OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need: Examiner Reliability Study: Black and White Box Studies on Bloodstain Pattern Analysts

Keyword(s): Bloodstains, Bloodstain Patterns, Conclusions, Classification, Analysis, Variability, Accuracy, Error

Submitting subcommittee(s): Bloodstain Pattern Analysis Date Approved: 1/5/17

(If SAC review identifies additional subcommittees, add them to the box above.)

Background Information:

1. Description of research need:

Evaluate the variability of results provided by practicing bloodstain pattern analysts when making pattern observations, pattern classifications and reconstruction of test samples. Additionally, evaluate the variability of results provided by practicing bloodstain pattern analysts when conducting classifications of bloodstain pattern test samples. The research outcomes should do some or all of the following: (1.) Quantify intra-analyst and inter-analyst variability as a function of the quality/quantity of the evidence provided, (2.) Quantify intra-analyst and inter-analyst variability as a function of the test taker’s education and discipline-specific training and experience, (3.) Identify aspects of the evaluation and classification process and evidence that are sources of consistency in reporting conclusions, (4.) Identify aspects of the evaluation and classification process and evidence that are sources of variability in reporting conclusions, (5.) Elucidate the process by which analysts observe, classify and reconstruct bloodstain patterns (e.g., quality, sufficiency, etc.). Note: Practitioner involvement in providing subject matter expertise during the planning phase of this research is highly encouraged in order to ensure that the research outcomes have applicability to casework, and the test samples are as realistic as possible under the research constraints.

2. Key bibliographic references relating to this research need:


Additional relevant research is provided in the ADDENDUM.

3a. In what ways would the research results improve current laboratory capabilities?

The results of this research would be considered by the bloodstain pattern analysis community, laboratories and accrediting bodies in order to implement necessary changes to the methods, standard operating procedures, training programs and other quality assurance practices to reduce analyst error and minimize intra- and inter-analyst variation in reporting. The findings will facilitate discussions between analysts on disputed patterns.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

A white box study will generate insight into the cognitive process that underlies the analysis of bloodstain patterns. The white and black box studies will consider factors to include: human factors, cognitive factors, the quality of the evidence; visible characteristics of the bloodstains (quality, quantity, clarity, complexity, extent of bloodstain pattern, bloodstain number, size and distribution); the examiner’s education, training and experience; examiner certification and laboratory accreditation; and peer review.

3c. In what ways would the research results improve services to the criminal justice system?

The research results will identify the factors that influence the analyst’s ability to analyze bloodstain evidence and accurately interpret their findings. Further, the results will be valuable in promoting transparency, objectivity, and the communication between experts and laypersons, particularly within the criminal justice system. This research will provide the criminal justice system an assessment of the reliability of bloodstain analyses and the weight that can be given to these findings.

4. Status assessment (I, II, III, or IV):

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<tr>
<th>Major gap in current knowledge</th>
<th>Minor gap in current knowledge</th>
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<tr>
<td><strong>No or limited current research is being conducted</strong></td>
<td><strong>I</strong></td>
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<tr>
<td><strong>Existing current research is being conducted</strong></td>
<td><strong>II</strong></td>
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*This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.*
## Approvals:

**Subcommittee**

| Approval date: |  
|----------------|---|

*(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)*

**SAC**

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<th>1. Does the SAC agree with the research need?</th>
<th>Yes</th>
<th>No</th>
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<td>2. Does the SAC agree with the status assessment?</td>
<td>Yes</td>
<td>No</td>
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If no, what is the status assessment of the SAC:  

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<th>Approval date:</th>
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*(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)*
Completed Research Regarding
The Accuracy and Reliability of Bloodstain Pattern Analysis
OSAC BPA Research Task Group November 2016

1. Behrooz, N. Bloodstain pattern analysis of determination of point of origin (BSc dissertation), Department of Mechanical and Industrial Engineering, University of Toronto, 2009.

Version 1.1 / Date of Issue: 2.09.16 / Issuing Authority: Forensic Science Standards Board (FSSB)


28. Rowe, W.F. *Errors in the determination of the point of origin of bloodstains*, FSI 161, no. 1: 47-51
