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Abstract

This paper identifies the issue of cognitive bias, with emphasis on confirmation bias, and its implications within the forensic science field. Biased thinking or processing of forensic evidence can have significant effects on an investigation process. The literature analyzed discusses the consequences of providing contextual or irrelevant ancillary information to forensic experts. Following this discussion, the opinions held by forensic professionals with regards to confirmation bias and erroneous conclusions will likewise be evaluated. It is important that the forensic science field continues to listen to its experts in order to develop solutions for dealing with and preventing instances of confirmation bias.

Keywords

forensic science, cognitive bias, confirmation bias

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Introduction

The field of forensic science has become plagued by several types of biases perpetuated by experts and the professions within it. Cognitive bias can be defined as a limitation in the ability of human thinking that causes one to filter information unconsciously based upon personal experiences, preferences, and patterns. Confirmation bias in particular is a known issue. This bias differs slightly from cognitive bias in that it not only limits one's ability to be objective because of experience, preference, and pattern-seeking but it can also cause the neglect information that negates one's working theory or opinion on a matter.

Errors in forensic science due to biased factors result in innocent people being convicted of crimes or vice versa, but as a whole, confirmation bias is a threat to the integrity of forensics and the criminal justice system. This research suggests that some of the errors presented may be due to the tendency that the human mind must interpret new information by relating it to information that already exists in one's mind. This source of error is confirmation bias, a way that the mind confirms one's preexisting beliefs and opinions based on past information and experience. Some forensic labs are still resisting the available knowledge and protections against confirmation bias in their professions' work and conclusions, while other labs have made great strides in understanding the usage of the best practices in regards to status quo confirmation bias.

Literature Review

The Problem

Cooper and Meterko (2019) investigated twenty-nine forensic science confirmation bias studies, including latent fingerprint, DNA mixture, and forensic pathological analyses. The subjects observed ranged from industry professionals to

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university students to members of the general public, which provided a vast and highly variable pool of subjects. The authors' research focused on providing various amounts of case information to the investigators to study how this information influenced the subjects' decision-making. Some examples of peripheral information provided to industry professionals included whether or not there was a confession from the suspect, result reports from other types of forensic analyses, crime scene photos that were irrelevant to the scope of the professionals' investigation, and names of medications found at a scene and more. The contextual information provided to the test subjects studying case-specific evidence was falsified to test the impact of influence. Of the eleven disciplines represented in the study, six of them among the forensic science professional practitioners showed evidence of influence. This comprehensive research shows evidence of influence due to contextual information seen specifically among professional forensic scientists in specialized fields.

The issue of providing "case-specific" information to forensic scientists raises an alarming concern regarding cognitive bias among professionals. As demonstrated in the research, when information is provided to create context, that context can become influential to the decisions and conclusions made by those who are counted on to be unbiased. Another issue brought up by the use of contextual information is the use of ancillary information such as other lines of evidence that in a particular case can paint a picture in the mind of an analyst, influencing the conclusion of an independent piece of evidence. This concern is particularly pertinent considering that reviewing multiple lines of evidence relating to a single case is well within the purview of a forensic scientist. Cooper and Meterko (2019) state that current available

information supports the idea of increased susceptibility to several types of cognitive and confirmation biases among forensic science professionals. Additionally, the value in methods used to reduce the amount of peripheral or contextual information provided to professionals outside of their scope of research and promote the use of multiple comparison samples in place of the former showed significant improvement in the reduction of biased conclusions. This comprehensive study provides a clear idea of the problem and identifies the extent to which cognitive bias can influence forensic scientists. Cognitive bias plagues the human mind across all identifying facts. Still, it seems to be present in a greater amount than normal in people whose professions require objective thinking—forensic science professionals. It is highly alarming, but mitigation efforts suggest a promising improvement in current conditions.

Expanded Research on Professionals in the Field

Kukucka et al. (2017) assert that the exposure of irrelevant contextual information prompts confirmation of biased conclusions from forensic scientists. This research surveyed 403 forensic science practitioners from twenty-one countries to assess their understanding of their own cognitive bias. It showed that within the vast sample size chosen for this examination, the majority of forensic science professionals deemed their judgments and professional conclusions infallible (Kukucka et al., 2017). As a result of this belief, the biased investigators studied showed a minimal appreciation for and understanding of cognitive bias's significant reach and implications for their profession. More specifically, fewer than half of the investigated forensic professions within this research supported the use of blind testing in the workplace. Most of the researched groups believed to some

degree that they, as professionals, are somehow immune to cognitive bias or can steel themselves against it.

Embracing routine blind testing to reinforce error control is a method that can be followed to identify better the extent to which forensic professionals allow cognitive bias to influence their work. A better understanding of cognitive bias in general and the professional forensic community is imperative to curbing preventable errors. Additionally, providing the relevant tools to mitigate bias can prevent forensic practitioners from misconstruing their own cognitive bias as an ethical issue rather than the commonplace scientific consideration. Finally, additional perspectives on the issue of the perception of bias in oneself are necessary for a better understanding of why professionals refuse to acknowledge it in their work.

Commentary by a Forensic Examiner

As the research has proven, no matter how well-intended or educated a person may be, the human mind is incapable of resisting inherent bias. Butt (2013) is a forensic examiner with thirty years of experience. His perspective on inherent bias among forensic experts is an interesting challenge to the way of thinking that is common within the discipline. Butt (2013) confirms in his commentary that regardless of willpower, forensic analysts of all kinds are impacted and influenced by personal and contextual biases, some individuals more than others. Butt (2013) highlights that it is unfortunately not uncommon for individuals involved and interested in specific case outcomes to attempt to influence forensic analysts further into a certain decision, outcome, or opinion depending on their motive. Butt also mentions that he is aware of a handful of forensic investigators seeking additional investigative materials to use in conjunction with the investigation, such as police reports, additional medical history,

history of drug usage, or prison records. Since there are few policies and procedures in place to defend against this type of informational influence, the bias continues unadulterated. This perspective brings about an interesting pair of questions: What information should be considered relevant to a forensic expert? How should it be guaranteed that the contextual information being provided is not biased?

Butt argues that Kukucha et al. (2017) blew the issue of bias among forensic professionals out of proportion. He argues that the insufficient number of forensic examiners is to blame for the cases in which erroneous results are reported, asserting that the addressing the understaffing issue would alleviate the rate at which overworked forensic examiners make mistakes. Butt states that, by nature, the human mind will look for patterns and logical lines of reasoning and unintentionally "connect" cases. This perspective is interesting, but it highlights that this theory is a minimal part of why so much bias is reported among forensic professionals.

Commentary by a Fingerprint Expert

Charlton (2013) is another critic of the Kukucka et al. (2017) article*;* this article argues a different point of view and offers some insight into the standards put in place to eliminate bias. The author calls for empathy for "both sides" of the argument but comes from the place of a fingerprint expert. The plight of fingerprint examiners is presented as a self-fulfilling prophecy, perpetuating bias within the field of experts on loop. This evidence, or any other type of forensic evidence, is accepted based on the trust of both the credentials and expertise of the fingerprint examiner. Charlton (2013) further explains that the job of a fingerprint analyst is to analyze and evaluate evidence accurately, which is expected by the judiciary party. As a result of the

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aforementioned trust, any form of weakness in resolve or uncertainty in any sense is highly discouraged for fear of losing one's professionalism and credibility within the relevant community. This expectation of absolute certainty is a major factor in the perpetuation of bias across all forensic investigative disciplines.

It can be inferred that having to be certain in one's decision for fear of causing doubt in the validity of the whole line of evidence is a great deal of pressure. It is understandable how experts not just in the fingerprint field may develop bias based on this aspect alone: having to be confident 100% of the time.

Why We Expect Cognitive Bias

Pronin et al. (2002) present three studies that further our understanding as to why cognitive bias is such a difficult concept to accept. These studies suggest that understanding biases and their place in the human judgment of influence, as well as the ability to recognize the impact of these factors on others, neither prevents one from falling victim to, nor allows one to be aware that they have fallen victim to their own bias. The study goes on to state that the idea that reality is perceived without any distortion or influence outside of one's own consciousness is related to the lack of access to the cognitive and motivational processes that influence that very perception. Because of this lack of access, the operation of bias must become inferred. Such an inference, for example, would be if there is a discrepancy between what another individual claims to perceive and what one assumes to be truth or reality. Since others often do not share our viewpoints and opinions, we often dismiss them and infer that they are less objective than we are. As humans, we are slow to recognize that our views and interpretations of the world around us are no less subject to the bias that we then project onto the subject matter

placed before us. The research speculates that as convinced as we are of our understanding of the information given to us, we are merely seeing things through our unique lens and not "calling them as we see them" (Pronin et al., 2002).

The conclusions from this research and how they relate to the abundance of cognitive bias due to the susceptibility of influence that forensic scientists experience daily is clear. There is a "blind spot" that every individual has when it comes to their perception, and this can be exacerbated by the accumulation of expertise in a subject area. Further investigation into why forensics studies and investigative practitioners have such rampant confirmation bias is pertinent to proposing possible solutions to the problem.

Discussion

The problems highlighted in the research presented are alarming as forensic experts' opinions fall victim to inescapable cognitive bias. Additionally, some insights into other factors that lead to biased results have been presented by the members of the community: a lack of division of labor between forensic analysis and interpretation that causes all the work to be done by one individual, a lack of trained personnel, or a lack of funding to do necessary tests, among many others. When one individual or a small group of individuals are responsible for the analysis of forensic data or evidence with the immense amount of pressure to be correct and certain, the environment for bias is established.

The system induces bias by placing the burden of absolute truth on a single individual or small group of individuals (Koppl, 2005). In some cases, this fact has led to outright fraud to meet the needs of the system itself. There is the need for certainty, the pressure to match all evidence regardless of necessity, the inability to give each case the time and thought it requires, and

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more. Primarily, it lies the weight of the unconscious presence of bias in each forensic professional as a human being. Unfortunately, knowledge of investigative techniques is currently running far ahead of knowledge of how to best mitigate and control bias in modern investigative environments. This knowledge gap is contributing to poor quality results and a decrease in the confidence of forensic investigations and the professionals that lead them. While most well-intentioned forensic professionals do not consciously exacerbate bias, several factors based on their environment and the nature of the profession "induce" bias.

There are solutions to the problems presented by the community regarding bias being perpetuated in the workplace, starting with independence from public agencies. The majority of forensic science organizations are either county, state, or federally run and funded-this fact causes dependence on these agencies and the personnel employed by them. For example, suppose a county-run crime lab has the funds to hire another fingerprint examiner or put those funds towards equipment for law enforcement officers and chooses the latter. That will then place a higher workload and amount of pressure on their existing fingerprint experts simply because the department entity chose to spend its funds a certain way. This issue could also be resolved by the creation of a forensic authority organization whose purpose would be advocating for labs within larger agencies in terms of funds, need for equipment upgrades, more personnel, etc. Another, more overarching, solution to the issue of forensics labs being run by larger organizations would be the mass privatization of these labs. Private, client-funded forensics labs exist currently but are the minority of those that are currently operational in the US. These agencies are known for state-of-the-art equipment and techniques,

fair pay and working hours for their employees, as well as their stellar reputations within the forensic science and greater law enforcement communities. When a result or conclusion made by a government-run agency is unsatisfactory, a second opinion is usually looked for through a private forensics lab for either confirmation or information that was missed by the former. Additionally, these agencies are run by entities or people who understand forensic science and the areas of expertise the labs specialize in which is pertinent for successfully managing the experts who work for them.

Conclusion

The identified causes and perpetrators of bias in forensic science professionals and various solutions to these issues are of utmost concern to the greater criminal justice community. The current knowledge of forensic science is running far ahead of the knowledge on how to manage forensic science professionals, and this knowledge gap is contributing to the issue of bias. To tackle the issue of bias as a whole, we must first hear the professionals out when they tell us where the problems are coming from, seriously consider privatization or elements of privatization within larger agencies, and do what is possible to better understand the aspects of bias that are present in everyday lives to highlight how bias can best be minimized in the field of forensic science.

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