



## Questioned Documents Section - 2012

### **J10 Frequency of Occurrence in Handwriting and Hand Printing Characteristics — Research Methodology**

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After attending this presentation, attendees will have a better understanding of how to apply various scientific principles to research so as to achieve maximum validation of any research efforts.

This presentation will impact the forensic science community by instructing and enforcing the need for the use of proper research methods.

Research is the backbone of any science. People often hear the word “exact science” thrown around in courts and elsewhere, but the cold, hard, fact is there is no such thing as an exact science, as that would necessitate a body of knowledge that never changes or advances. For any science to maintain their integrity and legitimacy, the profession must proactively seek to advance – whether through use of new technologies, new methods, or the reconsideration of established practices under the beneficial eyes of further experience.

Leading the way are those of the profession that take the time to conduct research. One can look at any journal, scientific magazine, or various organizational websites to see that there are countless meetings in every corner of the world providing presentations of work from professionals.

But how much of this work is truly research that will impact the advancement of the science? Yes, there is room for “I had a case,” and “Let me show you a really neat new gadget,” but advancement requires committed time and study into areas and thoughts that may be new and unexplored. It can require imagination that is out of the ordinary. One thing is for sure: effective research requires proper planning as to the methodology used. Is the method a valid method? Is the method the most valid method? What are the weaknesses and strengths of the method? Can the limitations be quantified in any way? Are there experts in other areas, such as statisticians, that can help in the validation process?

In January 2011, a large-scale, two-year research project was initiated. One of the goals of this study was to utilize the most valid methods. In so doing, subject matter experts were utilized in order to insure that proper methods were indeed being used. It is the purpose of this presentation to walk attendees through the development of the methods used in this study. One of the first issues was determining how many specimens would be needed to provide an adequate sampling of the population in the United States. Numerous questions arose in dealing with this issue. For example, what criteria were used to determine adequate numbers? Should a random selection process be used or some other method? Is there more than one method that would be considered statistically valid? Is there a good-better-best of the valid methods? What are the criteria that needs to be addressed in order to obtain the best sampling, if not random? What authorities and standards apply to this problem?

Another issue addressed was what features within handwriting would be utilized in the study. Again there were numerous concerns that affected the product of this portion of the study. One of the concerns was whether the cataloguing of each characteristic would be reproducible. To deal with this problem, features were initially listed that were thought to be objective in nature. For example, whether a certain stroke curved clockwise, curved counterclockwise, or was relatively straight would be used. Whether a stroke was long or short was not used, as it was thought that this kind of feature was too subjective. Next the selected features were put through a pilot test by having attendees at the 2011 ASQDE meeting categorize one set of specimens in order to determine whether any of the characteristics displayed an unacceptable level of non-reproducibility. These were but a few of the issues that had to be addressed in order to maximize the value and integrity of this study. The presentation will detail these issues and how they were addressed.

**Research, Statistics, Principles**