

Greater San Diego Science and Engineering Fair 2015 PROJECT SUMMARY

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Project Title:

The Hand Span Journey: A Comparison of Peripheral Vision Ability in Those of Different Ages

Abstract

Objectives/Goals

The objective of this experiment is to test and compare the peripheral vision abilities between different age groups of children, teenagers, adults, and elders.

Hypothesis

Based on previous experiments, the average peripheral angle will be first observed at 13 degrees for children, 18 degrees for teenagers, 25 degrees for adults, and 40 degrees for elders. For 85% of the subjects, the color red will be easiest to see, then green, then blue.

Methods/Materials

The materials needed for this experiment were a vision protractor and three different colors on wooden sticks: blue, green, and red. The vision protractor is shaped like a semicircle with a diameter of two feet, and a small semicircle with a diameter of one inch was cut out on the middle of the edge of the protractor to make a place for the nose of the test subject to be during testing. There were 120 test subjects, 4 groups and 30 people in each group. First, the age and gender of the test subject was recorded. Then the vision protractor was put on their nose, and one of the colors was randomly moved around the curve of the protractor until the test subject first saw the color out of the corner of their eye. The subjects were tested on the left and right side of their indirect sight, and there were three trials per color.

Results

There were several differences in overall assessment among the age groups for the color responses. On the right side of indirect eyesight, the average degrees of loss in overall assessment were 15.748 ± 4.065 degrees for the child group, 14.087 ± 4.626 degrees for the teenage group, 19.318 ± 6.013 degrees for the adult group, and 28.225 ± 9.776 degrees for the elder group. The average degrees of loss on the left side were 14.925 ± 3.624 degrees for the child group, for the teenager group the average was 14.925 ± 4.393 degrees, 20.614 ± 7.361 degrees for the adult group, and 27.385 ± 10.094 degrees for the elder group. Based on these results, the teenager group had the largest peripheral vision ability, then the child group and the adult group. The elder group had the lowest. The color blue was easiest to see, followed by red. The color green was hardest to see.

Conclusions/Discussion

The results for the children were a bit lower than the hypothesis, but it was much closer than the other groups. The teenagers did better than expected by about 4 degrees on both sides, as did the adults by about 5 degrees. The elders did much better than the hypothesis, by more than 10 degrees but were still the lowest in their peripheral vision ability.

Summary Statement

In this experiment, 120 people divided into four groups were tested for their peripheral vision abilities, and the results of each group were compared.

Help Received

Dr. Stuart Anstis was my mentor and gave me knowledge about peripheral vision, my parents and sister recorded data into a notebook while I tested subjects, and my science teacher, Mrs. Gillum, helped me with writing.