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Gender and Personality Differences in the Self-Estimated Intelligence of Koreans

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Abstract

This study set out to examine gender and personality effects on self-estimated multiple intelligence. In all, 124 Koreans made self-estimates of 24 different kinds of intelligence. They also completed a short personality test. Results showed that males gave higher estimates than females on many different types of intelligence. Openness to experience, agreeableness and neuroticism were found to correlate with self-estimated intelligence. Income and education were also correlated with various self-estimated intelligence measures, but not overall self-estimated intelligence. The different intelligences factored into interpretable dimensions. Results were similar to those from different countries. Implications and limitations of the findings are discussed.

Keywords

1. Introduction

Over the past decade there has been a great interest in Self-Estimated Intelligence (SEI) (Freund & Kasten, 2012). There are at least three reasons for this. First, to help people with poor insight into their performance whose self-estimates are very different from their objective scores (Schlösser, Dunning, Johnson, & Kruger, 2013). Second, to look at the individual differences and processes (like social desirability, hubris, and ability test experience) that lead to good and poor insight about abilities (Paulhus, 1986). Third, to assist ability self-awareness as it relates to career choice (Ackerman & Wolman, 2007).

The studies are now international, including those from Austria (Stieger et al., 2010), Croatia (Bratko, Butkovic, Vukasovic, Chamorro-Premuzic, & von Stumm, 2012), Germany (Ortner, Muller, & Garcia-Retamero, 2011), the Netherlands (Bipp & Kleingeld, 2012; Bipp, Steinmayr, & Spinath, 2012), Russia (Furnham & Sha-

gabutdinova, 2012; Kornilova & Novikova, 2012), and Spain (Perez, Gonzales, & Beltran, 2010). One study compared self-estimates from twelve countries (von Stumm, Chamorro-Premuzic, & Furnham, 2009). Further, they have been extended to issues like self-rated attention and concentration (Mengelkamp & Jager, 2007).

Many studies have also investigated self-estimates of the "multiple intelligences" argued to be independent of each other. This study looks at self-estimates of overall and multiple intelligences from the perspective of three different researchers namely Gardner (1999), Sternberg (1997) and Cattell (1975) who each have different conceptions of intelligence. Gardner distinguishes between eight to ten, Sternberg three and Cattell ten types of intelligence which do not overlap very much and will each be used in this study.

Studies in this area have examined sex, as well as cultural, differences in self-estimates of ability (von Stumm, Makendrayogam, Chamorro-Premuzic, & Furnham, 2009). Nearly all have demonstrated that males give higher estimates than females and that Africans and Americans give higher self-estimates than Europeans. Most studies done in Asia have shown the lowest self-estimates on all the types of intelligence rated. Some of these studies have also investigated participants' beliefs about intelligence (such as whether there are actual sex differences) and their personal experience of tests to examine whether these beliefs are related to self-estimates (Furnham & Fukumoto, 2008).

Over thirty studies that used the "multiple" self-estimated intelligence model (Rammstedt & Rammsayer, 2002) have found that gender differences were strongest on the Mathematical/Logical and Spatial intelligences, followed by overall ("g") and verbal intelligences, with males significantly overestimating and females significantly underestimating their abilities. A meta-analytical study investigating the magnitude of gender differences in mathematical/logical, spatial, overall and verbal self-estimated intelligences (Szymanowicz & Furnham, 2013), found that the biggest weighted mean effect sizes were for Mathematical/Logical, ($d = .44$), followed by Spatial ($d = .43$), Overall ($d = .37$) and Verbal ($d = .07$) intelligence, with males providing higher estimates in all but verbal intelligence. Mathematical, spatial and verbal intelligences were the best predictors of self-estimated overall intelligence, as demonstrated through numerous multiple regression analyses (Furnham, 2001). Furnham (2000) proposed that people view intelligence as "male-normative", since mathematical/logical and spatial intelligences are areas where males are believed to excel (Storek & Furnham, 2013).

1.1. Current Study

This study focuses on South Korea. There are some studies that focused on actual, psychometrically measured intelligence among Korean people (Lynn & Song, 1994), but no studies appear to have been done on self-estimated intelligence. There are a few self-estimated intelligence studies which looked at people in Asian countries including China (Zhang & Gong, 2001), Hong Kong (Yuen & Furnham, 2005) and Japan (Furnham, Hosoe, & Tang, 2001).

Studies have clearly demonstrated that people in Asia have different concepts of intelligence and self-evaluation strategies (Markus & Kitayama, 1991; Niu & Brass, 2011). Asians have a broader concept of intelligence compared to academic conceptions but less socio/emotional and more cognitive than Africans. Studies have also found that Chinese people tend to give more modest scores in self-estimated intelligence measures compared to Westerners (Zhang & Gong, 2001), supporting the idea that how people perceive their intelligence is influenced, in part, by culture.

South Korea has been a male dominant society for a long time until recent years when women's status started to improve, as can been seen by the nation electing the woman president in 2013. It is possible that due to this national phenomenon, there may be an effect on how Korean people perceive of male and female differences in intelligence.

Following from previous studies, this study tested the following hypotheses:

H1: It is hypothesised that males will estimate their intelligence higher than females, especially in Overall, Mathematical/Logical, and Spatial intelligence.

H2: Extraversion, Openness and Conscientiousness will be positively related with Overall intelligence while Neuroticism and Agreeableness are negatively related with Overall intelligence.

2. Method

2.1. Participants

A total of 124 participants took part in the study. Participants were recruited on-line through email and web sites.

The age range was 16 to 68 years with the mean age of 29.98 (SD = 12.79). There were 74 male and 51 female participants. All participants were born in South Korea, but some were living in different countries at the time of the survey. All participants had secondary education or higher education qualifications. They were asked to rate themselves on a 7-point religious scale (1 = Not at all to 5 = Very) (M = 2.74, SD = 3.24) and political beliefs (1 = Strongly Right Wing to 7 = Strongly Left Wing) (M = 3.90, SD = 4.54).

2.2. Materials

Self-estimated intelligence. The study used a questionnaire which was developed by Furnham and his colleagues (Furnham, 2001) and had been used in many previous studies. The modified questionnaire asked participants to estimate 24 different intelligences which were defined by Gardner's theory of multiple intelligences (Gardner, 1999) and Sternberg's triarchic theory of intelligence (Sternberg, 1997) as well as Cattell-Horn-Carroll (CHC) theory of intelligence (Furnham & Mansi, 2014; McGrew, 2005). The questionnaire also asked participants to estimate overall intelligence ("g").

At the beginning of the questionnaire, participants were given a fully described normal distribution of IQ curve which displayed scores of 100 as an "average" intelligence, 115 as "slightly high", 130 as "high", 145 as "very high", and 85 as "slightly low" and so on. They were also given a description of each item of multiple intelligences. It was then followed by a set of questions which asked about participants' beliefs about intelligence and intelligence tests which include six questions that are widely used in this area (Furnham & Ward, 2001).

Ten-Item Personality Test (Gosling, Rentfrow, & Swann, 2003). A brief measure of the big five personality trait was used. The questionnaire includes 10 items and measures the big five personality traits. Despite its inferiority compare to standard measures, Gosling et al. (2003) suggest that it has an adequate level of reliability and validity.

2.3. Procedure

The questionnaire was translated into Korean from English which then was translated back into English by an independent Korean-English speaker to verify the accuracy of the translation. The questionnaire was created using Google Documents, and was distributed online via email and postings on various web sites (e.g., Facebook). They were told that the task takes about 10 minutes to complete. Upon completion of the questionnaire, participants were debriefed with a short description about theories involved. Ethical permission was sought and given.

3. Results

3.1. Gender Differences: Hypothesis One

The data was analysed using MANOVA to see the gender difference in self-estimated intelligence. The mean values of each item for different gender are shown in Table 1. Males tended to rate themselves around .60 to .75 of a standard deviation above the mean and females around .3 to .60 above the mean. The overall intelligence showed a significant difference with male giving higher scores than females in estimating their intelligence. Similarly, males estimated higher than females in ten other intelligences; crystallised, fluid, quantitative reasoning, long-term memory and retrieval, decision/RT speed, spatial, logical/mathematical and spiritual intelligence. One large effect was found in long-term memory and retrieval and medium effects were found in overall, crystallised, quantitative reasoning and logical/mathematical intelligence (Cohen, 1988). Thus Hypothesis 1 was confirmed.

3.2. Personality Differences: Hypothesis Two

Correlations between the Big Five trait scores and intelligence estimates scores were computed (see Table 2). Neuroticism showed significant correlations with overall (.20), crystallised (.20), quantitative reasoning (.19) reading and writing ability (.24), visual processing (.19), processing speed (.23), spatial (.20) and practical intelligence (.20). Extraversion showed no significant correlations except for body kinaesthetic intelligence (.25) and creative intelligence (.25) which were positively correlated. Agreeableness was significantly correlated with Overall intelligence (−.31) as well as crystallised (−.21), quantitative reasoning (−.25), processing speed (−.35) inter-personal (−20), emotional (−20) and practical intelligence (−.20). They all were negatively correlated except for inter-personal and emotional intelligence. Openness to experience was significantly correlated with all the self-estimated intelligences, especially fluid intelligence (.34) visual processing (.35) decision/reaction time/speed (.33) intra-personal (.41) existential (.33) spiritual intelligence (.33) and naturalistic intelligence (.36)

Table 1. Mean of self-estimated intelligences for each gender.

	Males (n = 74)	Females (n = 50)	F
Overall intelligence	115.21	108.57	5.78***
Crystallised intelligence	112.68	107.70	7.15***
Fluid intelligence	114.78	107.13	2.60*
Quantitative reasoning	113.96	103.71	4.46**
Reading and writing ability	109.38	110.24	1.45
Short-term memory	114.13	105.82	1.37
Long-term memory and retrieval	108.44	105.50	8.83***
Visual processing	112.12	106.59	2.26
Auditory processing	107.65	101.70	.37
Processing speed	110.90	103.18	1.53
Decision/reaction time/speed	110.91	103.56	3.30*
Verbal intelligence	113.51	112.98	1.05
Spatial intelligence	113.43	102.36	2.62*
Logical/mathematical intelligence	112.42	99.12	5.02**
Musical intelligence	109.73	106.54	1.37
Body kinesthetic intelligence	104.14	99.40	.99
Inter-personal intelligence	134.77	112.5	.55
Intra-personal intelligence	115.50	110.64	1.41
Existential intelligence	114.26	110.68	.65
Spiritual intelligence	104.01	102.98	2.76*
Naturalistic intelligence	105.11	106.32	.08
Emotional intelligence	109.51	112.34	1.61
Creative intelligence	112.38	107.20	1.99
Practical intelligence	115.57	107.92	2.29

Note: $^*p < .05$, $^{**}p < .01$.

except for crystallised, long-term memory retrieval, processing speed, inter-personal and practical intelligence. All the significant estimations were positively correlated with openness to experience. Conscientiousness was significantly, and positively correlated with decision/reaction time/speed (.20), inter-personal (.23) and intra-personal intelligence (.28). Not all aspects of Hypothesis two were confirmed.

3.3. Factor Analysis

The estimates of intelligence were then treated to a VARIMAX rotated factor analysis, to replicate the analysis procedure in most previous studies. The results are shown in **Table 3**. The first factor which accounted for over 50% of the variance had 13 "intelligences" loading on it and was labelled Cognitive Ability. The second which had 6 "intelligences" loading on it and which accounted for 10% of the variance was labelled as Humanistic Intelligence. The third factor had 4 items load upon it and was labelled Artistic Intelligence.

Table 2. Correlations between the big five and self-estimated multiple intelligence.

	Neuroticism ($n = 124$)	Extraversion ($n = 124$)	Agreeableness ($n = 124$)	Openness ($n = 124$)	Conscientiousness ($n = 124$)
Overall intelligence	.201[*]	.004	−.311[**]	.226[*]	.109
Crystallised intelligence	.202[*]	.004	−.214[*]	.073	.031
Fluid intelligence	.135	.021	−.174	.344[**]	.07
Quantitative reasoning	.190[*]	−.094	−.246[**]	.220[*]	.083
Reading & writing ability	.235[**]	.103	−.148	.221[*]	.033
Short-term memory	.151	.072	−.025	.210[*]	.079
Long-term mem/retrieval	.111	.059	−.171	−.030	−.109
Visual processing	.189[*]	.063	−.002	.346[**]	.125
Auditory processing	.165	.049	.039	.232[**]	.065
Processing speed	.231[**]	−.065	−.350[**]	.138	.091
Decision/reaction time	.185[*]	.072	−.085	.330[**]	.20[*]
Verbal intelligence	.036	−.112	−.140	.218[*]	−.073
Spatial intelligence	.204[*]	−.022	−.064	.278[**]	.027
Logical/mathematical IQ	.057	−.032	−.126	.202[*]	.003
Musical intelligence	.155	.173	−.054	.248[**]	.085
Body kinesthetic IQ	.117	.246[**]	.099	.247[**]	.018
Inter-personal intelligence	.008	.134	.199[*]	.001	.178[*]
Intra-personal intelligence	.166	.101	−.079	.405[**]	.227[*]
Existential intelligence	.130	.090	.085	.325[**]	.176
Spiritual intelligence	.022	.147	−.031	.368[**]	.154
Naturalistic intelligence	−.029	.115	.08	.364[**]	.09

3.4. Regressions

Various regressions were performed. First, the regression considered demographic and ideological correlates of the factor scores (see **Table 4**). In the first two sets of variables namely demographic (sex, age, education) and ideology (religious and political beliefs) were predictor variable and the three factor scores were criterion variables. All were significant. Each had only one significant predictor score and the variance accounted for was between 6% and 14%. Results indicated the only significant predictor of Cognitive Ability was gender (females gave lower estimates); the only significant indicator of Humanistic Intelligence was education showing those with less education gave lower scores; the only significant predictor of Artistic intelligence was political orientation (people with more left-wing beliefs gave higher estimates).

Second, personality and gender, were predictor variables and the factor scores were the criterion score (see **Table 5**). Two regressions were significant. The first, which accounted for 20% of the variance suggested that Open, Disagreeable, Neurotic males believed they had higher cognitive ability. The second, which accounted for 13% of the variance suggested that Open, Agreeable participants believed they had higher Humanistic Intelligence.

Table 6 shows three more regressions this time using Overall, fluid and crystallised intelligence as criterion variables and three sets of predictor variables: demographic (gender, age), beliefs (optimism, religiousness) and personality (the Big Five). The first analysis showed there were five significant predictors of Overall intelligence which accounted for 25% of the variance. Open, Disagreeable, Neurotic, right-wing males have higher self-estimates. There were only three significant predictors of Crystallised intelligence and they accounted for 16% of the variance. Neurotic, right-wing males gave higher self-estimates. There were only two predictors of Fluid intelligence which accounted for nearly a fifth of the variance: Open males gave higher scores.

Table 3. Results of the VARIMAX rotated factor analysis.

	Component		
	Factor 1	Factor 2	Factor 3
Practical intelligence	.829	.353	.052
Fluid intelligence	.812	.406	.000
Processing speed	.798	.087	.194
Quantitative reasoning	.792	.316	.152
Crystallised intelligence	.787	.191	.273
Verbal intelligence	.769	.226	.196
Reading and writing ability	.763	.394	.002
Spatial intelligence	.761	.397	.010
Logical/mathematical intelligence	.738	.253	.136
Decision/reaction time	.679	.497	.155
Long-term storage and retrieval	.662	.015	.489
Short-term memory	.596	.412	.416
Visual processing	.511	.480	.475
Creative intelligence	.310	.815	.103
Naturalistic intelligence	.253	.782	.279
Emotional intelligence	.175	.778	.369
Existential intelligence	.268	.721	.358
Intra-personal intelligence	.473	.682	.261
Spiritual intelligence	.419	.606	.350
Inter-personal intelligence	−.217	.227	.786
Body kinaesthetic intelligence	.254	.376	.646
Auditory intelligence	.407	.441	.637
Musical intelligence	.524	.339	.556
Eigenvalue	13.19	2.35	1.13
Variance (%)	57.33	10.23	4.89

Table 4. Regression of the three factors onto the demographic and ideological scores.

	Cognitive ability		Humanistic intelligence		Artistic intelligence	
	Beta	t	Beta	t	Beta	t
Gender	−.303	−3.40**	.150	1.72	−.154	−1.70
Age	−.086	−.80	.166	1.58	−.047	−.43
Education	.113	−1.28	−.338	−3.91**	.156	1.73
Political orientat.	−.164	−1.65	−.052	−.53	.270	2.66**
Religiousness	−.192	1.82	−.100	−.97	−.069	−.64
F (5,123)	3.65**		4.91***		6.62*	
Adjusted R^2	.10		.14		.06	

Note: $^*p < .05,$ $^{**}p < .01,$ $^{***}p < .001.$

Table 5. Regression with factor scores as criterion variable and traits as predictor factors.

	Cognitive ability		Humanistic intelligence		Artistic intelligence	
	Beta	t	Beta	t	Beta	t
Gender	−.21	2.49**	.01	.02	.19	1.79
Extraversion	−.09	1.01	.05	.66	.03	1.76
Agreeableness	−.27	3.31***	.26	3.42***	.04	1.16
Conscientiousness	−.13	1.48	.15	1.84	.04	.39
Neuroticism	.26	2.90**	.00	.11	.04	.33
Openness	.18	2.01*	.50	6.28***	.03	.99
F (6,123)	4.93***		11.11***		1.28	
Adjusted R²	.20		.13		.01	

Note: *p < .05, **p < .01, ***p < .001.

Table 6. Regression of three intelligence estimates onto demographic, personality and other factors.

	Overall intelligence		Crystallised intelligence		Fluid intelligence	
	Beta	t	Beta	t	Beta	t
Gender	−.305	3.70**	−.321	3.69***	−.222	−2.59**
Religiousness	−.069	.85	.091	1.06	−.070	−1.24
Political orientation	.164	2.01*	.173	2.07*	.117	1.31
Extraversion	.007	.08	.022	.20	−.047	.87
Agreeableness	−.226	2.76**	−.172	1.99	−.090	−.54
Conscientiousness	.042	.57	.008	.85	−.017	−.19
Neuroticism	.192	2.21*	.183	2.04*	.176	1.99
Openness	.225	2.61**	.085	.92	.372	4.14***
F (8,115)	5.98***		4.59***		4.42***	
Adjusted R²	.25		.16		.18	

Note: *p < .05, **p < .01, ***p < .001.

4. Discussion

As hypothesised, there was a significant gender effect in self-estimated intelligence. Males estimated their intelligence significantly higher than females in many intelligence measures including overall, crystallised and fluid intelligence as well as quantitative reasoning, short-term memory, long-term memory and retrieval, visual processing, spatial intelligence, logical/mathematical intelligence and practical intelligence. There were 3 to 15 points differences in self-estimated intelligence scores. The findings are consistent with studies done previously (Furnham, 2001), thus supporting the idea that the gender effect in self-estimated intelligence is universal. Indeed these results support studies done in countries as varied as Egypt, (Furnham & Mottabu, 2004), Iran (Furnham, Shahidi, & Baluch, 2007), Poland (Furnham, Wytykowska, & Petrides, 2005) and South Africa (Furnham & Akande, 2004).

None of female scores were significantly higher than males, which shows stronger "humility bias" than females in western countries, as studies done in other countries typically show higher ratings by males only on overall, mathematical and spatial intelligence (Furnham & Chamorro-Premuzic, 2005; Rammstedt & Rammsayer, 2002). Females scored higher on naturalistic and emotional intelligence, but they were not significant.

Although women's status is improving, it is still the case that men are still dominant in many areas in Korea such as business, education and government, and fewer women show exceptional success in these areas. This

may suggest that people still believe males to outperform females, leading them to see men as superior than women. In South Korea, every man needs to join and serve in the army compulsorily for at least 22 months as a national service, where they experience a quick change in environment and learn practical skills. This may lead them to believe that they are better at adapting to different environment, which may have led to higher ratings in practical intelligence.

Unlike previous studies, the current study failed to replicate the gender difference in verbal intelligence (Estimation by males was only 1 point higher than females, and was not significant) (Szymanowicz & Furnham, 2013). Although it is less common nowadays, there has been a social norm that "quiet men" are more desirable in Korea. This could have led participants to believe that males are less expressive and articulate than females in other cultures.

4.1. Personality Difference

Following the previous studies, the current study hypothesised Extraversion, Openness and Conscientiousness to be positively related, while Neuroticism and Agreeableness to be negatively related to higher ratings of general intelligence. However, the current study failed to replicate previous studies particularly for Neuroticism. Openness to experience was positively correlated while Agreeableness was negatively correlated with self-rated intelligence as predicted, but Neuroticism was unexpectedly positively correlated with self-estimates. Openness to experience was positively correlated with all the intelligences except crystallised, long-term memory and retrieval, processing speed, inter-personal and practical intelligence. Agreeableness was correlated with seven intelligence measures which all were negatively correlated except two intelligences which were emotional intelligence and inter-personal intelligence. Neuroticism was significantly correlated with nine intelligence measures which all were positively correlated. Although not correlated with overall intelligence, Extraversion and Conscientiousness showed correlations with some intelligence measures, as Extraversion was correlated with body kinaesthetic and creative intelligence while Conscientiousness was correlated with decision/reaction time/speed, inter and intra-personal intelligence.

What is most interesting in these results is perhaps positive relationship between Neuroticism and self-estimated intelligence. Many studies found that Neuroticism is negatively correlated with both self-estimated and actual psychometric intelligence, but this study found the opposite. The argument is not that Neurotics are less intelligent than stable individual but that their anxiety has a negative impact on test performance and makes them doubt their own ability. However, one possible explanation to this is the high level of stress in Korea and the elevated scores. It is possible that the back translation of the items had a special meaning in Korea and this merits further investigation.

The factor analysis shown in Table 2 replicates various other studies which suggests that lay people distinguish between the (real) academic intelligences and the social intelligences. Thus the three Gardener academic intelligences (mathematical, spatial, verbal) loaded on the same factor as the Cattellian factors which are level II factors (Furnham & Mansi, 2014). In this study, the social intelligences split into two with one factor being clearly linked to the arts involving dance and music. In this sense, lay people are not unlike orthodox intelligence researchers who distinguish between cognitive abilities (measured by timed, power tests) and social abilities (measured by untimed preference) tests.

4.2. The Regressions

The results of the study have a few, but important theoretical and practical implications. It provides an additional support for strong gender difference with less cultural variance in self-estimated intelligence. Practically, it provides an explanation to gender discrimination that still exists nowadays such as glass ceiling effect for women in workplaces, which is often overlooked and ignored. As both men and women often estimate women's intelligence less than men (Furnham, 2005), it is possible that women will be disadvantaged when other people evaluate their work hence causing slower progression and promotion in workplaces.

Despite some correlations and regressions found, there were limitations to this study. This study only looked at how self-estimated intelligence is related to gender and personality but not actual, psychometrically measured intelligence. This leaves the relationship between self-estimated intelligence and actual intelligence unanswered. It might have been the case that either males or females have realistic perception on their intelligence and the other gender estimates their intelligence higher or lower than the actual intelligence.

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