

Modern Scientific Evidence and Its Role in Proven Crimes

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Abstract

Among the essential, important, and vital pillars of achieving justice is modern science, which we aim to achieve as much as possible of, so that we may bring justice to both the perpetrator and the victim. Following the progress of the case, the judge and community have been assured that the evidence presented is accurate and clear, leaving no room for doubt against or for the victim. Because of the shortcomings of Arab legislation regarding scientific evidence, began taking scientific evidence, especially modern ones, which rely on contemporary methods to prove the perpetrator of red-handed crimes. The researcher concluded that it was necessary to shed more light on the nature and use of scientific evidence in the field of criminal proof and the shortcomings of using and employing modern and contemporary scientific evidence. This research shed light on the nature of scientific evidence and its application in criminal evidence. We defined modern scientific evidence and highlighted its unique characteristics. We provided examples of modern scientific evidence and its role in criminal evidence. The judge and the victim's family were also assured that the judge had the authority to estimate the evidence's value.

Keywords: Evidence, Scientific, Proof, Criminal, ethical considerations.

Introduction

Through this study, we discuss the role of modern scientific evidence in criminal proof, finding the perpetrators of the crime as quickly as possible, protecting the rights of the victims, and imposing punishment on the perpetrators of the crime. The police use modern scientific methods as presumptions that can be relied upon as conclusive evidence in identifying the perpetrators of crimes, and judges also use them when issuing sentences. The problem is that the accused uses scientific methods and modern science to commit crimes. Due to the development of methods of committing the crime, it has become difficult to discover the perpetrator. Scientific evidence in itself represents problems affecting basic human rights, which has made revealing the truth very difficult for the judiciary. (Palmiotto, 2012; Rosner, 1997). The research in modern scientific methods of proof, as it is a relatively recent topic that suffers from a scarcity of resources and previous references, is therefore a study

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that researchers can benefit from in their subsequent research for this study. In addition, scientific and technological progress led to serious qualitative and quantitative developments in the field of crimes, which led to turmoil in society. Therefore, specialists in the field of law need to pay attention to contemporary and modern technological and scientific issues and research the extent of their effectiveness in the field of criminal evidence. Due to the scarcity of studies and sources related to modern and contemporary scientific evidence and its role in the field of criminal evidence, this study is expected to pave the way for other studies on contemporary and modern scientific evidence in other fields of law and courts (Chukwuma et al., 2022).

The Arab legislator's lack of interest in the value and vitality of this type of evidence in the field of law, as well as the judges' lack of knowledge in appreciating the value of this evidence. Criminal trial law in most Arab legislation has defined the means and methods of proof, as this law clarified the means of proof, including confession, witnesses, experience, written evidence...etc. It also regulated the means of obtaining material and technical evidence by examining, inspecting, and seizing things related to the crime, but it did not regulate how to take modern scientific evidence, the means of dealing with it, and the arguments of some of it. Therefore, we needed to shed light on some of this scientific evidence, its authority, and its role in the field of criminal proof (Banerji et al., 2023).

With the rapid development of civilization and its complexities, moral, literary, and even religious values declined, and testimony lost its true value, which paved the way for scientific facts and the growing role of scientific evidence in criminal proof. This role was increased by scientific progress in the various fields of science, whether chemical, physical, or the technological means that support them (Canli & Amin, 2002; Rosner, 1997).

There is no room for doubt when science performs its role and its confirmations in the field of proof, as is the case when relying on traditional means of proof such as testimony and confession, which leaves no room for doubt about the possibility of the judge's decision being right or wrong and thus a feeling of reassurance for the victim or his relatives that the real culprit was the one who received his punishment and not anyone else. It must be pointed out that modern and contemporary scientific progress in the field of criminal evidence has left no room for doubt in verifying the crime and its perpetrators, and thus the statement (there is no perfect crime) is fulfilled, and in light of scientific progress in the field of contemporary scientific research and linking it to criminal proof, legal studies had to have a positive and effective role in crystallizing the most important and effective roles of modern scientific evidence in the field of criminal proof (Golovin et al., 2022).

Scientific evidence and its relationship to criminal evidence

Addressing the concept of scientific evidence in language and legal terminology by detailing the theoretical and legal opinion in the first requirement, in requirement two, we will address the distinctive characteristics of scientific evidence to be evidence in criminal proof, as follows: (Canli & Amin, 2002).

Scientific evidence in language and terminology

- a) **Evidence in the language:** Is the guide, and the plural: evidence and guides. Which is indicated by (The Intermediate Dictionary, access date: 8/25/2023)
- b) **The terminology:** it does not differ much from the legal definition and evidence in the legal sense: it is the immediate and direct procedural activity to obtain judicial certainty by the principle of material truth by confirming or denying the accusation (Korbatieh, 2022).

It is defined legally as establishing evidence of the existence of a legal fact that has its consequences before the judiciary in legally specified ways (Mazhar & Karim, 2022).

The researcher sees evidence as a set of means by which the judge or the competent authorities investigate prove or deny a fact.

- c) **Scientific evidence is defined as:** It is the evidence that exists from the opinion of the technical expert based on scientific standards and revolves around the assessment of material or verbal evidence that is not present in the case, experience differs from testimony, as the latter is considered a transfer in the mind of the witness through one of his senses, while scientific evidence is a technical assessment of certain event based on scientific criteria (Quadara et al., 2013; Wiltshire et al., 2015).

It is noted from the above definition that the judge's conviction in scientific evidence is greater than the judge's conviction in traditional evidence since this evidence depends on the judge's reassurance of the witness (Golovin et al., 2022).

One of the important rules is that the judge does not rule based on his knowledge, rather, the judge must resort to technical expertise if the matter is related to technical matters, the judge cannot determine the nature of the victim's injury and know the used tools in the crime, and he cannot examine fingerprints, seeking help from technical expertise, since fingerprints contribute greatly to detecting the perpetrators of crimes, whether fingerprints, it is necessary to seek help from technical expertise, as fingerprints contribute greatly to detecting the perpetrators of crimes, whether voice or body fingerprints, or other things (De Groot et al., 2021). It is necessary to seek help from technical expertise such as criminal investigation, forensic medicine, and fingerprint experts (Hazard, 2016)

The Holy Qur'an, specifically in Surat Yousif (peace be upon him) has mentioned in two aspects:(Canli & Amin, 2002).

- a) **The first aspect:** The Almighty's saying: (And they brought upon his shirt false blood. [Jacob] said, "Rather, your souls have enticed you to something, so patience is most fitting. And Allāh is the one sought for help against that which you describe (King et al., 2017).
- b) **The second aspect:** The Almighty's saying: (Joseph) said, "It was she who sought to seduce me." A witness from her family testified, "If his shirt is torn from the front, then she has told the truth, and he is one of the liars (Wiltshire et al., 2015).

It is clear in the second noble verse a serious allegation made by the wife of Aziz of Egypt against our master Yousif (peace be upon him) that he tried to assault her, and he has no evidence to deny it except what he said, and it also includes a witness who did not see the incident with his own eyes, since they were alone and the doors were tightly closed, where this witness is considered an experience witness with our contemporary definition since he built his testimony by examining the clothes and the location of each one of them, and he took the opinion of this witness, and the innocence of our master Yousif (peace be upon him) was proven. The Holy Qur'an has taught us about revealing facts and crimes, scientific evidence gives the judge the ability to understand matters through facts that agree or differ with oral evidence, which helps him in giving the correct judgment (Thakare et al., 2021).

Conclude from the above that scientific evidence is considered one of the forms of testimony that the judge resorts to to reach the truth, for example, the technical experts who carry out expert work are only witnesses, but of a special type that uses their experience in forming what is called scientific testimony(Rabie & Al-Haddad, 2023). The forensic doctor is considered an impartial technician witness. appears before the judiciary to seek clarification from about technical and scientific points that the court cannot know, and technical experts do not intervene within the scope of the law as the judge is presumed to know (Nassif, 2017).

Characteristics of scientific evidence

Some characteristics distinguish scientific evidence from criminal evidence, such as witness testimony and confessions, and the most important of these characteristics are(Acharya, 2012).

First: The consistency and stability of scientific methods

Scientific methods are characterized by consistency and stability because they are based on stable scientific foundations, this feature makes them deal with material effects and the stability of the results without significant differences between

them, no matter how different the sites are, such as blood, semen, and fingerprint analysis, this evidence is consistent and stable, unlike witness testimony, which often has multiple human sources about the incident, which leads to a discrepancy in testimony, whether before the public prosecution, the court, or at any stage of the case (Thakare et al., 2021).

Second: Neutrality and honesty

Practical reality has proven that the expert is not always alone in his opinion but rather is subject to oversight by his superiors as well as judicial oversight, so he is required to base his opinion on honesty, sincerity, and rational thinking (Korbatieh, 2022; Palmiotto, 2012).

Likewise, there is no connection between the expert and the adversary so that he is not divided or complimentary in his work, and the expert is often a public employee who is chosen by the state through conditions that must be met by him, which are honesty, sincerity, integrity and accuracy in his work, in contrast to the testimony of witnesses, where the witness can be from a relative of the opponent, there may also be a relationship between the witness and the opponent, whether commercial, professional, or other (Ibrahim, 1981; Rabie & Al-Haddad, 2023).

Third: The continuous development of scientific evidence

One of the most important features of scientific development and progress is that it has no limits in all fields, within the criminal field, new scientific methods may emerge as a result of ongoing research in the criminal field that are useful in uncovering facts that cannot be proven at present, and the matter will become easier in the future, the scientific community has been able in the criminal field involves extracting a DNA fingerprint, this DNA carries a genetic code through which the eye can be attributed to its source in many crimes such as murder, rape, and identifying unknown bodies (Hazard, 2016; Riaz et al., 2023).

Fourth: The interim unit in extracting evidence

The scientific evidence is considered interconnected and homogeneous even in its details, meaning that no conflict occurs, no matter how many sources of material evidence there are, and no matter how many tests it has been subjected to the reason for this is that it is built on a scientific basis with a single source, so that it does not accept doubt or controversy, this makes it prevail over the moral evidence (Hazard, 2016; Peterson, 1984).

Models of modern scientific evidence in criminal evidence

Modern scientific evidence in criminal cases can be understood through different models. One approach is the formal-logical approach, which focuses on

logical reasoning and justification of law enforcement decisions (Arshad et al., 2018). Another approach is the factual approach, which emphasizes the gathering and presentation of factual information to support the case. The cybernetic approach views evidence as information assets that are accumulated and used as argumentative resources. The pragmatic approach, influenced by Anglo-Saxon legal systems, focuses on the proper certification of information and its use in influencing law enforcement decisions (Broeders, 2006). Additionally, probabilistic graphical models, such as Bayesian networks, have been used to assess the joint probative value of different analyses in criminal cases. These models help deal with complex situations and provide insights into the application of probabilistic reasoning in real criminal cases (Mack & Chatterjee, 2021; Rossinskiy, 2023).

The strengths and weaknesses of each of the models of modern scientific evidence in criminal evidence

Modern scientific evidence in criminal cases has strengths and weaknesses. One strength is that it allows for a more accurate assessment of mental states and the assignment of punishments. Another strength is that it is based on a scientific approach, particularly in the field of forensic DNA analysis, which provides more reliable and valid evidence. However, there are also weaknesses. One weakness is the difficulty in assessing the weight of forensic evidence, as seen in recent cases where the weight of expert evidence was either over- or understated (Sallavaci, 2014). Another weakness is the potential for subjective interpretations and conclusions, especially in traditional identification disciplines like dactyloscopy and handwriting analysis, which may not adhere to the same scientific standards as forensic DNA analysis. Additionally, there are concerns over the validity and reliability of expert evidence submitted to courts, and the limited mechanisms available to test and challenge such evidence (Denno, 2020; Ishaq & Bashir, 2023).

The most common types of modern scientific evidence

Modern scientific evidence used in proven crimes includes various types such as DNA testing, fingerprint profiling, micro-observations, and Narco-tests. These methods are used to identify the reality related to crime and suspects accurately (Zahra & Lohani, 2022). Additionally, digital evidence plays a crucial role in crime investigation, including CCTV footage, online purchase history, and mobile phone data (Thakare et al., 2021). These types of evidence are analyzed by different disciplines of forensic science, such as Biology, DNA, Chemistry, Toxicology, Ballistics, and Cyber. The multidisciplinary analysis of this evidence aids in fixing the crime scene, establishing the presence of the accused, and determining their involvement in the crime. Overall, the combination of modern scientific techniques

and disciplines in forensic science contributes to the accurate identification and interpretation of evidence in criminal cases (Broeders, 2006; Mack & Chatterjee, 2021).

Challenges faced in collecting and analyzing modern scientific evidence

Modern scientific evidence collection and analysis face several challenges. One challenge is the difficulty in judging whether the evidence is consistent with the claims presented, known as theory-evidence coordination. Another challenge is the vast amount of data available, making it challenging for scientists to find the most relevant datasets for their research (Bani & Al-Maliki, 2023). Additionally, the digital revolution, the use of neurosciences, and the increasing employment of artificial intelligence in adjudicating cases pose challenges to the traditional basis of fact-finding in criminal proceedings. Furthermore, the pressure to publish and the need for scientific rigor in data and publication contribute to the challenge of improving reproducibility in scientific research. These challenges highlight the need for interdisciplinary research, critical thinking, and the responsible communication of scientific findings to address the complexities of collecting and analyzing modern scientific evidence (Sangster & Oliver, 2012; Shah et al., 2017).

The impacts of modern scientific evidence in criminal cases

Modern scientific evidence has had significant impacts on criminal cases. It has played a crucial role in the investigation process, helping to identify the reality of crimes and suspects accurately. Forensic science, including DNA testing, micro-observations, fingerprint profiling, and Narco-test, has been used to inspect criminal crimes such as rape, murder, fraud, and drug tracking. (Salama, 1988) The use of modern scientific methods has allowed for the detection of crimes that were previously difficult to detect using traditional methods (Perlin & Lynch, 2016). Additionally, neuroscientific evidence has been increasingly used in criminal justice systems, primarily by defense attorneys for purposes of mitigation. It has had an impact on all phases of the criminal justice system, particularly in sentencing. Overall, modern scientific evidence has revolutionized the criminal justice system, providing valuable tools for investigation, identification, and decision-making in criminal cases (Bani & Al-Maliki, 2023; Mack & Chatterjee, 2021).

The ethical considerations in modern scientific evidence

Modern scientific evidence in proven crimes raises several ethical considerations. Affective and forensic neuroimaging studies have the potential to uncover the neural basis of emotion and personality, but also raise ethical debates about privacy and consent. The absence of universally accepted objective foundations for ethics in forensic science creates a need for interim ethical guidelines

to guide practice. Additionally, the pressure to provide definitive conclusions in the law can lead to unwarranted certainty and biased opinions, especially when there are financial or personal interests involved. The National Academy of Sciences has emphasized the need for enforceable standards and best practices in forensic science to ensure ethical practices. Overall, ethical considerations in modern scientific evidence in proven crimes involve privacy, consent, objectivity, bias, and the need for standards and guidelines (Canli & Amin, 2002; Franceschi, 2019).

Conclusion

The diversity and multiplicity of scientific evidence in the field of criminal evidence, as scientific evidence has specific characteristics that make it distinct from other traditional evidence. The tremendous development in all fields has created new methods for committing crime and creating new crimes that were not known before, as a result of this development, it was necessary to keep pace with this development by using new methods and means to detect and search for crime and its perpetrators. The study concluded that scientific evidence must have been obtained by legitimate means, and this evidence must be discussed in the presence of the parties in court sessions. This research estimates the value of all the evidence presented in the case, including scientific evidence, is up to the judge because the law grants him discretionary power according to his conviction of the value of each evidence. There is a lot of physical evidence found at the crime scene, which cannot be seen with the naked eye, such as latent fingerprints, dried sperm stains, or blood stains that have been washed, and they can be detected by ultraviolet rays, red rays, and gamma rays. Lastly, forensic medicine has a major role in preparing reports on the causes of death, incidents of rape, indecent assault, and other crimes that judges use to uncover the truth, despite the presence of some problems that forensic doctors suffer from.

Recommendations

1. The necessity of seeking to include scientific evidence and employ it in the field of criminal evidence through the legislative aspect
2. Striving to develop the use of modern scientific evidence in the field of criminal evidence by directing competent authorities to seek the assistance of specialized authorities and experts in the field of advanced criminal research.
3. Holding training courses for investigation officers and judges on how to deal with modern scientific evidence and how to judge its accuracy and quality in the issued judgments.
4. Directing researchers to further research and study in the field of criminal research and modern scientific evidence.

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