

The fact that there are less female than male engineers and other technology-related professions that require spatial abilities has been attributed often (too often for my taste) to biological differences in the brains of men and women. It is very difficult to look at the effects of nurture in general (how does one control for all possible variables?) and therefore the "nature" camp may seem more "scientific". Very ingenious researchers from the University of California in San Diego have managed to find almost perfect experimental conditions to test the influence of nature vs nurture in spatial abilities of men vs women: two neighboring populations (tribes) in Northern India, virtually genetically identical, but one is a patriarchy, where women cannot own property and receive on average 4 less years of schooling than the men, while the other is matriarchal and girls receive the same education as boys. The test: solving a puzzle that requires spatial reasoning skills; every participant was paid for correctly solving the puzzle as to avoid confusing skill with motivation. The results? Hardly surprising, but I still love it when the evidence is strong: in the patriarchal society, men solved the puzzle 36% faster than women, while in the matriarchal society, there were no differences between the sexes. In addition, in both populations, each year of schooling resulted in 4% faster puzzle solving, indicating that indeed, level of education is key. These data strongly suggest that education in spatial reasoning could reduce the gap in the number of women who study engineering or science-related subjects.

Here is the [abstract of the article](#), just published in PNAS:

Nurture affects gender differences in spatial abilities

± Author Affiliations

1. ^aRady School of Management, University of California at San Diego, La Jolla, CA 92093; and
 2. ^bDepartment of Economics, University of Chicago, Chicago, IL 60637
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Abstract

Women remain significantly underrepresented in the science, engineering, and technology workforce. Some have argued that spatial ability differences, which represent the most persistent gender differences in the cognitive literature, are partly responsible for this gap. The underlying forces at work shaping the observed spatial ability differences revolve naturally around the relative roles of nature and nurture. Although these forces remain among

the most hotly debated in all of the sciences, the evidence for nurture is tenuous, because it is difficult to compare gender differences among biologically similar groups with distinct nurture. In this study, we use a large-scale incentivized experiment with nearly 1,300 participants to show that the gender gap in spatial abilities, measured by time to solve a puzzle, disappears when we move from a patrilineal society to an adjoining matrilineal society. We also show that about one-third of the effect can be explained by differences in education. Given that none of our participants have experience with puzzle solving and that villagers from both societies have the same means of subsistence and shared genetic background, we argue that these results show the role of nurture in the gender gap in cognitive abilities.

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