E32 Beer, Wine, and Forensic Science

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After attending this presentation, attendees will gain a general understanding of how observer effects can influence the human decision- making process in general, and specifically, how confirmation bias and context effects can compromise the interpretation of a forensic analysis. Attendees will learn how an administrative and analytical work flow designed to unmask domain-relevant information in an appropriate sequential manner can effectively minimize the potential for bias.

This presentation will impact the forensic science community by educating the forensic consumer about how bias can enter the enter the system, how it can affect a forensic analysis, and how to minimize these effects.

The National Academy of Sciences (NAS) Report clearly articulates the need to "… minimize, to the greatest extent reasonably possible, potential bias and sources of human error in forensic practice". The committee also encourages "… research programs on human observer bias and sources of human error in forensic examinations …" including "… studies to determine the effect of contextual bias in forensic practice". They add that, "Unfortunately, at least to date, there is no good evidence to indicate that the forensic science community has made a sufficient effort to address the bias issue; thus, it is impossible for the committee to fully assess the magnitude of the problem". They also suggest that the "development of such research programs can benefit significantly from other areas, notably from the large body of research on the evaluation of observer performance in diagnostic medicine and from the findings of cognitive psychology on the potential for bias and error in human observers".

Observer effects are rooted in the universal human tendency to interpret data in a manner consistent with one's expectations. This tendency is particularly likely to distort the results of a scientific test when the underlying data are ambiguous and the scientist is exposed to domain-irrelevant information that engages emotions or desires. Even in disciplines such as DNA, in which instrumental data customarily produces high resolution patterns, analysts often must resolve ambiguities, particularly when interpreting difficult evidence samples such as those that are very small, contaminated, degraded, or contain inhibitors.

The idea that cognitive bias is inherent to the human condition has now gained wide acceptance in the forensic community. However there remains resistance to instituting measures to minimize the chance for such bias to influence the decisions, judgment, and conclusions of the forensic analyst. Some suggest that the scientist is somehow different from others, and can, with sufficient education and experience, develop an immunity to the influence of external motivators. Others suggest certain quality assurance measures can mitigate the effects of domain- irrelevant information. It is instructive to examine other realms of human endeavor, both professional and general, to see examples of how biasing information can affect cognition and judgment. This presentation will discuss examples ranging from medicine to marketing.

The full potential of forensic testing can only be realized if observer effects are minimized. This risk can be minimized by preventing analysts from having information unnecessary to the proper analysis of an item, and proceeding through interpretation in a step-wise fashion, with additional information revealed only after traits of the questioned item have been characterized and documented.

It is understood that at least some of the resistance to implementing sequential unmasking procedures derives from a fear that the criminalist will be denied information required for an intelligent and optimized analysis. It is not suggested that forensic scientists be blind to information that might afford them the greatest opportunity to generate reliable information from evidentiary samples. Nor do they ascribe to the perspective that complete and enduring ignorance of case specific information is a good idea. However, a sequential unmasking procedure must be used to shield the analyst from task-irrelevant information when initially interpreting results in order to minimize observer effects. Discussion on why such procedures can and should be adopted immediately by all forensic testing laboratories will be presented.

Sequential Unmasking, Observer Effect, Context Effect

 ** Presenting Author*