J7 Status of Research Into Frequency Occurrence in Handwriting and Hand Printing Characteristics

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After attending this presentation, attendees will understand the importance and status of the research into frequency occurrence in handwriting and hand printing characteristics, and the opportunity to assist in its completion.

This study will have a major impact on the forensic science community by providing yet another statistical basis for the identification sciences and help insure its continued use in the United States judicial system.

In 2010, the National Institute of Justice awarded a research grant to the University of Central Florida's National Center for Forensic Science in order to determine the frequency of occurrence in certain handwriting and hand printed characteristics. The initial idea for this project began with informal discussions with several document examiners about court decisions and judicial comments stating their concern over a lack of statistical basis for the profession.

The idea was hatched to design research that would establish the frequency occurrence for handwriting and hand printing features. The design had several areas with which to deal. First, it was important to establish what kind of population sampling should be obtained. The statisticians involved in this research determined that the proper methodology would be to use a random-based stratified population sampling. In layman's terms this means that the sampling is to approximate percentages of certain biographical data such as age range, sex, education level, handedness, location of handwriting training, and ethnicity – all based on published intrinsic and extrinsic effects on handwriting according to Huber and Headrick.[1] Second, the project needed to select a handwriting specimens form that would provide an adequate sampling for use with as small a sampling as possible in order to keep this project from becoming too large. Fortunately and with permission, this problem was solved by the use of the handwriting specimens form developed by Dr. Sargur Srihari in previous research.[2] Third, it was important to select the features that would be examined. The features could not be subjective in nature such as a stroke being "long" or "short" as there would be substantial disagreement between individuals as to what exactly constitutes a particular stroke as being long or short. The statisticians emphasized that the selected handwriting and hand printing features must be objective to the point that examiners would select the same answer (reliability and reproducibility of results). Several pilot studies were conducted in order to select only features that proved to be reliable and reproducible through various Attribute Agreement Analyses. Studies were conducted on use of reproductions. It was clearly shown that the use of non-original documents did not allow for adequate reliability or reproducibility. Pilot studies were then conducted using original handwriting specimens and those features in which document examiners disagreed as to the results were eliminated from the project. Examiners also conducted multiple classifications on the same specimen in order to establish internal reliability and reproducibility within one examiner. All features that are now in this project must have passed the Attribute Agreement Analyses with 100% reliability and reproducibility.

The project is now at the stage in which the collected specimens are being classified into the database. This is a very large project and assistance from the document examination community is vital for its successful completion. A review of what has been done and how the classification system works will be offered during the presentation in order to educate, and hopefully, inspire attendees.

References:

1. Headrick, A.M., Huber, Roy A. Handwriting Identification: Facts and Fundamentals, Boca Raton: CRC Press 1999.
2. Srihari, Sargur N. PhD; Sung-Hyuk Cha, Ph.D.; Hina Arora, M.E.; and Sangjik Lee, M.S. Individuality of Handwriting, J Forensic Science, 2002 Vol 47(4) pp 856-874

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