Background

- Generalized cones provide a good model of recurring shape elements in the world.
- Geons are distinguished by non-accidental (= viewpoint invariant) differences in the dimensions of generalized cones.

- Both humans (Stanckiewicz, 2002) and cells in macaque IT cortex (Kayaert, Biederman, & Vogels, 2005 [above left]) have been shown to be independently sensitive to dimensions of generalized cones, such as axis curvature, aspect ratio, and taper.

The Himba are a semi-nomadic tribe in Northwestern Namibia with minimal contact with Western artifacts.

The Question

Would people raised in a much less "geonic" environment show the same sensitivity?

- The sensitivity of both the Himba and USC students to underlying dimensions of generalized cones suggests that such sensitivity does not require immersion in a geonic environment.

Experimental Task: texture segregation

- Subjects viewed a 5x5 array of shapes that differed metrically in both aspect ratio (thick vs. thin) and axis curvature (high vs. low), defining two fields that differed in either a single dimension (with the other varying randomly), or in two dimensions.

The subjects' task was to indicate whether the boundary, which could be between the second or third column or row, was vertical or horizontal.

- All displays were composed of the same four shapes; orientation and size of each shape varied randomly. Feedback was provided after each trial in the form of a green line over the correct divide.

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Conclusions

- For both Westerners (USC students) and the Himba, the conjunction task was markedly more difficult (higher error rates and longer RTs) than the single dimension tasks.
- The sensitivity of both the Himba and USC students to underlying dimensions of generalized cones suggests that such sensitivity does not require immersion in a geonic environment.

Results

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