LETTER

Sex differences in spatial abilities: Methodological problems in Hoffman et al.

Hoffman et al. (1) claimed to provide evidence that "nurture" (i.e., residing in a patrilineal vs. matrilineal tribe in India) critically affects sex differences in spatial abilities. Unfortunately, their conclusion is undermined by major problems with their measures of spatial ability and sex equality.

The first and biggest problem is with their measure of spatial abilities. "Spatial abilities" are a complex cognitive domain, with facets ranging from location memory (favoring women) to navigation in 3D virtual space (favoring men) (2). The puzzle used by Hoffman et al. (1) is similar to the Object Assembly subtest of the Wechsler Adult Intelligence Scale (3); sex differences on this task are extremely small ($d = 0.10$), at least 10-fold smaller than those found for spatial measures showing the largest sex differences. It is odd that Hoffman et al. (1) chose to investigate sex differences with this kind of sex-insensitive task.

The second problem is the lack of a control task. The insensitivity of the task used by Hoffman et al. (1) suggests that their finding that men outperform women in a patrilineal tribe but not a matrilineal tribe is not related to sex differences in spatial abilities per se but to other factors instead. Education, as they noted, is likely one of these. The use of a cognitive control task tapping nonspatial abilities would have allowed for an assessment of the specificity of the effect, but, unfortunately, such a task was not included.

Third, defining sex equality as matrilineality is problematic, because cross-cultural studies generally show that equality (a multidimensional construct) is not systematically correlated with descent system (4). From the descriptions of Hoffman et al. (1), it appears that women in the matrilineal Khasi have more economic power and better education, but this ignores other sex equality dimensions, such as positions of political and religious leadership, domestic authority, and autonomy. Without such measures, it is unclear whether the Khasi are, in fact, more sex-egalitarian than the Karbi. Furthermore, a recent 53-nation cross-cultural study has shown that sex differences favoring men on validated, reliable, multi-item spatial measures are positively associated with United Nation indices of sex development and empowerment (5), a pattern opposite to that reported by Hoffman et al. (1). For all these reasons, the study by Hoffman et al. (1) failed to support their conclusions.

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