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Sex Difference in estimated intelligence and estimated emotional intelligence and IQ Scores

Adrian Furnham[1] and Charlotte Robinson[2]

1. Department of Leadership and Organisational Behaviour, Norwegian Business School (BI), Nydalveien, Olso, Norway
2. Department of Psychology, University of Bath

The author is contactable at *adrian@adrianfurnham.com*

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Author Contribution

A.Furnham: Visualisation, Writing -review & editing

C. Robinson: Data analysis, Proofing

Abstract

In five different, on-line studies, community samples. participants (N > 2200) estimated their IQ and EQ on a single scale and completed three different, short, un-timed, intelligence tests. In all studies, females estimated their IQ significantly lower than males (effect sizes from .22 to .47) and estimated their EQ higher (effect size .04 to .32). In only one study were there actual sex differences in IQ test scores. All correlations between the two estimates were significant and positive, and ranged from .37<*r*<.47. The robustness of the IQ-EQ hubris-humility effect across measures and populations is discussed. Limitations are acknowledged, particularly in the use of tests.

Key Words: Intelligence; IQ; EQ; Self-estimates; sex differences

Introduction

There remains a growing interest in sex differences in self-estimated intelligence which began over 45 years ago (Beloff, 1992; Furnham, 2009; Greven et al., 2009; Hogan, 1978; Rammstedt & Rammsayer, 2002; Reilly et al., 2022). Indeed, there have now been a number of meta-analyses of studies in the field (Ackerman & Wolman, 2007; Freund & Kasten, 2012; Szymanowicz & Furnham, 2011; Zell & Krizan, 2014). The results suggest that there are reliable sex differences on self-estimated intelligence with small to medium effect sizes all showing a female humility, male hubris effect. This is despite the fact that IQ test results suggest minimal differences between the genders (Halpern, 2011). The question is when and how these differences develop.

There is also a smaller literature on estimated emotional intelligence (Furnham & Grover, 2020; Petrides & Furnham, 2000; Petrides et al., 2004; Siegling et al., 2014). Studies have been done on students as well as business people using either single self-estimates of overall EQ, as well as multiple estimates of the facets of EQ (Siegling et al., 2014). The results tend to be the opposite of that of self-estimated IQ: namely that women rate their EQ higher than men, though not always significantly so. Similarly studies on the self-estimates of the Gardner multiple intelligences indicate that women tend to give higher estimates for both inter- and intra-personal intelligence which could be seen as a proxy for multiple intelligence (Furnham et al., 2005; Neto & Furnham, 2011).

This paper attempts to replicate this as well as examine sex-differences with regard to both self-estimates intelligence and self-estimated emotional intelligence and the relationship of both estimates to actual IQ test scores.

Nature and Nurture and IQ

One of the hottest topics in the whole of psychology concerns sex differences in IQ, also known as gender similarities in intelligence (Furnham, 2017). The extreme positions are those that argue that sex/gender differences are entirely the consequence of socialisation vs those who argue that they are the result of biology and genetics. Thus, for instance, the latter argue: similar sex differences are observed across time; culture and species (hence unlikely to be learned); these differences are predictable on basis of evolutionary specialisation (hunter/warrior vs gatherer/nurse/educator); brain differences are established by prenatal sex hormones; later on, hormones affect ability profiles; sex-typed activity appears before gender-role awareness. environmental affects (e.g. expectations, experience training) are minimal though they may exaggerate (or perhaps reduce) differences. These arguments are applied to IQ rather than EQ, and greatly contended.

The question arises however more in estimated IQ and EQ. Some would argue that sex differences in both are simply a reflection of reality. Others suggest different explanations for these differences namely that sex differences that do emerge are not real and occur for three reasons. Females are taught humility and males hubris: and that this social message, encountered from an early age lead them to approach tests differently. Second it is less of a social requirement (particularly in mate selection) for girls to be intelligent so they invest less in education and skill development. Third, females are less emotionally stable than males and thus anxiety reflects that test performance. Thus, any differences that emerge do not reflect underlying reality: it is all about attitude toward and experience in test taking.

Certainly, assuming that EQ and IQ tests are accurate and valid, an interesting and important question is why some people over or under-estimate their scores: what developmental processes influence self-assessments and how might they be changed.

Early Work

Early researchers questioned whether self-assessments could serve as reliable proxies for actual test scores (Paulhus et al., 1998), while many became interested in consequences of these estimates particularly if they were inaccurate (Cooper et al., 2018; Dunning et al., 1989; Hofer et al., 2022; Neubauer & Hofer, 2020; Neubauer et al., 2018).

The literature has shown that females rate their intelligence significantly lower, by around 5-10 IQ points, than males, in nearly every society (Bennett, 1996; Furnham et al., 2001; 2002; Kaufman, 2012; Kornilova & Novikova, 2012). Females also rate their female relatives (mother, grandmother, daughter) less intelligent than their male relatives (father, grandfather, son) (Furnham & Gasson, 1998; Furnham et al., 2002).

There has also been an interest in sex differences in the rating of the multiple intelligences (Furnham, 2000; 2002ab; Furnham et al., 1999; 2001; Neto, 2019; Neto et al., 2016; 2017; Storek & Furnham, 2012; 2013; 2014; 2016; Shahzada et al., 2014), which indicates that whilst males seem nearly always to rate their mathematical and spatial intelligence higher than females, they rate their emotional intelligence (inter- and intra- personal) lower. On some dimensions, like musical intelligence, there is usually no difference.

There is also a literature on actual sex differences in IQ which remains both important and controversial (Ackerman, 2006; Halpern, 2011; Lynn & Kanazawa, 2011; Nyborg, 2005). If there are established and explicable sex differences in intelligence of .3 to .5 of an SD, the findings on sex differences in self-estimates could be seen to simply reflect self-awareness. If

on the other hand, there are little or no actual sex differences in intelligence the differences the self-estimate data presents an interesting conundrum: what accounts for female humility and male hubris? Whilst there have been speculations about the developmental processes these have not been investigated in longitudinal studies though there is some experimental work on this topic (Storek, 2011).

There is, as to be expected, a literature on the correlation between self-estimated and actual test-derived IQ (Furnham et al., 2005; Paulhus et al., 1998; von Stumm et al., 2014). The data suggests that the correlations are positive and significant and vary from around $.2 < r < .5$. The size of the correlations appears to depend on a number of factors: who are the participants (students vs adult population), their familiarity with IQ tests (Furnham & Ward, 2001), the IQ test used in the study, and indeed whether they gave self-estimates before or after consciously completing an IQ test (Furnham et al., 2002). It appears that young people, those more familiar with tests in general, and that having taken an IQ test just before making an estimate shows the highest correlations. The vast majority of studies in this area have used students, though there are exceptions.

In a relevant review, Zell and Krizan (2014) examined self-evaluations of ability (e.g., academic ability, intelligence, language competence, medical skills, sports ability, and vocational skills) and objective performance measures across 22 meta-analyses. They found that effects ranged from .09 to .63, and the mean correlation between ability self-evaluations and performance outcomes across meta-analyses was moderate ($M = .29$, $SD = .11$). The relation was stronger when self-evaluations were specific to a given domain rather than broad and when performance tasks were objective, familiar, or low in complexity. They concluded that people have only moderate insight into their abilities but also underscore the contextual factors that enable accurate self-perception of ability.

In these studies we also got participants to rate their Emotional Intelligence (EQ), though we did not have a test measure of EQ. It should be noted however that there is a major difference between tests of ability vs trait EQ; the former seeing EQ as essentially a personality or trait measure and the latter as an ability or "power" measure (Petrides et al., 2016; O'Connot et al., 2019). Importantly, ability and trait EI measures are weakly intercorrelated and show different findings regarding sex differences. While women outperform men in ability EI, there are no consistent sex differences regarding trait EI. However, as noted above the pattern of results with regard to self-estimated EQ is that women give higher estimates than men.

Another issue concerns the relationship between test measured/assessed EQ and IQ. Many studies indicate small positive, non-significant or indeed small negative correlations between IQ and EQ test scores depending on the population and the tests used (Treglown & Furnham, 2022), despite the fact that studies always seem to indicate moderate to high correlations between self-estimates of IQ and EI (Gignac, 2021).

These Studies

As is often the case, most of the self-estimate studies referenced above are based on student populations who are usually both more intelligent and better informed (in general and about tests) than the normal population. In each of these studies however, we have volunteering primarily European adults, only a few of which are students.

It has been suggested that results differ according to when they take the IQ test, and what test relative to their estimate (von Stumm, 2014). In each of these studies participants complete general knowledge/crystalised IQ test items *interspersed* with other questions. This is similar to Cattell's famous 16PF test which actually contained items measuring fluid intelligence (called Reasoning Ability). In this study we use three abbreviated tests choosing fluid

intelligence items from the Wonderlic Test (Wonderlic, 1990), select items from a general knowledge test of crystallised intelligence (Lynn, Irwing, & Cammock, 2002) and a short but robust test modelled after examples in Eysenck's work (Eysenck, 1990). Paricipants should get a sense of how easy or difficult they find the questions (around 10 to 20 in all) and thus are more sensitive to their abilities and accurate in their estimations.

These were all online studies using the Prolific platform, which is not ideal for testing intelligence. This meant that the IQ tests were not timed and that it was possible for participants to "cheat", as has been recognised (Furnham, 2020). The question is whether estimate-test score correlations are similar to those in other studies.

In each study participants make a single rating of their IQ and EQ either on a percentage (0-100) or a normal distribution which has been used many times before (Furnham, 2001). None appeared to have any problem in doing so. We also used three different intelligence tests to attempt to be able to generalise the results.

All studies were approved by the same ethics committee (CEHP/514/2017) and formed part of a bigger research programme.

Study 1

Method

Participants

There were 502 participants: 254 males and 248 females. They ranged in age from 30-69 with a modal age of 36. In all 70.9% were graduates.

Questionnaires

Self Ratings: On a scale from 1-100 (100 being extremely high) how would you rate your intelligence *(Very unintelligent)* 1- 100 *(Very intelligent)*? On a scale from 1-100 (100 being

extremely high) how would you rate your emotional intelligence *(Very unintelligent)* 1-100 *(Very intelligent*)?

The Wonderlic Personnel Test (Wonderlic, 1990). The original 50-item test is administered in 12 minutes and measures general intelligence. The test has impressive norms and correlates very highly (r = .92) with the WAIS-R. In this study we used 16 items from Form A (14, 15, 18, 21, 24, 27, 28, 29, 30, 32, 33, 34, 36, 37, 43, 46). The alpha was .81.

Results

Insert Table 1

Table 1 shows the mean scores and the correlations. Males gave significantly higher ratings for IQ ($F(1,500) = 6.04$, $p < .01$: Cohen's $d = .22$) lower for EQ ($F(1,500) = 12.67$, $p < .001$; Cohen's $d = .32$), and had higher IQ scores (($F(1,500) = 11.49$, $p < .001$; Cohen's $d = .08$). The correlations were significant (r = .18) between estimated and test-derived scores. Females rated their IQ lower ($r = -.11$) but their EQ higher (r = .18) than males. The two self-ratings were moderately correlated ($r = .39$).

Study 2

Study 2 replicated study 1 on a very similar population but with different individuals.

Method

Participants

A total of 616 participants completed the questionnaire: 307 were men and 309 were women. They ranged in age from 18 to 70yrs with the mean age was 36.14 years ($SD = 9.54$) years. All had secondary school education and were 53% were graduates.

Questionnaires

The same as in study 1

Results

Insert Table 2

Table 2 shows the mean scores and the correlations. Males gave significantly higher ratings for IQ ($F(1,614) = 6.59$, $p < .01$; Cohen's d= ..14), lower for EQ ($F(1,614) = 6.31$, $p < .01$; Cohen's d= .20), but there were no differences in IQ scores ($F(1,614) = 3.53$, ns). The correlations were significant (r = .16) between estimated and test-derived scores. Females rated their IQ lower (r = -.10) but their EQ higher (r = .18) than males. The correlation between estimated IQ and EQ was significant: r = .47.

Study 3

Participants

In all 292 people took part in this study: 147 male, 145 female. They ranged in age from 28 to 75 with a mean of 38.2 years (SD = 18.36). In all 69% were graduates, 87% were British nationals, and 48% were married.

Method

Questionnaires

Self Ratings: Same as in Study 1

The Wonderlic Personnel Test (Wonderlic, 1990). In this study we used 18 items from Form B. The alpha was .79

Results

Insert Table 3

Table 3 shows the mean scores and the correlations. Males gave significantly higher ratings for IQ ($F(1,290) = 10.01$, $p < .001$; Cohen's d= .38), but there were no differences in estimated

EQ ($F(1,290) = 0.45$, ns) or IQ scores ($F(1,290) = 2.32$, ns). The two self-ratings were highly correlated ($r = .38$).

Study 4

Participants

In all 397 people took part in this study: 195 male, 199 female and 3 non-binary. They ranged in age from 19 to 71 with a mean of 39.9 years ($SD = 11.63$). In all 54% were graduates and 93% were British nationals.

Questionnaires

Self Ratings: Same as in Study 1

General Knowledge Test (Crystalised IQ) (Lynn, Irwing, & Cammock, 2002) is an open-answer item questionnaire that measures essentially crystalised intelligence (Batey, Chamorro-Premuzic & Furnham, 2009). The test has been used in numerous studies mainly done by Lynn and his colleagues. Scores were computed by adding together all correct answers (1 = correct, 0 = incorrect). We decided to use a short version which comprised 10 items such as *"Who wrote 1984; What disease stops blood clotting? Which Italian designer was shot in Miami in 1997? In what game can you bid a grand slam? Which is the principal street for finance in New York?*" The mean score was 6.94 ($SD = 2.42$). The alpha was .78.

Results

Insert Table 4

Table 4 shows the mean scores and the correlations. Males gave significantly higher ratings for IQ ($F(1,396) = 6.87$, $p < .01$; Cohen's $d = .26$), lower for EQ ($F(1,396) = 8.93$, $p < .01$; Cohen's $d = .30$), but there were no differences in IQ/GK scores (*(*$F(1,396) = 2.57$, ns). The two self-ratings were highly correlated ($r = .41$).

Study 5

Participants

There were 475 British participants, of which 240 were males. Their average age was 29.08 years (*SD* = 12.32), with a skew toward younger people in their late 20s. In all 146 (31%) had a high school certificate, 173 (36%) an undergraduate degree, and 90 (19%) a postgraduate degree as their highest qualification.

Questionnaire

Self Ratings: Participants were shown a normal distribution with scores and description for 1 to 3 standard deviations above and below the mean. This method was used in many early studies in the area (Furnham, 2002).

Intelligence (Grover, 2018). This was a 10-item intelligence test with knowledge items such as *"What score is obtained by hitting the bull's eye in darts?', 'What is the unit of sound intensity?', Who wrote 'Of Mice and Men?".* It also had five fluid intelligence questions based on spatial and mathematical intelligence. The results were normally distributed (*M* = 4.74, *SD* = 1.78). The alpha for the test was .82.

Results

Insert Table

Table 5 shows the mean scores and the correlations. Males gave significantly higher ratings for IQ ($F(1,473) = 26.10$, $p < .001$; Cohen's $d = .47$), but there were no differences in estimated EQ ($F(1,473) = 0.22$, ns) or IQ scores ($F(1,473) = 0.49$, ns). The two self-ratings were highly correlated ($r = .43$).

Discussion

This study replicates the well-established results with populations of all ages, backgrounds and cultures. Females provide lower estimates of their IQ than males, (effect sizes:.22, .14,.38., 26., and 47) even though their test scores suggest that is not true, with only 1/5 of the results showing an actual difference (study1). Thus, as many other studies have shown, it is not possible to explain these results simply in terms of "actuality": that there is a significant sex difference in overall intelligence (Furnham, 2016). Thus the question becomes how do the perceptions of one's own intelligence develop.

Yet, it remains unclear as to why, universally, there is a significant sex difference in self-estimates. There may be, for men, an advantage in signalling intelligence to potential female mates who are attracted to cognitive abilities, as they are known to be associated with occupational success and wealth. This would suggest that men tend to hubris but does not explain why women consistently show humility in their self-assessments. One other issue concerns the nature of outliers, particular females with high IQ score who give low self-estimates and males with relatively low test scores who give high estimates. No study has attempted to explore the characteristics of extreme outliers to establish the cause of their beliefs. Equally it is not clear if hubristic males are more common than humble females and the extent to which the hubris is grandiose or vulnerable, as discussed in the literature on narcissism.

One issue never investigated is the development of self-estimates and how, when and whether they change over time. That is, at what age sex differences appear and what maturation processes or developmental experiences affect them. This would give an insight into helping

reduce patent misjudgements particularly when bright or sensitive people under-estimate their abilities which could lead to self-fulfilling prophesies (Furnham,2019).

The size of the correlations between similar self-estimates but different test scores ranged from $.29 < r < .08$ with four being significant. These results are similar to, though a little lower than, other studies irrespective of tests used or how they were administered. One question is what other factors play a part in self-estimates of intelligence.

This study advanced the literature by examining self-estimated but not test-derived EQ as well as IQ where the sex difference results appear to go in the opposite direction with females giving higher scores. This was the case in all samples though in three only the difference was significant ($.20<d<.32$). Unlike the literature in IQ, the ability EQ literature does indeed suggest that there is a sex difference in favour of women (Barrett et al., 2016; Siegling et al, 2014) though not all studies show that to be the case. There are however a number of evolutionary arguments to suggest why and how females do have greater emotional insight and skills, one of which is to perceive that ability (Furnham & Kanazawa, 2020). There remains therefore less of a puzzle as to the sex difference in the estimation of EQ.

One interesting finding was that in all studies the correlation between EQ and IQ was modest with a range of $.38 < r < .47$. This is important because the extensive literature in this area suggests that when measured accurately the correlations are low, and in some instances negative (Arteche et al., 2008; Furnham & Treglown, 2022; Olderbak et al., 2018). In this sense self-estimated IQ (and EQ) are simply indexes of self-confidence or self-esteem, or even test-taking style (Gignac, 2021). This explains why extraversion is positively and neuroticism

negatively associated with self-estimated IQ (Furnham et al., 2005). It could be that personality or indeed narcissism is an important mediator between gender and self-estimates.

This study has replicated a by now well-known result with regard to self-estimated IQ and EQ using large community sampled adults and with an online study and three different, non-timed, short IQ tests. We had different measures of self-estimates and test-derived IQ which made it unwise to combine into a single large data set for analysis. We believe our five studies indicates the robustness of the results. In all studies we had a single item self-estimated score which is common in these studies and showed a normal distribution. However, it may have been preferable to use multi-item scales looking at different facets of both EQ and IQ.

Certainly, it would have been desirable to know more about the participants and have them complete recognised IQ and EQ test batteries under rigorous test conditions. It may also have been very interesting to interview groups of outliers to get some insight into why their estimates were so poor, particularly of intelligent females who gave low self-estimates.

Perhaps the greatest limitation of these studies was that we did not have either, or preferably both, a measure of ability or trait EQ. This would have allowed us the opportunity of comparing the results of the tests, but more importantly to really explore the hubris-humility effect for EQ, that has been much more explored for IQ.

References

Ackerman, P. L. (2006). Cognitive sex differences and mathematics and science achievement. *The American Psychologist, 61*(7), 722-723. https://doi.org/10.1037/0003-066X.61.7.722

Ackerman, P., & Wolman, S. (2007). Determinants and validity of self-estimates of ability and self-concept measures. *Journal of Experimental Psychology: Applied*, *13*(2), 57-78. https://doi.org/10.1037/1076-898X.13.2.57

Arteche, A., Chamorro-Premuzic, T., Furnham, A., & Crump, J. (2008). The relationship of trait EI with personality, IQ and sex in a UK sample of employees. *International Journal of Selection and Assessment, 16*(4), 421-426. https://doi.org/10.1111/j.1468-2389.2008.00446.x

Barrett, L.F., Lewis, M, & Haviland-Jones, J.M. (2016). *Handbook of Emotions, Fourth Edition*. Guilford Publications. ISBN 978-1-46-252536-2.

Batey, M., Chamorro-Premuzic, T., & Furnham, A. (2009). Intelligence and personality as predictors of divergent thinking: The role of general, fluid and crystallised intelligence. *Thinking Skills and Creativity*, *4*(1), 60-68.

Beloff, H. (1992). Mother, father and me: Our IQ. *The Psychologist, 5,* 309-311.

Bennett, M. (1996). Men's and women's self-estimates of intelligence. *Journal of Social Psychology, 136*(3), 411-412. https://doi.org/10.1080/00224545.1996.9714021

Cattell, R. B. (1971). *Abilities: Their structure, growth, and action.* New York, NY: Houghton Mifflin.

Cooper, K., Krieg, A., & Brownell, S. (2018). Who perceives they are smarter? *Advances in Physiology Education*, *42*(2), 200-208. https://doi.org/10.1152/advan.00085.2017

Dunning, D., Meyerowitz, J. A., & Holzberg, A. D. (1989). Ambiguity and self-evaluation: The role of idiosyncratic trait definitions in self-serving assessments of ability. *Journal of*

Personality and Social Psychology, 57(6), 1082-1090. https://doi.org/10.1037/0022-3514.57.6.1082

Eysenck, H.J. (1990). *Know your own IQ.* Harmondsworth, UK: Penguin.

Freund, P. A., & Kasten, N. (2012). How smart do you think you are? A meta-analysis on the validity of self-estimates of cognitive ability. *Psychological Bulletin, 138*(2), 296-321. https://doi.org/10.1037/a0026556

Furnham, A. (2000). Parents' estimates of their own and their children's multiple intelligences. *British Journal of Developmental Psychology, 18*(4), 583-594. https://doi.org/10.1348/026151000165869

Furnham, A. (2001). Self-estimates of intelligence: culture and gender difference in self and other estimates of both general (g) and multiple intelligences. *Personality and Individual Differences, 31*(8), 1381-1405. https://doi.org/10.1016/S0191-8869(00)00232-4

Furnham A. (2009). Sex, IQ, and Emotional Intelligence. *Psychological Reports*, 105(3)1092-1094.

Furnham, A. (2016). Whether You Think You Can, or You Think You Can't—You're Right. Differences and Consequences of Beliefs about Your Ability. In R. Sternberg, S. Fiske, & D. Foss (Eds.), *Scientists Making a Difference* (pp. 297-230). Cambridge, UK: Cambridge University Press.

Furnham, A. (2017). Biological Sex and Cognitive Development. In K. Nadal (Ed.), *The SAGE Encyclopaedia of Psychology and Gender* (pp. 150-152). Thousand Oaks, CA: SAGE Publications, Inc

Furnham, A. (2020). *The Assessment of General Knowledge Online*: Two studies using two platforms. Unpublished paper.

Furnham, A., Clark, K., & Bailey, K. (1999). Sex differences in estimates of multiple intelligences. *European Journal of Personality, 13(4),* 247-259. doi:10.1002/(sici)1099-0984(199907/08)13:43.0.co;2-7

Furnham, A., & Gasson, L. (1998). Sex difference in parental estimates of their children's intelligence. *Sex Roles, 38*(1-2), 151-162. https://doi.org/10.1023/A:1018810723493

Furnham, A., & Grover, S. (2020). Correlates of Self-Estimated Intelligence. *Journal of Intelligence, 8*.

Furnham, A., & Kanazawa, S. (2020). The Evolution of Personality (pp 462–470) in *The Cambridge Handbook of Evolutionary Perspectives on Human Behavior,* edited by Lance Workman, Will Reader, and Jerome H. Barkow. New York: Cambridge University Press.

Furnham, A., Crawshaw, J., & Rawles, R. (2006). Sex Differences in Self-Estimates on Two Validated IQ Test Subscale Scores. *Journal of Applied Social Psychology, 36*, 417-440.

Furnham, A., & Ward, C. (2001). Sex Differences, Test Experience and the Self-Estimation of Multiple Intelligence. *New Zealand Journal of Psychology, 30*(2), 52-59.

Furnham, A., Hosoe, T., & Tang, T. (2001). Male hubris and female humility? A cross-cultural study of ratings of self, parental, and sibling multiple intelligence in America, Britain, and Japan. *Intelligence, 30(1),* 101-115. doi:10.1016/S0160-2896(01)00080-0 .

Furnham, A., Reeves, E., & Budhani, S. (2002a). Parents think their sons are brighter than their daughters: Sex differences in parental self-estimations and estimations of their children's multiple intelligences. *Journal of Genetic Psychology, 163*(1), 24-39. https://doi.org/10.1080/00221320209597966

Furnham, A., Shahidi, S., & Baluch, B. (2002b). Sex and Culture Differences in Perceptions of Estimated Multiple Intelligence for Self and Family. *Journal of Cross-Cultural Psychology, 33*(3), 270-285. https://doi.org/10.1177/0022022102033003004

Furnham, A., Chamorro-Premuzic, T., & Moutafi, J. (2005). Personality and Intelligence: Gender, the Big-Five, Self-Estimated and Psychometric Intelligence. *International Journal of Selection and Assessment, 13*(1), 11-24. https://doi.org/10.1111/j.0965-075X.2005.00296.x

Furnham, A., Wytykowska, A., & Petrides, K. (2005). Estimates of multiple intelligences: A study in Poland. *European Psychologist,* 10, 51–59

Gignac, G.E. (2021). People who consider themselves smart do not consider themselves interpersonally challenged: Convergent validity evidence for subjectively measured IQ and EI. *Personality and Individual Differences, 174*, 110664. https://doi.org/10.1016/j.paid.2021.110664

Greven, C. U., Harlaar, N., Kovas, Y., Chamorro-Premuzic, T., & Plomin, R. (2009). More Than Just IQ: *Psychological Science, 20(6*), 753-762.

Grover, S. (2018). *A short and validated measure of crystalised intelligence.* University College London

Halpern, D. F. (2011). *Sex Differences in Cognitive Abilities* (4th ed.). Mahwah, NJ: Erlbaum.

Hofer, G., Mraulak, V., Grinschgl, S., & Neubauer, A. C. (2022). Less Intelligent and Unaware? Accuracy and Dunning–Kruger Effects for Self-Estimates of Different Aspects of Intelligence. *Journal of Intelligence 10*(1), 10. https://doi.org/10.3390/jintelligence10010010

Hogan, H. W. (1978). IQ self-estimates of males and females. *Journal of Social Psychology, 106(1*), 137-138. https://doi.org/10.1080/00224545.1978.9924160

Kaufman, J. (2012). Self-estimates of general, crystallised, and fluid intelligences in an ethnically diverse population. *Learning and Individual Differences, 22*, 118–122. https://doi.org/10.1016/j.lindif.2011.10.001

Kornilova, T., & Novikova, M (2012). Self-Assessed intelligence, personality and psychometric intelligence. *Psychology in Russia, 2,* 34-47.

Kruger, J. (1999). Lake Wobegon be gone! The "below-average effect" and the egocentric nature of comparative ability judgments. *Journal of Personality and Social Psychology, 77(2),* 221-232. doi:10.1037/0022-3514.77.2.221

Lynn, R. & Kanazawa, S. (2011) A longitudinal study of sex differences in intelligence at ages 7, 11, and 16 years. *Personality and Individual Differences, 51,* 321-328. http://dx.doi.org/10.1016/j.paid.2011.02.028

Lynn, R., Irwing, P., & Cammock T. (2002). Sex Differences in General Knowledge. *Intelligence, 30*, 27-40.

Neubauer, A. C., & Hofer, G. (2020). Self-estimates of abilities are a better reflection of individuals' personality traits than of their abilities and are also strong predictors professional interests. *Personality and Individual Differences, 109850.* https://doi.org/10.1016/j.paid.2020.109850

Neubauer, A. C., Pribil, A., Wallner, A., & Hofer, G. (2018). The self–other knowledge asymmetry in cognitive intelligence, emotional intelligence, and creativity. *Heliyon, 4*(12), e01061. https://doi.org/10.1016/j.heliyon.2018.e0106

Neto, F. (2019). Sex differences in estimates of lay views about reversal motivational intelligences for self and others. *Annals of Psychology, 35*(1), 68-74. http://dx.doi.org/10.6018/analesps.35.1.

Neto, F., & Furnham, A. (2011). Sex Differences in Parents' Estimations of their Own and their Children's Multiple Intelligences: A Portuguese Replication. *Spanish journal of psychology, 14*, 99 - 110.

Neto, F., Mullet, E., & Furnham, A. (2016). Self-estimated correlates of lay views about reversal multiple intelligences. *Imagination, Cognition and Personality, 35*(4), 380-396. https://doi.org/10.1177/0276236615599532

Neto, F., Pinto, M. C., Mullet, E., & Furnham, A**.** (2017). Estimates of reversal multiple intelligences for self and others: Sex and cross-cultural comparisons. *International Journal of Psychology*, *52*(6), 436-444. https://doi.org/10.1002/ijop.12241

Nyborg, H. (2005). Sex-related differences in general intelligence g, brain size, and social status. *Personality and Individual Differences, 39*(3), 497-509. http://dx.doi.org/10.1016/j.paid.2004.12.011

O'Connor, P. J., Hill, A., Kaya, M., & Martin, B. (2019). The Measurement of Emotional Intelligence: A Critical Review of the Literature and Recommendations for Researchers and Practitioners. *Frontiers in Psychology*, *10*, 1116. https://doi.org/10.3389/fpsyg.2019.01116

Olderbak, S., Semmler, M., & Doebler, P. (2018). Four-branch model of ability emotional intelligence with fluid and crystallized intelligence: A meta-analysis of relations. *Emotion Review, 11*, 166-183. https://doi.org/10.1177/1754073918776776

Paulhus, D. L., Lysy, D. C., & Yik, M. S. M. (1998). Self-report measures of intelligence: Are they useful as proxy IQ tests? *Journal of Personality, 66*(4), 525-554. https://doi.org/10.1111/1467-6494.00023

Petrides, K.V., & Furnham, A. (2000). Gender Differences in Measured and Self-Estimated Trait Emotional Intelligence. *Sex Roles, 42*, 449-461.

Petrides, K.V., Furnham, A., & Martin, G.N. (2004). Estimates of Emotional and Psychometric Intelligence: Evidence for Gender-Based Stereotypes. *Journal of Social Psychology, 144*, 149 - 162.

Petrides, K. V., Mikolajczak, M., Mavroveli, S., Sanchez-Ruiz, M.-J., Furnham, A., & Pérez-González, J.-C. (2016). Developments in Trait Emotional Intelligence Research. *Emotion Review*, *8*(4), 335–341. https://doi.org/10.1177/1754073916650493

Rammstedt, B., & Rammsayer, T. H. (2002). Gender differences in self estimated intelligence and their relation to gender role orientation. *European Journal of Personality, 16(5),* 369-382. doi:10.1002/per.454

Reilly. D., Neumann, D. L., & Andrews, G. (2022). Gender Differences in Self-Estimated Intelligence: Exploring the Male Hubris, Female Humility Problem. *Frontiers in Psychology, 13*, 812483. https://doi.org/10.3389/fpsyg.2022.812483

Sánchez-Núñez, M.T., Medina, C.R., & Rubio, N.G. (2018). Gender Differences in Perceptive Emotional Adjustment of Parents on Their Children's Emotional Intelligence. *Psychology, 09*, 124-143.

Shahzada, G., Khan, U., Noor, A., & Rahman, S. (2014). Self-Estimated multiple intelligences of urban and rural students. *Journal of Research and Reflections in Education, 8*(2), 116-124.

Siegling, A. B., Sfeir, M., & Smyth, H. J. (2014). Measured and self-estimated trait emotional intelligence in a UK sample of managers. *Personality and Individual Differences, 65,* 59–64

Storek, J.S. (2011). *The hubris and humility effect and the domain-masculine intelligence type: exploration of determinants of gender differences in self-estimation of ability*. Doctoral thesis , UCL (University College London).

Storek, J., & Furnham, A. (2012). Gender and gender role differences in domain-masculine intelligence and beliefs about intelligence: A study with Mensa UK members. *Personality and Individual Differences, 53*(7), 890-895. https://doi.org/10.1016/j.paid.2012.05.039

Storek, J., & Furnham, A. (2013). Gender, g, gender identity concepts, and self-constructs as predictors of the self-estimated IQ. *Journal of Genetic Psychology, 174*(6), 664-676. https://doi.org/10.1080/00221325.2013.772501

Storek, J., & Furnham, A. (2014). Gender and task confidence as predictors of the Domain Masculine Intelligence Type (DMIQ). *Personality and Individual Differences, 69,* 43-49. https://doi.org/10.1016/j.paid.2014.05.006

Storek, J., & Furnham, A. (2016). The role of gender, task success probability estimation and score as predictors of the Domain-Masculine Intelligence type (DMIQ). *Learning and Individual Differences, 50,* 23-29. https://doi.org/10.1016/j.lindif.2016.06.011

Szymanowicz, A., & Furnham, A. (2011). Gender differences in self-estimates of general, mathematical, spatial and verbal intelligence: Four meta-analyses. *Learning and Individual Differences, 21*(5), 493-504. https://doi.org/10.1016/j.lindif.2011.07.001

Treglown, L., & Furnham, A. (2022). *Are EQ and IQ Negatively Related? The Relationship between Trait Emotional Intelligence and Fluid Cognitive Ability.* Paper under review.

von Stumm, S. (2014). Intelligence, gender, and assessment method affect the accuracy of self-estimated intelligence. *British Journal of Psychology, 105*(2), 243-253. https://doi.org/10.1111/bjop.12031

Wonderlic, E. (1990). *Wonderlic Personnel Test.* Libertyville, IL: WPTI.

Zell, E., & Krizan, Z. (2014). Do people have insight into their abilities? A meta-synthesis. *Perspectives on Psychological Science, 9*, 111–25. https://doi.org/10.1177/1745691613518075

Table 1. Results from the first study

		Mean	SD	1	2	3	4
(1)Sex	Total	1.49	.50				
(2)Intell	Male	74.55	13.20				
	Female	71.59	13.67				
	Total	73.09	13.50	-.11*			
(3)EmotIntell	Male	70.18	17.15				
	Female	75.54	16.47				
	Total	72.81	17.02	.16***	.39***		
(4)IQTotal	Male	10.69	2.68				
	Female	9.85	2.91				
	Total	10.27	2.83	-.15***	.18***	-.05	

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

Table 2. Results from the second study

		Mean	SD	1	2	3	4
(1)Sex	Total	1.50	.50				
(2)Intell	Male	68.98	15.51				
	Female	66.71	15.90				
	Total	67.36	17.76	-.10*			
(3)EmotIntell	Male	64.48	20.74				
	Female	68.57	19.54				
	Total	66.62	20.24	.10*	.47***		
(4)IQTotal	Male	10.97	2.86				
	Female	10.59	3.00				
	Total	10.78	2.96	-.06	.16***	-.05	

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

Table 3. Results from the third study

		Mean	SD	1	2	3	4
(1)Sex	Total	1.50	.50				
(2)Intell	Male	74.88	13.99				
	Female	69.04	16.57				
	Total	71.98	15.58	-.19**			
(3)EmotIntell	Male	70.08	17.42				
	Female	71.56	18.46				
	Total	70.82	17.93	.04	.38***		
(4)IQTotal	Male	16.58	3.70				
	Female	15.92	3.63				
	Total	16.25	3.67	-.09	.08	-.10	

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

Table 4. Results from the fourth study

		Mean	SD	1	2	3	4
(1)Sex	Total	1.51	.50				
(2)Intell	Male	68.99	15.22				
	Female	65.02	14.91				
	Total	66.97	15.17	-.13**			
(3)EmotIntell	Male	65.76	17.26				
	Female	71.12	18.32				
	Total	68.47	17.98	.15**	.41***		
(4)IQTotal	Male	7.07	2.43				
	Female	6.83	2.42				
	Total	6.95	2.43	-.05	.24***	.14***	

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

Table 5. Results from the fifth study

		Mean	SD	1	2	3	4
(1)Sex	Total	1.49	.50				
(2)Intell	Male	107.08	13.15				
	Female	100.64	14.07				
	Total	103.90	13.97	-.23***			
(3)EmotIntell	Male	103.16	12.80				
	Female	103.68	13.52				
	Total	103.4	13.15	.02	.43***		
(4)IQTotal	Male	4.18	1.68				
	Female	4.12	1.74				
	Total	4.15	1.71	-.02	.29***	.06	

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