Cognitive Gender Differences Among Israeli Children

Sorel Cahan and Yael Ganor
The Hebrew University of Jerusalem

The study investigated gender differences among 11,000 Israeli children in Grades 4-6 with respect to verbal, spatial, and mathematical ability, as measured by 12 intelligence tests. Consistent differences in score variance were found across grades for 11 of the 12 tests. In each of these tests the variance for boys exceeded that for girls by 10%-20%. With respect to mean achievement, consistent cross-grade differences were found only for mathematical ability, where boys had the edge (about 0.20 SD). These findings diverge from those of recent American studies, which found no gender differences in any of these realms. Furthermore, they differ from the results of earlier Israeli studies in that the gender gap is limited to mathematical ability, and its size is much smaller. The revealed gender gap can be partially attributed to differences in response strategy: girls were found to be more likely to skip items for which they lack an answer (i.e., to take fewer risks in guessing). This implies that the performance of girls on intelligence tests will improve if they are encouraged to dare to guess.

Recent meta-analyses clearly indicate a continuous and considerable reduction in gender differences with respect to all cognitive areas among non-selective populations. Gender differences have virtually disappeared in the verbal realm (Feingold, 1988, 1992; Hyde & Linn, 1988; Linn & Hyde, 1989), and they are slight for most spatial tasks, although boys continue to

1This research was supported by the Henrietta Szold Research Institute. We thank Nora Cohen for providing the data base; Lavee Artman, Kalman Binyamini, Nora Cohen, Eyal Gamliel, and two anonymous reviewers for their helpful comments on previous drafts; and Helene Hogri for the editorial revisions.

2To whom correspondence should be addressed at School of Education, The Hebrew University, Jerusalem, 91905, Israel.
hold a clear advantage with respect to mental rotation (Linn & Hyde, 1989; Linn & Petersen, 1985). Even mathematical ability, long a province of males, has come to be relatively evenly distributed between boys and girls in non-selective elementary-school populations (Friedman, 1989; Hyde, Fennema & Lamon, 1990). Differences (in favor of boys) appear only in secondary school with respect to mathematical problem solving, and they are largest (about 0.5 SD) in the quantitative component of the Scholastic Aptitude Test (SAT). It should be kept in mind that SAT results are based on the selective population of college aspirants (Cole, 1990; Halpern, 1989; Hyde, Fennema & Lamon, 1990).

The above conclusions are not necessarily generalizable. First, they are based on weighted averages that may not reflect typical findings. For example, the 254 effect sizes included in Hyde, Fennema and Lamon's (1990) meta-analysis of gender differences in mathematics performance ranged between -0.89 and 0.88, with a mean of -0.05. Fifty-one percent of the effect sizes were positive and 43% were negative. It should be stressed that this considerable variation is not entirely attributable to random error. The homogeneity analyses performed by Hyde and colleagues (1990) indicated that the set of 254 effect sizes was heterogeneous in terms of true effect size. Therefore, its representation by means of a single average value is unwarranted and may be misleading.

Second, most if not all the studies included in the meta-analyses were based on North American samples. Yet gender differences in intelligence have been found to vary in both direction and size from one population to another (Born, Bleichrodt & Van Der Flier, 1987; Feingold, 1992; Linn & Hyde, 1989; Maccoby & Jacklin, 1974; Zeidner, 1986). There are, therefore, good grounds to examine the question in other populations and cultures (Feingold, 1992). This is particularly true with respect to gender differences in variability, which are inconsistent across countries: the well established U.S. findings of greater male variability in mathematical and spatial abilities do not always hold true in other cultures and nations (Feingold, 1994).

The present study investigates gender differences among elementary school children in Israel. Existing research on gender differences in Israeli society is scarce and focuses only on mean cognitive ability. Moreover, most of these studies were carried out on voluntary subpopulations, mainly university candidates. For instance, Nevo (1986) and Zeidner (1986) both found a stable advantage for males on the results of university entrance examinations. However, the selective nature of these groups precludes generalization to the Israeli population at large (see also Cole, 1990; Linn & Hyde, 1989). Indeed, Nevo's and Zeidner's findings may be attributed to