

Female guppies with larger brains found to favor more colorful mates

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Male and female guppies (*Poecilia reticulata*). Image: Wikipedia.

(Phys.org)—A team of researchers with members from Sweden and the U.K. has found that female guppies with larger than average brains preferred to mate with males that were more colorful than average compared to smaller brained females. In their paper published in the journal *Science Advances*, the team describes how they bred guppies to develop larger brains and used them for comparison purposes in specially constructed fish tanks.

Prior research has shown that guppies with larger brains are smarter than other guppies—in this new effort, the researchers sought to find out if bigger brains also impacted their choice of mates.

The study consisted of breeding [guppies](#) over several generations selecting for different brain sizes—that resulted in the production of 36 [females](#) with larger than average brains and 36 with smaller than average brains. The team also constructed a special fish tank for the experiment that allowed the females to swim back and forth between two ends where males were held. The males were constrained and thus had to stay in one end of the tank or the other. The researchers then placed males with differing degrees of coloring in either end of the tank and then placed a female in the middle tank. This arrangement allowed the female to visit males on both sides of the tank and then to choose which she found more desirable by spending more time with them, i.e. swimming in their vicinity for longer periods of time.

In comparing how the females behaved in the tank, the researchers found that those with bigger brains showed a strong preference for more colorful males than small-brained females. They noted also that wild average-sized [brain](#) females preferred the more colorful males as well.

The researchers suggest the extra cognitive ability not only allowed the females to keep mental images of the [males](#) in their brains as they swam back and forth between potential mates, but to size them up and to make a choice. They note that a more colorful male is likely an indicator of health as the coloring comes from pigments in the foods they eat; thus, those that are more colorful are more successful at finding food.

More information: Alberto Corral-López et al. Female brain size affects the assessment of male attractiveness during mate choice, *Science Advances* (2017). [DOI: 10.1126/sciadv.1601990](https://doi.org/10.1126/sciadv.1601990)

Abstract

Mate choice decisions are central in sexual selection theory aimed to understand how sexual traits evolve and their role in evolutionary diversification. We test the hypothesis that brain size and cognitive

ability are important for accurate assessment of partner quality and that variation in brain size and cognitive ability underlies variation in mate choice. We compared sexual preference in guppy female lines selected for divergence in relative brain size, which we have previously shown to have substantial differences in cognitive ability. In a dichotomous choice test, large-brained and wild-type females showed strong preference for males with color traits that predict attractiveness in this species. In contrast, small-brained females showed no preference for males with these traits. In-depth analysis of optomotor response to color cues and gene expression of key opsins in the eye revealed that the observed differences were not due to differences in visual perception of color, indicating that differences in the ability to process indicators of attractiveness are responsible. We thus provide the first experimental support that individual variation in brain size affects mate choice decisions and conclude that differences in cognitive ability may be an important underlying mechanism behind variation in female mate choice.

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