



B145 Determining the Confidence of Fingerprint Examiners at Various Steps in the Analysis, Comparison, Evaluation-Verification (ACE-V) Method

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Learning Overview: After attending this presentation, attendees will be familiar with the limited published information regarding the Analysis, Comparison, Evaluation-Verification (ACE-V method) used for fingerprint examination, contributing to a lack of trust or to hesitancy about the findings of analysts who use this method. This study will provide a better understanding of the decisions being made by fingerprint examiners, and their confidence in those decisions, and will help to further validate the use of the ACE-V method.

Impact on the Forensic Science Community: This research will impact the forensic science community by providing a better understanding of the details that make up the complex and unstandardized process of the ACE-V method and its use by fingerprint examiners.

The ACE-V method is the most common procedure used by fingerprint examiners to analyze a fingerprint found at a crime scene (unknown donor) and comparing it with a fingerprint in a database (known/exemplar).¹ One problem with this procedure is that there is not a set list of steps to follow that is consistent among all fingerprint examiners; there is not a clear definition of what each step entails, and few steps are standardized.²

A problem with this lack of detail and standardization is that each fingerprint examiner, even those from the same agencies, find different 'points' of comparison to match the fingerprints. Points are the areas of a print identified in the unknown print and are matched to those in the exemplar print. These differences in the identification of critical points show the variability of each examiner. Because of this variation in the determined points of comparison, the use of fingerprints as evidence has become scrutinized.³

For these reasons, understanding the confidence of fingerprint examiners, at various points throughout the ACE-V method, will help the support the use of this method in a court of law.

This study has four research questions:

1. What is an examiner's level of confidence at various decision points of the ACE-V method, including after determining how many points for comparison exist within the presented fingerprint?
2. Does this level of confidence at each decision point vary depending on level of training?
Hypothesis: The more experience an examiner has, the higher their reported confidence level when compared with those examiners with fewer years of practice.
3. Does the number of points of comparison identified vary depending on level of training?
4. Does experience impact the conclusion at each decision point of the ACE-V method?

To answer these questions, an online survey will be used to ask fingerprint examiners questions about fingerprint images that appear before them. Requests for participation in the study will be submitted through a variety of various forensic science and criminalistics organizations. The fingerprint stimuli for this study were created under the guidance of current fingerprint examiners and pretested before final dissemination of the survey. The survey includes questions about participants' occupation, years of experience as a fingerprint examiner, the suitability for comparison of the presented fingerprint, the number of points that are found for comparison, and how confident examiners are in their decisions.

Data collection will be completed by January 2019. Anticipated findings include that those fingerprint examiners with more training and experience in using the ACE-V method will find more points of comparison within fingerprint(s) to justify their decisions (i.e., match, exclusion, inconclusive) and will be more confident in those decisions. These anticipated findings will guide future directions for research involving fingerprint examination and the ACE-V method, including discussion of the methodological and practical implications for generating empirical knowledge in this area.

Reference(s):

1. Sarah V. Stevenage and Christy Pitfield. "Fact or Friction: Examination of the Transparency, Reliability and Sufficiency of the Ace-V Method of Fingerprint Analysis." *Forensic Science International* 267 (August 2016):145-56, <http://dx.doi.org/10.1016/j.forsciint.2016.08.026>.
2. Glenn Langenburg, Christophe Champod, and Pat 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, no. 3 (May 2009): 572-82, <https://doi.org/10.1111/j.1556-4029.2009.01025.x>.
3. Bradford T. Ulery, R. Austin Hicklin, Maria Antonia Roberts, and JoAnn Buscaglia. "Interexaminer Variation of Minutia Markup on Latent Fingerprints." *Forensic Science International* 264 (March 2016): 89-99, <http://dx.doi.org/10.1016/j.forsciint.2016.03.014>.

Fingerprints, ACE-V, Decision-Making Confidence