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What role should investigative facts play in the evaluation of scientific evidence?

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Concern about contextual bias has led some authorities to recommend that forensic scientists know as little as possible about the facts of the underlying case when interpreting physical evidence; but concern about contextual ignorance has led other authorities to recommend, to the contrary, that forensic scientists know as much as possible in order to frame questions properly. This article recommends a case manager model that addresses both concerns. This article also responds to standard objections to the use of blind procedures in forensic science, explaining why contextual bias cannot be conquered through willpower; why use of domain-irrelevant contextual facts undermines the value of forensic evidence; how a well-known cognitive illusion (the ‘introspection illusion’) can mislead forensic scientists into thinking they can control their biases, when they cannot; and how a paradoxical feature of forensic inference (the ‘criminalist’s paradox’) can mislead analysts into thinking they should rely on contextual facts, when they should not.

Keywords: context; bias; blind procedures; observer effect; domain-relevant; case manager

Introduction

When called upon to analyze and interpret physical evidence, what should a forensic scientist know about the facts of the underlying case? Although this is a fundamental question for the forensic sciences, it has received minimal attention in the forensic science literature. What little commentary exists is sharply divided between commentators who have focused on two very different concerns.

Concern about contextual bias has led some commentators to recommend that forensic scientists know as little as possible about the facts of the case. Consider, for example, this passage from an early treatise on document examination by William E. Hagan¹:

...the examiner must depend wholly upon what is seen [in the forensic examination], leaving out of consideration all suggestions or hints from interested parties; and if possible it best subserves the conditions of fair examination that the expert should not know the interest which the party employing him to make the examination has in the result. Where the expert has no knowledge of the moral evidence or aspects of the case

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in which signatures are a matter of context, there is nothing to mislead him, or to influence the forming of an opinion; and while knowing of the case as presented by one side of the context might or might not shade the opinion formulated, yet it is better that the latter be based entirely on what the writing itself shows, and nothing else. (Ref. 1, p. 82)

Although published in 1894, this statement is entirely consistent with more recent commentary^{2,3} calling for greater use of blind procedures in forensic analysis. (I thank Charles Berger and Reinoud Stoel for bringing the Hagen passage to my attention).

Other commentators have focused on a different concern: that ignorance or misunderstanding of the facts of a case may cause forensic scientists to ask and answer the wrong questions. For example, Inman and Rudin⁴ described cases in which forensic laboratories performed analyses that were useless and even harmful to a criminal investigation because the analysts misunderstood the factual context of the case. To remedy such problems, they urged that forensic scientists should know as much as possible about the fact of the case. Although they acknowledged a risk that investigative facts might 'subconsciously bias' the examination and interpretation of evidence, they argued that adequate 'checks and balances' exist to minimize that problem. By their account, contextual ignorance is a greater evil than contextual bias. (Inman and Rudin have taken a more nuanced position, however, in recent writings^{5,6} and now endorse the need for blind procedures in some circumstances).

Controversy over what forensic scientists should know has grown more heated recently as a result of two developments. On one hand, forensic scientists are becoming involved earlier, and more deeply, in criminal investigations. In order to bring scientific expertise to the crime scene, and avoid the kinds of problems discussed by Inman and Rudin, police in many jurisdictions have been integrating forensic scientists into investigative teams, particularly those assigned to investigate homicides and other major crimes. As a result of this trend, forensic scientists in many jurisdictions tend to have more knowledge of investigative facts than they did in the past.

On the other hand, concerns about contextual bias are growing. Academic commentary suggesting that forensic scientists are subject to contextual bias^{2,3} has been supported by empirical studies showing startling evidence of such bias⁷⁻⁹ and illustrating its consequences¹⁰, and by the discovery of high profile errors that have been attributed, in part, to contextual bias¹¹⁻¹³. In its 2009 report on forensic science¹⁴, the United States National Research Council acknowledged these concerns and agreed that they are a problem for the field, declaring unequivocally that 'forensic science experts are vulnerable to cognitive and contextual bias' and that this bias 'renders experts vulnerable to making erroneous identifications.' The NRC report called for research on methods to address this problem, and major funding agencies have begun to invest resources in this project (for example, the US National Science Foundation funded an important conference¹⁵).

The situation might appear, at first glance, to pose an insoluble dilemma. Do forensic scientists have too much contextual knowledge, or too little? Should they institute blind procedures for interpretation, and risk asking the wrong questions; or should they learn as much as they can about the case, and risk contextual bias? Practitioners might be forgiven for feeling that they will be criticized no matter which course they take. But there are ways out of this dilemma. It is possible to address the problem of contextual bias in a scientifically rigorous manner while still

maintaining a useful and appropriate involvement of forensic scientists in the investigative process. In order to achieve this goal, however, it is necessary to make an honest and thoughtful assessment of the appropriate role of forensic scientists in criminal investigations, and the appropriate role of investigative facts in the analysis and interpretation of scientific evidence. This article comments on these important issues.

The role of forensic scientists in criminal investigations

Let us begin by considering the role (or roles) that forensic scientists might play in a criminal investigation. An array of possibilities exist that range from deep involvement in the investigation to little or no involvement.

At one extreme is what I will call the 'CSI model' (based on the television series) in which forensic scientists are integral parts of the investigative team. They work directly with detectives, help determine the direction of the investigation, help evaluate the culpability of suspects, and sometimes even participate in the interrogations. The same individuals perform and interpret tests back at the laboratory.

At the other extreme is what I will call the 'blind service lab model'. In this model, the forensic scientists work in the crime lab and have no direct involvement in the investigation. Their job is limited to analyzing and comparing evidence samples submitted by investigators. The investigators specify what tests and comparisons they want (e.g., determine the nature and chemical composition of this white powder; compare the DNA profile of the blood on this garment to the DNA profile of these reference samples), but provide little or no information about the case. The analysts in the lab are 'blind' in that they do not know the identity of the samples and do not know what is at stake when they make their determinations. They can conclude that the blood stain on 'Garment A' has the same DNA profile as 'Reference Sample #6' without knowing how that determination will affect the case, or even what the case is about.

As far as I know, there are no actual forensic laboratories that fit exactly either the CSI model or the blind service lab model. These two models are prototypical and are used here merely to illustrate the range of variation that is possible in the degree to which forensic scientists are involved in investigations. Most jurisdictions fall somewhere between the two models.

In light of the discussion above, the primary advantages and disadvantages of the two prototypical models should be clear. The CSI model addresses the concerns about contextual ignorance, but leaves analysts vulnerable to contextual bias; the blind service lab model avoids contextual bias during the analysis of evidence, but may result in contextual ignorance. An obvious question that arises when the models are contrasted in this manner is whether there might be some hybrid of the two approaches that would achieve the benefits of each, while suffering the disadvantages of neither. Two such hybrid approaches have been proposed.

One hybrid approach has been called the 'case manager model'. This approach seeks to minimize both contextual ignorance and contextual bias through a separation of functions. Forensic scientists serve either as case managers or analysts. The role of case manager is to communicate with police officers and detectives, participate in decisions about what specimens to collect at crime scenes and how to test those specimens, and manage the flow of work to the laboratory. The role of the

analyst is to perform analytic tests and comparisons on specimens submitted to the laboratory in accordance with the instructions of the case managers.

This separation of function allows case managers to be fully informed of the investigative context (like forensic scientists in the CSI Model), while analysts remain blind to context and are thereby protected from contextual bias (like analysts in a blind service lab). The case managers convey to the analysts only those investigative facts that are directly pertinent to the scientific assessment. For example, if analysts are examining latent prints, they might be told the nature of the surface from which a latent print was collected; if they are analyzing a biological stain, they might be told about the substrate and the environmental conditions to which the stain was exposed. The analysts record the results of their 'blind' analyses in written reports, which are conveyed to the case managers. The case managers then present these reports to the investigative team and provide any advice the investigators need to understand and draw appropriate conclusions from the reports.

A second hybrid approach, which was proposed specifically for forensic DNA analysis, is called sequential unmasking⁵. This approach controls the sequence in which various analyses are performed in order to minimize the potential for contextual bias. A key concern, addressed by this approach, is that knowledge of a suspect's DNA profile might influence an analyst's interpretation of evidentiary samples. To avoid this, analysts make an initial examination of evidentiary samples before learning the profiles of any known or suspected contributors. Based solely on examination of the evidentiary profile, the analyst determines and records the possible genotypes of all possible contributors. At that point, information about known or expected contributors is 'unmasked'. In a sexual assault case, for example, the analyst learns the profile of the victim and any other expected contributors, such as the victim's husband. Then, while still ignorant of the profiles of any suspects, the analyst again examines the evidentiary profile and, in light of the information about known contributors, determines and records the possible genotypes of all unknown contributors. Only at that point, after the analyst's interpretation of the evidentiary sample has been 'fixed' and recorded, is information about the profile of the suspect 'unmasked' so that the analyst can compare it to the evidentiary profile.

Sequential unmasking does not purport to be a complete solution to the problem of contextual bias. It may be feasible only for tests such as DNA analysis for which analysts, after examining evidentiary samples, can determine and list the characteristics of possible contributors. And it will not eliminate all possible forms of contextual bias. For example, it will not prevent contextual bias if and when an analyst who is aware of investigative facts must compare a suspect's profile to an evidentiary profile in order to estimate the probability of allelic dropout under the hypothesis that the suspect was a contributor. But it minimizes one important type of contextual bias, and does so with relatively little extra effort by the analyst and without the need for a second person to act as case manager.

Although these hybrid approaches are available, few laboratories have adopted them. In the forensic laboratories with which I am familiar, blind or anonymous testing is rare. Forensic scientists are almost always informed of the nature of cases; they usually are fully cognizant of the consequences, for the investigation, of their determinations.

Even DNA analysts, who typically spend most of their time at the bench processing samples, stay informed about what the samples are and how the results of their work will affect the case. There often are entries in DNA analysts' lab notes that

show a deep knowledge, if not a personal involvement, in the investigation. Because I am interested in the psychological dynamics of experts' interpretation of evidence, these notes have long been intriguing to me and I have compiled an extensive collection.

For example, a DNA analyst in Virginia wrote:

Matt told me D. Abato left message stating this S. is suspected in other rapes but they can't find the V. Need this case to put S. away... [D stands for Detective; S for Suspect and V for Victims].

In a California case, the DNA analyst wrote:

Suspect-known crim gang member—keeps 'skating' on charges—never serves time. This robbery he gets hit in head with bar stool—left blood trail. Miller wants to connect this guy to scene w/DNA... [Miller was the Deputy District Attorney who was prosecuting the case].

The authors of these notes are not blind testers of anonymous samples. They clearly know and care about the course of criminal investigations. They are in touch with the detectives. As they perform and interpret their tests, they know what is at stake. They are involved. These are the very conditions under which contextual bias is likely to be a problem^{2,3}.

Why not adopt blind procedures?

It is well established that human beings are vulnerable to contextual bias. The existence of contextual bias (also known as observer effects) has been called 'one of the most venerable ideas of traditional epistemology'¹⁶ as well as 'one of the better demonstrated findings of twentieth century psychology'¹⁶. Because the problem is widely recognized, scientists in most fields assiduously guard against it¹⁷. Particularly when scientists must rely on subjective judgment to interpret the results of an experiment, they routinely take careful steps to mask or shield the person interpreting data from extraneous information that might improperly influence the interpretation¹⁷. Blind procedures are also widely used for peer-review of scientific articles, for grading of written examinations, and for other functions for which it is important to minimize contextual bias¹⁷.

One of my academic colleagues is an evolutionary biologist who has made a lifelong study of the Australian finch. In recent years she has made extensive use of DNA testing to determine the lineage of the birds in her aviaries. It is important for theoretical purposes to know, for example, whether male birds with bright plumage have more 'mating opportunities' and whether the male bird in a bonded pair is actually the father of his partner's offspring. When I asked this academic scientist whether she employed blind procedures when interpreting DNA tests in her laboratory, she was adamant that such procedures are essential. She pointed to the well-known danger that a scientist's pet theories can influence interpretation of data, and stated that she would neither be able to obtain support from major funding agencies nor publish her findings in peer-reviewed scientific journals if she failed to use blind methods. Even if others did not insist on such procedures, she would still use them, she said, to satisfy her own standards of scientific rigor. 'You must understand that this work is extremely important,' she declared, 'it affects our understanding of the entire evolutionary history of the finch!'

I present this anecdote here because it raises an important question. If blind methods are considered essential for studies of bird mating, why do we fail to use such procedures when interpreting forensic tests that may have consequences of the most serious nature for human beings?

Can bias be eliminated through willpower?

I have wondered about the absence of blind procedures in forensic science for many years and, as a result, have made a point of asking forensic scientists why they fail to use such procedures¹⁸. One common response is that blind procedures are unnecessary for individuals who have proper values and standards of personal integrity. Those who give this response often claim to be insulted at the very suggestion that they might be biased.

This response construes contextual bias as a personal moral failure. According to this view, contextual bias arises when analysts *allow* their scientific judgments to be influenced by extraneous facts; bias is only a problem for analysts who are poorly trained (because they do not realize they should ignore contextual facts) or analysts who are unethical (and therefore are unwilling to ignore contextual facts). Hence, contextual bias, if it exists at all, should be addressed by better training and by weeding out ‘bad apples.’

The problem with this response is that it rests on a faulty understanding of human judgment and decision making. Psychologists who study the operation of the human mind in judgmental tasks have shown repeatedly that people lack conscious awareness of factors that influence them¹⁹. This research has a clear implication for the present discussion: contextual bias cannot be conquered by force of will because people are not consciously aware of the extent to which they are influenced by contextual factors.

One of the most famous and frequently cited articles in twentieth-century psychology¹⁹ reviews a plethora of studies showing that people are often unaware of factors that influence them. When asked, people confidently claim to know whether a particular factor influenced them or not, but these verbal reports are often wrong. People often believe they were influenced by factors that did not affect their judgments; and believe they were *not* influenced by factors that *did* affect their judgments. In one consumer study, for example, researchers discovered they could manipulate people’s judgments about the relative quality of four pairs of socks by changing the position of the socks in an array. Whichever pair of socks occupied the right-most position tended to be judged highest in quality. When asked whether they had been influenced by this contextual factor (the position of the socks), people denied it and instead attributed their judgments to inherent properties of the socks. But the results of the study showed their verbal reports were wrong. The quality of the sock was not what was affecting the judgments – whichever pair occupied the right-most position was strongly preferred¹⁹.

Because similar results have been found in hundreds of studies, there is a consensus among cognitive psychologists that people have ‘an intellectual blind spot’ when it comes to recognizing their own biases^{20–26}. The blind spot arises from a fundamental property of the human mind: we ‘have no direct access to higher order mental process such as those involved in evaluation, judgment, problem-solving and the initiation of behavior.’¹⁹ In other words, we are not able, through introspection, to directly observe and monitor the mental processes we use to make judgments.

When people are asked to explain their judgments, they cite factors that according to their a priori expectations should have influenced them, but these reports are sometimes wrong because, as studies have repeatedly shown, people can be influenced by factors that they did not know or expect would influence them¹⁹. People who claim to know whether they were influenced by a particular factor are falling victim to what psychologists call the introspection illusion²⁵. An article by three of the world's leading researchers on cognitive bias explained the illusion as follows:

We tend to treat our own introspections as something of a gold standard in assessing why we have responded in a particular way and whether our judgments have been tainted by bias . . . [but] the faith people have in the validity of their own introspections is misplaced²⁵.

The inevitability of contextual bias is recognized and accepted in most scientific fields¹⁷. One can imagine the reaction if a medical researcher claimed that he need not use blind procedures in his clinical trials because he is a person of integrity who will not *allow* himself to be biased. The claim would not only be rejected, it would invoke derision and ridicule. In my view, forensic scientists who claim to be able to avoid contextual bias through force of will deserve a similar reaction. These claims are unsupportable both because they are wrong and because they display a dangerous ignorance of scientific fact concerning human judgment.

Do forensic scientists make better judgments when they consider context?

A second argument sometimes offered against the use of blind procedures is that contextual knowledge is helpful because it leads to better and more accurate judgments. According to this argument, analysts are more likely to reach correct conclusions – that is, conclusions that coincide with the ground truth – when they consider the big picture and take all evidence into account. Some claim that the term ‘contextual bias’ is a misnomer. As one put it, ‘if this so-called bias leads toward the truth, is it really a bias?’

When making this point, forensic scientists sometimes draw analogies between themselves and other professionals. We would not want physicians to be ‘blind’ to context when diagnosing illness, they argue, because they will make the best judgments by considering the entire context of the case, not by focusing narrowly on the results of a physical examination or diagnostic tests. I have also heard forensic scientists compare themselves to medical examiners and coroners, who often take into account contextual factors when determining cause of death. When deciding whether a questioned death was due to homicide, suicide or natural causes, for example, medical examiners do not confine themselves to the scientific evidence derived from examinations of the decedent, they also consider what William Hagen called the moral evidence, such as the life circumstances of the decedent, the decedent's writings, and witnesses' statements regarding the apparent physical and mental state of the decedent prior to death. If medical examiners can and do consider contextual factors when determining cause of death, why should a forensic scientist avoid consideration of such factors when deciding whether a suspect was the source of a trace left at a crime scene?

To answer this question one must consider the respective roles of the medical examiner/coroner and the forensic scientist in the legal system. We generally expect

the person or body charged with making an ultimate determination on some legal issue to take into account all relevant evidence. The medical examiner is charged by law with making an ultimate determination about cause of death and is therefore expected to consider all relevant evidence, including contextual factors. Analogously, physicians have the final say on medical diagnoses and are therefore expected to consider all relevant facts, including context. But the forensic scientist occupies a different position.

While forensic science evidence may address a variety of propositions related to crime, including propositions about the source of traces, the activity that led to the deposit of traces, and whether those activities constitute a crime^{27,28}, it is not the forensic scientist's job to make final determinations about the truthfulness of any of these propositions. The role of the forensic scientist is to provide input to the judicial process, the final judgment about the truthfulness of various propositions in the case is made by the trier-of-fact (typically a judge or jury). While we expect the trier-of-fact to consider all relevant evidence, including contextual factors, it does not logically follow that forensic scientists should consider such factors.

With regard to the medical analogy, the role of the forensic scientist is closer to the role of supporting medical personnel, such as medical lab technicians, radiologists, and experts who interpret imaging tests, than to the role of the physician making the ultimate diagnosis. Accordingly, a question worth asking is whether the judgments of ancillary medical personnel are improved if they consider the full context of a case when interpreting laboratory tests. This question has been examined for a number of medical procedures 29–34, and the answer is a resounding no. For example, one study looked at whether experts interpreting echocardiographs made better judgments with or without being informed about other clinical information in the case, such as the patient's medical history and symptoms, results of blood cultures, and results of a physical examination (including whether a heart murmur was detected)²⁹. The study found that exposure to the clinical information greatly increased the false positive rate of these medical experts, and this 'clinical information bias' thereby undermined the diagnostic value of the electrocardiogram. Similar findings have been reported in studies on other medical procedures 30–34. In these medical situations it is clearly better if those running and interpreting diagnostic tests remain unaware of contextual factors and focus their attention solely on their own findings.

The criminalist's paradox

The conclusion that less information is better may be difficult for some forensic scientists to accept, however, due to what I will call 'the criminalist's paradox'. By considering contextual information, analysts may well become more likely to interpret their evidence correctly – that is, to reach conclusions that correspond to what actually happened. Yet by doing so, they also (paradoxically) undermine the ability of the trier-of-fact to determine the truth, and thereby reduce the likelihood the legal system will reach a just outcome. This is the paradox: by helping themselves be 'right' such analysts make it more likely that the justice system will go wrong. By trying to give the 'right' answer, they prevent themselves from providing the best evidence.

To illustrate, let us consider the situation of an expert asked to examine a latent print in order to determine if it was made by a particular suspect. Let us imagine that

it is a difficult case, a close call. When comparing the smudged, partial latent print to the suspect's fingerprint, the analyst sees a number of common features, but some discrepancies. He must think hard and long about whether the similarities are sufficient to conclude that the prints were made by the same finger, or whether the discrepancies are sufficient to conclude that they were not. Suppose that at that point the analyst learns an important contextual fact – the suspect has confessed to police that he touched the item from which the latent print was lifted – and after learning this fact the analyst decides to report that the prints match. Has the analyst done something wrong?

Although we know that false confessions are possible, confessions are generally considered strong and reliable evidence. Consequently, the analyst, if he is thinking logically, should be far more confident that the prints match after hearing about the confession than before. Because the confession is strong evidence that the prints have a common source, the analyst's determination (match or not) is more likely to be consistent with what actually happened if the analyst considers the confession than if he does not. If the goal of the analyst is to be right – that is, to make the determination that corresponds to the truth – he is better off relying on the confession.

If the analyst is influenced by the confession, however, it creates a serious potential problem for the legal system. Part of the problem is that (as with the echocardiographs) the false positive probability (FPP) is likely to be higher (perhaps much higher) if the analyst considers this contextual fact. The FPP is the conditional probability that the analyst will report a match if the two prints in fact come from different people. It can be demonstrated mathematically that the probative value of forensic evidence, as measured by the likelihood ratio, decreases as the FPP increases, other factors being equal³⁵. When the FPP is low, even small increases can drastically decrease the value of forensic evidence³⁶. Suppose, for example, that the FPP in our latent print case is 1 in 10,000 if the analyst is blind to contextual facts. If learning about the confession increases the false positive probability to 2 in 10,000 then, other factors being equal, the probative value of this forensic evidence will decrease by half; if the false positive rate increases to 1 in 1000, the probative value of the forensic evidence will be reduced by 90%. These effects might be moderated somewhat in practice by simultaneous changes in the probability of a true positive and a false negative, but under any plausible assumptions about the values of these variables, the probative value of the latent print match will decrease to the extent the analyst is influenced by the confession.

One way to look at the matter is that the analyst undermines the independence of the forensic evidence (*vis-à-vis* other evidence in the case) when he considers contextual facts. If the analyst is unaware of the confession, then the evidence of the confession and the evidence of the latent print exist in a relationship that Bayesian theorists call conditional independence³⁷. The only connection between the two pieces of evidence is that both are linked to a source-level proposition about the case – i.e., that the suspect is the source of the latent print. If knowledge of the confession makes the analyst more likely to declare a match, however, the two items of evidence are no longer conditionally independent. The value of the latent print comparison now depends, in part, on the accuracy of the confession. This dependency reduces the incremental probative value of the confession – that is, the ability of the confession to add new, independent insight to the case. One might say the forensic evidence becomes less valuable in its own right because it has been colored (some

might say tainted) by the other evidence in the case. As legal scholar Michael Risinger explained, 'results [of forensic tests] are never made epistemically better, and are often made worse' when analysts are exposed to 'domain-irrelevant information'³⁸.

Another way to look at the matter is that the analyst's use of contextual facts creates 'double-counting' of evidence. The evidence of the confession is effectively counted twice – once by the analyst, who uses it to resolve his uncertainty about whether the prints match, and again by the jury. The jurors are unlikely to understand or appreciate that the latent print identification was colored by evidence of the confession. They think they are receiving two independent pieces of evidence, and therefore give the evidence as a whole more weight than they should.

If one could trust that the other evidence in the case always pointed in the right direction, then allowing a forensic scientist to be influenced by this information would be less problematic. The rub, of course, is that other evidence sometimes points in the wrong direction. Even confessions are sometimes false, misunderstood, or misreported³⁹. When the other evidence points in the wrong direction, the ability of forensic science to correct matters, to put the investigation back on track, is reduced to the extent the forensic evidence is colored by other investigative facts.

Indeed, a lack of independence among different pieces of evidence is a prominent feature of many erroneous convictions. An interesting example is the case of Josiah Sutton, a young Texan who was falsely convicted of rape after being identified by two seemingly independent pieces of evidence⁴⁰. The victim identified him and a DNA analyst reported that he could not be excluded from a mixed DNA sample taken from the victim⁴⁰. But Sutton was exonerated when subsequent post-conviction DNA testing definitively excluded him. Examination of the case showed that the seemingly independent pieces of evidence were actually linked. The victim knew about the DNA evidence when she testified, and this knowledge appears to have bolstered an otherwise shaky identification⁴⁰. And the DNA analyst knew about the victim's identification of Sutton before she conducted the DNA test, which may explain why she misinterpreted the DNA test results, failing to notice that various items of evidence (and particularly information about the profiles of other mixture contributors), taken together, indicated that Sutton should be excluded, rather than included, in the DNA mixture⁴⁰. In other words, each faulty piece of evidence managed to prop up the other. Although the case looked powerfully persuasive to the jury, it rested on an inferential house of cards.

Conclusion

Contextual bias is a serious problem that demands careful consideration by the forensic science community. Forensic scientists will only embarrass themselves if they insist, against the weight of scientific evidence, that they are able to avoid contextual bias by force of will. And they will embarrass themselves further if they take the epistemologically bankrupt position that contextual bias isn't really a bias. The field should instead focus its attention on how best to deal with the problem.

This article offered a number of suggestions for managing contextual bias. It showed that forensic scientists need not choose between knowing too much and knowing too little about the factual context of a case. By using the case manager model, forensic scientists can provide effective advice to police and investigators

while also interpreting evidence in a rigorously blind manner, although these separate functions cannot be performed by the same person. Procedures such as sequential unmasking will also help, particularly in situations where a case manager is not feasible.

The problem of contextual bias will not be solved with excuses and half-measures. Forensic scientists need to join the rest of the scientific community in using more rigorous procedures for interpreting evidence.

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