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Commentary

Errors in forensics: Cause(s) and solutions

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Authors Kassin, Dror, and Kukucka speculate on causes underlying forensic errors in their article, "The forensic confirmation bias: Problems, perspectives, and proposed solutions" (2013). The authors highlight that forensic conclusions are less reliable than once assumed. This not only applies to the less well-known forensic disciplines, like hair analysis, bite mark analysis and arson investigation, but also to the most trusted disciplines, such as fingerprint comparison and DNA analysis. Although fingerprint analysis has been used for over 100 years, errors affecting the lives of innocent people have occurred, making it necessary to investigate causes and implement effective corrective action.

The article suggests that bias and subjectivity are the root cause of many errors and then suggests remedies for such problems. The recommendations include performing an examination in a linear manner with a full analysis of data prior to comparing the evidence to a known exemplar, blinding analysts from certain information, and more comprehensive documentation of information known and relied on during the examination process. As stated in the article, these recommendations are not new; they have been previously suggested and implemented by some agencies.

On the surface, the suggested reasons and associated recommendations for errors sound reasonable; however, errors in forensics are a new area of research and as such, have not yet been fully explored. Other causes for errors need to be considered. Past research has been performed which hypothesized that bias and subjectivity cause errors. Subsequently, experiments were performed to verify these beliefs. This type of research shows a correlation between bias and errors but more thorough research may indicate that subjectivity and bias are actually symptoms of other causes. If a different primary cause is found, it is possible that suitable corrective action may account for the prime cause as well as subjectivity and bias, fixing multiple problems with one action.

Early philosophers recognized that decisions could be skewed when based on faulty factors. One obvious reason behind poor decisions is a lack of clear expectations. This reason for errors might sound unrealistic given the long standing use and acceptance of forensic testing; however, ambiguous directions need to be seriously considered as a reason behind differing conclusions. Telling a person to arrive at correct conclusions without stating the requirement for correct is like telling a teenager not to be home late without stating a time. Vague instructions allow for subjectivity in a conclusion and will inevitably lead to undesirable results. In order to account for any personal influences that may affect conclusions, science has developed requirements for conclusions arrived at by inference. These requirements have been developed and refined over the past 2000 years, beginning with philosophers such as Thales and Aristotle. The usefulness of these requirements is so notable that conclusions that meet these requirements are considered the supreme form of knowledge.

Scientific requirements for conclusions include, but are not limited to:

(1) Conclusions must be based on data that can be demonstrated to others. Conclusions are not to be based in any part on the practitioner; not on their notoriety, training, experience or confidence level.

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(2) Conclusions must be arrived at with methods that have undergone testing and debate before being accepted as valid; not on methods that are accepted without question.
(3) Conclusions must be those that withstand debate to the point of general acceptance. It should be recognized that withstanding debate is not the same as finding others who agree with a conclusion. General acceptance accounts for the subjectivity and biases of each individual by only allowing conclusions that other reasonable people would corroborate. This minimizes the individual effects of each person.

Forensic conclusions that have met scientific requirements have stood the test of time. Those that did not have been labeled as errors. The Mayfield fingerprint misidentification, for example, did not hold up to the first and third requirements above. The conclusion given was not based on data that could be corroborated by others; the analysts were allowed to put weight in their own training, experience and confidence levels. Allowing these personal factors to influence conclusions authorizes the use of non-scientific protocols, which in turn fosters misinterpretation of information. As seen, the conclusion of those who erred did not withstand rigorous scrutiny to the point of general acceptance. The conclusion was not a scientific conclusion since it did not meet scientific requirements; it was merely the personal opinion of forensic practitioners. The identification to Mayfield would not have been reported if basic scientific requirements had been met.

An analyst questioning whether a possible conclusion would hold up to rigorous debate should test this notion by allowing others to scrutinize the data used, the conclusion and the logic associating the data with the conclusion. Scrutiny must be as critical as possible. If a conclusion holds up under the most extreme conditions then the conclusion should stand the test of time.

The solutions Kassin, Dror and Kukucka recommend have been implemented by some agencies and have been found to be extremely time consuming with little significant improvement in the correctness of conclusions. Another way of making fingerprint conclusions more consistent has been to implement a numerical standard of how many characteristics are sufficient to establish an identification, i.e. a point standard. Numerical standards reduce subjectivity by making expectations more specific and thereby lead to more consistent conclusions; however, the numbers relied on in a standard needs to be validated prior to use in order to ensure conclusions are both consistent and correct. To date, there has been no validation behind past numerical standards used. On the other hand, there is a solid basis behind the requirements listed for scientific inferences. Applications of these standards produce an effective and efficient means of improving conclusions. The four practitioners who erred in the Mayfield fingerprint case were considered to be experts trained to competency; however, it is unknown if they were trained in basic scientific protocols and, more importantly, whether or not they were required to abide by them.

Although the majority of past forensic conclusions have met the scientific standard stated previously, this standard has not been specifically stated to forensic practitioners in this manner. Without proper training, these principles cannot be consistently applied, turning conclusions which should be scientific in nature into nothing more than personal judgments. Knowledge, understanding and correct application of these requirements are essential in achieving the best possible conclusions and also to ensure a specific inquiry is a scientific inquiry.

The value of these concepts is that they are overwhelmingly accepted in science as simple, efficient and effective protocols to improve judgments. A paradigm shift is taking place in the forensic science disciplines. The forensic sciences have recognized the need to communicate these ideas more thoroughly so that practitioners understand and apply these principles in a more consistent fashion. Likewise, practitioners are recognizing their responsibility to doubt and question ideas rather than living in a culture of blind acceptance.

1. Conclusion

Kassin, Dror and Kukucka correctly highlight a serious problem associated with forensic conclusions: conclusions are subjective and errors occur. These matters need to be acknowledged, discussed, researched and resolved. Subjectivity and bias are valid concerns that could be addressed in isolation; however, the suggestions offered lack sufficient effectiveness testing and may be extremely inefficient. Many of the references offered as support for these recommendations are proposals by others, not tested solutions. Misapplication of scientific protocols is a broader concern. Implementing policies that adhere to scientific protocols would address a more rudimentary cause of errors while also addressing subjectivity and bias.

To resolve the current problems associated with forensic conclusions, different solutions need to be tested against each other prior to application. The stronger more valued protocols will be determined and utilized, thereby strengthening conclusions in the most effective and efficient manner possible.

Reference

Kassin, S., Dror, I., & Kukucka, J. (2013). The forensic confirmation bias: Problems, perspectives, and proposed solutions. *Journal of Applied Research in Memory and Cognition*, *2*, 27–37. http://dx.doi.org/10.1016/j.jarmac.2013.01.001