

Males' superior spatial ability likely is not an evolutionary adaptation

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(Phys.org)—Males and females differ in a lot of traits (besides the obvious ones) and some evolutionary psychologists have proposed hypotheses to explain why. Some argue, for example, that males' slight, but significant, superiority in spatial navigation over females – a phenomenon demonstrated repeatedly in many species, including humans – is probably "adaptive," meaning that over the course of evolutionary history the trait gave males an advantage that led them to have more offspring than their peers.

A new analysis published in *The Quarterly Review of Biology* found no support for this hypothesis.

The researchers, led by University of Illinois psychology professor Justin Rhodes, looked at 35 studies that included data about the territorial ranges and spatial abilities of 11 species of animals: cuttlefish, deer mice, horses, humans, laboratory mice, meadow voles, [pine voles](#), [prairie voles](#), rats, rhesus [macaques](#) and talastuco-tucos (a type of burrowing rodent). Rhodes and his colleagues found that in eight out of 11 species, [males](#) demonstrated moderately superior [spatial skills](#) to their female counterparts, regardless of the size of their territories or the extent to which males ranged farther than females of the same species.

The findings lend support to an often-overlooked hypothesis, Rhodes said. The average superiority of males over females in spatial navigation may just be a "side effect" of testosterone, he said. (Previous studies have shown that women who take testosterone tend to see an improvement in their spatial navigation skills, he said.)

The analysis adds a new dimension to an ongoing debate about the evolutionary significance of some baffling human traits. Rhodes and his colleagues object to "creation stories" that seek to explain sexual phenomena like the female orgasm, rape or menopause by hypothesizing that they evolved because they provided an [evolutionary advantage](#). Some evolutionary psychologists describe rape, for

example, as an alternate mating strategy for males who otherwise are reproductively unsuccessful. Others say menopause evolved in women to enhance the survival of their genes by increasing the time spent nurturing their grandchildren. Some of these hypotheses seem intuitive, Rhodes said. "But these stories generally are not testable."

Researchers tend to overlook the fact that many physical and behavioral traits arise as a consequence of random events, or are simply side effects of other changes that offer real evolutionary advantages, he said.

"For example, women have nipples because it's an adaptation; it promotes the survival of their offspring," Rhodes said. "Men get it because it doesn't harm them. So if we see something that's advantageous for one sex, the other sex will get it because it's inheriting the same genes – unless it's bad for that sex."

Similarly, scientists who claim that the different spatial skills in men and women are adaptive must explain why women failed to inherit the superior spatial skills of their navigationally enhanced fathers, Rhodes said.

"The only way you will get a sex difference (in an adaptive trait) is where a trait is good for one sex and bad for the other," he said. "But how is navigation bad for women? This is a flaw in the logic."

"When people hear arguments made or stories told, particularly about human behaviors being products of adaptation, I think they should ask the question: 'Where is the evidence?'" Rhodes said.

Provided by University of Illinois at Urbana-Champaign

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