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:** July 26, 2019

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

Background Information:

1. Description of research need:

Further research is needed to evaluate the accuracy and reliability of results provided by practicing bloodstain pattern analysts when making observations, classifications and conclusions. 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 study participant'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.). (6.) Identify the effects of bias on the evaluation and classification process. 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:

Arthur, RM, Cockerton, S.L., de Bruin, KG, and Taylor, MC, *A novel, element-based approach for the objective classification of bloodstain patterns*, Forensic Sci Int, 2015: p.220-228.
Laber TL, Taylor MC, Kish PE. *The Reliability of Current Methods of Sequencing Bloodstain Patterns*. The Journal of BPA. 2014;30(1):10.
Osborne, NKP, Taylor, MC, and Zajac, R, *Exploring the role of contextual information in bloodstain pattern analysis: A qualitative approach*, Forensic Sci Int, 2016: p. 1-8.
Osborne, NKP, Taylor, MC, Healey, M and Zajac, R, *Bloodstain pattern classification: Accuracy, effect of contextual information and the role of analysts characteristics*, Science and Justice, 2016; 56(2): 123-128.
Osborne, N. K. P. and M. C. Taylor (2018). *Contextual information management: An example of independent-checking in the review of laboratory-based bloodstain pattern analysis*. Sci Justice 58(3): 226-231.

Taylor, MC, Laber, TL, Kish, PE, Owens, G, and Osborne, NKP, *The reliability of pattern classification in bloodstain pattern analysis, Part I: Bloodstain patterns on rigid non-absorbent surfaces*, J Forensic Sci, 2016: doi:10.1111/1556-4029.13091.
Taylor, MC, Laber, TL, Kish, PE, Owens, G, and Osborne, NKP, *The reliability of pattern classification in bloodstain pattern analysis, Part II: Bloodstain patterns on Fabric Surfaces*, J Forensic Sci, 2016 (6): 1461-1466.
Additional relevant research is provided in the ADDENDUM.

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

The bloodstain pattern analysis community, laboratories and accrediting bodies can use this research to inform and implement improvements to the methods, standard operating procedures, training programs and other quality assurance practices.

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 processes that underlie the analysis of bloodstain patterns. The white and black box studies will consider factors to include: contextual information, bias, the quality of the evidence; visible characteristics of the bloodstains (quality, quantity, clarity, complexity, extent of bloodstain pattern, size and distribution); the analyst's education, training and experience; examiner certification and laboratory accreditation; and technical 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 analysts' ability to accurately and reliably interpret bloodstain evidence. 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 pattern analysis and the weight that can be given to these findings.

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

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III
Existing current research is being conducted	II	IV

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

1. Does the SAC agree with the research need?   Yes [ ]   No [ ]
2. Does the SAC agree with the status assessment?   Yes [ ]   No [ ]

    If no, what is the status assessment of the SAC: [   ]

Approval date: [   ]

(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)