Shape perception in brain develops by itself

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Despite minimal exposure to the regular geometric objects found in developed countries, African tribal people perceive shapes as well as westerners, according to a new study.

The findings, published online this week in *Psychological Science,* suggested that the brain's ability to understand shapes develops without the influence of immersion in simple, manufactured objects.

"In terms of perceiving the world … either genetics or the natural world will give you the right type of experiences," said lead author Irving Biederman, an expert on perception who holds a named chair in neuroscience at the University of Southern California's College of Letters, Arts and Sciences.

Biederman and his team specifically measured subjects' sensitivity to "non-accidental" properties of objects, such as whether they have straight or curved edges.

A theory of shape recognition developed by Biederman holds that the brain is more sensitive to non-accidental properties - which stay the same as an object rotates in space - than to metric properties, such as degree of curvature, that do appear to vary with orientation.

In one experiment, subjects were asked to identify which of two geometric objects was an exact match to a sample object. The one that didn't match differed either in a non-accidental or metric property.

The researchers found that Western college students and members of the semi-nomadic Himba tribe of northwestern Namibia, a rural area bordering Angola, both showed greater sensitivity to non-accidental properties.

The findings have an incidental implication: Parents can probably toss the beloved shape sorter on the large heap of educational toys toddlers do not really need.

Shape sorters may have other potential benefits such as fine motor training. And some children simply enjoy them. But Biederman questioned the main advertised benefit of the toys.

"Your kids will grow up being able to see shapes just fine without specific training," he said.

Most members of the Himba have never seen a computer or television, do not use a phone and have only handmade tools, Biederman said.

The Himba also lack words for many shapes, including squares, circles and triangles.

Nevertheless, Himba and university student volunteers responded virtually identically to variations in shape in sorting experiments on a laptop computer.

"The bottom line is that the Himba differ not at all from individuals living in what is, arguably, the most artifactual of environments [Los Angeles]," the authors stated.

"The experiment offers, to our knowledge, the most rigorous assessment of the effects of exposure to modern artifacts on the representation of shape."

The research team went deep into tribal territory to find nomadic groups that would have had almost no contact with manufactured objects. Each six-day excursion in a four-wheel drive vehicle took the research team a full day's drive or more from Opuwo, the last township on the edge of Himba lands.

More information:
• The Psychological Science study is available at www3.interscience.wiley.com/jo … rnal/121537669/issue
• A related study in the journal *Visual Cognition* is available at www.informaworld.com/smpp/cont … 80/13506280802507806

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