College students, fish show surprising similarities in numerical approximation

February 15 2012

Fish are as good at evaluating numerical ratios as college students are, says a study published in the Feb. 15 issue of the open access journal *PLoS ONE*.

Both the fish and the college students had to determine which of two collections of objects was larger. The students played a computerized game in which they chose the display showing more dots, without verbally counting them. The guppies were given the option to join either of two groups of fish, in adjoining tanks to each side; previous work has shown that guppies show a strong preference for larger groups.

The results showed strong similarities between the behaviors of the two species. In both cases, the ability to distinguish between large numbers depended greatly on the ratio between them; for example, it would be easier to choose between 25 and 5 (high ratio) than between 25 and 20 (low ratio). On the other hand, for smaller numbers (up to four), the ratio did not affect the participant's ability to discriminate.

The authors, led by Christian Agrillo of the University of Padova in Italy, write that their results may suggest an ancient evolutionary origin for modern human mathematical abilities.

More information: Agrillo C, Piffer L, Bisazza A, Butterworth B (2012) Evidence for Two Numerical Systems That Are Similar in Humans and Guppies. *PLoS ONE* 7(2):e31923. doi:10.1371/journal.pone.0031923