Debate

IQ, VISUOSPATIAL ABILITY AND THE GENDER DIVIDE: A REPLY TO BILALIĆ AND MCLEOD

ROBERT W. HOWARD

School of Education, University of New South Wales, Sydney, Australia

Summary. Bilalić and McLeod’s arguments fall short on several grounds. There are excellent logical reasons to expect strong ability/chess expertise links and specific research evidence to date is sparse, with mixed findings. Data are presented from Georgia, which has a high female participation rate in chess, which suggest that differing gender motivation levels and participation rates impact relatively little on chess performance differences at the extreme.

Bilalić and McLeod (2006) argue that chess expertise has little to do with visuospatial ability and IQ and that Howard’s (2005a) results may be due to differing motivation and interest levels, which perhaps induce different participation rates. Howard actually concluded only that the results were consistent with ability differences and that only glass ceiling and lack of female role models explanations could be excluded. However, ability differences still are a likely factor.

Howard (2005b) examines links between psychometric abilities and chess expertise in detail. The research evidence actually is sparse, with a mixed and even ‘puzzling’ pattern of results (Gobet et al., 2004, p. 175). However, compelling logical reasons suggest strong links. IQ correlates with performance of every intellectual task and chess is a highly intellectual task, used in cognitive science for that reason (Newell, 1973; Charness, 1992). Becoming a grandmaster requires learning and adeptly using a vast amount of knowledge and top level chess is as intellectually demanding as any occupation. Intellectually demanding occupations evidently require a minimum IQ score of 120 to 125 for strong performance (Hunt, 1995; Gottfredsen, 1997). If IQ had little role in chess expertise, it would affect no other intellectual activity. IQ tests would have no predictive value and the concept of intelligence would be superfluous.

Two independent components of visuospatial ability are image vividness and ability to manipulate images, and males excel at the latter (e.g. Lohman, 1988;
Visuospatial ability is important in such occupations as surgery and piloting and in science and mathematics (Hegarty & Waller, 2005) where males typically outperform females (Halpern & Collaer, 2005), as in chess. Visuospatial ability is essential in chess calculation and top players need it (Howard, 2005b; Frydman & Lynn, 1992).

Motivation and related participation rate differences no doubt impact. Howard (2005a) found that females have shorter careers and play fewer games. For some, chess perhaps is a passing interest but others might lose interest due to perceived insufficient talent (e.g. Halpern & Collaer, 2005).

However, effects of motivation and participation rate can be tested empirically using Howard’s (2005a) database. Figures 1 and 2 present the female participation rates and mean rating difference in the first list each year between all males rated at least 2200 and all females. Female participation rate varies to some extent, with little apparent effect on rating difference. For instance, in the lowest participation years of 1993, 1994 and 1995, rating differences vary between 183 and 189 points. In the highest, 2005, it is 208 points.

A stronger test is with data from the female chess superpower – the Caucasus nation of Georgia – which has a very high female participation rate. Girls get much encouragement and opportunity to play from an early age. Georgia has the highest proportion of female internationally rated players and title-holders of any nation and has had a stranglehold on the women’s world title. If male/female ability differences have no impact but motivation and participation rate are critical, Georgia should have little or no gender difference in performance.

Rating lists give Georgian player’s nationality as USSR before 1992, which complicates the analysis. Georgian players dropping off the list before 1992 cannot be identified readily and are not included here. All 219 players listed as Georgian at least once from 1992 were sampled and their pre-1992 data also were obtained (given in the

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**Fig. 1.** Proportion of female players out of the total of males rated at least 2200 and females in the first list each year since 1975.
figures as Georgians-Whole-Span). All Georgian-only data also are given from 1993 (Georgians-Resident).

Georgian female participation rate is high but gender rating differences are still pronounced – though often less than those for all players. Participation rate mainly falls from 1975 (though possibly as an artifact of the above sampling problem with the USSR’s demise), with little obvious impact on the rating difference.

Clearly, other factors also contribute to the performance difference.

References


Fig. 2. Average rating differences in the first list each year between males rated at least 2200 and females.

