

Literature Review:

Fingerprint Similarity Between Siblings and Biological Parents

Every human being has a different fingerprint because we are all composed of different DNA. Since families share similar DNA, does this mean that families share similar fingerprints as well? Many studies have been done in both the past and present to figure out fingerprint similarities between siblings and biological parents. Human fingerprints consist of many different patterns and all have unique minutiae that make them different. There is an inheritable quality in familial fingerprints in some cases but not all. If fingerprint similarities are found between families it could potentially help decipher a criminal by checking their fingerprints with a biological family member.

A fingerprint is a pattern of marks on the tip of a finger. Fingerprints are taken with ink and are used for means of identification (Science Project 2006 Web). There are three main patterns of fingerprints; loops, arches and whorls. Within these three patterns there are many different types such as double loops and a combination of patterns (Fingerprint Samples Web). Within fingerprints there are many different minutiae that differentiate one fingerprint from another. Minutiae are the tiny details of the fingerprint. Some examples include bifurcations, bridges and forks (Performance Web). No two fingerprints are identical and are unique to each individual (Fingerprints Web).

Fingerprints provide a very reliable source of identification because no two people have the same fingerprint. Fingerprints are often used in the investigation of crimes because of how unique they are and the fact that they do not change over time (Fingerprints Web). Police officers use the fingerprints found at a crime scene and compare them to the fingerprints of the suspects that are already in police files (Fingerprint Evidence Web). Comparing a family member's fingerprints to a suspect in a case could pose helpful because it would give the police a person to talk to about the whereabouts and life of the suspect.

A big question regarding fingerprints is whether or not identical twins share identical fingerprints. Identical twins come from the same fertilized egg and share the same genetic material but there is one definite thing that sets them apart, their fingerprints (O'Connor Web). Fingerprints stay the same throughout a person's life unless they permanently scar them (Fingerprints Web). Fingerprints develop during the fetal developments stage. The tension and pressure within the womb create the ridge and pattern on the finger. This is the reason why no two fingerprints are identical because each womb is different (Do Family Web).

Many people believe that fingerprints are “completely random” and are not hereditary. Studies have been done to prove these beliefs false. Studies and data show that there is indeed a relationship between family members fingerprints. The groups of related people show to have more similarities than groups of non-related people. Data shows as well that it is more likely for a child to receive fingerprint patterns from one parent more so than both showing hereditary similarities (Alder Web). Since families

share similar DNA, they also share very similar fingerprints due to the genes passed down from generation to generation (Slatius Web). Genetics helps determine the general patterns on a fingertip (O'Connor Web).

Family fingerprints are compared by recognizing first the pattern of the ridges such as loop, whorl or arch. Noting these patterns helps determine who the child got their fingerprint patterns from, mother or father (Alder Web). Despite the similar or exact patterns on the fingerprint it is the tiny details that set them apart. Not all differences can be seen directly on the finger (Fingerprint Samples Web). Fingerprinting is done to discover the minutiae and to see if the family has similar prints (Watson Web). Fingerprinting helps not only investigators in a crime scene but also helps a person realize how they are truly unique and unlike any other human.

Bibliography

- Adler, Jacob B. "Are There Genetic Relationships between Fingerprints in a Family?" *Are There Genetic Relationships between Fingerprints in a Family?* (n.d.): n. pag. Web. 18 Nov. 2014. <<http://www.usc.edu/CSSF/History/2003/Projects/J1001.pdf>>.
- "Do Family Members Have Similar Fingerprints?" *Do Family Members Have Similar Fingerprints?* N.p., n.d. Web. 18 Nov. 2014. <<http://www.dermatoglyphics.com/family/>>.
- "Fingerprint Evidence in Criminal Cases | Nolo.com." *Nolo.com*. N.p., n.d. Web. 18 Nov. 2014. <<http://www.nolo.com/legal-encyclopedia/fingerprint-evidence-what-you-need-29818.html>>.
- "Fingerprint Samples & How to Classify Them." *Fingerprint Samples & How to Classify Them*. N.p., n.d. Web. 18 Nov. 2014. <http://shs2.westport.k12.ct.us/forensics/04-fingerprints/fingerprints_handout.htm>.
- "Fingerprints." *Crime Library*:. N.p., n.d. Web. 17 Nov. 2014. <<http://www.crimemuseum.org/crime-library/fingerprints>>.
- O'Connor, Anahad. "REALLY?" *The New York Times*. The New York Times, 01 Nov. 2004. Web. 18 Nov. 2014. <http://www.nytimes.com/2004/11/02/health/02real.html?_r=1&>.
- "Performance of Fingerprint Recognition System in Maritime Environment." : *What Are Fingerprint Minutiae*. N.p., n.d. Web. 18 Nov. 2014.

<<http://fingerprint-maritime.blogspot.com/2009/01/what-is-fingerprint-minutiae.html>>.

"Science Project 2006." *Science Project 2006*. N.p., n.d. Web. 18 Nov. 2014.

<<http://www.selah.k12.wa.us/soar/sciproj2006/HannahR.html#Research>>.

Slatius, H. M., M. B. Katznelson, and B. Bonne-Tamir. "The Inheritance of Fingerprint Patterns." N.p., n.d. Web. 18 Nov. 2014.

<<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1685016/>>.

Watson, Stephanie. *HowStuffWorks*. HowStuffWorks.com, n.d. Web. 18 Nov. 2014.

<<http://science.howstuffworks.com/fingerprinting1.htm>>.