CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY

Name(s)
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Project Number
J0399

Project Title
Visual Perception: Do Children and Adults See Visual Images Differently?

Abstract

Objectives/Goals
My objective was to learn if children and adults see visual images differently.

Methods/Materials
At first, I showed a variety of images to 21 subjects of different ages. I found that children may be more likely to see in two dimensions and adults more likely to see in three dimensions. I found that children may perceive upside down images differently than adults. I conducted a second phase of research focusing on two dimensional, three dimensional, and upside down images. All surveys were conducted in a consistent manner.

Results
I found that children are more likely to see in two dimensions while adults are more likely to see in three dimensions. Based on the survey results, this conclusion is statistically significant at high confidence levels for several visual images. For example, for 3D Image #1, 8 of 25 children saw the 3D image, while 17 of 25 adults (68%) saw it. This difference in sample proportions is statistically significant at the 95% confidence level but not at the 99% confidence level. Another example is the Cubes and Arrows Image where the cubes are shown in 3D and the arrows in 2D. 50% of the children and only 29% of the adults see the arrows which is a statistically significant difference in sample proportions at the 95% confidence level but not at the 99% confidence level. Young people are more likely to see in two dimensions while adults are more likely to see in three dimensions.

I found that young people see upside down images differently than adults. For example, for the Upside Down Pie Image, 15 of 20 children (75%) see the whole pie with one slice missing. Only 5 of 20 adults see this image, with the other 75% of adults seeing the one slice of pie. This difference in sample proportions is statistically significant at the 99% confidence level.

I am currently conducting more interviews with additional images.

Conclusions/Discussion
Children are more likely to see an image in a two-dimensional way, and adults are more likely to see an image in a three-dimensional way. Children see upside down images differently than adults. These findings are statistically significant and are not documented in the literature. When adults prepare images for children to view, they should take into account these differences in visual perception. These results may be meaningful to testing performed to diagnose neurological disorders.

Summary Statement
Children and adults perceive visual images differently.

Help Received
My father taught me how to do statistical analysis of sample proportions.