A206 Forensic Latent Fingerprint Decisions: How Accurate Are They?

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The goal of this presentation is to inform attendees of the results of this large-scale study of latent print examiner accuracy and to demonstrate the feasibility of the "black box" model for objectively assessing the accuracy and effectiveness of forensic examiners.

This presentation will impact the forensic science community by serving as a preliminary step in demonstrating potential areas of strength and weakness within the latent fingerprint discipline as well as offer some objective measures to support admissibility requirements.

Despite over one hundred years of the forensic use of fingerprints, the accuracy of decisions made by latent fingerprint examiners has not previously been ascertained in a large-scale study.[1] Recently, there has been increased scrutiny of the discipline resulting from publicized errors and a series of court admissibility challenges to the scientific basis of fingerprint evidence.[2-5] In response to the misidentification of a latent print in the 2004 Madrid bombing, a Federal Bureau of Investigation (FBI) Laboratory review committee evaluated the scientific basis of friction ridge examination.[6] That committee recommended research, including the study described in this report: a test of the performance of latent print examiners.[7] The need for evaluations of the accuracy of

fingerprint examination decisions has also been underscored in critiques of the forensic sciences by the National Academy of Sciences (NAS) and others.[8-11] This study is based on a black box approach, evaluating the examiners' accuracy and consensus in making decisions rather than attempting to determine or dictate how those decisions are made.

This study evaluated examiners on key decision points during fingerprint analysis, comparison, and evaluation. One-hundred and sixty- nine latent fingerprint examiners were tested, each of whom compared approximately 100 pairs of latent and exemplar fingerprints randomly drawn from a pool of 744 pairs. The pool was constructed to be representative of difficult comparisons from searches of an automated fingerprint identification system (AFIS) containing more than 58 million subjects. The fingerprints were selected to include a range of attributes and quality encountered in forensic casework. Latents of low quality were included in the study to evaluate the consensus among examiners in making value decisions about difficult latents. Image pairs were selected to be challenging: mated pairs were randomly selected from the multiple latents and exemplars available for each finger position; non-mated pairs were based on difficult comparisons resulting from searches of AFIS.

Examiners frequently differed on whether fingerprints were suitable for reaching a conclusion. More than 99.8% of individualization decisions were correct, and 86.6% of exclusion decisions were correct. Procedures used operationally to reduce the possibility of error would have improved these rates, such as examination of original evidence or paper fingerprint cards, review of multiple exemplars from a subject, consultation with other examiners, revisiting difficult comparisons, verification by another examiner, and quality assurance review.

A follow-up study of the repeatability of latent print examiners' decisions (intra-examiner variability) was also conducted, in which examiners were presented with image pairs that they had assessed weeks or months previously as part of this research effort.

The results of these studies, as well as the applicability of the black box test model for assessing examiner performance in other forensic disciplines, will be discussed.

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