A65 Assessing the Quantity of Friction Ridge Characteristics as a Function of Human Perception

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After attending this presentation, attendees will understand the degree of variation in the perception and interpretation of friction ridge skin characteristics by Ten-Print and Latent Print Examiners.

This presentation will impact the forensic science community by discussing the variation in the quantity of friction ridge skin characteristics as perceived and interpreted by practicing Ten-Print and Latent Print Examiners.

Friction ridge skin characteristics (bifurcations, ridge endings, dots) and their unique arrangements are the primary information content evaluated by Ten-Print and Latent Print Examiners when comparing unknown friction ridge skin impressions to known (record) impressions. During the comparison process, the information content (characteristics) of these friction ridge skin impressions are perceived and interpreted by the human examiner. This study seeks to understand the variability associated with the human perception of friction ridge skin characteristics.

Fifty (50) high quality friction ridge skin impressions were evaluated and the quantity of friction ridge skin characteristics (bifurcations, ridge endings, dots) were reported by eight practicing Ten-Print Examiners and fifteen practicing Latent Print Examiners (total n=23). Each impression was prepared by the same individual recording the impressions under controlled conditions from nine different donors using standard black printers ink and a standard fingerprint card. Each impression was scanned into a digital format at 1,200 dpi and image samples used in the evaluation were cropped from various areas in the fingerprints at a set size of 6x6mm^2. Of the fifty impressions, two pairs of impressions were duplicate images to assess any variation in perception from the beginning of the study to the end of the study. Each of the fifty impressions was presented to the study participants in a digital format for evaluation. Examiners were asked to count and record how many bifurcations, ridge endings, and dots are perceived and interpreted by them for each impression.

Preliminary results from these twenty-three participants reveal more variation than expected in the perception and interpretation of friction ridge skin characteristics. Statistical analyses found no significant difference in the perception of friction ridge skin characteristics due to gender, age (<40yrs vs >40yrs), experience (<10yrs vs >10yrs), and specialty (Ten-Print Examiner vs. Latent Print Examiner). A slight variation was observed in the quantity of friction ridge characteristics perceived in the two pairs of duplicate images; however these variations were not statistically significant.

Preliminary results suggest the information content relied upon by Ten-Print and Latent Print Examiners may vary due to perception and interpretation differences by the human examiner. These preliminary results warrant further research to compare with computer based interpretations using the automated fingerprint identification system, to better understand the inter-examiner variability, and to determine whether these results have any impact on the conclusions generated during the comparison process.

The opinions or assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the Department of the Army or the Department of Defense.

Forensic Science, Fingerprint Characteristics, Fingerprint Perception

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