B15 Experiments in Forensic Science Administration Help in the Design of Error Discovery

Roger G. Koppl, PhD, Fairleigh Dickinson University, Silberman College of Business M-MS2-02, Madison, NJ 07940; Lawrence Kobilinsky, PhD, John Jay College of Criminal Justice, 445 West 59th Street, New York, NY 10019; and Robert Kurzban, PhD, University of Pennsylvania, Department of Psychology, 3815 Walnut Street, Philadelphia, PA 19104-6196*

After attending this presentation, attendees will learn how experiments in forensic science administration can inform the design of error-discovery mechanisms. This knowledge can be implemented by creating cross-lab control measures that support self-policing mechanisms in forensic science.

This presentation will impact the forensic community and/or humanity by revealing both the correct principles and fine details of how to institute cross-lab control measures to reduce error rates in forensic science and other areas. Reducing error rates in forensic science will benefit society by improving justice. Reducing error rates in medical testing will benefit society by improving health. Mistakes in medicine and the criminal justice system are costly. The project will benefit society as a whole by lowering incidence of such mistakes and thus their cost. Further benefits to society are likely to follow from the application of the methods and principles of the study to other lab-based social processes such as the lab-based natural sciences.

All lab-based social processes including pure science, medical testing, drug screening, and forensic science are subject to errors. None has an error rate of zero, in spite of the best efforts and intentions of participants in them. There are many causes for errors in lab-based social processes, all rooted in the simple fact that humans are imperfect. Important among these reasons is the relationship between the decision making of lab personnel and the organizational structure of any lab- based social process. Participants in lab-based social processes respond to the structure of the network relating one lab to another. In pure science there is a complex set of network relationships among labs, whereby results produced in any one lab are subject to challenge from other labs. This network structure creates a self-policing system that seems to have improved the reliability of pure science. In forensic science and some other areas, the results from any one lab are unlikely to be challenged by any other lab.

The radical difference in network structure in forensic science and pure science suggests the possibility of reducing error rates in forensic science by altering its network structure to look more like that of pure science. This conjecture is strengthened by the apparent facts concerning errors in pure science. The errors that do occur seem to be concentrated where reproducibility is hardest and where, therefore, the network structure of pure science is weakest.

In the past, there has not been enough reliable, empirically grounded scientific knowledge of the relationship between lab performance and network structure. Improving the reliability of lab- based social processes means improving such knowledge. Improved knowledge will make it possible to develop improved procedures and protocols for crime labs and other areas. The procedures and protocols emerging from the project under discussion go beyond what can be applied within a given lab to involve redesigning the network structure of the lab system.

The presentation explains how the research team is using experimental techniques to study the connection between error rates and network structure. Results so far suggest a strong connection and the possibility of reducing error rates through a reorganization of the network structure of forensic science. The practical implication is to institute cross-laboratory control measures to reduce the probability of errors occurring.

Laboratory Analysis, Experimental Error, Error Reduction

 ** Presenting Author*