

# New study disputes notion that men are better at spatial thinking than women

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(PhysOrg.com) -- Throughout much of human history, it has been assumed by both men and women that men are somehow better able to solve so-described spatial problems than are women. This apparent discrepancy has been used to explain the differences in the numbers of men versus women receiving doctoral degrees in the math and sciences, at least in the United States. Now however, new research by Moshe Hoffman, a researcher from the University of California and colleagues suggests that conventional thinking might be wrong. He and his team have published a paper on the *Proceedings of the National Academy of Sciences* that suggests that spatial ability comes more as a result of the environment in which a person is raised, rather than from gender.

Spatial problems are those that exist in the three dimensional physical world, rather than as themes or ideas. Figuring out how to fit randomly shaped objects into a single whole, for example, as is needed in building a stone fence perhaps, shows an ability to imagine how things will fit together as the project moves along, rather than using trial and error, demonstrates spatial reasoning. Spatial abilities are often believed to be a requisite for doing well in math and other sciences, particularly engineering and physics. Thus the debate about inherent gender abilities takes on more meaning in the academic world.

In their study, Hoffman and his team went to India where they found two very similar cultures living very nearly side by side - with one major difference. One was patrilineal (mostly run by males), the other matrilineal (mostly run by females). To test their theory that culture has more to do with spatial ability than gender, they paid 1,279 adult volunteers of both genders from both groups to assemble a wooden puzzle as quickly as they could; a task they believe that requires spatial abilities. They found that men from the patrilineal group performed the task on average 36% faster than women from the same group. With the matrilineal group however, no discernable time difference between the genders was found, indicating, according to the group, that differences in culture lead to differences in ability to solve a spatial problem rather than gender.

Others however are still not convinced; some suggest that assembling a wooden puzzle doesn't truly demonstrate spatial abilities at all since it's actually just a two dimensional puzzle. Others add that the differences found in the study could be due to other cultural differences such as the desire to please.

In either case, the research does show that differences in problem solving abilities can occur due to cultural differences and that more research is needed before making any definitive conclusions one way or the other.

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**More information:** Nurture affects gender differences in spatial abilities, *PNAS*, Published online before print August 29, 2011, [doi:10.1073/pnas.1015182108](https://doi.org/10.1073/pnas.1015182108)

**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.