D2 Recent Research on Expert Witnesses May Help Reduce Error Rates in the Forensic Sciences

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Attendees will learn ways to minimize errors in the analysis of forensic casework, in report writing and in testimony. This presentation assist will attendees in thinking about how institutions can influence the examiners experimental work, conclusions, and report writing. Furthermore, they will learn about ways to minimize error by forensic examiners.

Reducing error rates is an important goal of research in the forensic sciences. There is an emerging field of study which deals with expert witnesses. It provides a set of tools to help practitioners in the forensic sciences reduce error rates in evaluating case work. Contributions to this field come from many disciplines, including economics, philosophy, sociology, and psychology. The authors review this literature and discuss its importance for forensic science.

Several important themes emerge from the literature on expert witnesses. Expert witnesses are human beings and subject, therefore, to social, psychological, and economic influences. These may be considered "extraneous influences." It is a legitimate and important scientific question to ask what extraneous influences exist and how they operate. Different researchers have proposed different and sometimes contradictory answers. The authors emphasize the notion that the institutional environment influences the significance and direction of extraneous influences. The authors argue that the influence of institutions should be of interest to forensic scientists and to managers and directors of crime labs. Researchers in forensic science should examine studies of expert witnesses to find ways of reducing error rates in forensic science evidence analysis, experimental observations, conclusions, report writing, and in testimony.

An understanding of the sources of error can help researchers understand the nature of the positive contribution that might be made by the scientific study of expert witnesses. Forensic scientists follow validated and accepted procedures in performing their analyses. However, these procedures will not generally prevent all errors. Some errors are explained by considering the procedure in the light of the underlying phenomenon being examined. These are "task-based errors." The error derives from the nature of the task that the procedure creates. For example, a procedure requiring fingerprint examiners to match only two Galton points (and nothing else) will have a higher human identification error rate than a procedure requiring the matching of five Galton points. The lower resolution procedure produces errors because it gives the analyst the task of matching only two Galton points. Other errors are explained by considering the procedure in light of the characteristics of the examiners themselves. These are "agent-based errors." For example, requiring traditional hair analysts to view one hair at a time would create a higher error rate than if the analyst used a comparison microscope. This difference is not attributable to any characteristics of hair, but to the limited ability of human examiners to retain in short-term memory a precise image of an examined hair. Agent-based errors may be further divided into two groups. If the error emerges even when the procedure is followed, as in the hair example, it is an "error against nature." If the error emerges only when the procedure is not followed, it is an "error against standard." PCR-DNA analysis can produce errors against standard because of the difficulty of adhering to its demanding protocols. By virtue of definition, all task-based errors are necessarily errors against nature.

The emerging field of study of expert witnesses provides tools for concentrating on agent-based errors, including both errors against nature and errors against standard.

Expert Witness, Quality Control, Minimizing Error

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