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In the trap of certainty: the role of confirmation bias in criminal justice

En la trampa de la certeza: el papel del sesgo de confirmación en la justicia penal

Csongor Herke  0000-0002-5106-339X

Department of Criminal and Civil Procedure Law, Faculty of Law, University of Pécs (Hungary).
herke.csongor@ajk.pte.hu

Abstract

The study examines the pervasive role of confirmation bias in criminal justice decision-making. It explores how cognitive biases can shape the interpretation of evidence, influence investigative and prosecutorial strategies, and reinforce initial assumptions about a suspect's guilt. Through the analysis of wrongful conviction cases, the paper illustrates how confirmation bias can lead to overlooking exculpatory evidence and misinterpreting ambiguous facts and proposes safeguards to mitigate their impact.

Resumen

El estudio examina el papel omnipresente del sesgo de confirmación en la toma de decisiones en la justicia penal. Explora cómo los sesgos cognitivos pueden moldear la interpretación de las pruebas, influir en las estrategias de investigación y enjuiciamiento, y reforzar las suposiciones iniciales sobre la culpabilidad de un sospechoso. A través del análisis de casos de condenas injustas, el artículo ilustra cómo el sesgo de confirmación puede llevar a pasar por alto pruebas exculpatorias y a malinterpretar hechos ambiguos, y propone salvaguardias para mitigar su impacto.

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I. Introduction

One of the fundamental objectives of criminal justice is to ensure that decisions made during proceedings are as objective and reliable as possible. The principle of the rule of law and the presumption of innocence require that judgments be based solely on the free assessment of evidence, a thorough evaluation of the relevant facts, and the consistent application of the law. In reality, however, a number of cognitive biases can influence human decision-making, one of the most significant being confirmation bias.

The essence of confirmation bias is that people tend to favor information that supports their prior beliefs or hypotheses, while ignoring or underestimating evidence that contradicts them¹. This phenomenon can have a serious distorting effect not only on everyday decision-making, but also at all levels of criminal proceedings, including investigation, prosecution, trial, and evidence assessment.

The problem of confirmation bias has been widely studied in international research, with a particular focus on criminal investigations, expert evidence, prosecution, and sentencing². The literature provides numerous examples of how bias can lead to misidentification³, unjustified prosecutions, or even serious miscarriages of justice⁴.

In Hungary, too, there are cases in which confirmation bias may have played a direct or indirect role in wrongful decisions. Suffice it to refer to the tragic and protracted case of the bank robbery in Mór, where the possibility arose during the investigation and court proceedings that the interpretation of the evidence was influenced by preconceived suspicions⁵. Although a detailed analysis of such cases will be provided in later chapters of this study, it can already be indicated in the introduction that these errors do not occur exclusively in foreign examples, but can also appear in domestic practice.

Confirmation bias is particularly dangerous in criminal proceedings because it can reinforce false hypotheses and thus maintain the wrong direction of the investigation, instead of decision-makers correcting their assumptions through an objective evaluation of the evidence. A single misinterpreted witness statement, misinterpreted

1. Nickerson, Raymond Sampson. "Confirmation Bias: A Ubiquitous Phenomenon in Many Guises," *Review of General Psychology* 2, no. 2 (1998): 175-220, doi: 10.1037/1089-2680.2.2.175.
2. Kassin, Saul M., Itiel E. Dror, Y Jeff Kukucka. "The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions," *Journal of Applied Research in Memory and Cognition* 2, no. 1 (2013): 42-52, doi: 10.1016/j.jarmac.2013.01.001.
3. Findley, Keith A., and Michael S. Scott. "The Multiple Dimensions of Tunnel Vision in Criminal Cases," *Wisconsin Law Review* 2006, no. 2 (2006): 291-397.
4. Dror, Itiel E., and Simon A. Cole. "The Vision in 'Blind' Justice: Expert Perception, Judgment, and Visual Cognition in Forensic Pattern Recognition," *Psychonomic Bulletin & Review* 17, no. 2 (2010): 161-167, doi: 10.3758/PBR.17.2.161.
5. Kovács, Lajos. *A Mór megtette...* Budapest: Korona, 2009, 376 pp. ISBN 97896395889957.

expert opinion, or evidence placed in the wrong context can be enough to bring charges against or convict an innocent person, while the real perpetrator remains free.

The aim of this study is to present in detail the concept of confirmation bias, its manifestations at different stages of criminal proceedings, and to analyze how investigating authorities, prosecutors, courts, and other procedural actors—such as experts, witnesses, defense counsels, and defendants—can fall into the trap of this bias. The analysis is based partly on international research and case studies and partly on domestic cases, the lessons of which can help prevent future mistakes.

The study is structured as follows: Chapter 2 introduces the concept of confirmation bias and its psychological background, while Chapter 3 presents the forms of bias broken down by different procedural actors, illustrated with domestic examples. The fourth chapter focuses on prevention options and international and domestic best practices, and the fifth chapter summarizes the most important conclusions and recommendations.

2. The concept of confirmation bias

Confirmation bias is one of the best known and most widely researched cognitive biases, referring to the phenomenon whereby people tend to favor information that confirms or supports their prior beliefs or hypotheses, while ignoring or attributing less importance to information that contradicts them hypotheses, while ignoring or attaching less importance to data that contradicts them⁶. This psychological phenomenon has been known for decades and has received considerable attention in both basic research and applied sciences such as law, medicine, and criminology.

2.1. Psychological background and theories

The roots of confirmation bias can be found in the fundamental findings of cognitive psychology, which state that human information processing is not entirely rational, but is strongly influenced by previous experiences, beliefs, and emotions⁷. People's mental models—their internal representations of the world—guide attention, memory, and perception, so new information is interpreted through these

6. Klayman, Joshua, and Young-Won Ha. "Confirmation, Disconfirmation, and Information in Hypothesis Testing," *Psychological Review* 94, no. 2 (1987): 211–228, doi: 10.1037/0033-295X.94.2.211.

7. Kunda, Ziva. "The Case for Motivated Reasoning," *Psychological Bulletin* 108, no. 3 (1990): 480-498, doi: 10.1037/0033-2909.108.3.480.

filters⁸. The so-called belief persistence is the tendency for people to continue to reinforce a theory even though the evidence underlying that theory contradicts it⁹.

There are several explanations for this bias. According to Festinger's cognitive dissonance theory, people strive for internal consistency and experience unpleasant psychological tension when new information contradicts their existing beliefs. This tension is often reduced by rejecting or reinterpreting the contradictory data while reinforcing their previous position¹⁰.

Similarly, the theory of motivated reasoning emphasizes that our thought processes serve not only to seek the truth, but also to reinforce desired conclusions¹¹. Therefore, people tend to seek and interpret information that supports their desired outcome, even if it is objectively less supported.

A special variant of confirmation bias is the sunk cost fallacy, also known as the Concorde effect¹². This refers to the phenomenon whereby people continue with a decision or action because they have already invested significant resources – time, money, energy – in it, regardless of whether the future prospects justify continuing. In criminal proceedings, this can occur when the investigating authority or the prosecution continues to pursue a line of inquiry or a suspect despite new evidence weakening the validity of the hypothesis.

The Concorde effect is a classic and famous example of the sunk cost fallacy, named after the Concorde aircraft. The Concorde was financed by the British and French governments, and although it became clear during the test phase that it would not be economically viable, the project was nevertheless carried through, partly because “too much money had already been invested in it.” The Concorde effect refers to people or organizations continuing with loss-making or useless projects simply because they have already invested a lot in them and find it difficult to withdraw due to prestige or self-justification¹³.

According to Arkes and Blumer, a combination of the two is the finding that if people accidentally book two trips for the same weekend, one costing \$100 and the

8. Neisser, Ulric. *Cognition and Reality: Principles and Implications of Cognitive Psychology*. San Francisco, CA: W. H. Freeman, 1976.

9. Anderson, Craig A., and Kathryn L. Kellam. “Belief Perseverance, Biased Assimilation, and Covariation Detection: The Effects of Hypothetical Social Theories and New Data,” *Personality and Social Psychology Bulletin* 18, no. 5 (1992): 555-563, doi: 10.1177/0146167292185005.

10. Festinger, Leon. *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press, 1957.

11. Kunda, Ziva. “The Case for Motivated Reasoning,” *Psychological Bulletin* 108, no. 3 (1990): 480-498, doi: 10.1037/0033-2909.108.3.480.

12. Arkes, Hal R., and Catherine Blumer. “The Psychology of Sunk Cost,” *Organizational Behavior and Human Decision Processes* 35, no. 1 (1985): 124-140, doi: 10.1016/0749-5978(85)90049-4.

13. Lidén, Mikael, Martin Gräns, and Peter Juslin. “Self-Correction of Wrongful Convictions: Is There a ‘System-Level’ Confirmation Bias in the Swedish Legal System’s Appeal Procedure for Criminal Cases? — Part I,” *Law, Probability and Risk* 17, no. 4 (2018): 311-336, doi: 10.1093/lpr/mgy018.

other \$50, but the latter is of better quality, the majority of participants in the study will still let the \$50 trip go to waste so as not to lose more money¹⁴.

Another related psychological mechanism is the phenomenon of belief perseverance, whereby people maintain their previous beliefs even when the evidence supporting them is refuted. Contradictory evidence is considered insignificant or misunderstood¹⁵. This is particularly dangerous in criminal justice, because a false suspicion can persist for a long time and influence the interpretation of evidence.

2.2. Confirmation bias in the context of criminal proceedings

Criminal proceedings provide a unique environment for confirmation bias. The nature of the investigation and prosecution process is hypothesis-driven: investigators make assumptions about the perpetrator and the circumstances of the crime based on initial information. This initial narrative can later determine what evidence is sought, which witnesses are heard, and how expert opinions are interpreted¹⁶.

The literature emphasizes that confirmation bias can affect all actors in the justice system:

- Investigating authorities: they tend to focus on the primary suspect, while paying little attention to investigating alternative perpetrators.
- Prosecutors: after the decision to prosecute, they often seek and present evidence supporting the charges, ignoring exculpatory evidence.
- Courts: during the trial, first impressions can strongly influence the evaluation of evidence.
- Experts: contextual information obtained during the investigation may influence the objectivity of expert opinions¹⁷.

In criminal proceedings, confirmation bias often operates in the form of a self-reinforcing cycle: evidence collected and interpreted on the basis of an existing hypothesis confirms the original hypothesis, which further reinforces the biased selection of evidence. This circular logic poses a serious threat to the integrity of the justice system.

14. Arkes, Hal R., and Catherine Blumer. "The Psychology of Sunk Cost," *Organizational Behavior and Human Decision Processes* 35, no. 1 (1985): 124-140, doi: 10.1016/0749-5978(85)90049-4.

15. Ross, Lee, Mark R. Lepper, and Michael Hubbard. "Perseverance in Self-Perception and Social Perception: Biased Attributional Processes in the Debriefing Paradigm," *Journal of Personality and Social Psychology* 32, no. 5 (1975): 880-892, doi: 10.1037/0022-3514.32.5.880.

16. Findley, Keith A., and Michael S. Scott. "The Multiple Dimensions of Tunnel Vision in Criminal Cases," *Wisconsin Law Review* 2006, no. 2 (2006): 291-397.

17. Dror, Itiel E., and Simon A. Cole. "The Vision in 'Blind' Justice: Expert Perception, Judgment, and Visual Cognition in Forensic Pattern Recognition," *Psychonomic Bulletin & Review* 17, no. 2 (2010): 161-167, doi: 10.3758/PBR.17.2.161.

2.3. Consequences of the phenomenon

The effects of confirmation bias in criminal justice can be serious:

- Wrongful identifications and convictions.
- Failure to find the real perpetrator.
- Long periods of detention for innocent defendants.
- Erosion of legal certainty and public trust in the justice system.

Such consequences are not merely theoretical dangers: we are aware of numerous notorious international and domestic cases, but there are also many lesser-known procedural errors in smaller cases that can be explained by similar mechanisms, highlighting the tangible risks of confirmation bias.

In the next chapter will present in detail the specific manifestations of confirmation bias in the work of investigative authorities, prosecutors, courts, and other procedural actors, illustrated with domestic examples.

3. Forms of confirmation bias in criminal proceedings

3.1. Confirmation bias in investigative authorities

The work of investigative authorities is fundamentally hypothesis-driven: based on initial information about the crime, witness statements, and clues, they form assumptions about the possible perpetrator, the method of the crime, and the motive¹⁸. This initial narrative can later guide the search for and evaluation of evidence. Although hypothesis formation is a natural and essential part of the investigation, premature and overly rigid commitment can easily lead investigators into the trap of confirmation bias¹⁹.

A typical manifestation of confirmation bias in investigative authorities is that they seek evidence that fits their initial suspicion, while ignoring or giving less weight to information that contradicts their hypothesis²⁰. The psychological background to

18. Kassir, Saul M., Itiel E. Dror, and Jeff Kukucka. "The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions," *Journal of Applied Research in Memory and Cognition* 2, no. 1 (2013): 42-52, doi: 10.1016/j.jarmac.2013.01.001.

19. Lidén, Mikael, Martin Gråns, and Peter Juslin. "Self-Correction of Wrongful Convictions: Is There a 'System-Level' Confirmation Bias in the Swedish Legal System's Appeal Procedure for Criminal Cases? — Part I," *Law, Probability and Risk* 17, no. 4 (2018): 311-336, doi: 10.1093/lpr/mgy018.

20. Findley, Keith A., and Michael S. Scott. "The Multiple Dimensions of Tunnel Vision in Criminal Cases," *Wisconsin Law Review* 2006, no. 2 (2006): 291-397.

this phenomenon often includes motivated reasoning²¹, reduction of cognitive dissonance²² and the Concorde effect²³: due to the time and resources invested in the investigation, police officers tend to stick to a theory even if new evidence refutes it.

Investigative pressure and public expectations also play a significant role. In cases of high public interest, such as serial murders or high-profile violent crimes, investigative authorities often face strong political and media pressure to deliver quick results. However, De Keijser and van Koppen found that professional judges may exhibit a sentencing paradox: judges needed less evidence to convict a suspect if the crime was more serious²⁴. This environment is conducive to the development of confirmation bias, as confirming suspicion often becomes more important than objective investigation.

One of the best-known examples in the history of Hungarian criminalistics is the Martfű serial killer case, which clearly illustrates the dangers of investigative confirmation bias. In the late 1950s, a brutal murder took place near Martfű: a local woman was raped and killed. During the investigation, the police quickly became suspicious of János Kirják, who had previously known the victim, and certain circumstances (such as his whereabouts and alleged conflicts) “fit” the criminal narrative developed by the investigators.

Instead of investigating all possible perpetrators in parallel, the investigators focused almost exclusively on gathering evidence against Kirják. As a result:

- Contradictory witness statements were given little consideration or were discredited.
- Expert opinions that supported the suspicion were preferred.
- Data supporting Kirják’s innocence, such as details of his alibi, were given little attention²⁵

At the end of the trial, János Kirják was convicted (originally sentenced to death, but fortunately commuted to life imprisonment by the Supreme Court on appeal), while the real perpetrator remained at large and committed further crimes. It was only years later that it emerged that Péter Kovács, the “real Martfű monster” should have been held responsible for the murders. The tragedy affected the lives

21. Kunda, Ziva. “The Case for Motivated Reasoning,” *Psychological Bulletin* 108, no. 3 (1990): 480-498, doi: 10.1037/0033-2909.108.3.480.

22. Festinger, Leon. *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press, 1957.

23. Lidén, Mikael, Martin Gräns, and Peter Juslin. “Self-Correction of Wrongful Convictions: Is There a ‘System-Level’ Confirmation Bias in the Swedish Legal System’s Appeal Procedure for Criminal Cases? — Part I,” *Law, Probability and Risk* 17, no. 4 (2018): 311-336, doi: 10.1093/lpr/mgy018.

24. De Keijser, Jan W., and Pieter J. Van Koppen. “Paradoxes of Proof and Punishment: Psychological Pitfalls in Judicial Decision Making,” *Legal and Criminological Psychology* 12 (2007): 189-205, doi: 10.1348/135532506X11872.

25. Szabó, László. *13 bíró emlékezik*. Budapest: Táncsics, 1980, 336 pp. ISBN 9633212847.

of several people: not only the victims and their families, but also the innocent man who was convicted²⁶.

This case clearly illustrates the phenomenon of “tunnel vision,” which is an extreme form of confirmation bias²⁷. Due to the narrow focus of the investigators, alternative scenarios and suspects were ignored, and the collection and evaluation of evidence became one-sided. Not to mention that in 1950s Hungary, the criminal policy objective was to identify the perpetrator as quickly as possible, even at the risk of convicting the wrong person.

The Martfű case and similar investigative errors warn us that confirmation bias:

- It stems from early commitment: hypotheses formed at the beginning of the investigation fix the thinking²⁸.
- It results in information asymmetry: investigators devote more time and resources to supporting their suspicions than to refuting them²⁹.
- It reinforces contextual biases: experts and witnesses may also receive biased information, which further increases bias³⁰.

From a prevention perspective, the literature suggests several solutions:

- Conscious examination of alternative theories (“consider-the-opposite” strategy)³¹.
- Involvement of independent investigative teams in the review process.
- Evidence evaluation independent of knowledge of the suspect.

Confirmation bias on the part of the investigating authority is therefore not merely an individual psychological weakness, but a problem perpetuated by organizational and cultural factors. The Martfű case highlights that a flawed investigative focus and distorted evidence analysis can lead the justice system astray for decades, while the real culprits continue to claim new victims.

26. Dulai, Péter. “A médiaerőszak által belobbantott tűz – Egy szexuális indítékből elkövetett sorozatgyilkosság kriminálpszichológiai szemszögből,” *Belügyi Szemle* 2020, no. 2 (2020): 103-113.

27. Findley, Keith A., and Michael S. Scott. “The Multiple Dimensions of Tunnel Vision in Criminal Cases,” *Wisconsin Law Review* 2006, no. 2 (2006): 291-397.

28. O’Brien, Barbara. “Prime Suspect: An Examination of Factors That Aggravate and Counteract Confirmation Bias in Criminal Investigations,” *Psychology, Public Policy, and Law* 15, no. 3 (2009): 315-334, doi: 10.1037/a0016908.

29. Schmittat, Silja M., Birte English, Lena Sautner, and Patrick Velten. “Alternative Stories and the Decision to Prosecute: An Applied Approach Against Confirmation Bias in Criminal Prosecution,” *Psychology, Crime & Law* 28, no. 6 (2021): 608-635, doi: 10.1080/1068316X.2021.1941013.

30. Dror, Itiel E., and Greg Hampikian. “Subjectivity and Bias in Forensic DNA Mixture Interpretation,” *Science & Justice* 51, no. 4 (2011): 204-208, doi: 10.1016/j.scijus.2011.08.004.

31. Hirt, Edward R., and Keith D. Markman. “Multiple Explanation: A Consider an Alternative Strategy for Debiasing Judgments,” *Journal of Personality and Social Psychology* 69, no. 6 (1995): 1069-1086, doi: 10.1037/0022-3514.69.6.1069

3.2. Confirmation bias in the prosecution

A good example of confirmation bias is the case of Ronald Cotton (USA, North Carolina, 1984). Cotton was convicted of sexual assault based on the testimony of Jennifer Thompson, who positively identified him from a series of photographs and then again during an identification parade. In 1995, DNA testing proved that the real perpetrator was Bobby Poole. Cotton spent 10, s and a half in prison for a crime he did not commit because no thorough investigation was conducted after the initial identification³².

This case clearly illustrates the danger of confirmation bias: in the prosecutor's decision-making, the early theory based on witness testimony became so dominant that new evidence was only taken into account at a late stage. The wrongful indictment ultimately led to a conviction.

In the United States, several cases have highlighted the dangers of prosecutorial persistence, such as the Duke Lacrosse case, where prosecutors maintained charges against three college athletes for a long time, even though DNA evidence clearly pointed in another direction³³. In the United Kingdom, the Birmingham Six case followed a similar pattern, with prosecutors fighting for years against those accused of a bombing, even when new evidence emerged proving their innocence³⁴.

The role of the public prosecutor's office in criminal proceedings in Hungary is threefold: firstly, it supervises the legality and expediency of the investigation; secondly, it prepares and represents the prosecution before the court; and finally, in certain cases, it conducts investigations (in the latter respect, the provisions applicable to the investigating authority apply). This triple function carries with it the risk that the prosecutor, in line with the findings of the investigating authority, may himself become a victim of confirmation bias, which reduces the possibility of objective assessment. From the perspective of cognitive psychology, confirmation bias manifests itself here in that the prosecutor tends to interpret the evidence at his disposal in such a way as to support the indictment already formulated, while giving less consideration to or downplaying evidence that offers exculpatory or alternative explanations³⁵.

Prosecutors often base their further decisions on information received at the beginning of the investigation and on the image of the perpetrator established by the

32. Weinberg, Steve. "Seeing is Believing," *The American Prospect*, November 27, 2012. Accessed January 22, 2024. <https://prospect.org/justice/seeing-believing/>

33. Mosteller, Robert P. "The Duke Lacrosse Case, Innocence, and False Identifications: A Fundamental Failure to 'Do Justice,'" *Fordham Law Review* 76 (2007): 1337-1412. Available at: <https://ir.lawnet.fordham.edu/flr/vol76/iss3/6>.

34. Mullin, Chris. *Error of Judgment: The Truth About the Birmingham Bombings*. Dublin: The Mercier Press, 1997

35. Nickerson, Raymond Sampson. "Confirmation Bias: A Ubiquitous Phenomenon in Many Guises," *Review of General Psychology* 2, no. 2 (1998): 175-220, doi: 10.1037/1089-2680.2.2.175.

investigating authority³⁶. Since the vast majority of the investigation material is submitted to the prosecutor's office before the indictment, the prosecutor's cognitive schemas are already formed at this stage. This early hypothesis can have a lasting influence on the assessment due to the so-called "primacy effect"³⁷.

In practice, this can lead to the prosecutor supporting the indictment even if subsequent evidence weakens its validity. In such cases, confirmation bias is not merely a passive phenomenon, but an active decision-making factor that can push the prosecution process in a direction contrary to the presumption of innocence.

Due to the nature of the work of prosecutors, the purpose of bringing charges is to prove guilt beyond reasonable doubt before a court of law. However, this may make the prosecutor inclined to downplay the value of exculpatory evidence or question its relevance³⁸. The phenomenon of motivated reasoning in this context is that the prosecutor may consider his or her own professional success, reputation, and "winning the case" to be more important than finding the actual truth³⁹.

Behind false accusations, there is often a desire to uphold the theory of the case developed during the investigation and prosecution, which becomes a matter of prestige. In the institutional functioning of the prosecution service, success indicators often include the proportion of indictments and the number of convictions. This can put implicit pressure on prosecutors to "see cases through to the end," even if doubts arise in the meantime.

There are several solutions to mitigate prosecutorial confirmation bias:

- Independent review unit: before charges are brought, the evidence is assessed by another department of the prosecution service or an independent professional body⁴⁰.
- "Devil's advocate" procedure: during the preparation of the indictment, a specially appointed prosecutor is tasked with presenting the counterarguments⁴¹.

36. Findley, Keith A., and Michael S. Scott. "The Multiple Dimensions of Tunnel Vision in Criminal Cases," *Wisconsin Law Review* 2006, no. 2 (2006): 291-397.

37. Lord, Charles G., Mark R. Lepper, and Elizabeth Preston. "Considering the Opposite: A Corrective Strategy for Social Judgment," *Journal of Personality and Social Psychology* 47, no. 6 (1984): 1231-1243, doi: 10.1037/0022-3514.47.6.1231.

38. Kassir, Saul M., Itiel E. Dror, and Jeff Kukucka. "The Forensic Confirmation Bias: Problems, Perspectives, and Proposed Solutions," *Journal of Applied Research in Memory and Cognition* 2, no. 1 (2013): 42-52, doi: 10.1016/j.jarmac.2013.01.001.

39. Kunda, Ziva. "The Case for Motivated Reasoning," *Psychological Bulletin* 108, no. 3 (1990): 480-498, doi: 10.1037/0033-2909.108.3.480.

40. Burke, Alafair S. "Improving Prosecutorial Decision Making: Some Lessons of Cognitive Science," *William & Mary Law Review* 47, no. 5 (2006): 1587-1632. Available at: <https://scholarship.law.wm.edu/wmlr/vol47/iss5/3>.

41. Nemeth, Charlan J., Kyle Brown, and Joel Rogers. "Devil's Advocate Versus Authentic Dissent: Stimulating Quantity and Quality," *European Journal of Social Psychology* 31, no. 6 (2001): 707-720, doi: 10.1002/ejsp.58

- Further education and training: training for prosecutors on cognitive biases, with practical examples.
- Mandatory review mechanism: if new exculpatory evidence emerges, an automatic review of the case should be initiated⁴².

3.3. Confirmation bias in courts

The role of the court in criminal proceedings is to evaluate the evidence impartially and in a balanced manner, taking into account the arguments of both the prosecution and the defense. In practice, however, judicial decision-making can also be influenced by cognitive biases, including confirmation bias. The essence of this is that when evaluating evidence, judges tend to favor information that supports their preconceived opinions or hypotheses, while giving less weight to contradictory data⁴³.

The presumption of innocence (*praesumptio boni viri*) and the requirement of proof beyond reasonable doubt (*in dubio pro reo*) are among the fundamental principles of criminal procedure. However, confirmation bias can easily lead to the judge, consciously or unconsciously, seeking to prove the defendant's guilt during the trial rather than examining the possibilities for acquittal. This is particularly dangerous if the court arrives at the trial with a preconceived opinion based on the investigation files and conducts the examination of evidence in a manner subordinate to this opinion⁴⁴.

In Hungary, eight people lost their lives in a bank robbery in Mór on May 9, 2002, but the perpetrators were incorrectly identified due to serious errors in the investigation and court proceedings. Ede Kaiser and László Hajdú were charged in the case and convicted by the court of first instance, but their guilt was later refuted by other evidence, including the confessions of the real perpetrators. This first-instance verdict was upheld by the court of second instance, and it was only after the real perpetrators were apprehended, several years later, that the defendants were acquitted.

One serious criticism of the judicial proceedings was that the evidence was focused almost exclusively on proving the defendants' guilt, while exculpatory evidence and alternative versions of events were largely ignored. The confirmation bias manifest-

42. Kerstholt, Johanna H., and Annemarie R. Eikelboom. "Effects of Prior Interpretation on Situation Assessment in Crime Analysis," *Journal of Behavioral Decision Making* 20, no. 5 (2007): 455-465, doi: 10.1002/bdm.570.

43. Nickerson, Raymond Sampson. "Confirmation Bias: A Ubiquitous Phenomenon in Many Guises," *Review of General Psychology* 2, no. 2 (1998): 175-220, doi: 10.1037/1089-2680.2.2.175.

44. Kahneman, Daniel, and Shane Frederick. "Representativeness Revisited: Attribute Substitution in Intuitive Judgment," in Thomas Gilovich, Dale Griffin, and Daniel Kahneman (eds.), *Heuristics and Biases: The Psychology of Intuitive Judgment*, 49-81. Cambridge, UK: Cambridge University Press, 2002.

ed itself here in the fact that the court accepted the prosecution's theory early on in the trial and concentrated further evidence on confirming this⁴⁵.

The judge in the first instance recounted in a later university lecture what had convinced him of Kaiser Ede's guilt: when the defendant presented his alibi, he said that he had been having lunch at his mother's house at the time of the robbery. The judge asked him what he had eaten, and Ede Kaiser replied that his mother had cooked him potato pasta. At the university lecture, the judge interpreted this as follows: "This also shows that he is lying, because how could he remember what he had for lunch, so he is guilty."

This argument reflects the logic of confirmation bias: even a neutral or even innocent circumstance can be interpreted as proving guilt. From a psychological point of view, this is a case of cognitive dissonance reduction and subjective evidence selection, where prior beliefs override the objective evaluation of facts⁴⁶.

A similar phenomenon was observed in the United States in the Central Park Five case, where the judicial assessment ignored the possibility of exculpatory DNA evidence for years because the defendants' earlier confessions fit the prosecution's theory⁴⁷. In the United Kingdom, the Guildford Four case showed a similar pattern, where the court insisted on the early prosecution theory for a long time, even though new evidence and witness statements pointed in a different direction⁴⁸.

The role of a judge carries a high level of responsibility and authority, which makes it psychologically difficult for the judge concerned to admit their own mistake. As a result, judgments that have become final are often only reviewed in the presence of new, indisputable evidence, such as DNA samples or confessions. These institutional and human factors together reinforce confirmation bias in judicial decision-making.

Judicial confirmation bias is particularly dangerous because the court's decision is the final point in the proceedings, and it can take years or even decades to correct a wrongful conviction. The lesson of the Mór case is that courts should ensure at the institutional level that alternative narratives and exculpatory evidence are given equal weight.

45. Herke, Csongor. "Ártatlanul elítélve – A móri bankrablás tanulságai," *Erdélyi Jogélet* 2021, no. 3 (2021): 77–85.

46. Festinger, Leon. *A Theory of Cognitive Dissonance*. Stanford, CA: Stanford University Press, 1957.

47. Boston Bar Association. *Getting It Right: Improving the Accuracy and Reliability of the Criminal Justice System in Massachusetts (Task Force Report)*. Boston, MA: Boston Bar Association, December 2009. Available at: https://bostonbar.org/wp-content/uploads/2022/05/BBAGetting_It_Right_12-16-09.pdf.

48. Usher, Graham. "UK Commentary: The Guildford Four: English Justice and the Irish Community," *Race & Class* 31, no. 3 (1990): 81–98, doi: 10.1177/030639689003100305.

3.4. Other confirmation biases (experts, witnesses, defense counsels, defendants)

Confirmation bias may not only affect investigative authorities, prosecutors, and courts, but also other participants in criminal proceedings. Experts, witnesses, defense counsels, and the defendants themselves may also be subject to this psychological phenomenon. Since they all interpret events based on their own experiences, interests, emotions, and assumptions, there is a risk that they will process the information available to them selectively in a way that reinforces their own narrative.

3.4.1. Expert confirmation bias

Expert evidence is one of the most important elements of criminal proceedings, especially when special expertise is required to clarify the facts of a case. At the same time, international literature provides increasing evidence that experts are also subject to confirmation bias⁴⁹. The expert's prior information—for example, background information received from investigators or prosecutors—may unconsciously influence their assessment⁵⁰.

In Hungarian practice, there have also been cases where forensic experts did not examine alternative explanations independent of the investigation version with sufficient thoroughness. In one specific case, the first experts stated that the time of death could have been anywhere between 4:42 p.m. and 6 a.m. the following day. On this basis, the court set the time of death at 5:00 p.m., although several pieces of evidence (e.g., the toilet was flushed at 9:10 p.m. and the shower was used around 11:00–12:00 a.m.) suggested a later presence at the scene. This was problematic because the defendant could only have been the perpetrator if the time of death was so early, since he was proven to have been at a different location at 9:10 p.m. (and thereafter). The Supreme Court noted that “calculating” the time of the crime in this way would only be valid if the defendant was the perpetrator; otherwise, the act could have taken place much later when the defendant was demonstrably elsewhere. The case was ultimately dismissed due to a lack of evidence “beyond reasonable doubt”⁵¹.

49. Dror, Itiel E., Ann E. Péron, Susan-Lee Hind, and David Charlton. “When Emotions Get the Better of Us: The Effect of Contextual Top Down Processing on Matching Fingerprints,” *Applied Cognitive Psychology* 19, no. 6 (2005): 799-809, doi: 10.1002/acp.1130.

50. Nakhacizadeh, Sherry, Itiel E. Dror, and Ruth M. Morgan. “Cognitive Bias in Forensic Anthropology: Visual Assessment of Skeletal Remains Is Susceptible to Confirmation Bias,” *Science & Justice* 54, no. 3 (2014): 208-214, doi: 10.1016/j.scijus.2013.11.003.

51. Fázsi, László. „Húsz év fegyház helyett felmentés – Avagy a bűnösség rejtett vélelmének jelentősége az ítélezésben,” *Büntetőjogi Szemle* 2023, no. 2 (2023).

The distortion here was a typical case of context bias and top-down information processing: the expert adjusted his professional conclusions to fit the existing theory without systematically ruling out alternative possibilities⁵².

Studies in the field of dactyloscopy have shown that experts were more likely to be biased when they had access to different types of contextual information⁵³. In forensic anthropology, empirical studies on cognitive biases have confirmed confirmation biases in the assessment of sex, ancestry, and age at death when preparing biological profiles⁵⁴. Unreliable and irrelevant information can also lead to biased interpretations during fire scene investigations⁵⁵.

However, even DNA analysis, which is considered almost infallible, can pose problems, especially in the case of mixed DNA samples. A good example of this is the Josiah Sutton case (1998), where the DNA test results were incorrect because the expert subconsciously wanted to prove identity (based on what later turned out to be false victim testimony/identification), even though it later turned out that his analysis was incorrect⁵⁶. In DNA analysis, we often encounter incomplete or partial DNA profiles, and it is often difficult to interpret these profiles and determine the number and identity of contributors in a mixed sample. Therefore, if a DNA analyst assumes that the defendant's DNA could have produced the observed profile, this may potentially increase the analyst's confidence that the defendant contributed to the sample. At the same time, they may overlook and/or fail to identify possibilities that could have resulted in the same data being generated without the defendant's contribution to the sample⁵⁷. Dror and Hampikian's study on DNA analysis started with a mixed DNA sample from a gang rape. DNA experts analyzed the complex DNA mixture and concluded that the evidence supported the guilt of the defendant identified by the cooperating witness. In their preliminary conclusion, the DNA experts concluded that the defendant could not be excluded based on the mixed DNA sample. Dror and Hampikian presented the same DNA

52. Dror, Itiel E., Ann E. Péron, Susan-Lee Hind, and David Charlton. "When Emotions Get the Better of Us: The Effect of Contextual Top Down Processing on Matching Fingerprints," *Applied Cognitive Psychology* 19, no. 6 (2005): 799-809, doi: 10.1002/acp.1130.
53. Dror, Itiel E., David Charlton, and Ann E. Péron. "Contextual Information Renders Experts Vulnerable to Making Erroneous Identifications," *Forensic Science International* 156, no. 1 (2006): 74-78, doi: 10.1016/j.forsci-int.2005.10.017.
54. Nakhazadeh, Sherry, Itiel E. Dror, and Ruth M. Morgan. "Cognitive Bias in Forensic Anthropology: Visual Assessment of Skeletal Remains Is Susceptible to Confirmation Bias," *Science & Justice* 54, no. 3 (2014): 208-214, doi: 10.1016/j.scijus.2013.11.003.
55. Bieber, Paul. "Measuring the Impact of Cognitive Bias in Fire Investigation," *Proceedings of the International Symposium on Fire Investigation Science and Technology*. Paper presented at the *International Symposium on Fire Investigation Science and Technology*, University of Maryland, October 2012. Available at: <https://forensicsources.org/resources/measuring-the-impact-of-cognitive-bias-in-fire-investigation/>.
56. Thompson, William C. "Painting the Target Around the Matching Profile: The Texas Sharpshooter Fallacy in Forensic DNA Interpretation," *Law, Probability and Risk* 8, no. 3 (2009): 257-276, doi: 10.1093/lpr/mgp013.
57. Thompson, William C. "Painting the Target Around the Matching Profile: The Texas Sharpshooter Fallacy in Forensic DNA Interpretation," *Law, Probability and Risk* 8, no. 3 (2009): 257-276, doi: 10.1093/lpr/mgp013.

mixture to 17 neutral North American DNA experts without providing them with any contextual information or background on the case. Only one expert agreed with the original analysis, four DNA experts deemed the sample inconclusive, and 12 excluded the defendant in question⁵⁸.

Some of the proposals aimed at minimizing cognitive effects and preventing double counting of evidence suggest separating different laboratory functions, i.e., assigning them to different individuals. One proposal is to establish evidence and quality controllers who would act as highly trained professionals within evidence management units. Their main tasks would include filtering out irrelevant information, formulating the least suggestive questions, and coordinating the transfer of evidence to the appropriate department⁵⁹.

Another possible solution for improving the accuracy and decision-making of forensic matching methods (such as DNA analysis and dactyloscopy) is the filler control method. In this case, experts are provided with at least three samples for comparison instead of just two: the sample from the crime scene and the suspect's sample are supplemented with a control sample. The expert must determine which sample is identical to which, without knowing which sample belongs to the suspect⁶⁰. This protects investigators from contextual influences⁶¹.

3.4.2. Witness testimony and confirmation bias

Witness memory is extremely fragile and, according to psychological research, easily influenced by the statements of others, the media, or even the manner of questioning⁶². In the case of confirmation bias, this manifests itself in the witness's tendency to adjust their memories to their own preconceptions or to the narrative suggested by the interrogator.

58. Dror, Itiel E., and Greg Hampkian. "Subjectivity and Bias in Forensic DNA Mixture Interpretation," *Science & Justice* 51, no. 4 (2011): 204-208, doi: 10.1016/j.scijus.2011.08.004.

59. Saks, Michael J., D. Michael Risinger, Robert Rosenthal, and William C. Thompson. "Context Effects in Forensic Science: A Review and Application of the Science of Science to Crime Laboratory Practice in the United States," *Science & Justice* 43, no. 2 (2003): 77-90, doi: 10.1016/S1355-0306(03)71747-X.

60. Wells, Gary L., Melissa M. Wilford, and Laura Smalarz. "Forensic Science Testing: The Forensic Filler Control Method for Controlling Contextual Bias, Estimating Error Rates, and Calibrating Analysts' Reports," *Journal of Applied Research in Memory and Cognition* 2, no. 1 (2013): 53-55, doi: 10.1016/j.jarmac.2013.01.004.

61. Saks, Michael J., D. Michael Risinger, Robert Rosenthal, and William C. Thompson. "Context Effects in Forensic Science: A Review and Application of the Science of Science to Crime Laboratory Practice in the United States," *Science & Justice* 43, no. 2 (2003): 77-90, doi: 10.1016/S1355-0306(03)71747-X.

62. Wells, Gary L., Mark Small, Steven Penrod, Roy S. Malpass, Solomon M. Fulero, and C. A. E. Brimacombe. "Eye-witness Identification Procedures: Recommendations for Lineups and Photospreads," *Law and Human Behavior* 22, no. 6 (1998): 603-647, doi: 10.1023/A:1025750605807.

3.4.3. Defense counsel confirmation bias

The defense counsel's job is to protect the defendant's rights as much as possible, but the defense counsel can also be subject to confirmation bias—especially if they believe too strongly in the defendant's innocence. This can lead the defense counsel to disregard certain pieces of evidence or underestimate their significance if they do not fit into the defense strategy.

It is common for the defense counsel to base their strategy on a small amount of evidence that supports the defendant's innocence, while failing to request other potentially exculpatory evidence. In such cases, it is easy for the defendant to be convicted on the basis of other incriminating evidence, even though additional exculpatory evidence could have been obtained.

Defense counsel lack basic knowledge about the functioning and internal limitations of judicial investigations. Therefore, without proper training, they are often unable to recognize the impact of judicial confirmation bias on the interpretation of data and investigation results⁶³.

3.4.4. Confirmation bias on the part of the defendant

Paradoxically, defendants are also prone to confirmation bias, especially when it comes to their own innocence or minimizing their guilt. This can manifest itself in the defendant emphasizing details that support their innocence when recalling events, while concealing or downplaying incriminating facts.

Confirmation bias can therefore affect all participants in criminal proceedings, not just the authorities. The combined biases of experts, witnesses, defense counsel, and defendants can significantly increase the risk of wrongful convictions. Such biases can only be identified and addressed if debiasing techniques are consciously applied at all stages of the proceedings, such as the devil's advocate role, blind reviews, and systematic consideration of alternative scenarios.

4. Recommendations for preventing confirmation bias

Confirmation bias poses a serious risk of wrongful convictions at all levels of the criminal justice system, from investigative authorities to prosecutors and courts, to experts and witnesses. Psychological research and international legal practice both confirm that awareness of bias and the systematic use of methods to counteract it can significantly reduce the rate of wrong decisions. The following recommendations aim to reduce confirmation bias at several levels.

63. Fletcher, Connie. *Every Contact Leaves a Trace: Crime Scene Experts Talk About Their Work from Discovery Through Verdict*. New York: St. Martin's Press, 2006, 337-338.

4.1. Prevention at the organizational level

Independent control mechanisms: during the investigation and prosecution process, it is advisable to involve an external lawyer or investigator who is not directly involved in the case and who can analyze the existing evidence from a critical perspective. This “devil’s advocate” method⁶⁴ forces the investigating authorities and the prosecution to consider alternative explanations.

Use of blind procedures: in forensic and expert examinations, “blind” or “double-blind” methods⁶⁵ can minimize the distorting effect of contextual information⁶⁶. For example, in fingerprint or DNA identification, the expert conducting the examination should not know the identity of the suspect, the details of the crime, or the version of the investigation.

Rotation system: in longer investigations, it is advisable to rotate investigators, prosecutors, and experts periodically to reduce adherence to one-sided versions. This method has already been incorporated into several police protocols in the United Kingdom and Canada⁶⁷.

4.2. Prevention at the procedural level

Mandatory examination of alternative scenarios: during the assessment of criminal cases, whether at the investigation or trial stage, the official examination of alternative versions should be required. The Dutch police’s “falsification” protocol, for example, explicitly requires the documentation of contrary interpretations of evidence⁶⁸.

Quality assessment of evidence (not just quantity): the “number of pieces of evidence” is still given greater weight than their relevance and reliability. International guidelines (e.g., National Academy of Sciences, 2009) emphasize that the value of evidence must be assessed taking into account its source, the circumstances in which it was collected, and the context.

64. Nemeth, Charlan J., Kyle Brown, and Joel Rogers. “Devil’s Advocate Versus Authentic Dissent: Stimulating Quantity and Quality,” *European Journal of Social Psychology* 31, no. 6 (2001): 707-720, doi: 10.1002/ejsp.58

65. Dror, Itiel E., Ann E. Péron, Susan-Lee Hind, and David Charlton. “When Emotions Get the Better of Us: The Effect of Contextual Top Down Processing on Matching Fingerprints,” *Applied Cognitive Psychology* 19, no. 6 (2005): 799-809, doi: 10.1002/acp.1130.

66. Wells, Gary L., Melissa M. Wilford, and Laura Smalarz. “Forensic Science Testing: The Forensic Filler Control Method for Controlling Contextual Bias, Estimating Error Rates, and Calibrating Analysts’ Reports,” *Journal of Applied Research in Memory and Cognition* 2, no. 1 (2013): 53-55, doi: 10.1016/j.jarmac.2013.01.004.

67. Kerstholt, Johanna H., and Annemarie R. Eikelboom. “Effects of Prior Interpretation on Situation Assessment in Crime Analysis,” *Journal of Behavioral Decision Making* 20, no. 5 (2007): 455-465, doi: 10.1002/bdm.570.

68. Maegherman, Eva F. L. *Facilitating Falsification in Legal Decision Making: Problems in Practice and Potential Solutions* [doctoral thesis, Maastricht University; University of Gothenburg]. The House of Legal Psychology, 2021, doi: 10.26481/dis.20210114em.

Preference for open questions during interviews: suggestive questions should be avoided when interviewing witnesses, victims, and suspects. The use of the PEACE model (Planning, Engagement, Account, Closure, Evaluation), which is used in the United Kingdom and Australia, has been shown to reduce errors resulting from confirmation bias.

4.3. Prevention at the personal level

Increasing cognitive awareness: training for legal actors—investigators, prosecutors, judges, experts—should include mandatory knowledge about psychological biases, including confirmation bias. Experimental studies show that simply raising awareness of biases reduces their impact⁶⁹.

Practicing questioning one’s own position: decision-makers should regularly practice the “consider-the-opposite” technique⁷⁰, which involves systematically seeking arguments against one’s own assumptions.

Use of objective evaluation lists: predefined, standardized checklists for evaluating evidence can reduce decisions based on intuition and prejudice.

4.4. Technological tools

Artificial intelligence (AI)-based control systems: AI is capable of objectively evaluating larger amounts of evidence than humans can process, using statistical methods. However, it is important that algorithms operate transparently and do not create new biases.

Cross-referencing databases from multiple sources: Cross-referencing forensic databases (DNA, fingerprints, ballistic data) from multiple sources reduces the likelihood that a single, incorrect database match will determine the direction of an investigation.

Confirmation bias cannot be completely eliminated, but its impact can be significantly reduced through the coordinated application of organizational, procedural, personal, and technological measures. By adopting and adapting international best practices, the Hungarian justice system has a realistic chance of reducing the number of wrongful convictions.

69. Wilson, Timothy D., and Nancy Brekke. “Mental Contamination and Mental Correction: Unwanted Influences on Judgments and Evaluations,” *Psychological Bulletin* 116, no. 1 (1994): 117–142, doi: 10.1037/0033-2909.116.1.117.

70. Hirt, Edward R., and Keith D. Markman. “Multiple Explanation: A Consider an Alternative Strategy for Debiasing Judgments,” *Journal of Personality and Social Psychology* 69, no. 6 (1995): 1069–1086, doi: 10.1037/0022-3514.69.6.1069

5. Summary

Confirmation bias is one of the most significant, yet long underestimated, risk factors in criminal justice. Both theoretical psychological research and criminological experience show that people tend to seek, interpret, and remember information that confirms their prior assumptions, while underestimating or ignoring contradictory data. This bias can be found in all participants in criminal proceedings, from investigating authorities and prosecutors to courts, experts, and witnesses.

The first part of the study presented the psychological background of confirmation bias, which includes general cognitive mechanisms (such as the Concorde effect or cognitive dissonance reduction) and distorting processes identified specifically in the context of criminal law (such as investigator preconceptions or excessive rigidity in charging decisions). The model elements known from psychological research are also highly applicable to the analysis of Hungarian legal practice.

In the third chapter, we reviewed in detail the various forms of confirmation bias in the different stages of criminal proceedings. In the case of the investigative authorities, the Martfű serial murder case is a striking example of an investigation that focused on a single suspect without examining alternative versions, ultimately leading to the conviction of an innocent person. With regard to the public prosecutor's office, we pointed out that the prosecution may continue to insist on the charges even when new evidence clearly supports the guilt of another person. In the court proceedings, the verdict in the Mór bank robbery case illustrates that the evidence was presented in a way that was biased towards the guilty verdict, while evidence pointing to acquittal was pushed into the background. Finally, confirmation bias can also be demonstrated in the case of other actors—experts, witnesses, defense counsels, and the accused—which can manifest itself, for example, in the contextual distortion of expert opinions or in memory distortion in witness testimony.

The recommendations presented in Chapter 4 aim to mitigate the impact of confirmation bias at the organizational, procedural, personal, and technological levels. The adaptation of international best practices—such as blind procedures, the role of the devil's advocate, or the PEACE interrogation model—to the Hungarian legal environment offers a realistic opportunity to reduce the number of wrongful convictions. At the same time, it should be emphasized that completely eliminating bias is not a realistic goal; the task is to minimize its impact and keep it under control.

The lesson to be learned from the Hungarian examples is that combating confirmation bias is not only a matter of amending legislation, but also of changing the culture of law enforcement. This requires continuous training of those involved, conscious reform of evidentiary practice, and ensuring that the “presumption of innocence” and the “principle of in case of doubt in favor of the accused” are truly

upheld at all levels of the criminal justice system. Only in this way can serious mistakes such as those made in the Martfű and Mór cases be avoided in the future⁷¹.

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