CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
J1001

Project Title
Are There Genetic Relationships between Fingerprints in a Family?

Abstract

Objectives/Goals
The purpose of my project was to prove that the commonly held belief "fingerprints are not hereditary" and "fingerprints are completely random" is false.

Methods/Materials
I collected fingerprints from my relatives, my neighbor's family, and other people from different backgrounds and races. I had the participants place their thumbs on an inkpad then onto a piece of paper. I looked at each of the fingerprints and made a chart categorizing the fingerprints by the features they possessed. I compared people of different relationships and found how many features their fingerprints had in common and found the average number for each of the six groups I analyzed.

Results
Parents and children had an average of 5.06 features in common. Siblings had an average of 4.72 features in common and grandparents had an average of 3.90 features in common with their grandchildren. The parents and children group was further analyzed to determine the contribution of fingerprint features from one parent to the child compared to the other parent. The parents could be divided into groups with an average of 6.62 features in common with their child for the "dominant parent" group and an average of 3.69 features in common for the "less dominant parent" group. In contrast, non-related people had the lowest number of features in common with only an average of 2.66.

Conclusions/Discussion
The data shows that there is indeed a relationship between fingerprints of people in a family. All of the groups of related people had more features in common than non-related people. The data also suggests that fingerprints are passed down to a child in many cases through one parent more than the other parent, which is a typical pattern indicating the features are hereditary.

Summary Statement
I analyzed the patterns of fingerprints of people of various relationships to see if there was a genetic relationship or if fingerprints were completely random.

Help Received
Parents helped me make the family trees using the "Reunion" program.