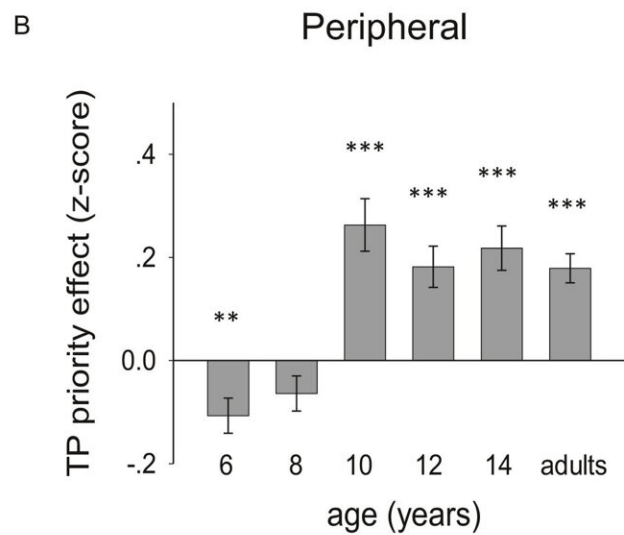
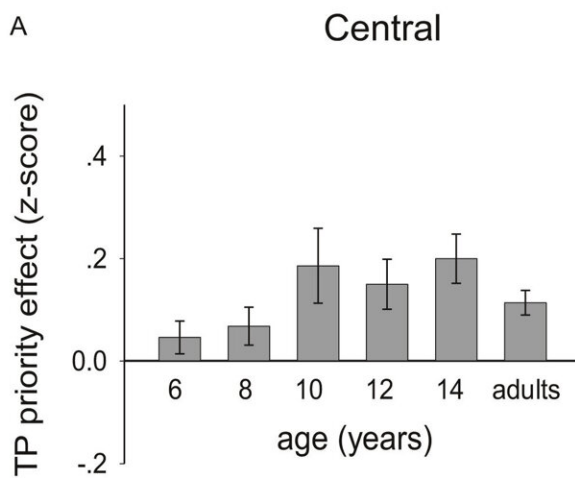


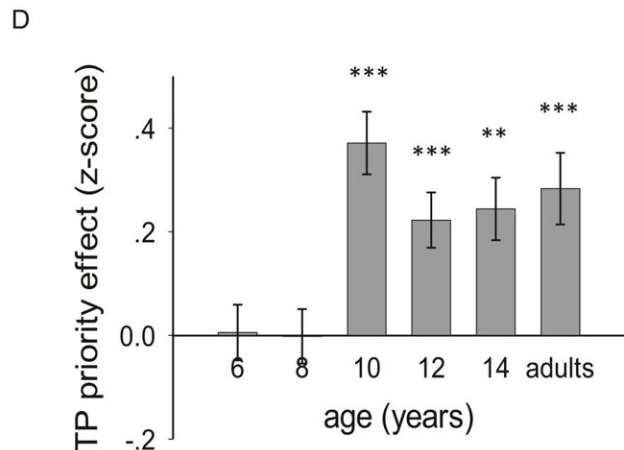
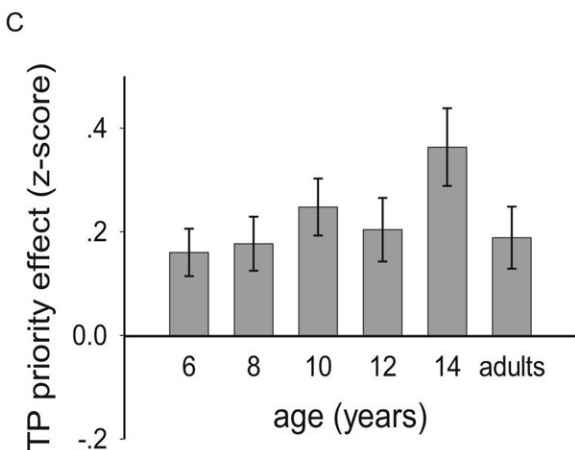
# Children's visual perception continues to develop up to age 10

October 18 2021

## Experiment 1a



## Experiment 1b



Normalized TP priority effects. Mean normalized TP priority effects for the central and peripheral vision for each age group in Experiment 1a (A and B) and

1b (C and D). Normalized TP priority effects (z-score) were computed from the normalized reaction time differences between non-TP and TP trials. Error bars show SEM values. TP = topological property. Credit: DOI: 10.1111/cdev.13629

It is generally believed that children's visual perception basically reaches adults' level at the age of 6–7. But a new study shows that the development of children's visual perception does not stop before the age of 10.

The study, published in *Child Development* on Sept. 27, was conducted by Dr. Huang Yan's group from the Shenzhen Institute of Advanced Technology (SIAT) and Dr. Chen Lin's group from the Institute of Biophysics of the Chinese Academy of Sciences.

Topological property (TP) is a basic geometric attribute of objects, which is preserved over continuous and one-to-one transformations and considered to be processed in early vision.

Human visual system has been shown to be highly sensitive to topological differences in images. Plenty of evidence shows that TP is processed prior to non-TP attributes of a visual stimulus, i.e., TP priority effect.

The flapping wings of a flying bird make the bird's shape changing all the time, but we always perceive it as the same bird. Global topological property of an object is exactly a geometric property that describe the maintaining of unchanged shape during continuous deformation.

The researchers found that the global topological priority in peripheral vision didn't emerge until the age of ~10 and the [development](#) of central and peripheral vision was different.

Evidence showed that children's basic visual functions are similar to adults," although have not fully matured. For example, the spatial contrast sensitivity among 4-year-old children follows a curve similar to that of adults, before reaching the adult level at the age of six to seven.

The researchers investigated the global TP perception of 773 children aged 6 to 14, as compared to 179 adults. The results revealed that adults and children aged 10 or over showed a TP priority trend in both central and peripheral vision, i.e., less time was required to discriminate TP-differences than non-TP-differences. Children aged 6 to 8 showed a TP priority trend for central stimuli, but a reverse trend in their peripheral vision.

The TP discrimination tests provided a unique window into the development of the early stages of visual processing in children. This study discovered a significant difference in topological processing in peripheral [vision](#) between adults and [children](#) under the age of 10, which suggested that the global topological [priority](#) in [peripheral vision](#) does not emerge until the age of ~10.

**More information:** Hongsi Tang et al, Late Development of Early Visual Perception: No Topology-Priority in Peripheral Vision Until Age 10, *Child Development* (2021). [DOI: 10.1111/cdev.13629](https://doi.org/10.1111/cdev.13629)

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