

## Forensic Profiling: Theoretical and Practical Foundation in the Context of Contemporary Crime Investigation

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**ABSTRACT:** Criminal profiling represents a complex investigative methodology aimed at inferring the psychological, behavioral, and socio-demographic characteristics of unknown offenders through the systematic analysis of crime-related data. This paper provides a critical and theoretically grounded examination of the conceptual foundations and methodological evolution of criminal profiling, with particular attention to the major paradigms developed within the American and European scientific traditions. The study traces the transition from early inductive and typological models—most notably those developed within the FBI’s Behavioral Science Unit and the framework of Investigative Psychology—to contemporary data-driven and computational approaches, including the increasing integration of artificial intelligence and advanced analytical techniques. Special emphasis is placed on the epistemological challenges that continue to affect the field, such as the scientific validity of profiling assumptions, methodological inconsistency, and the persistent influence of cognitive and cultural biases. The analysis highlights key controversies surrounding the reliability of profiling practices, including the critique of the organized/disorganized dichotomy, the limitations posed by the personality-behavior relationship, and the difficulties associated with empirical verification and reproducibility. Despite notable technological and methodological advancements, criminal profiling remains constrained by insufficient standardization, limited cross-disciplinary integration, and unresolved questions regarding its evidentiary value in judicial contexts. The paper argues for a reconceptualization of criminal profiling as a probabilistic and hypothesis-driven analytical tool rather than a deterministic investigative technique. It concludes by emphasizing the need for rigorous empirical validation, methodological transparency, and interdisciplinary collaboration in order to enhance the scientific credibility and practical relevance of profiling within contemporary criminal investigation.

**KEYWORDS:** Forensic Profiling, Investigative Psychology, Scientific Validity, Forensic Methodology, Critical Analysis

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### Introduction

Forensic profiling is one of the most controversial and fascinating investigative methods in the arsenal of contemporary forensic science. Derived from the Latin “filum” (to profile, to shape), profiling seeks to identify the social, emotional, psychological, and demographic characteristics of an unknown offender based on behavioral analysis of the crime scene and

available evidence (Turvey, 2011). This investigative method stands at the intersection of criminology, psychology, behavioral science, and forensics, generating both admiration for its heuristic potential and skepticism about its scientific foundations.

The tension between practical popularity and scientific validation is the problematic core of profiling research. On the one hand, law enforcement agencies around the world have massively adopted profiling techniques, from the Federal Bureau of Investigation (FBI) in the United States to the Bundeskriminalamt in Germany and the National Crime & Intelligence Division (NCID) in the Netherlands. On the other hand, the academic community continues to raise fundamental questions about the validity, reliability, and actual utility of these methods (Winerman, 2004). Campbell, in a seminal 1976 article published in *Psychology Today*, challenged researchers to demonstrate that profilers are “better than bartenders” at predicting the characteristics of criminals - a question that remains surprisingly relevant nearly five decades later (Campbell, 1976).

The conceptual evolution of forensic profiling has gone through several distinct stages, each marking paradigmatic shifts in the understanding of the methodology and its theoretical foundations. Modern precursors of profiling can be identified in the works of Cesare Lombroso (1876), considered the father of criminal anthropology, who attempted to establish correlations between physical characteristics and criminal tendencies, as well as in the contribution of Thomas Bond (1888), who developed the first documented criminal profile in the case of the famous “Jack the Ripper” (Lombroso, 1876; Brussel, 1968). However, these early attempts were marked by biological determinism and the lack of a systematic methodology.

The modern institutionalization of forensic profiling is closely linked to the establishment of the Behavioral Science Unit (BSU) at the FBI Academy in Quantico, Virginia, in 1974. Under the leadership of Special Agents Howard Teten, John Douglas, and Robert Ressler, the BSU developed a systematic approach based on interviews with 36 serial killers, thus creating the foundations for what would become the “Crime Scene Analysis” method (Douglas, et al., 1986). This period marked the transition from intuitive speculation to attempts to codify investigative experience into a transmissible methodological corpus. The Violent Criminal Apprehension Program (VICAP), launched in this context, represented the first systematic effort to accumulate and analyze data on violent serial crimes. Parallel to American developments, Europe experienced its own developments in the field of forensic profiling. In the United Kingdom, David Canter founded Investigative Psychology as a rigorous, empirically grounded, and statistically tested academic discipline, marking an epistemological break from the clinical-intuitive approach of the FBI (Canter, 2004). Canter advocated the need for validated psychological theories and the use of advanced statistical tools, such as Multidimensional Scaling (MDS), for the analysis of criminal behavior. In Germany, the Bundeskriminalamt developed “Operative Fallanalyse” (Operational Case Analysis), a proprietary methodology that combines elements of objective hermeneutics with traditional forensic principles (Dern & Baurmann, 2006; Widmaier, 2014).

Starting in the 2000s and accelerating dramatically during the 2020-2025 period, forensic profiling has undergone a new transformation through the integration of artificial intelligence, machine learning, and big data analytics technologies. This evolution promises unprecedented analytical capabilities, but simultaneously generates new ethical and epistemological challenges related to algorithmic transparency, data bias, and respect for fundamental rights (Statewatch, 2025). The European Union responded to these concerns by including restrictions on “predictive policing” in the AI Act, reflecting the inherent tensions between investigative efficiency and the protection of civil liberties.

This research aims to provide a systematic critical analysis of the theoretical and methodological foundations of forensic profiling, examining both the American and

European perspectives in a balanced manner. Specific objectives include: evaluating the epistemological premises supporting profiling (behavioral consistency, homology hypothesis), critically analyzing the main methodologies (inductive, deductive, geographic, diagnostic assessment), investigating issues of scientific validity and reliability, and examining contemporary challenges generated by the integration of digital technologies. The research methodology consists of a systematic review of academic literature published between 1976 and 2025, including both American reference sources (Douglas, Ressler, Burgess, Canter) and European contributions (Dern, Baurmann, Alison, Mokros).

The need for such a critical analysis becomes evident in the context of the extensive application of profiling in real investigations, in the absence of consistent scientific validation and methodological standardization. Recent empirical research reveals considerable variability in the accuracy of profiling, methodological inconsistencies among practitioners, and a lack of transparent and replicable protocols (Snook, et al., 2007). This situation raises fundamental questions about the epistemological status of profiling: is it a mature science, an art based on experience, or a pseudo-science perpetuated by anecdote and media popularity? The answer to this question is not just academic, but has direct implications for criminal justice, the rights of the accused, and the effectiveness of criminal investigations.

## **Discussions and Results Obtained**

The in-depth analysis of forensic profiling requires a critical examination of its theoretical foundations, the methodologies used and the validity issues that have generated intense debates in the scientific community. Before evaluating the practical effectiveness of profiling, conceptual clarification and precise delimitation of the object of study are essential, given the terminological polysemy that characterizes this field.

Forensic profiling is known by multiple names in specialized literature: “criminal profiling,” “offender profiling,” “psychological profiling,” “personality profiling,” “crime scene analysis,” “criminal investigative analysis,” and “behavioral profiling” (Turvey, 2011). This terminological diversity does not simply reflect regional linguistic preferences, but often indicates substantive differences in methodological approach and theoretical underpinnings. The definition proposed by Douglas and his collaborators at the FBI, which describes profiling as “a technique for identifying the major personality and behavioral characteristics of an individual based on an analysis of the crimes he has committed”, has become a standard reference point (Douglas et al., 2006, p. 18). However, this definition hides the complexity of the process and the diversity of existing approaches. It is very important to distinguish between the psychological profile and the search portrait. The search portrait includes observable material data about the offender—such as height, gait, external physical characteristics—and depends on the quality of the perception of witnesses. In contrast, psychological profiling aims to construct the mental, emotional and social characteristics of an unknown criminal, based exclusively on the analysis of behavioral traces left at the crime scene (Kocsis, 2006). This distinction is fundamental to understanding the inherent limitations of profiling: the profile does not serve to individualize the offender, but to determine the type of person who might have committed a particular crime.

The theoretical foundations of criminal profiling are based on two major premises that have been subject to systematic criticism in recent decades: behavioral consistency and the homology hypothesis. Behavioral consistency assumes that crimes committed by the same perpetrator will tend to be similar to each other, manifesting a relatively stable “behavioral style”. The homology hypothesis postulates that similar crimes are committed by similar offenders, thus allowing the inference of personal characteristics from the characteristics of the act (Alison et al., 2002). These two assumptions form the backbone of

profiling reasoning: if criminal behavior is consistent and if similar offenders act similarly, then the analysis of criminal behavior should allow the inference of the characteristics of the offender. However, recent empirical research has raised serious doubts about the validity of these fundamental premises. Alison and his colleagues, in an influential 2002 article published in *Psychology, Public Policy, and Law*, identified what they call the “personality paradox” in criminal profiling (Alison, et al., 2002). Most profiling approaches assume that behavior is primarily determined by personality - an assumption that psychological research since the 1960s has shown to be an oversimplification. Modern psychology recognizes that human behavior is the result of a complex interaction between dispositional factors (personality traits) and situational factors (context, opportunity, circumstances). Ignoring this interaction can lead to systematic errors in profiling, overestimating the stability of criminal behavior and underestimating the influence of situational context.

Wilson and colleagues have empirically demonstrated that most offenders exhibit both “organized” and “disorganized” characteristics in their crimes, contradicting the FBI’s fundamental dichotomous typology (Wilson et al., 1997). Furthermore, the same offender may shift from one behavioral style to another between different crimes, depending on circumstances, accumulated experience, substance use, or emotional state. This behavioral inconsistency calls into question the usefulness of profiles based on the assumption of stability. The homology hypothesis faces its own epistemological challenges. Canter points out that crime scene evidence is often incomplete and ambiguous, which means that judgments based on this evidence are necessarily speculative (Canter, 2000). Furthermore, interpretations of the same evidence by different profilers can lead to divergent conclusions, raising serious problems of replicability. If two experts arrive at contradictory profiles based on the same data, what is the epistemological value of the method? This problem becomes even more acute when we consider that the decision regarding the relevant aspects of the crime scene is left to the discretion of the individual profiler - an inherently subjective process that introduces systematic bias into the analysis.

Methodological approaches in forensic profiling can be classified into two fundamental categories: inductive and deductive. Inductive profiling is based on statistical generalizations derived from the study of large samples of criminals and crimes. The essence of the method consists in determining the common characteristics of the perpetrators of certain types of crimes, in a given geographical area and time period, thus establishing statistical averages from which inferences can be made about a typical criminal. For example, if statistical data indicates that 70% of serial rapists in a particular region are Caucasian, unmarried men between the ages of 25-35, then the inductive profile for a new case would suggest these characteristics as the most likely (Holmes & Holmes, 2008).

The apparent strength of inductive profiling lies in its empirical underpinnings and its use of statistical methods for validation. However, this approach faces fundamental conceptual limitations. Applying statistical averages to individual cases involves what philosophers call the “ecological fallacy” - the assumption that what is true at the aggregate level is necessarily true at the individual level. A specific individual may deviate substantially from the average statistical profile, and the likelihood that the profile is correct depends critically on the homogeneity of the reference population and the representativeness of the sample used to generate the statistics. More problematic is the issue of logical circularity inherent in inductive profiling: statistical data are derived from captured and convicted offenders, who may not be representative of the totality of offenders. Captured offenders may have systematically different characteristics from those who evade capture - for example, the latter may be more intelligent, more cautious, or more experienced. This reverse selection introduces a systematic bias into the databases used for profiling, limiting the validity of the inferences. Colin Campbell, in his famous “bartender

test”, ironically suggested that an experienced bartender could make equally accurate predictions based on informal observations, without the sophisticated statistical apparatus of inductive profiling (Campbell, 1976). Deductive profiling, in contrast, seeks to determine the most salient characteristics of a specific offender using only what is known about that particular case, without statistical generalizations. This approach, associated particularly with the FBI’s Behavioral Science Unit, relies on clinical experience, expert intuition, and detailed crime scene analysis to construct an individualized profile. The methodological foundations of deductive profiling were established by Douglas and Ressler’s famous interviews with 36 serial killers in the 1970s, which led to the development of the “organized versus disorganized” typology (Douglas et al., 1986).

The organized/disorganized typology has become perhaps the FBI’s most influential and, at the same time, most critical contribution to forensic profiling. “Organized” crime involves premeditated planning, control over the victim, concealment of the body, cleanup of the crime scene, and lack of obvious evidence. The organized criminal is theoretically intelligent, socially competent, employed, often married, and uses a vehicle in the commission of the crime. In contrast, “disorganized” crime is spontaneous, chaotic, with excessive violence, the body left visible, and “dirty” crime scenes. The disorganized criminal is theoretically of below-average intelligence, socially isolated, unemployed, and living near the crime scene (Ressler et al., 1988). The criticisms of this typology are multiple and fundamental. First, the empirical basis of the typology is problematic: the sample of 36 serial killers is not statistically representative, and the retrospective interview methodology raises serious validity issues. Serial killers are known for manipulating narratives and distorting their memories of past events - qualities that make their interviews extremely unreliable sources of data for the construction of scientific theory (Ainsworth, 2001). Ainsworth notes that there have been few serious attempts to establish the validity of the FBI’s criminal types using scientifically testable methods.

Second, subsequent empirical research has demonstrated that most crimes exhibit mixed characteristics, not conforming to one of the two categories. Canter and colleagues, in a rigorous statistical analysis of 100 serial killings, found that the organized/disorganized dichotomy operates as a continuum rather than a discrete category, and that very few crimes fall clearly into one of the two extremes (Canter et al., 2004). This finding suggests that typology oversimplifies the reality of criminal behavior, imposing artificial categories on a much more complex and nuanced phenomenon.

Third, deductive profiling faces the problem of the “black box”—the opacity of the decision-making process. Unlike statistical methods that allow for the logical path from data to conclusions to be followed, deductive profiling relies on the intuition and experience of the individual profiler, cognitive processes that cannot be transparently explained or independently replicated. When two profilers reach different conclusions for the same case (a situation documented in the literature), there is no objective mechanism to determine which is correct or to understand the source of the divergence. This lack of transparency and replicability raises serious questions about the scientific status of the method.

Alternative profiling methods have emerged in response to the limitations of classical approaches, attempting to bring more scientific rigor and empirical validation to the field. Geographic profiling, developed notably by Kim Rossmo in Canada and Brantingham & Brantingham in the USA, analyses the spatial distribution of crime patterns to infer the likely location of residence or activity of the offender (Rossmo, 2000). This method is based on validated theories from behavioral geography and environmental psychology, using mathematical algorithms to generate “geographic profiles” in the form of probability maps.

The major advantage of geographic profiling lies in its measurable and empirically testable nature. Predictions can be objectively assessed by comparing the generated

probability distribution with the actual location of the offender once identified. Validation studies have demonstrated moderate to strong accuracy in linking crimes to a single offender and in prioritizing search areas (Goodwill et al., 2014). However, the method has its own limitations: it critically depends on the quality and completeness of geographic data, assumes that the offender operates in a defined geographic area (the so-called “awareness space”), and is less useful for offenders who travel long distances or who do not exhibit the expected spatial behavioral patterns.

Investigative Psychology, developed by David Canter at the University of Liverpool, represents the most ambitious attempt to transform profiling from an intuitive art into a rigorous scientific discipline. Canter proposed five fundamental theoretical principles: interpersonal coherence (criminal behavior is an extension of the general interpersonal style), time and place significance (spatiotemporal choices reflect the offender’s mental map), criminal characteristics (the existence of identifiable behavioral patterns), criminal history (criminal history influences current behavior), and forensic alertness (the ability to evade capture) (Canter, 1995). Canter’s major contribution lies in the application of advanced statistical tools, in particular Multidimensional Scaling (MDS), to identify the underlying structure of criminal behavior. By analyzing a large number of behavioral variables from crime scenes, MDS allows for the identification of fundamental dimensions that differentiate criminals and their grouping into empirically validated typologies. This approach represents a substantial improvement over the intuitive categorizations of the FBI, providing a methodology that is transparent, replicable, and amenable to statistical validation (Lehmann et al., 2013). However, Investigative Psychology is not without its critics. Magliocca notes that “IP remains abstract and theoretical”, with limited practical applicability in real-world investigations (Magliocca, 2020). The complexity of statistical analyses and the need for extensive databases make the method difficult to implement for most law enforcement agencies. Furthermore, the focus on measurable and testable variables may neglect important qualitative aspects of criminal behavior that do not lend themselves to quantification. The tension between scientific rigor and practical utility remains a central challenge for Investigative Psychology.

In Germany, the Bundeskriminalamt has developed “Operative Fallanalyse” (Operational Case Analysis), a methodology that attempts to reconcile clinical expertise with scientific standards. This approach, documented by Dern, uses principles of objective hermeneutics for crime scene analysis, seeking to minimize subjectivity through standardized procedures and inter-rater evaluation (Dern, 2009). Operative Fallanalyse emphasizes the integration of information from multiple sources—crime scene analysis, victimology, evidence, social context—into a comprehensive synthesis that guides the investigation.

Diagnostic assessment is a distinct category of profiling, based on the individual clinical expertise of mental health professionals—psychiatrists, clinical psychologists, criminologists. Unlike the systematic methods described above, diagnostic assessment is based on clinical judgment informed by the practitioner’s experience, without a standardized methodology or explicit protocols. Diagnostic profiles are often provided as appendices to primary reports, such as mental health assessments or autopsy findings, and vary significantly depending on the training and experience of the evaluator (Petherick, 2014).

The criticisms of diagnostic assessment are severe and well-documented. Bartol, in a study of the use of profiling by police psychologists, found that 70% of respondents were uncomfortable providing profiles or found the process questionable (Bartol & Bartol, 2004). The extreme subjectivity, lack of methodological standardization, and high inter-rater variability make diagnostic assessment the most problematic form of profiling from a scientific validity perspective. When two eminent psychiatrists reach contradictory

conclusions about the same case (a situation documented in the legal literature), confidence in the method as an investigative tool is seriously compromised.

The issue of scientific validity and reliability is perhaps the most serious challenge facing forensic profiling. Despite its extensive application in real-world investigations and its media popularity, the empirical evidence on the accuracy and usefulness of profiles remains ambiguous and inconsistent. Copson, in a large study conducted for the UK Home Office, evaluated 184 profiles provided in real-world investigations and found that only 2.7% were instrumental in identifying the offender, although 83% of investigators considered the profiles to be “useful” in a general sense (Copson, 1995). This discrepancy between perceived usefulness and measurable impact raises important questions about what profiling actually offers practitioners.

Snook and colleagues conducted a meta-analysis of studies comparing the accuracy of professional profilers to that of non-professionals (students, police officers without training in profiling, members of the general public) (Snook et al., 2007). The results were surprising: although professional profilers were slightly more accurate, the differences were modest and inconsistent across studies. In some cases, non-professionals performed as well as or even better than experts. This finding re-enacts Campbell’s 1976 challenge: if professional profilers are not substantially better than untrained individuals, what justifies the investment in this specialized expertise?

The problem of behavioral inconsistency, documented by Wilson and colleagues, undermines the theoretical foundation of profiling (Wilson et al., 1997). If offenders do not exhibit consistent behaviors across crimes, then the assumption that we can infer stable characteristics from the analysis of a single crime scene becomes problematic. Bateman and Salfati, in a study of behavior in serial homicides, found that the level of consistency varies significantly across offenders and across different aspects of criminal behavior (Bateman & Salfati, 2007). Some characteristics (e.g., victim control) may be relatively consistent, while others (e.g., level of violence) vary substantially even for the same offender.

The variability of profiles is another major reliability problem. When the same case is presented to different profilers, they often reach divergent, sometimes even contradictory, conclusions. Kocsis and colleagues have demonstrated this variability experimentally, finding that inter-rater agreement among profilers is modest at best (Kocsis et al., 2000). This lack of agreement raises fundamental questions about the reproducibility of the method, an essential requirement for any practice claiming scientific status. In the natural sciences, independent experiments should produce similar results; in forensic profiling, independent “experiments” (different profilers analyzing the same case) often produce inconsistent results. The lack of a validated theoretical basis constitutes a fundamental epistemological weakness. Most profiling approaches assume that there are stable correlations between crime scene behavior and the personal characteristics of the offender, but the precise nature of these correlations remains poorly understood theoretically. Why should a particular criminal behavior indicate a particular personality trait? By what psychological mechanism does this link manifest? Rigorous answers to these questions are largely absent from the literature, replaced by empirical generalizations and clinical intuitions. Alison and colleagues propose a paradigm shift from “offender profiling” to “behavioural investigative advice”, arguing for a more modest and pragmatic approach (Alison et al., 2010). Rather than claiming the ability to generate precise profiles of unknown offenders, behavioral advisors should offer a range of possibilities, identify investigative hypotheses to test, suggest interrogation strategies, and help link cases. This reformulation recognizes the inherent limitations of profiling and focuses on more concrete and easily validated contributions to the investigative process.

The integration of contemporary technologies, especially artificial intelligence and machine learning, promises a radical transformation of forensic profiling, but

simultaneously generates new epistemological and ethical challenges. These systems can process amounts of information that are unmanageable for human analysts, can identify subtle correlations invisible to human intuition, and can generate predictions with greater speed and consistency than traditional methods. However, AI-assisted profiling introduces the algorithmic “black box” problem on a new scale. Complex machine learning models, especially deep neural networks, operate as opaque systems in which the decision-making process cannot be traced or explained in terms that humans can understand. When an algorithm generates a profile or prediction, investigators and courts must trust the system without being able to critically evaluate the underlying reasoning. This opacity is problematic not only epistemologically but also legally: how can evidence generated by systems whose internal workings are unintelligible be used in court? (Chifflet, 2015).

The issue of data bias is perhaps the most serious ethical challenge of AI-assisted profiling. Machine learning systems are trained on historical data that reflects existing biases in the criminal justice system, for example, the over-representation of certain ethnic or socio-economic groups in criminal databases. An algorithm trained on such data will learn and perpetuate these biases, generating profiles that systematically discriminate against already marginalized groups. Statewatch documents the growing use of “predictive policing” systems in Europe that, despite claims of technological objectivity, amplify racial and socio-economic discrimination (Statewatch, 2025). The organization highlights that these crime “prediction” systems disproportionately affect black and racialized communities, victims of gender-based violence, migrants, and people from disadvantaged socio-economic backgrounds. The use of historical data reflecting discriminatory police practices (e.g., intensive surveillance of certain neighborhoods) leads to profiles that suggest that these communities are “prone” to crime, creating a vicious cycle of stigmatization and surveillance. In 2025, the European Union included restrictions on “predictive policing” in the AI Act, recognizing the inherent dangers of such systems, but the implementation and enforcement of these restrictions remain significant challenges (Regulation (EU) 2024/1689 of the European Parliament and of the Council laying down harmonized rules on artificial intelligence - Artificial Intelligence Act).

The legal aspects of profiling raise questions about admissibility in court and standards of scientific validation. In the American legal system, the Daubert and Frye standards require that scientific evidence meet reliability criteria before it is admissible. Forensic profiling has had an ambiguous status in relation to these standards: some courts have accepted the profilers’ testimonies, while others have rejected them as unscientific or too prejudicial (Muller, 2000). The jurisprudential inconsistency reflects the scientific inconsistency of the field itself. The problem becomes even more complex in the context of AI-assisted profiling, where algorithmic opacity makes it difficult to assess compliance with legal standards of reliability and transparency.

Profiling in the context of cybercrime is an emerging frontier that presents distinctive methodological challenges. Unlike traditional crimes that leave tangible physical traces, cybercrimes take place in virtual spaces, and the evidence is largely digital. Greco notes that profiling a cybercriminal requires “a unique blend of knowledge across disciplines, including profiling techniques, technology, cybersecurity, digital forensics, and interviewing techniques” (Greco & Greco, 2020). Without substantial technical skills, applying traditional profiling methods to cybercrime is nearly impossible.

The absence of physical evidence and direct perpetrator-victim interaction eliminates many of the traditional sources of behavioral information on which profiling relies. How can interpersonal coherence theory be applied when the interaction is entirely technologically mediated? How can geographic profiling be used when the physical location of the offender can be masked through proxies, VPNs, and Tor networks? These



questions suggest that cybercrime profiling may require fundamentally different conceptual paradigms, rather than simply adapting existing methods (Greco & Greco, 2020).

Despite challenges and criticisms, forensic profiling continues to be widely used by law enforcement agencies around the world. This persistence can be explained in part by its usefulness as a heuristic tool in complex investigations, even if its precise accuracy remains uncertain. Profiles can help investigators organize information about a case, generate hypotheses to test, prioritize potential suspects, and develop interrogation strategies. Even if the profile does not correctly identify the offender, the process of building a profile can clarify investigators' thinking and suggest productive directions for research.

However, this instrumental utility should not be confused with scientific validity. A method can be "useful" in a pragmatic sense without being scientifically valid, for example, astrology can be "useful" to some people in decision-making, without therefore being a valid science. The distinction between subjective utility and objective validity is essential for the critical evaluation of profiling. The purpose of science is not only to provide useful tools, but to produce verifiable, reproducible and incremental knowledge about the world. From this more rigorous perspective, forensic profiling remains a maturing discipline, with partial achievements but also with fundamental deficiencies that require systematic addressing.

## Conclusions

The analysis carried out highlights the fact that forensic profiling continues to be in a state of structural epistemological tension, situated between its operational attractiveness and the fragility of its scientific foundations. Although it is frequently used in investigative practice and enjoys wide professional recognition, profiling has not yet managed to acquire the status of a rigorously validated method, comparable to other established scientific tools of forensics or applied psychology.

The progress made in recent decades is undoubtedly significant. The shift from intuitive and speculative approaches to more structured analytical models—particularly through the development of Investigative Psychology and geographic profiling—marks an important step towards the rationalization of the profiling approach. The use of statistical methods, systematic behavioral analysis and computer tools has allowed the partial transformation of profiling from an eminently interpretive practice into an approach susceptible to empirical testing and evaluation. In particular, geographic profiling and the analysis of links between cases have demonstrated measurable operational utility in certain investigative contexts. However, the structural limitations of profiling remain evident and deeply problematic. The absence of a validated general theory, the lack of standardized protocols, and the difficulty of replicating the results constitute major deficiencies. The fundamental assumptions of profiling—such as behavioral consistency or the homology between behavior and personality traits—are constantly questioned by empirical research. The so-called "personality paradox" has not been overcome, but only circumvented by methodological reformulations that avoid direct confrontation with the instability of human behavior in different situational contexts. In particular, the issue of empirical validation remains unresolved. Comparative studies consistently show that professional profilers do not achieve significantly superior results compared to non-experts, and the practical utility of profiles is often limited to orienting or organizational functions. The conclusions of the Copson report and subsequent research confirm that profiling rarely contributes decisively to the identification of the perpetrator, functioning more as a cognitive support tool than as a predictive method in itself.

The major divergences between the schools of thought—American, European and German—reflect the absence of a paradigmatic consensus. The FBI's inductive model, British-inspired investigative psychology and German operational analysis start from

different epistemological premises and often reach incompatible conclusions. This methodological plurality, although apparently fertile, in reality indicates the lack of a common theoretical basis that would allow for the objective evaluation of results and the progressive accumulation of knowledge.

The integration of artificial intelligence technologies and predictive analytics introduces new opportunities, but also additional risks. Although algorithms can improve the capacity to process data and identify spatial or behavioral patterns, they generate major problems related to transparency, reproducibility and systemic bias. Recent European Union regulations, in particular the AI Act, reflect the awareness of these risks and explicitly limit the use of predictive profiling in a criminal context, precisely because of its discriminatory potential and its incompatibility with the fundamental principles of the rule of law.

From an ethical and legal perspective, forensic profiling raises serious issues. The risk of stigmatization, confirmation of prejudice and misdirection of investigations cannot be ignored. The use of profiles as a decision-making support, in the absence of clear methodological safeguards, may lead to violations of fundamental rights, in particular the presumption of innocence and the right to a fair trial. The fact that courts treat the probative value of profiling with reservations actually reflects this persistent scientific uncertainty.

The development prospects of the field depend on the assumption of clear and rigorous research directions. Longitudinal studies, with transparent methodologies, are needed to evaluate the real performance of profiling under operational conditions. Standardizing procedures, clarifying inferential limits, and integrating quantitative methods with qualitative analysis are essential steps to overcome the current state. Equally, the training of specialists must be interdisciplinary, combining psychology, criminology, data analysis, and applied ethics.

Finally, forensic profiling should not be abandoned, nor should it be overestimated. It can legitimately function as an auxiliary tool, capable of supporting the formulation of hypotheses and the organization of the investigation, but it cannot substitute objective evidence, nor can it provide deterministic conclusions. The future of this field depends on its ability to abandon professional mythology and adopt a reflexive, critical, and empirically grounded approach.

Profiling is thus at a crossroads: either it remains a hybrid practice, situated between intuition and science, or it evolves into a mature discipline, methodologically integrated and compatible with the contemporary demands of criminal justice and research. The choice of this direction is not only a scientific one, but also an ethical, legal and societal one.

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