academic performance than psychometric intelligence, there is some evidence suggesting that subjective beliefs are also related to actual academic performance, although more modestly than objectively measured intelligence".

The studies on self-estimates of intelligence have been extended in different directions. One issue concerns cultural differences in estimated intelligence. This is an important issue to examine cross-culturally because of the social importance of the concept in different cultures. Cross-cultural studies give insights into how the concept is socially constructed and how it is utilized by individuals in that society. To test the robustness of the findings across cultures, Furnham and colleagues have completed various cross-cultural comparative studies of self-estimated intelligence. Data have been collected from Africa (South Africa, Uganda), the United Sates, Asia (China, Hong Kong, Japan, Singapore), Europe (Belgium, Germany, Portugal, Slovakia, United Kingdom), and the Middle East (Iran). With very few exceptions, study results have shown that men give higher self-estimates of overall intelligence compared to women (Furnham, 2001). For example, Furnham, Hosoe, and Tang (2001) found that in comparable groups of American, British, and Japanese students, the Americans gave themselves the highest on all ratings, particularly on overall and verbal intelligence, followed by the British, and then followed by the Japanese. Across all cultures, men rated themselves higher on overall intelligence and numerical intelligence. Furnham, Fong, & Martin (1999) found British students awarded themselves higher overall, verbal, and cultural intelligence scores than did Americans (but exclusively from the state of Hawaii) and Singaporeans. Once again there was evidence that Asians, this time Singaporeans (all of Chinese ethnic origins), tended to show humility in their self-estimations of the seven Gardner (1983) intelligences.

This study extends these investigations to cross-cultural comparisons of Timorese and Portuguese participants. In this sense it is an East-West comparison. Previous self-estimation studies in this area have shown evidence of Asian humility over European hubris. That is Asians appear to favour modesty and therefore personal IQ estimates around the average while Europeans seem to believe they are half a standard deviation above the average (Furnham, & Fong, 2000; Furnham, Hosoe, & Tang, 2001; Furnham, Rakow, & Mak, 2002). This is an East-West comparison examining two countries not previously tested on self-estimated intelligence. Whilst ability assessment across cultures is fraught with difficulty (Greenfield, 1997), this study looks at self-estimates of ability.

In view of the long-term relations and the respective contexts of East Timor and Portugal, as well the multicentury interaction between them, this multiple intelligence comparison study was launched. Timorese culture is a collectivistic culture very different from Western culture, and it will thus provide a useful contrast between most of the available literature on intelligence in Western and individualistic in cultural orientation. With the Philippines, East Timor is one of only two majority Roman Catholic countries in Asia. East Timor's two official languages are Portuguese and Tetum, a local Austronesian language. The culture of East Timor reflects numerous cultural influences, including Portuguese, Roman Catholic

and Malay, on the indigenous Austronesian cultures of Timor (Neto, Pinto, & Mullet, 2007a). Timorese also represent a significantly underserved population: empirical studies and applied articles related to Timorese culture are few (Neto, Pinto, & Mullet, 2007b).

Bond (1996) and Smith and Bond (1998) have described various salient cross-cultural differences that are relevant to this study. This includes the fact that Asian people place great emphasis on education attainment, achievement, motivation, and self-discipline. Bond (1996) notes the Asian academic emphasis on memory, attention to detail, and, as a consequence of socialization, high spatial intelligence. It was suggested that Asians tended to use contextualized and more changeable explanations to intelligence than fixed inherited traits (Markus & Kitayama, 1991). Asians tended to be modest in self-estimates of intelligence presumably because of culture requirements for modesty (Furnham, 2001).

This study had three major aims. First, it sought to consider the sex differences within specific types of intelligence. Most studies on self-estimates of intelligence involve measuring overall intelligence or "g". However, many researchers have made distinctions between various types of intelligence, an approach consistent with the view of most lay people. Gardner (1983) initially identified seven subtypes of intelligence that every normal individual should develop to some extent, but owing to a combination of heredity, early training, and learning opportunities, certain individuals develop some more than others. The "object-related" intelligences he defined are logical-mathematical (the ability to reason logically, solve numerical problems), spatial (the ability to navigate the environment, form and manipulate mental images), and bodily-kinesthetic intelligence (the ability to carry out motor movement, manipulate objects with finesse). The "object-free" forms of intelligence are verbal (linguistic ability) and musical (the ability to perceive and create pitch and rhythm patterns). Finally, there are two types of personal intelligence: interpersonal (understanding the behaviour, thoughts, and feelings of others) and intrapersonal (the ability to understand oneself and develop a sense of one's own identity). In his latest book, Gardner (1999) adds a further three possible types of intelligence (naturalistic, spiritual, and existential). The multiple intelligence theory has little or no published empirical evidence, although it has generated a great deal of interest among educators (Furnham, 2001). The idea of the specific multiple intelligences proposed (definitively the seven, possibly the ten) seems to "chime" with lay people's understanding of the concept of intelligence. That is, academic tests and theories seem too limited.

Sex differences on all multiple intelligences are considered, thus updating the work on self-estimates of multiple intelligences. Although the topic of sex differences in intellectual ability has been academically controversial (Flynn, 1999; Lynn, 1997; Mackintosh, 1998), it is usually acknowledged that sex differences in psychometric intelligence are far too small to consider sex a relevant predictor of ability tests performance (Chamorro-Premuzic & Furnham, 2005; Hyde, 2005; Reilly & Mulhern, 1995). Therefore, it is likely that the so called sex differences in self estimates of intelligence may be more precisely understood in terms of lay beliefs or stereotypes about sex, on the one hand, and intelligence, on the other hand.

The male hubris-female humility effect for self estimates of intelligence across different countries, has been documented (e.g., Furnham & Akande, 2004; Furnham & Chamorro-Premuzic, 2005; Furnham, Hosoe, & Tang, 2002). Interestingly, these studies have found both sex and culture differences, but rarely interaction between the two. The results from these studies suggest that the overall sex difference in estimated IQ is largely due to differences in the two specific facets of mathematical and spatial intelligence.

Second, this study extends these investigations to cross-cultural comparisons of Timorese (Asia) and Portuguese (Europe) participants, though it may well be argued that East Timor is not typical of Asian countries, and likewise, Portugal is not typical of European countries. The selection of these "atypical" East-West countries strengthens the unique contribution of this paper. Cross-cultural studies seem to indicate that South-East Asians provide generally lower self-estimates than people either from Europe and North America and specially Africa. Thus Furnham, Hosoe and Tang (2002) comparing American, British and Japanese students estimates of their own, their parents' and their siblings' multiple intelligences found Americans rated their multiple IQ around a half a standard deviation (6-10) points above the Japanese students. Similarly the Japanese students rated their parents' intelligence lowest of the three groups. Indeed the Japanese were the only group to give estimates below the mean of 100.

Studies using Chinese parents from Hong Kong (Furnham, Rakow, & Mak, 2002) also showed the Chinese more modest in their estimates compared to European and American groups. However what is interesting is that despite their modest Chinese and Japanese respondents appear to show the same sex differentiation as other groups. More recently Neto, Furnham, and Paz (2007) examined differences in sex and culture between Macanese and Portuguese university students in self and parental estimations of IQ. Portuguese gave higher self and family ratings than Macanese, as expected. This seems to indicate, at least compared to Western students', evidence of national/culture modesty.

The third aim of this study was to focus on parents' estimates of multiple intelligences. By asking men and women to estimate the intelligence of their parents, it is possible to investigate whether the hubris-humility findings from self-estimates extend to others of the same sex as well as of different sex or whether self-estimates are somehow different. If men believe their fathers are brighter

than their mothers, this may be seen as good evidence for gender stereotypes. It is particularly interesting to explore the perceptions of women to discover if their noted self-depreciation and humility in self-estimates extend to others (Beloff, 1992). Research on IQ estimates suggests that the male-favouring difference extends to estimates of relatives, with fathers and sons being perceived as more intelligent than mothers and daughters, respectively (Furnham, 2001).

Thus, this study focuses on sex and culture differences in self-estimated IQ and estimates of parents' IQ in students from East Timor, and Portugal, and aimed at testing the following hypotheses based on extant literature:

Hypothesis 1. It was anticipated that there would be sex differences in self-rated mathematical and spatial intelligence, with men giving higher self-estimates than women.

Hypothesis 2. It was predicted that there would be cultural differences between Timorese and Portuguese, with the former awarding themselves and their parents significantly lower scores than the latter.

Hypothesis 3. Irrespective of gender, participants would rate their fathers as more overall intelligent than their mothers.

Hypothesis 4. Factor analyses of the ten estimates or eight multiple intelligences would reveal a three-factor solution as set out by Gardner (1999), namely, "traditional intelligence" (linguistic/verbal and logical/mathematical), "artistic intelligence" (musical, body-kinesthetic, spatial) and "personal intelligence" (interpersonal and intrapersonal).

Method

Participants

In all, there were 323 students (158 women and 165 men) from Dili University, East Timor, and 183 students (103 women and 80 men) from Porto University, Portugal. The association between gender and culture was not significant (X^2 = 2.54, p>.05). The mean age of the Portuguese students was 20.98 years (SD = 3.35), whereas for the Timorese students, it was 22.06 (SD = 2.60). This difference was significant, $F(1, 504) = 16.06$, $p < .001$, indicating Timorese were older on average than were the Portuguese students. Both students groups were social sciences students in East Timor and Portugal. All had completed secondary schooling and received high grades.

Questionnaire

Participants completed the one-page questionnaire included in previous studies in this area (Furnham, 2000; Neto & Furnham, 2006). The questionnaire showed a normal distribution of intelligence scores, and titles against each score. Thus, 55 was labelled *mild retardation*, 70 *borderline retardation*, 85 *low average*, 100 average, 115 *high average*, 130 *superior*, and 145 *gifted*. The graph was taken from a general textbook with a chapter on intelligence (Goldstein, 1994). These were directly translated into Tetum (the main dialect in East Timor). Participants were then shown a grid with eleven rows and four columns. The first row was labelled "Overall Intelligence" and the remaining ten taken from Gardner (1999). There was a short description of what each intelligence stood for. This included the eight "definite multiple intelligences plus the two currently rejected, but considered, candidates."

The short descriptions of each intelligence: 1. Verbal or linguistic intelligence (the ability to use words). 2. Logical or mathematical intelligence (the ability to reason logically, solve number problems). 3. Spatial intelligence (the ability to find your way around the environment, and form mental images). 4. Musical intelligence (the ability to perceive and create pitch and rhythm). 5. Body-kinesthetic intelligence (the ability to carry out motor movement; e.g. being a surgeon or a dancer). 6. Interpersonal intelligence (the ability to understand other people). 7. Intrapersonal intelligence (the ability to understand yourself and develop a sense of your own identity). 8. Existential intelligence (the ability to understand the significance of life, the meaning of death and the experience of love). 9. Spiritual intelligence (the ability to engage in thinking about cosmic issues, the achievement of a state of trance; e.g. achieving trance states and the ability to have spiritual effects on others). 10. Naturalistic intelligence (the ability to identify and employ many distinctions in natural world; e.g. categorizing species membership).

The columns were labelled "You", " "Your Father", and "Your Mother". Thus each participant was requested to make 33 IQ estimates of themselves against population norms.

Procedure

The questionnaire was translated and back translated by two Portuguese-Tetum speakers. Students were tested in class groups of 15 to 30 at both universities. There was a 100% response rate. They were thoroughly debriefed after the study in their respective class group.

Results

Sex and Cultural Differences in Estimates of Intelligence

First, three (self, father, and mother) multivariate analysis of covariance (MANCOVA) were performed on the ten multiple intelligences (Table 1). Sex and culture were the classification factors, whilst age was treated as covariate due to possibly confounding effect of age (Furnham &

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Rawles, 1995). The MANCOVA yielded significant sex effects for self, $F(10, 483) = 2.57$, $p < .01$, $\eta_p^2 = .05$ and mother, $F(10, 482) = 1.87$, $p < .05$, $\eta_p^2 = .04$ estimates. Cultural effects were observed on all generations: self, $F(10, 483) = 15.87$, $p < .001$, $\eta_p^2 = .25$, father, $F(10, 478) = 16.89$, $p < .001$, $\eta_p^2 = .03$ and mother, $F(10, 482) =$, $p < .001$, $\eta_p^2 = .20$.

Inspection of the ANCOVAs indicated that men rated themselves higher than did women in logical-mathematical, spatial, and naturalistic intelligence. These results tend to confirm our first hypothesis. There were four sex differences in the estimates for father, and three for mother.

Results for the main effect for culture/nationality showed many significant differences. Six of the ten culture differences for self-estimates were significant and almost all went in the same direction (Portuguese participants gave higher self-estimates than Timorese students), with only one exception (Timorese participants gave higher self-estimates for spiritual intelligence than Portuguese). No significant interaction was found. However four cultural similarities were found: interpersonal, intrapersonal, existential, and naturalistic intelligences. In these domains Timorese tended to evaluate themselves higher than the average (100). Thus Timorese also have self-serving tendencies in these specific multiple intelligences. The main effect for culture showed eight significant differences for father, and six for mother. With only five exceptions (ratings of spiritual intelligence for father, and mother, and ratings of interpersonal and existential intelligence for father), the Portuguese sample gave higher estimates than the Timorese. There were six significant interactions for father's estimates. This indicated that Timorese men gave lower estimates for father verbal, and mathematical intelligence than the other three groups, and that Timorese women gave higher estimates for father interpersonal, existential, and spiritual intelligence than the other three groups. Besides that whereas Portuguese women gave lower estimates of the naturalistic intelligence for fathers than Portuguese men, it was the opposite for the Timorese women, whose mean estimates were 6.2 points higher than those of Timorese men.

There were three significant interactions for mother's estimates. This indicated that Timorese men gave lower estimates for the mother's spatial intelligence than the other three groups, and that Timorese women gave lower estimates for the mother's interpersonal intelligence than the other three groups. Besides that whereas Portuguese women gave lower estimates of the intrapersonal intelligence for mothers than Portuguese men, it was the opposite for the Timorese women, whose mean estimates were 7.3 points higher than those of Timorese men.

Table 1
Cross-cultural data showing Timorese and Portuguese men's and women's estimates with 2-way ANCOVA results for self

		Timorese		Portuguese		F		
Variable		Women	Men	Women	Men	Sex	Culture	Sex × Culture
Self-Estimates								
Verbal	*M*	97.3	99.6	109.9	111.2	1.42	57.5***	.08
	SD	(18.1)	(19.1)	(13.3)	(10.5)		(0.10)	
Mathematical	*M*	94.6	96.5	100.4	106.8	6.14*	19.37***	1.95
	SD	(20.4)	(22.2)	(11.4)	14.2)	(0.01)	(0.04)	
Spatial	*M*	101.2	104.5	105.2	115.6	13.60***	17.12***	3.65
	SD	(22.4)	(21.1)	(15.4)	(12.6)	(0.03)	(0.03)	
Musical	*M*	85.6	91.3	101.0	100.9	1.41	32.03***	1.79
	SD	(25.2)	(28.4)	(18.0)	(15.6)		(0.06)	
Body Kinetic	*M*	97.8	94.4	107.0	109.6	.11	34.65***	1.73
	SD	(25.6)	(25.3)	(17.3)	(15.9)		(0.07)	
Interpersonal	*M*	114.0	119.5	116.7	118.0	.29	.12	.35
	SD	(20.8)	(22.9)	(12.4)	(12.0)			
Intrapersonal	*M*	111.2	113.4	110.7	113.2	1.06	.01	.01
	SD	(24.2)	(23.3)	(13.1)	(13.9)			
Existential	*M*	111.8	114.1	110.1	113.1	1.98	.52	.04
	SD	(23.9)	(22.2)	(14.2)	(13.5)			
Spiritual	*M*	110.1	109.7	98.1	98.2	.02	28.54***	.01
	SD	(26.7)	(23.4)	(18.8)	(19.4)		(0.05)	
Naturalistic	*M*	103.0	106.6	102.8	109.6	8.40**	.28	1.0
	SD	(22.9)	(24.5)	(15.4)	(11.2)	(0.02)		

Note. Parentheses under statistically significant F values indicate effect sizes (η^2 values).
*$p < .05$; **$p < .01$; ***$p < .001$.

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Table 2
Cross-cultural data showing Timorese and Portuguese men's and women's estimates with 2-way ANCOVA results for father

		Timorese		Portuguese		F		
Variable		Women	Men	Women	Men	Sex	Culture	Sex × Culture
Father								
Verbal	*M*	105.4	95.9	106.8	106.6	4.85*	7.41**	5.21*
	SD	(24.4)	(25.9)	(14.1)	(14.3)	(0.01)	(0.02)	(0.01)
Mathematical	*M*	100.6	88.9	108.9	108.5	8.02*	41.31***	7.08**
	SD	(25.2)	(25.4)	(15.4)	(16.7)	(0.02)	(0.08)	(0.01)
Spatial	*M*	106.8	98.3	110.9	109.5	4.84*	11.40**	3.74
	SD	(23.7)	(24.9)	(14.5)	(14.4)	(0.01)	(0.02)	
Musical	*M*	85.6	79.4	96.8	95.6	.16	31.26***	1.45
	SD	(27.7)	(28.5)	(14.8)	(14.9)		(0.06)	
Body Kinetic	*M*	95.1	85.7	100.5	99.1	6.41*	19.11***	3.25
	SD	(26.2)	(27.1)	(13.3)	(13.9)	(0.01)	(0.04)	
Interpersonal	*M*	113.4	106.5	103.6	106.2	.73	8.69**	6.83**
	SD	(21.0)	(24.3)	15.7	16.3		(0.02)	(0.01)
Intrapersonal	*M*	111.1	111.4	104.6	107.7	.28	1.93	.17
	SD	(26.6)	(23.8)	(14.0)	(13.9)			
Existential	*M*	115.8	109.4	106.9	109.4	.60	6.07*	5.29*
	SD	(25.2)	(25.4)	(14.6)	(11.5)		(0.01)	(0.01)
Spiritual	*M*	113.1	105.6	93.0	96.7	.44	74.73***	7.38**
	SD	(25.8)	(25.2)	(17.2)	(18.2)		(0.09)	(0.02)
Naturalistic	*M*	106.1	99.9	101.5	105.4	.12	.01	6.25*
	SD	(26.3)	(26.1)	(14.1)	(13.1)			(0.01)

Note. Parentheses under statistically significant F values indicate effect sizes (η^2 values).
*$p < .05$; **$p < .01$; ***$p < .001$.

Table 3
Cross-cultural data showing Timorese and Portuguese men's and women's estimates with 2-way ANCOVA results for mother

		Timorese		Portuguese		F		
Variable		Women	Men	Women	Men	Sex	Culture	Sex × Culture
Mother								
Verbal	*M*	96.2	84.8	106.9	103.9	10.49**	43.41***	3.14
	SD	(27.0)	(28.1)	14.2)	(17.9)	(0.02)	(0.08)	
Mathematical	*M*	93.5	83.1	100.9	98.9	9.39**	31.6***	3.50
	SD	(27.7)	(25.5)	(13.9)	(14.6)	(0.02)	(0.06)	
Spatial	*M*	99.9	89.9	100.1	102.1	2.61	6.38*	9.49**
	SD	(26.9)	(25.2)	(13.4)	(12.8)		(0.01)	(0.02)
Musical	*M*	78.0	79.5	95.5	95.6	.06	24.85***	.04
	SD	(25.5)	(24.9)	(15.1)	(12.8)		(0.05)	
Body Kinetic	*M*	90.4	84.5	99.8	97.6	3.85	28.22***	.60
	SD	(26.4)	26.7)	(13.8)	(15.6)		(0.05)	
Interpersonal	*M*	100.5	105.7	109.9	112.6	.08	1.48	4.02*
	SD	(23.4)	(26.9)	(15.5)	(14.7)			(0.01)
Intrapersonal	*M*	110.4	103.1	104.9	109.2	.43	.01	7.68**
	SD	(25.9)	(25.7)	(16.3)	(13.2)			(0.02)
Existential	*M*	112.4	108.7	107.9	112.6	.07	.02	3.71
	SD	(25.5)	(27.7)	(17.4)	(11.9)			
Spiritual	*M*	108.6	103.7	97.9	99.8	.45	10.68**	2.32
	SD	(26.9)	(25.7)	(19.0)	(16.4)		(0.02)	
Naturalistic	*M*	103.4	97.7	100.7	100.8	1.4	.01	1.72
	SD	(27.7)	(27.9)	(15.0)	(16.5)			

Note. Parentheses under statistically significant F values indicate effect sizes (η^2 values).
*$p < .05$; **$p < .01$; ***$p < .001$.

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Parental Intelligence

Did participants believe their mother or father was overall more intelligent? A Parent (2) × Sex (2) × Culture (2) mixed ANCOVA model yielded a significant Parent effect, $F(1, 486) = 8.23$, $p < .05$, $\eta_p^2 = .02$, indicating that participants estimated overall intelligence of their father higher than of their mother (father $M = 99.83$, $SD = 22.07$; mother $M = 94.97$, $SD = 23.89$). The effect of culture was also significant, $F(1, 486)=5.86$, $p < .05$, $\eta_p^2 = .02$, indicating that Portuguese participants (father $M = 107.78$, $SD = 12.52$; mother $M = 106.01$, $SD = 9.98$) estimated overall intelligence of their father and of their mother, higher than the Timorese participants (father $M = 97.89$, $SD = 23.44$; mother $M = 92.27$, $SD = 25.49$). The effect of the sex was not significant, $F(1, 486)= 3.42$, $p > .05$. No interaction effects were significant. This confirms the third hypothesis.

Factor structure

Table 4 shows the results from the VARIMAX solution factor analysis. Criteria for extraction was an eigenvalue greater than 1. This was done on the full 10, the currently recognized 8, and finally the original 7 multiple intelligences as specified by Gardner (1983, 1999). The pattern is very clear. On all analyses in the Timorese sample, the spatial, inter- and interpersonal intelligence load on the same factor. In the 8 multiple intelligence model existential loads on this factor, while in the 10 multiple intelligence model spiritual and naturalistic load on this model. The other factor concerns the verbal, logical, musical, and body-kinaesthetic intelligence. This factor structure is similar to that found in the Portuguese sample, the only differences being that verbal and spatial intelligences loaded in different factors. Thus, the fourth hypothesis was not supported. These results are similar to various other factor-analytic studies done by Furnham (2001) and by Yuen and Furnham, (2005), but not the factor structure proposed by Gardner (1983, 1999).

Discussion

This research extended sex and cultural differences in self- and other estimates of IQ to Timorese college students.

Table 4
Results of Factor Analyses on Self-Rated Intelligence (IQ) with 10, 8, and 7 Types of Intelligence Included as Variables

Type of intelligence	10 types of IQ		8 types of IQ		7 types of IQ	
	F1	F2	F1	F2	F1	F2
Timorese						
Verbal	19	**60**	17	**60**	**58**	18
Logical	15	**74**	13	**74**	**75**	11
Spatial	**56**	41	**55**	44	42	**60**
Musical	–11	**72**	–12	**71**	**70**	–09
Body-K	34	**51**	38	**52**	**51**	41
Inter-p	**56**	–13	**64**	–13	-17	**76**
Intra-p	**74**	15	**79**	19	21	**75**
Existential	**77**	14	**76**	18		
Spiritual	**65**	19				
Naturalistic	**62**	32				
Eigenvalue	2.77	2.04	2.11	1.96	1.92	1.71
Variance	27.71	20.38	26.35	24.53	27.40	24.41
Portuguese						
Verbal	**.49**	–.12	**.63**	–.09	–.07	**.74**
Logical	.24	**.55**	.19	**.60**	**.62**	.10
Spatial	.08	**.74**	.09	**.74**	**.75**	.11
Musical	.05	**.58**	.03	**.58**	**.56**	.06
Body-K	.12	**.72**	.09	**.73**	**.73**	.08
Inter-p	**.70**	.10	**.76**	.12	.15	**.79**
Intra-p	**.74**	.16	**.76**	.22	.37	**.71**
Existential	**.70**	.17	**.61**	.24		
Spiritual	**.53**	.25				
Naturalistic	**.62**	.27				
Eigenvalue	2.51	1.93	1.98	1.89	1.89	1.70
Variance	25.11	19.31	24.76	23.74	26.97	24.33

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Students' self-estimated intelligences might have important influence on their educational motivation, efforts and selection of activities, courses and future career. This study tested a number of specific hypotheses concerning self- and other estimates of IQ.

A familiar pattern emerged when we examined multiple intelligences. We found that men gave higher estimates of their own mathematical and spatial intelligences than did women. These results support our first hypothesis. Nearly all previous studies in this area that have examined sex differences in the rating of the ten multiple intelligences have found differences in mathematical and spatial intelligence (Furnham 2000, 2001; Furnham & Baguma, 1999; Furnham, Clark, & Bailey, 1999; Furnham, Fong et al., 1999). The differences in estimated mathematical and spatial intelligence may reflect sex differences on these factors. Some researchers found a modest, but significant and replicable sex difference on spatial intelligence tasks. However, these results have been disputed (e.g., Mackintosh, 1998). Men also rated themselves more highly than did women on naturalistic intelligence. Men believed they understand the taxonomic function of naturalistic intelligence better than do women. Baron-Cohen (2003) found that men in his sample were more interested on order and categorization than were women.

Data comparing the responses of the Timorese and Portuguese samples were interesting because of the many significant main effects for culture. The cultural differences in IQ estimates were globally as predicted. It was found that there were systematic differences between Timorese and Portuguese students. This paper showed that almost without exception Portuguese gave higher ratings than the Timorese. Six showed significant differences in self-estimates, eight in estimates of father's intelligence, and six in estimates of mother's intelligence. On almost all (except, namely, on spiritual intelligence), Portuguese estimates their own scores as being higher than those of the Timorese population. This may be to the Asian virtue of humility (Furnham, Hosoe, & Tang, 2001). The "modesty" bias has been called as self-effacing bias, and it has been reported in various studies conducted with Asian participants. Smith and Bond (1998) have, however, pointed out that not only are there self-serving and self-effacing biases that are quite different in different cultures, but that these often depend on the nature of the ratings made. Thus, Asians tend to show modesty effects (self-effacing biases) for ability ratings and hubris effects (self-serving biases) for effort ratings. Further, it should not be assumed that modesty is necessarily a sign of low self-esteem or inability to become assertive. Interpersonal styles are often culturally defined ways of solving everyday problems. In other words, it is particularly difficult to do cross-cultural research on rating data such as those used here and understanding the exact meaning of the results (Smith & Bond, 1998). However, certainly current findings are contrary to the empirical evidence on IQ, which suggests that Asians have a higher IQ than Europeans (Lynn, 1997). Humility should not be a negative factor. Asians believe that effort and endurance are the roads to success, and believe that humility is related to effort and endurance. Optimistic ideas do not create endurance and hard effort but by understanding themselves, they would believe that they need to work harder.

The present study found evidence of sex differences in estimates of parental intelligence, with fathers in general given higher estimates than mothers. This was also to be expected as many previous studies have shown this to be the case in terms of sex stereotyping (e.g., Furnham, Rakow, & Mak, 2002). This confirmed the third hypothesis that father's IQ will be estimated higher than mother's, showing sex's stereotyping.

The factor analytic results failed to confirm either Gardner's classification or those found in previous traditional textbooks on intelligence (Eysenck, 1981). However, factor analysis does show that participants differentiate between the various intelligences specified. This should not be seen either as confirmation or disconfirmation of Gardner's (1999) theory, as this paper was about the self-estimate of skills and abilities that may not be related to general intelligence.

The results of this and other studies in this programmatic research endeavour (Furnham, 2000; Furnham, Hosoe, & Tang, 2001) should not be seen as attempts to validate Gardner's (1983, 1999) theory, although it surely does require robust empirical assessment. Rather they represent attempts to better understand lay theories about intelligence (Sternberg, 1990) and how they may relate to expectations, evaluations, and performance on ability tests of all kinds (Beyer, 1999; Lynn, 1994).

It should be acknowledged that cross-cultural studies such as the one presented here have certain kinds of limitations. Participants were college students, and the generally high level of education may have had an impact on ratings of intelligence. In addition the participants in the current study were young adults, who might have different conceptions of intelligence and gender roles than older adults with different educational background experiences. Student populations may render them relatively comparable but clearly unrepresentative of the population from which they are drawn. Future research would do well to utilise larger, representative samples. In order to ensure meaningful comparisons, it is important to have culturally invariant questionnaires and matched participants, otherwise any differences found could be attributable to confounding factors. In the present case, it is possible that differences between the two samples in variables that were not part of the design (e.g., socio-economic status, parental education) may have had an impact on the results. While it is not immediately clear precisely which confounding variables may have affected the analyses, the best way to establish the robustness of these results is by means of a replication study. In addition, it would be worthwhile to attempt

systematically to vary the possible sources of cultural differences by employing samples from a larger number of specially selected countries and regions.

However, results from these cross-cultural studies are not only important to test hypotheses about cultural differences in self-presentation and cultural beliefs but because of the implications of these results for such things as education and training. The theoretical and social significance of the results of the study are worth considering. Many researchers have pointed out that there may be important academic and work-related consequences of the sex difference in self-rated abilities. Whilst some researchers seem concerned to study and help females who are seen to be biased in favour of modesty and lower-than actual estimations (Beloff, 1992; Beyer, & Bowden, 1997), others believe it is more important to examine male biases and the potentially negative consequences of hubris in self-estimated intelligence (Dweck, 2000). Dweck has shown in a series of studies that an individual's beliefs about their own intelligence (self theories) can and does effect their motivation in educational settings, the goals that they set for themselves and how they react to feedback. Furthermore having an accurate appraisal of ones own cognition ability can particularly benefit those who through little or no feedback on their actual abilities hold erroneous beliefs that inhibit or handicap their performance. Certainly this area of research provides an excellent theoretical and practical area for the study of such things as self-fulfilling prophecies and the effect of self-estimations of intelligence on academic performance all around the world.

This study reveals cultural differences in self-estimation that no doubt affects self-presentations. This could lead to cross-cultural misunderstanding with Westerns appearing arrogant to those from the East. Equally people from Europe may inappropriately understand the abilities of those from Asia, who give very average ratings of their abilities. Understanding of cultural differences in self-estimates as well as test-derived abilities may thus go some way to improve cross-cultural understanding.

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