B164 Forensic Science and Biometrics: What's the Difference?

Max M. Houck, MA, Forensic Science Initiative, 3040 University Avenue, Suite 3102, West Virginia University, PO Box 6217, Morgantown, WV 26506-6217*

After attending this presentation, attendees will understand the fundamental differences between forensic science and biometrics and their applications. The attendee will also learn how the various methods of personal identification are applied differently by these two fields.

Forensic science and biometrics are often confused because they apply similar technologies; their fundamental principles, however, are quite different. This presentation will impact the forensic community and/or humanity by making those differences clear to forensic scientists and to define the application and research territories of both disciplines. Confounding the two will obscure important applications, research, and funding; this presentation will dispel that confusion.

The terms "biometrics" and "biometry" have been used since early in the 20th century to refer to the field of development of statistical and mathematical methods applicable to data analysis problems in the biological sciences, such as the analysis of data from the yields of different varieties of wheat or data from human clinical trials evaluating the relative effectiveness of competing therapies for a disease. Recently, the term "biometrics" has also been used to refer to the emerging field of technology devoted to automated methods for authentication of individuals using physiological and behavioral traits, such as retinal or iris scans, fingerprints, hand geometry, face recognition, handwriting, and gait.

Biometric technologies are quickly being integrated in a broad range of secure identification and personal verification applications. Government and corporate IDs, secure electronic banking, retail sales, law enforcement, and health and social services are already applying biometrics as solutions. Because a biometric links an event to a particular individual (a password may be entered by anyone who knows it) and is convenient (you always have it with you), biometrics are becoming accepted by users and consumers.

Forensic science, on the other hand, is the application of the natural and physical sciences to questions of legal or public concern. The most common application is the analysis of evidence, such as blood, hairs, fibers, bullets, and fingerprints, from criminal cases like bank robberies, homicides, and kidnappings. The perpetrator is typically unknown at the time of the crime and, therefore, an investigation is required to reduce the list of possible suspects; sometimes the victim is also unknown and must be identified through fingerprints, dental records, DNA, or some other forensic method. Many of these methods are meant to identify the deceased and, therefore, are more intrusive.

Forensic science and biometrics both apply various identification sciences, some the same and some unique to the particular discipline, although they do so for very different reasons (Figure 1). Biometrics uniformly applies to a *pre-event situation*, such as gaining access, surveillance, or verification. In this way, biometrics chooses which mode of identification will be used. Forensic science, however, applies to *post-event situations*; as a historical science, forensic science reconstructs past criminal events to assist adjudication. Because forensic scientists never know which mode of identification will be used ahead of time (DNA, fingerprints, dentition, etc), they must sort through all of the information to discern significant clues. This highlights another important difference between the two disciplines—the results of a forensic science report may ultimately end up in court, whereas those of a biometric analysis rarely do.

Distinctions such as these have important implications for the definition of and research agenda for both disciplines.

Forensic identification, Biometrics, Forensic Science

 ** Presenting Author*