



# Gender and gender role differences in Domain-Masculine Intelligence and Beliefs about Intelligence: A study with Mensa UK members

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## ABSTRACT

In all 278 members of British Mensa completed three questionnaires concerned with self-estimated intelligence (SEI), Beliefs about Intelligence and its measurement and a gender role inventory. Males rated their domain masculine intelligence (a combination of mathematical, spatial and verbal intelligence) almost three (143.9) and females more than two (134.3) standard deviations above the mean and this difference was highly significant (Cohen's  $d = .70$ ). The Beliefs about Intelligence factored into seven interpretable dimensions and there were no gender differences between them. Masculinity was positively correlated with SEI. Regressing SEI on gender, gender role and Beliefs about Intelligence showed gender was the only significant predictor. Despite the high self-estimates which maybe expected with this group the results confirm nearly all studies in this area.

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## 1. Introduction

Mensa is an international, non-political organisation founded in Britain in 1946, which has more than 100,000 members in more than forty countries. Membership is open to anyone who can demonstrate an IQ in the top two per cent of the population, measured by a recognised or approved IQ testing process, usually through Cattell's Culture Fair IQ Test (Mensa UK, 2010).

This study is primarily concerned with self-estimated intelligence (SEI) which is a topic of considerable current interest (Freund & Kasten, 2011; Kaufman, 2012). The studies are now international ranging from Austria (Stieger et al., 2010) to Spain (Perez, Gonzalez, & Beltran, 2010) and Russia (Furnham & Shagabutdinova, 2012) and have been extended to issues like self-rated attention and concentration (Mengelkamp & Jager, 2007).

### 1.1. Domain-Masculine Intelligence type (DMIQ)

Over thirty studies that used the 'multiple' self-estimated intelligences model (e.g. Furnham, 2000; Furnham & Bunclark, 2006; Furnham, Clark, & Bailey, 1999; Furnham & Gasson, 1998; Furnham & Mkhize, 2003; Rammstedt & Rammesayer, 2002a) 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. This consistent gender difference has been referred to as the Hubris-Humility Effect (HHE).

A meta-analytical study investigating the magnitude of gender differences in mathematical/logical, spatial, overall and verbal self-assessed intelligences (Szymanowicz & Furnham, 2011), 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 (e.g. Furnham, 2001). This finding led Furnham (2000) to conclude that gender differences in SEI reflect laymen's view of intelligence, i.e. an amalgamation of verbal, mathematical and spatial intelligences. Furnham (2000) proposed that people view intelligence as 'male-normative', since mathematical/logical and spatial intelligences are areas where males are believed to excel.

This particular claim is explored in this study with the introduction of the 'Domain-Masculine Intelligence' (DMIQ), a composite of mathematical/logical and spatial intelligences. This study sets to investigate whether gender differences in the numerical-spatial factor of SEI will be confirmed among Mensa UK members who have an interest in intelligence and possibly know how they scored on a test that made them eligible for membership. Given the similarities between gifted and normal populations however and the demonstrated 'humility' among gifted females (e.g., Roznowski, Reith, & Hong, 2000), it is predicted that HHE will prevail on DMIQ (H1).

### 1.2. Knowledge about intelligence

Mensa UK keeps its members abreast about diverse findings and developments in the intelligence research. Equally, it seems natural for intellectually gifted individuals to be more aware of

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their abilities and have a thorough understanding of expert and laymen views of intelligence. Likewise, previous research has shown that cultures do not differ much in their understanding and Beliefs about Intelligence (e.g., Swami et al., 2008). This claim will be tested with the highly intelligent sample, using a questionnaire based on experts' opinions about intelligence, but in regards to gender differences. This was the result of academic psychologists' responses to the *Bell Curve* controversy where 50 international experts agreed 50 "facts" about intelligence (Gottfredson, 1997). It was assumed that Mensa members would endorse the views of the experts but it was predicted that no significant gender differences will be observed in Beliefs about Intelligence among British Mensa members (H2).

### 1.3. Gender identity

Various other studies have looked at whether it is gender or gender role that is most clearly responsible for differences in SEI (Furnham et al., 1999; Rammstedt & Rammsayer, 2002a; Szymonowicz & Furnham, under review). The results suggest that gender role/orientation is less related to SEI than biological sex but that masculinity tends to be associated with higher estimates. Gender identity variables are reintroduced to ascertain whether the previous findings about the observed relationship with DMIQ with normal populations will be replicated in the intellectually gifted sample. Thus, a positive relationship between masculinity and DMIQ is expected to be observed (H3).

The relationship between gender, gender role/identity variables, Beliefs about Intelligence and DMIQ will also be explored. Based on the literature about the role of age in SEI (Rammstedt & Rammsayer, 2002b) age is also included in the analysis to establish whether the previously observed age-DMIQ relationship will be replicated in this sample. Thus it is predicted that gender, age and Beliefs about Intelligence will be correlated with DMIQ (H4). In accordance with reported findings (e.g., Roznowski et al., 2000; Shea, Lubinski, & Benbow, 2001) gender is expected to be the best predictor of DMIQ over and above gender identity variables and Beliefs about Intelligence (H5).

## 2. Methods

### 2.1. Participants

A total of 278 British Mensa members took part in this study. There were 143 males (51%) and 135 females. Their age ranged from 17 to 75 ( $M = 47.39$ ,  $SD = 15.02$ ) years. All participants were fluent in English, with 95% native English speakers. In all, 36.2% had completed non-university, higher-level education, 33.8% achieved BA/BSc level, 21.2% MA/MSc level and 5% achieved Ph.D./Doctorate or equivalent level of education.

### 2.2. Measures

#### 2.2.1. Self-estimated intelligence (SEI) (Furnham & Gasson, 1998)

This is a simple half-page questionnaire based on that developed by Furnham and Gasson (1998). The measure consists of a normal IQ score distribution ( $M = 100$ ,  $SD = 15$ ) with descriptive labels and a normal distribution IQ curve figure. The average score is 100, a score of 55 is labelled 'mild retardation', a score of 75 a 'borderline retardation', a score of 85 'low average', score of 115 'high average', score of 130 'superior', and that of 145 'gifted'. Thereafter, a table with the ten labelled and briefly described intelligence types and the overall-estimated IQ score was provided, e.g. 'Verbal/Linguistic Intelligence: the ability to speak fluently along with understanding of grammar (syntax) and meaning (semantics)'. The

ten intelligences were based on Gardner (1983) and comprise of verbal, mathematical, spatial, musical, body-kinaesthetic, interpersonal, intrapersonal, existential, spiritual, and naturalistic intelligences. The participants were asked to estimate their ten own actual intelligences as well as their overall IQ scores by providing an actual IQ score estimate. Alpha for Domain-Masculine Intelligence Type was .62 and the inter-item correlation  $r = .45$ .

#### 2.2.2. Intelligence beliefs meaning and measurement of intelligence questionnaire (Furnham, 2003)

This non-timed 30 item measure is designed to measure general public' Beliefs about Intelligence. The questionnaire items were gathered from a summary of 50 (Western) psychologists and experts on intelligence research (reprinted in Gottfredson, 1997). The summary was a response to an uproar over the publication of *The Bell Curve* (Herrnstein & Murray, 1994) in *Wall Street Journal* (15 December 1994) (Swami et al., 2008, p.238). The items concern among other statements about what intelligence is, e.g., *Intelligence is a very general mental capability that involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly from experience; IQ scores predict equally accurately for all groups regardless of race and social class.* The items are scored using an 8-point Likert scale, where 1 is *Strongly Disagree* and 8 is *Strongly Agree*. Previous research has shown good internal consistency, i.e. Cronbach's  $\alpha = .81$  (Swami et al., 2008). The alpha in this study was also .81.

#### 2.2.3. Gender identity: Bem Sex Role Inventory (BSRI) (Bem, 1981)

This non-timed 60-item measure is designed to measure the orthogonal constructs of masculinity and femininity. Each construct is made of 20 items, with the remaining 20-items measuring the gender-neutral or androgynous characteristics; the items are worded as adjectives. Items were scored using a 7-point scale, where 1 = *never or almost never true* and 7 = *almost always true*, e.g. athletic, sensitive to others' needs, solemn. The scale has been shown to have satisfactory internal reliability and homogeneity, with alphas for masculinity .86 and femininity .74 (Francis & Wilcox, 1998). The alphas for masculinity and femininity in this study were, .86 and .77, respectively.

### 2.3. Procedure

All participants completed the survey either online or in a paper version that was sent to them with a pre-paid return envelope. Two hundred and seventy participants (97%) took the survey online. Eight Mensans – those without internet access, the most elderly and a handful from the Isle of Man, returned the paper questionnaires by post. The study was approved by the university Ethics Committee, meeting confidentiality and Data Protection requirements. Debrief feedback was available at the end of the survey questionnaire.

## 3. Results

### 3.1. Domain-Masculine Intelligence and the hubris and humility effect

An independent  $t$ -test,  $t(243) = 5.56$ ,  $p < .001$ , two-tailed, confirmed significant differences between highly intelligent males ( $M = 143.92$ ,  $SD = 12.53$ ) and highly intelligent females ( $M = 134.43$ ,  $SD = 14.58$ ) in the Domain-Masculine Intelligence Type. The magnitude of the differences in the means (mean difference = 9.49, 95% CI: 6.13–12.85) was medium ( $\eta^2 = .11$ ; Cohen's  $d = .70$ ). Hypothesis 1 was confirmed.

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