



Criminalistics Section – 2010

A198 Evaluation of Individualization of Shoe Wear Patterns

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After attending this presentation, attendees will have a greater appreciation for the amount of wear necessary to change a shoe print from class evidence to individual evidence.

This presentation will impact the forensic science community by providing information about the effects of wear, weight, gender, and sole tread on shoe wear patterns. It is expected that these factors contribute to the individualization of wear patterns. This information could be used to assist in the evaluation of shoe prints and impressions at crime scenes.

Shoe print evidence is found at a significant number of crime scenes each year. Two-dimensional footwear prints are often found in dust, blood, and oil. They can also be found on glass, paper products, and human skin. Three-dimensional impressions can also be found. Random wear patterns affect the impressions found at scenes; however, this study focuses on shoe prints. Some of these prints may be class evidence while many others are individual evidence. If the footwear evidence found at a crime scene is class evidence then it is difficult to draw definitive conclusions. However, if the footwear evidence is found to be individual, then it could link that pair of shoes to the scene and possibly the individual who wore the shoes. The class evidence of shoe prints can be transformed into individual evidence based on random wear patterns.

In this study, nine subjects were given new sneakers to be worn at their discretion. Of the nine subjects, there were three males and six females. Three of the females wore the same size and model New Balance sneakers. The remaining females wore the same Reebok model; two of the three females wore the same size shoe. Two of the men wore the same model of Champion sneakers in different sizes. The third man wore a pair of Asics sneakers. The shoe wear patterns were tracked through weekly prints taken with black magnetic powder while the subjects wore the shoes. The subjects were asked to take a typical step, as if while walking. These prints were photographed with a scale, as well as preserved using hairspray and protective covers. Shoe prints were compared using transparencies. Individuals' prints were compared to their own earlier prints, and weekly prints were compared between individuals.

The study resulted in distinct wear patterns between individuals' shoes. The weight and gender of the subject also seemed to influence the time required for the wear patterns to become individualized. One subject had a distinctive gait which produced an unusual wear pattern. While the other subjects' left and right shoe patterns were very similar, this individual's shoe patterns differed significantly between feet. **Shoe Prints, Random Wear Patterns, Individual vs. Class Evidence**