B117   A Field Analysis of Laboratory Case Processing: Latent Print Comparison and Examiner Conclusions

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Learning Overview: The goal of this presentation is to educate attendees about typical real-world procedures and conclusions spanning one calendar year within a large latent print comparison unit. This presentation will also explore sources of variability in sufficiency and identification conclusions.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by expanding upon a very limited research base and discussing how results can shape future research, policy, and professional practice. Attendees will be encouraged to introspect upon common practices within their own and their laboratory's casework.

Research examining the efficacy and reliability of latent print comparison has expanded in recent years in response to scholars highlighting the need for additional empirical support for many forensic science disciplines and calling attention to potential contextual effects in analytic conclusions.[1,2] A small body of research has attempted to elucidate the error rates of latent print comparison as a forensic discipline, and a growing body of research has examined the influence of contextual effects upon latent print comparison, suggesting that a number of task-irrelevant factors can influence conclusions.[3-7] However, almost no research has examined actual latent print casework to first determine typical analysis procedures and outcomes. Beyond the potential influence of contextual effects, broad examination of actual laboratory case processing is sorely needed, yet lacking.

Per research, there has been only one study of real-world outcomes in latent print comparison.[8] The current study sought to expand upon that study by achieving the following: (1) describe the casework completed by latent comparison examiners in a large laboratory over the course of one calendar year (i.e., 2018); (2) describe the prevalence of examiner conclusions during one year; (3) explore whether examiner conclusions vary according to casework variables such as latent print type, offense type, or Automated Fingerprint Identification System (AFIS) system use; and (4) explore the extent to which there are examiner differences in examiner conclusions and case processing. Researchers examined all latent print cases with reports dated 2018 within a large crime laboratory in Texas. In total, 17 latent print examiners submitted reports in 2018. All examiners were certified by the International Association for Identification, and work experience ranged from 5 to 36 years.

This presentation will provide detailed charts and statistics summarizing requests for latent print comparison and examiners' subsequent conclusions during 2018. In brief, the latent print unit addressed 3,239 analysis requests relating to 2,975 cases in 2018. Of the cases, 23.7% were person offenses. Of the 20,494 individual prints examined in 2018, 44.8% were deemed to be of sufficient quality to enter into AFIS. Few prints (1.7%) were deemed to have comparative value but be of insufficient quality to enter into AFIS. Slightly more than half (53.5%) of all prints were determined to have no comparative value.

Houston Forensic Science Center (HFSC) research examiners conducted 11,812 AFIS searches during 2018. Most searches were conducted at the county level (65.0%). State-level (16.9%) and federal-level (18.1%) AFIS searches were equally common. Most AFIS searches did not result in potential identifications (77.8%). Indeed, only 22.2% of AFIS searches resulted in potential identifications. As will be shown in a flowchart, 12.7% of all examined prints resulted in potential identifications.

This presentation will also describe the variability within sufficiency determinations and AFIS outcomes. For example, print type was significantly associated with sufficiency determinations (i.e., prints deemed to be of insufficient quality for AFIS entry were 2.78 times more likely to be unspecified impressions). Finally, this presentation will detail individual differences among 14 latent print examiners. For example, examiners completed between 12 and 46 requests each month, examining between 66 and 269 prints. Some examiners opined that one of every three examined prints (35.8%) were of sufficient quality for AFIS entry whereas others opined that 56.5% were of sufficient quality. Moreover, some examiners concluded preliminary AFIS associations for 13.3% of entered prints whereas others were two times as likely (27.1%) to conclude that an AFIS association existed.

Taken together, the current findings are among the first to describe typical, real-world casework completed by a latent print comparison unit. Results suggest variability in examiner conclusions that may be partially explained by AFIS system, print type, offense type, and individual differences. Given the lack of research examining influences upon real-world latent print conclusions, it is critical to continue examinations of crime laboratory casework and determine the extent to which external information may be associated with conclusions.

Reference(s):

1. National Academy of Sciences. *Strengthening Forensic Science in the United States: A Path Forward.* (2009). Washington, DC: National Academies Press.
2. President's Council of Advisors on Science and Technology. *Report to the President: Forensic science in criminal courts: Ensuring scientific validity of feature-comparison methods.* (2016). Washington, DC: Executive Office of the President of the United States.
3. Ulery, B.T., A. Hicklin, J. Buscaglia, and M.A. Roberts. (2011). Accuracy and reliability of forensic latent fingerprint decisions. *Proceedings of the National Academy of Sciences of the United States of America* 108,(2011): 7733-7738.
4. Pacheco, I., B. Cerchiai, and Stephanie Stoiloff. *Miami-Dade research study for the reliability of the ACE-V process: Accuracy & precision in latent fingerprint examinations.* (2014). Retrieved from www.ncjrs.gov/pdffiles1/nij/grants/248534.pdf.
5. Dror, I.E., and D. Charlton. Why experts make errors. *Journal of Forensic Identification* 56, (2006): 600-616.
6. Dror, I.E., A.E. Péron, S. Hind, and D. Charlton. When emotions get the better of us: The effect of contextual top-down processing on matching fingerprints. *Applied Cognitive Psychology* 19, (2005): 799-809.
7. Langenburg, G., C. Champod, and P. Wertheim. Testing for potential contextual bias effects during the verification stage of the ACE-V methodology when conducting fingerprint comparisons. *Journal of Forensic Sciences* 54, (2009): 571-582.
8. Rairden, A., B.L. Garrett, S. Kelley, D. Murrie, and A. Castillo. Resolving latent conflict: What happens when latent print examiners enter the cage? *Forensic Science International* 289, (2018): 215-222.

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