CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

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Project Number
J0304

Project Title
Spatial Ability vs. Sense of Direction

Abstract

Objectives/Goals
The objective is to determine if a person's spatial ability is related to his/her sense of direction.

Methods/Materials
Each subject was given a 3-part spatial test and a 2-part sense of direction test.
Spatial test A: 2D to 3D mapping test
Spatial test B: 3D rotation test
Spatial test C: 2D memorization test
Direction test A: A test where the subject is given a map with starting and ending points to study for up to 10 minutes. Then, they have to take us to the given destination without the map.
Direction test B: A test where the subject has to retrace a route on Stanford campus. They had been taken through this route about 1½ hours before, but were unaware that this was part of the test.
We also created a scoring rubric that was used with the sense of direction tests.

Results
Subjects with good spatial test A scores did well on the direction tests.
Poor spatial test A subjects' sense of direction score varies from high to low.
There was no subject with a high spatial score but low sense of direction score.
Spatial test B is too short.
Spatial test C is too easy.

Conclusions/Discussion
A person with a good spatial ability always has a good sense of direction. However, a person with a good sense of direction may not have a good spatial ability. From this project, we learned that one section of our spatial test practically controlled the score of the test. The other parts of the spatial test had too few problems or were too easy and didn't have significant contributions to the overall spatial ability score. We realize that one skill, the ability to transform 2D objects into 3D objects in your mind, determined most of the spatial test score.

Summary Statement
This project finds out if spatial ability and sense of direction are related.

Help Received
We received help from our parents who drove the subjects between their homes and the test site on Stanford University Campus. Another major contribution was, of course, the subjects who voluntarily gave up time to take our tests.