Parents’ estimates of their own and their children’s multiple intelligences

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Previous studies have shown that when parents estimate their own and their children’s overall IQ (general intelligence), fathers estimate their own scores significantly higher than mothers estimate their own scores, and both parents estimate their sons’ IQ higher than their daughters’ (Furnham & Gasson, 1998). This study looks at differences in parental estimation of children’s multiple intelligences based on Gardner’s (1983) seven-dimensional model. In all, 112 parents estimated their own and their sons’ and daughters’ ability on each of seven specific dimensions (verbal, mathematical, spatial, musical, body-kinesthetic, interpersonal, intrapersonal). As before, males (fathers) rated themselves as more intelligent on mathematical and spatial intelligence than females (mothers) rated themselves on these intelligences. Results indicated that differences in perception of children’s intelligence lay only in the areas of mathematical and spatial intelligence, which may be conflated with lay concepts of overall intelligence. Overall, mothers rated their children higher on mathematical and spatial intelligence than did fathers, and both parents indicated that they thought their sons more numerate than their daughters. This result was stronger for the first child than for the second, suggesting the cultural significance attached to first-born sons (primogeniture).

Parental beliefs about children’s intelligence is a potentially important area of research owing to the effect these ideas have on parental rearing and expectations (Goodnow, 1980; Goodnow & Collins, 1990; Sigel, 1985). More importantly, Goodnow and Collins (1990) provide evidence that parents’ ideas and expectations about development influence objective child outcomes. They note that parents’ beliefs about childhood, child development and parenting differ in quality and content depending on a number of factors, such as the gender, age, ethnicity and education of both parent and child. They consider that many of these ideas are ‘ready made’ aspects of culture and therefore are affected relatively little by actual experience with children. To this extent, these beliefs may reflect cultural stereotypes about many things including, presumably, sex differences in intelligence (Beloff, 1992; Bennett, 1996, 1997). Goodnow and Collins argue that the extant research suggests that parents distinguish between three kinds of intelligence: knowledge about things, abstract problem-solving ability and social intelligence. Furthermore, with respect to intelligence, parents often appear to hold mutually contradictory ideas, some of

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which are directly contrary to modern formal accounts of cognitive development. However, more work has been carried out on the content of parental ideas about intelligence than how these ideas develop over time and with experience, or the outcomes of these beliefs on the actual development of children.

Although there is a long research tradition into lay beliefs about the nature of intelligence (Flugel, 1947; Ruisel, 1996; Shipstone & Burt, 1973; Sternberg, Conway, Ketron, & Bernstein, 1981), far fewer studies have examined systematic differences in self-rated IQ. Hogan (1978) reported on 11 IQ estimate studies where participants estimated the total IQ of self, parents and people in general, and concluded that relative to men, women made significantly lower estimates of their own IQ. He also found that his student participants believed their fathers to be more intelligent than their mothers.

A study by Beloff (1992) among Scottish students (N = 767) appears to have provoked considerable interest in sex differences in the estimation of IQ. Beloff found that her young women students attributed to themselves significantly lower IQ scores than did the men. These results were replicated by others in Scotland (Bennett, 1996), Ireland (Reilly & Mulhern, 1995) and England (Furnham & Gasson, 1998; Furnham & Rawles, 1995, 1999), but not New Zealand (Byrd & Stacey, 1993). Some of the studies looked at the estimates of the IQ of participants’ relatives: thus Beloff (1992), Byrd and Stacey (1993) and Furnham and Rawles (1995) found students estimated their father’s IQ as higher than their mother’s. Furnham and Rawles also found that young people estimated their grandparents’ IQ higher than that of their grandmothers. Yet Byrd and Stacey (1993) found females thought their sisters had higher IQ scores than their brothers, but the scores were reversed for the male students, who rated their brothers as having higher IQ scores than their sisters.

Furnham and Gasson (1998) asked 184 British parents to estimate their own intelligence and that of their children. Mothers rated their own IQ (M = 104) significantly lower than did fathers (M = 108). Furthermore, both parents rated their first and second sons as having higher IQs than their daughters (M = 109 vs. M = 102 and M = 108 vs. M = 101, respectively). Regressional analysis showed that the child’s sex, much more than their age, was the stronger predictor of their parentally estimated IQ. Older parents gave higher IQ estimates in general, but also differentiated more between sons’ and daughters’ estimated IQ. The present study is an extension of Furnham and Gasson’s (1998) research, looking at multiple intelligences, as defined by Gardner (1983).

Some researchers in the area have suggested that an overall (g) estimate of IQ may obscure important dimensional differences. Thus, Bennett (1996) took Gardner’s (1983) concept of interpersonal intelligence and asked young Scots to estimate their own and their parents’ general, as well as interpersonal, IQ. Concerning the latter, there were no differences in self-estimates (M = 113 vs. M = 114), but mothers were considered to be more interpersonally intelligent than fathers (M = 116 vs. M = 106). Bennett (1997) factor analysed ability self-estimates using Gardner’s seven types and found two clear factors: logical-mathematical, spatial and kinesthetic intelligence loaded on one factor, and personal, linguistic and musical intelligence loaded on the other. Bennett (2000) has presented evidence that these two factors broadly represent Western stereotypes about masculine and feminine-type abilities which accounted for his male participants’ self-estimation of logical-mathematical, spatial and kinesthetic intelligence being higher than the female participants’ self-estimates on this factor.
Furnham, Clark, and Bailey (1999) asked 190 British adults to estimate their scores on each of Gardner’s (1983) seven basic types of intelligence. Only one of the seven (mathematical/logical) yielded a significant sex difference, with males rating themselves higher than did females. Rotated factor analysis of the seven scales yielded three interpretable factors and there was a sex difference on only one (mathematical/spatial). Again, males rated themselves higher on this factor, a result similar to Bennett (1997). Furnham et al. believe that studies which found sex differences in self-estimates of overall intelligence (g) may have exaggerated this finding, as the sex difference is clearly confined to a limited area of intelligence. Various other studies have confirmed the factor structure of the seven dimensions reported by Furnham, Fong, and Martin (1999) (Furnham & Baguma, 1999; Furnham & Fong, 2000). In the present study the individual seven estimates were examined.

This study extends the work of Furnham and Gasson (1998) on parental estimates of children’s intelligence. Instead of asking parents to estimate the overall (g) intelligence of their children, parents were required to estimate the intelligence of each of their children on each of Gardner’s (1983) seven intelligences. It was predicted that fathers would rate their own mathematical and spatial intelligence higher than would mothers, but that there would be no difference on the other factors. It was also predicted that parents, particularly fathers, would rate sons higher than daughters on mathematical and spatial intelligence.

**Method**

**Participants**

Of the 112 participants who completed the task, 46 were male and 66 female. Their mean age was 45.83 years (SD = 10.27 years). In all, 52% had only school-leaving qualifications; the remainder had higher or further educational qualifications.

**Questionnaire**

All participants completed a simple one-page (backed) questionnaire. The questionnaire showed a normal distribution of IQ scores with means, statistical deviations and descriptive labels against each standard deviation. Thus, a score of 85 was labelled ‘low average’ and that of 130 ‘superior’. Thereafter, they were given a grid with the seven intelligence types labelled and described in rows and seven columns to rate self and children, stipulating their sex and age. The seven intelligences were taken from Gardner (1983) (verbal, mathematical, spatial, musical, body-kinesthetic, interpersonal, intrapersonal), and short descriptions were attached to each (see Table 1).

**Procedure**

Members of the public were approached by one of four researchers, primarily at railway stations where they were waiting for trains. The researchers approached people who looked to be in the age group of 35 to 50. In all, 250 people were approached and asked if they would take part in a brief study; 212 agreed, but only 164 completed the task, which took about 20 min. Of the 164, 112 had children over 5 and below 25 years, which was the criterion for participating in this study.

**Results**

All participants had at least one child. For first children, there were 61 boys and 51 girls, with a mean age of 18.27 years (SD = 8.74 years). For second children, there were 48 boys
and 46 girls, with a mean age of 15.87 years (SD = 8.92 years). In all, only 40 participants had three or more children so only the results of the first two were analysed. Because of the large number of analyses performed on these data there is an increased risk of Type I errors. Attempts to guard against these errors included interpreting significant differences at the $p < .01$ level as well as carrying out multivariate analysis of variance where appropriate.

**Parental self-estimates**

The first issue to be examined was whether parents of different sex differ in their estimates of their own intelligences, as previously found. A one-way MANOVA was completed across the seven intelligence estimates, which was significant ($F(1,104) = 2.50, p < .05$). Univariate $F$ tests then showed significant differences on two factors: mathematical intelligence ($F(1,110) = 6.71, p < .01$), and spatial intelligence ($F(1,110) = 5.57, p < .05$).

Thus, men’s estimates for mathematical and (to some extent) spatial intelligence were higher than those of women. Overall, the participants rated their interpersonal, verbal and intrapersonal intelligences most highly (around $M = 110$), but their musical intelligence least of all seven of the self-estimates.

**Parental estimates of children**

The main focus of the study was parental sex differences in the estimates of the multiple intelligences of their male and female children. In order to examine sex difference effects, a series of ANOVAs was performed with the seven specific intelligence estimates being the dependent variable (see Table 2). First, however, a $2 \times 2$ MANOVA was computed on the data from the first and second child. For the first child, there was a significant sex of parent ($F(1,110) = 2.31, p < .05$) and a significant sex of child ($F(1,110) = 3.30, p < .01$) effect, but no interaction between the factors. What this indicated was that mothers gave higher ratings than fathers overall and that sons were given higher ratings than daughters. For the second child the MANOVA yielded only one significant main effect for sex of child ($F(1,91) = 2.84, p < .01$). Daughters were rated overall more intelligent than sons. ANOVAs were conducted for each of the seven intelligences; these analyses were carried out separately for first-born and for second-born children.

There was one parental effect: mothers rated their first child’s spatial IQ higher than did fathers. There were three sex-of-child effects, two of which were significant at $p < .01$. Boys were rated as having higher mathematical and spatial intelligence than girls (at $p < .001$). None of the interactions were significant. All analyses were then repeated, co-varying out first the age of the child, then age of parents, then both, but there was no difference in the pattern of findings.

There were only two marginally significant differences ($p < .05$) in the seven ANOVAs performed on intelligence estimates for the second child. Girls were thought to have greater interpersonal intelligence but lesser mathematical intelligence than boys.

In order to look at the effect of sex and age on intelligence estimates, a series of multiple regressions were run, following Furnham and Gasson (1998). Sex and age of parents and
Table 1. Sex differences in self-estimates for seven factors and three higher order factor scores

<table>
<thead>
<tr>
<th>Factor</th>
<th>Estimated IQ scores on standardized bell curve. Mean scores (SDs)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Self (Total M))</td>
<td>Male</td>
<td>Female</td>
<td>$F$ level</td>
<td>Child 1 M</td>
<td>Child 2 M</td>
<td></td>
</tr>
<tr>
<td>1. <em>Verbal</em> or linguistic intelligence (the ability to use words)</td>
<td>111.09</td>
<td>113.91 (15.00)</td>
<td>109.12 (13.79)</td>
<td>3.02</td>
<td>114.46</td>
<td>112.00</td>
<td></td>
</tr>
<tr>
<td>2. Logical or <em>mathematical</em> intelligence (the ability to reason logically, solve number problems)</td>
<td>105.90</td>
<td>110.54 (16.23)</td>
<td>102.66 (15.59)</td>
<td>6.71**</td>
<td>112.41</td>
<td>110.21</td>
<td></td>
</tr>
<tr>
<td>3. <em>Spatial</em> intelligence (the ability to find your way around the environment, and form mental images)</td>
<td>107.71</td>
<td>111.84 (17.23)</td>
<td>104.81 (14.80)</td>
<td>5.57*</td>
<td>110.38</td>
<td>110.36</td>
<td></td>
</tr>
<tr>
<td>4. <em>Musical</em> intelligence (the ability to perceive and create pitch and rhythm patterns)</td>
<td>96.47</td>
<td>93.80 (17.51)</td>
<td>98.33 (16.24)</td>
<td>1.97</td>
<td>107.39</td>
<td>106.65</td>
<td></td>
</tr>
<tr>
<td>5. <em>Body-kinesthetic</em> intelligence (the ability to carry out motor movement, e.g. being a surgeon or dancer)</td>
<td>101.79</td>
<td>100.43 (16.56)</td>
<td>102.72 (15.44)</td>
<td>.56</td>
<td>107.28</td>
<td>106.32</td>
<td></td>
</tr>
<tr>
<td>6. <em>Interpersonal</em> intelligence (the ability to understand other people)</td>
<td>112.59</td>
<td>112.82 (15.15)</td>
<td>112.42 (10.92)</td>
<td>.03</td>
<td>110.36</td>
<td>108.40</td>
<td></td>
</tr>
<tr>
<td>7. <em>Intrapersonal</em> intelligence (the ability to understand yourself and develop a sense of your own identity)</td>
<td>110.00</td>
<td>110.21 (16.22)</td>
<td>109.84 (13.38)</td>
<td>.02</td>
<td>108.08</td>
<td>104.97</td>
<td></td>
</tr>
</tbody>
</table>

*P < .05; **P < .01.
Table 2. Parents’ estimates for their children’s IQ scores with two-way (sex of parent, sex of child) ANOVA results

<table>
<thead>
<tr>
<th></th>
<th>Father</th>
<th>Child 1 (N = 112)</th>
<th></th>
<th>Father</th>
<th>Child 2 (N = 94)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Son</td>
<td>Daughter</td>
<td>F value</td>
<td>Child</td>
<td>PxC</td>
<td></td>
</tr>
<tr>
<td>1. Verbal</td>
<td>113.68</td>
<td>109.76</td>
<td>0.39</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or linguistic intelligence (the ability to use words)</td>
<td>115.97</td>
<td>116.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Logical</td>
<td>113.20</td>
<td>106.90</td>
<td>1.50</td>
<td>12.77***</td>
<td>1.42</td>
<td></td>
</tr>
<tr>
<td>or mathematical intelligence (the ability to reason logically, solve number problems)</td>
<td>119.58</td>
<td>107.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Spatial</td>
<td>108.60</td>
<td>102.14</td>
<td>12.22***</td>
<td>11.21***</td>
<td>0.25</td>
<td></td>
</tr>
<tr>
<td>intelligence (the ability to find your way around the environment, and form mental images)</td>
<td>117.64</td>
<td>108.93</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Musical</td>
<td>107.32</td>
<td>107.62</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>intelligence (the ability to perceive and create pitch and rhythm patterns)</td>
<td>107.31</td>
<td>107.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Body-kinesthetic intelligence (the ability to carry out motor movement, e.g. being a surgeon or dancer)</td>
<td>103.80</td>
<td>108.81</td>
<td>0.00</td>
<td>3.04</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>6. Interpersonal intelligence (the ability to understand other people)</td>
<td>110.22</td>
<td>105.57</td>
<td>0.33</td>
<td>102.22</td>
<td>109.13</td>
<td></td>
</tr>
<tr>
<td>7. Intrapersonal intelligence (the ability to understand yourself and develop a sense of your own identity)</td>
<td>113.33</td>
<td>110.33</td>
<td>2.57</td>
<td>101.94</td>
<td>109.35</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01; *** p < .001.
Table 3. Results of regressions for seven factors with respect to first child

<table>
<thead>
<tr>
<th></th>
<th>Verbal</th>
<th>Mathematical</th>
<th>Spatial</th>
<th>Musical</th>
<th>Body-kinesthetic</th>
<th>Interpersonal</th>
<th>Intrapersonal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>β</td>
<td>t</td>
<td>β</td>
<td>t</td>
<td>β</td>
<td>t</td>
<td>β</td>
</tr>
<tr>
<td>Parental sex</td>
<td>.13</td>
<td>1.37</td>
<td>.11</td>
<td>1.19</td>
<td>.27</td>
<td>3.12***</td>
<td>.05</td>
</tr>
<tr>
<td>Parental age</td>
<td>.27</td>
<td>1.53</td>
<td>.23</td>
<td>1.34</td>
<td>.09</td>
<td>0.58</td>
<td>-.07</td>
</tr>
<tr>
<td>Child’s sex</td>
<td>-.06</td>
<td>-0.70</td>
<td>-.35</td>
<td>-3.94***</td>
<td>-.31</td>
<td>-.82***</td>
<td>-.02</td>
</tr>
<tr>
<td>Child’s age</td>
<td>-.01</td>
<td>0.90</td>
<td>-.04</td>
<td>-0.27</td>
<td>.15</td>
<td>0.90</td>
<td>.13</td>
</tr>
<tr>
<td>F value</td>
<td>2.79*</td>
<td></td>
<td>5.27***</td>
<td></td>
<td>8.46***</td>
<td></td>
<td>0.19</td>
</tr>
<tr>
<td>R²</td>
<td>0.09</td>
<td></td>
<td>0.17</td>
<td></td>
<td>0.24</td>
<td></td>
<td>0.00</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01; ***p < .001.
of child were regressed on to each of the estimated scores for each child. Having set a significance level of $p < .01$, three of the regressions were found to be significant for the first child. The results of the 10 regressions for IQ estimates of the first child are given in Table 3.

As can be seen from Table 3, the F level for the regression on to spatial, mathematical and intrapersonal intelligence was significant at $p < .001$. The pattern was fairly clear: neither age of parents nor age of children were relevant. In all, 17% of the variance in estimates of mathematical intelligence was explained primarily by sex of child. Results for spatial and intrapersonal intelligence were almost identical, accounting for nearly a quarter of the variance: mothers estimated sons’ IQ higher than did fathers, on both spatial and intrapersonal intelligence estimates.

Only two of the 10 regressions were significant for the second child, and they replicated the significant findings for the first child. With spatial intelligence ($F(4,89) = 4.31, p < .01; R^2 = .16$), the child’s sex ($\beta = -.19$) was the best predictor (only significant $t$ test).

Comparisons of parental self-estimates and estimates of children

In order to consider whether parents believe their children are more intelligent than themselves, an appropriate MANOVA followed by ANOVAs were calculated looking at the difference between parent and first child. The totalled score yielded a difference with parents thinking their first child significantly more intelligent than themselves ($M = 110.05, SD = 14.43$ vs. $M = 106.50, SD = 14.33$). The MANOVA was significant ($F(7,105) = 11.08, p < .001$), which indicated parents believed their first child more intelligent than themselves. Four of the seven analyses were statistically significant. Parents believed their first child had greater musical ability ($M = 107.39, SD = 15.35$ vs. $M = 96.47, SD = 16.88; F(1,111) = 45.99, p < .001$), greater mathematical ability ($M = 112.41, SD = 14.60$ vs. $M = 105.90, SD = 16.23; F(1,111) = 12.52, p < .001$), greater body-kinesthetic intelligence ($M = 107.27, SD = 14.41$ vs. $M = 101.78, SD = 15.88; F(1,111) = 9.78, p < .01$) and greater verbal ability ($M = 114.45, SD = 13.82$ vs. $M = 111.08, SD = 14.47; F(1,111) = 4.61, p < .05$).

The same analysis was computed for the second child. Again, the MANOVA was significant ($F(7,105) = 8.35, p < .001$), which indicated that parents thought their second child also more intelligent than they themselves ($M = 108.99, SD = 14.09$ vs. $M = 106.82, SD = 15.73$). This yielded fewer significant differences. Parents believed their second child had greater musical intelligence ($M = 106.65, SD = 14.83$ vs. $M = 95.98, SD = 16.14; F(7,90) = 37.62, p < .001$), greater body-kinesthetic intelligence ($M = 106.32, SD = 13.44$ vs. $M = 101.49, SD = 16.07; F(7,90) = 8.18, p < .01$), but lower interpersonal intelligence ($M = 108.40, SD = 14.33$ vs. $M = 112.42, SD = 12.99; F(7,90) = 8.10, p < .01$).

Discussion

The results of this study have in part replicated, but also clarified and extended previous findings (Bennett, 1996, 1997; Furnham et al., 1999ab; Furnham & Gasson, 1998). As before, males (fathers) rate themselves overall as significantly more intelligent than do
females (mothers). However, the difference is confined to mathematical (at \( p < .01 \)) and spatial intelligence (at the less rigorous \( p < .05 \) level). The other five types of intelligence yielded no significant parental sex differences. Overall, the combined adult sample rated their interpersonal, verbal and intrapersonal intelligences highest, and their musical and body-kinesthetic intelligences lowest.

Parents tended to believe their children were overall more intelligent than they were themselves. Interestingly, the first born sons were thought of as more intelligent than daughters but for the second born the opposite was the case: daughters were overall rated more intelligent than sons. This latter finding was unexpected and is not currently amenable to explanation. However, it merits further exploration in view of the absence of significant effects of the univariate analyses of the specific intelligences. The tendency to rate children as more intelligent than oneself was most noticeable among mothers. Mothers' overall self-estimated score was \( M = 105.70, \) (SD = 14.37), while that of their first child (ignoring sex) was \( M = 111.27, \) (SD = 15.42). Considering the overall (g) scores, fathers only rated their son's IQ as one point higher (\( M = 107.65, \) SD = 15.41 for self vs. \( M = 108.77, \) SD = 15.09 for son and \( M = 107.00, \) SD = 14.31 for daughter), but mothers rated their sons as over 8 IQ points higher (\( M = 105.70, \) SD = 14.37 for self, \( M = 113.73, \) SD = 15.22 for first son, \( M = 108.82, \) SD = 15.14 for first daughter). Furnham and Rawles (1995) found their participants thought their parents' IQ was about 3 points lower than theirs, while that of their grandparents was nearly 10 points lower. Equally, Furnham and Gasson (1998) found that parents thought that their (male) children were about 3 IQ points higher than their own overall IQ. In that study parents believed their first born were 3.5 IQ points higher than themselves, while for the second child this difference was reduced to 2.1 IQ points. This may be an erroneous perceived generational difference, but it could be a real effect. The data from Flynn (1987) suggest significant improvements in IQ tests over generations, though the explanation for this is less clear (Lynn, 1982, 1994; Lynn & Pagliari, 1994).

When examined at the item level, an interesting pattern emerged. An inspection of fathers' self-estimates and estimates of the first son, on all seven intelligences, showed that they believed they had almost identical verbal intelligence to the same sex first child, but a higher spatial intelligence (difference for fathers and sons \( M = 3.24 \)) and higher interpersonal intelligence (\( M = 6.19 \)). But both parents believed their same sex children had a considerably higher musical intelligence (father/sons \( M = 13.52 \); mothers/daughters difference \( M = 9.29 \)). Parents also believed the same sex first born was more intelligent with regard to mathematical and body-kinesthetic intelligence than themselves. In over half of the seven intelligences specified, parents believed their own ability scores were lower than those of their children. The overall difference occurs not primarily because of their low personal self-estimates, but rather the relatively high child estimates. This, of course, may change over time as a function of the child's age.

It was noticeable that first sons were rated higher on all seven intelligences than second sons, particularly on verbal and mathematical intelligences. The same pattern did not apply to the intelligence estimates of first vs. second daughters. This may suggest some universal influence of the cultural significance attached to first sons, expressed in terms of the principle of primogeniture.

The results show that for both first and second children, parents (particularly mothers) believe their sons to have higher numerical IQ than their daughters. The overall score
showed the mean value of the parents’ estimate was 110 for their first son and 107 for their first daughter. Furnham and Gasson (1998) found that when attempting an overall (g) estimate, parents’ estimates were 109 for their first son and 102 for their first daughter. While the overall difference between the sexes in this study was less than in Furnham and Gasson (1998), the pattern was similar. However, what the results of this study suggest is not that parents think of their sons as broadly more intelligent than their daughters, but that this difference is confined to a particular area—namely mathematical and spatial intelligence. Further in this study, mothers, compared to fathers, appeared to give higher estimates on each of the multiple intelligences (particularly spatial, but not verbal or musical) to their sons.

The regressive analysis was performed to replicate Furnham and Gasson (1998), who found significant sex effects for first, second and third children in the estimations of overall intelligence. In this study, the beta weight for the child’s sex reached significance on three of the seven intelligences: mathematical, spatial and intrapersonal. Interestingly, the parent’s sex was significant in two of the regressions, indicating that mothers rated the spatial and intrapersonal intelligence of their sons higher than did fathers. Reasons for this are not clear. In fact, nearly a quarter of the variance in the estimate of spatial and intrapersonal intelligence was accounted for by the sex of parents and children.

Indeed, it is possible to argue, in part at least, that parental estimates with specific sex differences are fundamentally correct. Meta-analytic work on sex differences in spatial ability has shown a small consistent sex difference (Linn & Peterson, 1985), but meta-analytic work on mathematical ability reveals no consistent differences (Hyde, Fenneman, & Lamen, 1990). As Lynn (1982, 1994) has pointed out, there seems robust evidence for sex differences in spatial intelligence, though sex differences in this area have been shown to be small and context dependent. Moreover, recent British secondary school examinations showed girls to be performing better than boys, even in stereotypically ‘male’ subjects such as mathematics. Thus, the consistent sex differences in estimated intelligence found in these studies cannot be validated by research that actually measures the psychometric intelligence of males and females at all ages (Furnham, Clark, & Bailey, 1999; Furnham & Gasson, 1998). What is important about the research on actual abilities suggests little or no difference between the sexes in these domains. Yet the data from this study speak to consistent parental stereotyping with all that that implies for parental advice and encouragement with specific educational and vocational choices.

There may be another interpretation for these programmatic studies which find sex differences in self-estimated intelligence, it is possible that it is mathematical and spatial intelligence that lie at the heart of most laypeople’s conception of intelligence. This is probably based on their experience of popular books that supposedly help people measure their own IQ (e.g. Eysenck, 1981). Although these tests, like those of Eysenck, attempt to measure ‘verbal, numerical and visuospatial’ ability, they do seem dominated by questions measuring mathematical and spatial ability. Indeed, precisely what is novel about Gardner’s model is that most people do not think of musical ability or intra/interpersonal skills as part of the concept of (general) intelligence. Thus, it is possible that the conception of (general) intelligence is male normative: it is those abilities (mathematical/spatial) that men are considered to be best at, that most people consider to be the essence of intelligence. In this sense, people may conflate mathematical/spatial and overall intelligence, so explaining the consistent sex difference results in previous self-
estimate studies. This explanation of why general intelligence is rated higher in men than in women could be tested either by looking more carefully at lay beliefs about intelligence and intelligence testing or by examining groups that have not been exposed to Western psychometric tests of intelligence.

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