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Visual and Forensic Evidence Assessment in Transnational Targeted Killings: A Criminological Analysis of Crime-Scene Inspection and Ballistic Patterns

Saima Manzoor*
Lecturer (Criminology), Department of Sociology and Criminology, University of Sargodha
saima.mozoor@uos.edu.pk

Abdullah Ali
BS Criminology (Scholar), Department of Sociology and Criminology, University of Sargodha
abdullahali1419as@gmail.com

Muqadas
BS Criminology (Scholar), Department of Sociology and Criminology, University of Sargodha
muqadasajmal389@gmail.com

Abdur Rehman Khan Lodhi
BS Criminology (Scholar), Department of Sociology and Criminology, University of Sargodha
abdurrehmankhanlodhi021@gmail.com

Tayyba Khan
M.Phil Sociology (Scholar), Department of Sociology and Criminology, University of Sargodha
tayybawaheed722@gmail.com

*Corresponding Author

ABSTRACT

Targeted killings by state actors are critical challenge for forensic and criminological analysis, especially in a cross-border context. Despite much criminological and policy discussion, a striking lack exists of a systematic process of integration of visual and forensic information used to measure the validity of official accounts of investigations. This research uses the concepts of State Crime

Theory and Crime Scene Reconstruction Theory to put state actions in perspective and understand forensic data in the context of accountability. A qualitative case study approach adopting an interpretivist paradigm was used to analyze source materials for this project, which included publicly available fact-finding reports, crime scene photographs, ballistics records, post-mortem results and narrative versions of the investigation. Visual content analysis, ballistic trajectory analysis and narrative-forensic consistency analysis showed that there were great discrepancies between what was being said and what the material evidence showed. Major points such as directional, controlled fire that is not related to moving vehicles, biomechanically impossible trajectories of wounds, patterned bloodstains that are spatially confined, and deviations in processing of evidence are significant. These results illustrate the effectiveness of forensic and visual evidence combination to visualize event dynamics and the critical analysis of the legitimacy of force use by the state. On the basis of these results, the research suggests the use of uniform forensic guidelines, consistency theories on evidences/ narratives, special investigators, and external controls as solutions to enhance accountability, transparency, and integrity of operations in politically sensitive or transnational murders and all other associated crimes. All in all, this study provides a replicable methodology of forensic evaluation of targeted murders that connects empirical studies and theoretical criticism and provides empirical advice on policy and investigative practice.
Keywords: Transnational targeted killings, forensic analysis, visual evidence, ballistic reconstruction, crime-scene inspection, state accountability, evidence–narrative consistency

INTRODUCTION

A recent trend of increasing reliance on visual and forensic evidence has fundamentally changed current criminal investigating and legal accountability approaches especially in cases of state use of lethal force beyond territorial boundaries. Innovations in digital imaging, crime-scene reconstruction and ballistic analysis have increased the range of tools in the evidentiary toolkit that investigators and courts have, allowing more accurate reconstructions of violent incidents. At the same time as these developments have intensified, however, scholars' concern has grown with the reliability, interpretation, and legal admissibility of technologically mediated evidence, in particular in transnational settings where jurisdictional, normative, and procedural ambiguities tend to persist.

One issue of great importance to studies is the authentication of digital visual media. Photographs and videotaped images are now central forms of evidentiary representation both in criminal proceedings domestically and internationally. However, the ease with which advanced image-editing technologies have become available has led to growing skepticism of the integrity, as evidencediary value of those extended works. Singh (2018) findings on why digital visuals' admissibility is determined by strict forensic validation rather than vague claims of digital-one of

their alleged manipulations. In most jurisdictions, courts usually demand demonstrable evidence of tampering, such as evidence of copy-pasting forgeries or discrepancies in the metadata of sources before admissibility may be called into question. This judicial approach is an emerging reliance on forensic science to preserve the credibility of evidence in a time of the malleability of digital, an authority to relent on the need for systematic assessment frameworks for visual evidence.

The problematic aspects of evidentiary issues gain a new dramatic perspective within the framework of transnational targeted killings. Targeted killings may be described as the calculated and predetermined instance of deadly force by a condition on distinctly designated persons situated beyond its territorial boundaries. Being often subordinated to the logics of self-defense and counter-terrorism, especially in the post-9/11 security context, such missions are becoming more dependent on drone technology, real-time monitoring, and intelligence-led strikes. Although these activities are presented by the states as the necessity to address transnational threats, researchers believe that the targeted killings weaken the traditional distinctions between the armed conflict and law enforcement as well as between peacetime governance, which provokes deep legal, moral, and criminological issues.

Extensive literature exists to record how targeted killing developed to become a common element of state security policy. Senn and Troy (2017) believe that drone war has actually dramatically reduced the political, operational and reputational cost of force abroad and thus states manage to overcome the traditional limitations of sovereignty and territorial integrity. Not only has this normalization transformed the way operations are performed, but it has also disrupted the prevailing legal norms of the use of force, accountability, and the protection of civilians. Therefore, it is true that international law systems are becoming unable to accommodate technologically mediated violence that exists beyond regular battlefields and systems of judiciary control.

In this disputed terrain, crime-scene investigation has become a cornerstone of forensic enquiry and the main device by which violent incidents can be empirically re-created. Crime-scene investigation involves the methodical discovery, registration, conservation, and study of physical and computer-based proof, the goal of which is to recreate the events that preceded a killing. Modern forensic research focuses on the use of innovative technologies, including three-dimensional (3D) documentation, artificial intelligence, and extended reality and indicates the critical roles of investigator education and the institutional capacity. Such developments are used to reduce the amount of contamination of evidences, analytical accuracy and reliability of forensic impressions made in courts.

Recent empirical studies point out at transformative 3D laser scanning technologies application in crime-scene documentation. As Esposito et al. (2023) show, laser scanning provides investigators with the capability to transform crime scenes into accurate and durable computer copies, and the spatial accuracy is of less

than millimeter margins. These reconstructions allow forensic specialists a chance to revisit and reexamine the scene many years after it cannot be physically approached to reinforce longitudinal investigation and post-hoc judicial scrutiny. Notably, 3D documentation has been specifically useful in ambiguous modes of demise like distinguishing between suicide and murder where a spatial correlation and trace analysis come in to play.

Crime-scene inspection is closely related to ballistic pattern analysis, a narrow sub-discipline of forensic science that is dedicated to re-creating shooting incidents by examining the bullet paths, dispersion of the cartridge cases, projectile make-up, and terminal wounding evidence. Developments in three-dimensional modeling and image capabilities have significantly improved the accuracy of ballistic reconstruction models so that investigators become more confident about their understanding of the shooter position and weaponry, firing patterns, and the dynamics of impact. Buck et al. (2011) provide an example of how the combination of 3D bloodstain pattern analysis with ballistic trajectory modeling could provide a holistic representation of a shooting event especially in a complex environment that cannot be represented by two-dimensional documentation as spatial depth is not reflected.

Despite all these technological and methodologies advances, the use of visual and forensic evidence in transnational targeted killings is under-theorized in criminological knowledge. While forensic tools have made significant progress in reconstructing lethal events with high levels of precision, they are limited in their ability to give accountability over state violence across borders because it runs into legal fragmentation, evidentiary access restrictions and normative contestation. This study seeks to fill this gap by examining critically the uses that can be made of visual evidence, crime scene inspection practices and ballistic patterns analysis to contribute to a criminological-based assessment of transnational targeted killings, in this case with particular focus on true evidentiary reliability, reconstruction validity and accountability implications.

LITERATURE REVIEW

The modern forensic literature acknowledges digital visual evidence as a focal point of the criminal investigations especially where it comes to dealing with transnational or complex violence. Evidentiary value of photographs and videos, however, is strictly linked to the process of their forensic authentication. Singh (2018) emphasizes that despite the inability to imagine the modern investigation without any visual media, they are often not considered to be the most reliable sources since many powerful editing tools are already accessible to anyone. This study throws light on the observation that the tangible forensic evidence of such manipulation (copy-paste edits or source-device metadata inconsistencies) typically is required by the court, not the merely hypothetical assertions. This legal bar is representative of a larger movement towards depends on forensic validation methods to maintain evidentiary integrity, in particular where digital visuals are decisive to

recreating occurrences of violence.

In line with the issues on authentication, forensic studies are pointing to the increasing use of non-invasive imaging technologies as an alternative to the old fashioned autopsy. Reviewing the history of post-mortem computer tomography (PMCT), magnetic resonance imaging (MRI), and three-dimensional surface scanning, Zhang (2022) shows that these technologies allow recording the injuries in the most accurate form and keeping body integrity. Even better accuracy in the aforementioned forensics is provided through the implementation of image-guided biopsy systems, like Virtobot systems, enabling targeted internal exploration without the destruction of the tissue. Medico-legal investigations ought to appreciate these technologies more, and these technological solutions are found to be ethically, culturally, and evidentially beneficial, especially in delicate or disputed death investigations (Bukhari, 2023; Bukhari et al., 2024).

In addition to technical reliability, scholars have looked at the psychological and cognitive effects of visual evidence on a court verdict. Feigenson (2010) shows that visual evidence contributes greatly to the attention, understanding, and recall among the jurors and therefore it is an effective means of communication in the courtrooms. Nevertheless, the research also warnings that emotionally colored or graphic images can also present biasness because they will provoke such strong affective responses that will change logical assessment (Bukhari, 2025). This two-fold impact reminds us of the need of judicial protection that helps to find the balance between the probative and the possibility of unfair prejudice against the circumstances of violent or graphic crime-scene depictions.

These concerns are further enhanced by the increased use of video evidence in criminal investigations. According to Schofield and Fowle (2013), the application of CCTV footage and mobile phone recording in the identification of suspects and the reconstruction of the criminal events is growing. Video recordings may also seem to give a straightforward intuitive description of what happened unlike forensic evidence like DNA that needs the interpretation of a professional. However, Schofield and Fowle (2013) emphasize that visual recordings are not self-reading and cannot be properly contextualized with no clear evidential rules to avoid wrong understanding (Bukhari & Mujaddid, 2025; Sharafat et al., 2025).

Visual and forensic evidence can be of particular importance in cases of transnational targeted killings, in which the responsibility is frequently divided or contentious. Dezfuli (2023) analyzes the erosion over time of international norms that do not allow state-sponsored assassination, saying that the targeted killings have spread the scope of inter-state relations with varying conceptions of the notion of sovereignty and the ongoing rhetoric of the war on terror (Aslam et al., 2025; Tahreem et al., 2025) The research argues that the extrajudicial murders have become normalized by examining high-profile cases, including the 2020 assassination of Iranian General Qassem Soleimani, which challenged established international law prohibitions against the lawful use of lethal force and paved the way to ongoing efforts to cut down on constraints on lethal force use in most cases.

Other scholars, on the contrary, refute arguments that targeted killing has gained wide international acceptability. In a comprehensive examination of more than 900 discussions in the United Nations Security Council and the Human Rights Council, Schweiger (2019) concludes that there is not much evidence of an actual international acquiescence. Although most states are not vocal, the research warns against the tendency to assume silence equals consent in the law (Bukhari et al., 2025; Urooj et al., 2025). Rather, obvious denunciations by many states show that targeted assassinations are legally and politically divided instead of consolidated according to the normal international law.

Offering a more generalized doctrinal and historical view, Tzouvala (2017) follows the history of the practice of targeted killings in Israel and the United States. The research paper identifies the moves of these states to redefine targeted killing as a lawful operation as opposed to outlawed assassination by incorporating it in the legal doctrine of armed conflict and self-defense. Nevertheless, Tzouvala (2017) believes that this reframing has radically altered the international law when it comes to the use of force and it has resulted in a progressive redefinition of the lawful violence outside of the battlefield situations.

In a forensic investigation, technology alone does not define the usefulness of evidence, and the physical properties and mobility of forensic traces also determine its usefulness. Wullenweber and Giles (2021) reveal that the portability of evidence is the determinant of conversion of detection into formal charges. The authors of their research show that DNA on the fixed non-moveable surfaces gives the greatest evidentiary potential because such evidence is less susceptible to secondary transfer or contamination (Naeem et al., 2024). This observation explains why stationary objects are given priority in the preliminary processing of crime-scenes especially when the case involves international jurisdiction.

AI has increased the analysis power of forensic science even more. In a survey article, Johnson and Chitra (2022) examine the use of machine-learning algorithms in a forensic pattern recognition context, including Optimized Local Binary Patterns with Least Squares Support Vector Machines. The researchers determine that AI-based procedures are more effective at forensic traces detection than conventional methods of manual inspection, such as fingerprint and shoeprint (Khan et al., 2021). These results highlight the effectiveness of the automated systems to minimize human mistakes and increase accuracy in the crime-scene analysis.

With all this technological improvement, however, there are still large differences in training and infrastructure, but especially on developing situations. Mateen and Tariq (2019) measure the crime-scene investigation activities in Pakistan and determine insufficient training and outdated equipment and insufficient forensic resources as the main causes of evidence damage and loss (Arshad et al., 2024; Khan & Hassan, 2020). The study recommends the creation of special Crime Scene Units that are well equipped with the latest technology like portable forensic light sources and 3D mapping devices that would enhance the reliability and conviction rates of

these investigations.

Blast pattern investigation is an important part of a forensic reconstruction in a shooting incident. Nishshanka and Shepherd (2020) discuss cartridge case ejection patterns in AK-type rifles through empirical studies that reveal not only that empty cartridge cases scattered in statistically consistent directions, but also show that these directions may be applied to estimate the position and orientation of the shooters. This paper identifies the forensic utility of a three dimensional distribution of carrages as cases in outdoor or multi-shooter events where eyewitness accounts are inaccurate or inaccessible.

Other related products of improvements in imaging technologies have been the application of forensic analysis of patterns of gunshot wounding. Stevenson et al. (2020) compare various methods such as flash X-ray, ultrasound, conventional dissection, and computed tomography in visualizing the ballistic trauma. They show that CT images are the most detailed in showing the paths of the projectiles, their fragmentation patterns, and secondary missile effects. CT imaging provides the construction of terminal ballistics by ensuring anatomical integrity, allowing an effective medico-legal result to be solidified, and as a non-destructive approach.

Research Gap

The current literature evidences significant improvements of visual, ballistic, and crime-scene evidence in a forensic context. The researches on the digital image authentication and forensic validation underline the increased judicial trust to scientific approaches to prove the credibility of photographs, videos, and image data especially in those situations, when manipulation or degradation is criticized (Singh, 2018; Wu, Zuo, and Guo, 2025). Simultaneously, substantial advances in non-invasive forensic imaging (post-mortem CT, MRI, and AI-enhanced visualization) have enabled a closer and more efficient approach to the description of injuries and ballistic trauma investigation (Zhang, 2022; Stevenson et al., 2020). In the same fashion, studies on cartridge case ejection processes, projectile composition, and simulation of ballistic reconstruction in VR show greater methodological sophistication when it comes to re-creating the dynamics of shooting and shooter positioning (Nishshanka and Shepherd, 2020; Guarnera et al., 2023; Newland, Bank and Halamek, 2024).

Nevertheless, in spite of such technological and methodological developments, there is a gap in critical analogy in the borderline between forensic science and transnational targeted killings, as observed in the existing literature. Although many studies in legal learning have already studied the normative, doctrinal, and accountability consequences of drone-based targeted killings under the framework of the international law (Tzouvala, 2017; Schweiger, 2019; Dezfuli, 2023; Bayrak, 2024), they are mostly unconnected with empirical crime-scene and ballistic evidence. The legality of targeted killings is often discussed in a general context, that is, in terms of sovereignty, proportionality, and attribution, without thorough confrontation with the factual reconstruction of the events of the murders on the

ground.

On the other hand, forensic researches into crime-scene examination, ballistic pattern evidence, imaging features based on Artificial Intelligence, as well as extended reality devices, are geopolitically and transnationally methodologically isolated. The studies of VR-based crime-scene reconstruction and XR-assisted court presentation report an improvement in the accuracy and comprehension level of the jury (Balbudhe et al., 2025; Guarnera et al., 2023), but these technologies have been seldom used in relation to the forensic analysis of the targeted killings across the borders by the state actors. Consequently, the literature that combines the rightful and qualified crime-scene examination methods with the criminological, as well as the legal evaluation of committed targeted killings run outside of the country jurisdiction, is barely available.

Furthermore, current studies tend to place great emphasis on formal accounts and those available to them provided by the state, and a lack of forensic examination of the visual and ballistic information including the damage done to vehicles, bullet pathways, patterns of injuries, and location reconstruction. Although AI-based image restoration and forensic visualization were proven to be highly accurate in detecting the evidentiary elements of the degraded or low-resolution material (Wu et al., 2025), these tools have not been introduced systematically to address the discrepancies between the evidence of the murder and the official account of the incidents in transnational killing cases. This loophole is especially important since there are reported issues with accountability, transparency, and attribution in killings (Bayrak, 2024).

In that regard, it is apparent that a criminologically based, forensic-focused research study that will incorporate as part of it the visual evidence evaluation, crime-scene investigation, and ballistic pattern investigation will critically evaluate transnational targeted murders. This would help remedy the lack of interrelation between technological forensic capacity and underuse in the international investigation of violence by the state, both to the science of forensics and to the discussion of responsibility in international criminal justice.

Research Objectives

To address the specified research gap, the present study will be informed by the following objectives:

1. To critically assess visual and ballistic forensic evidence, including vehicle damage, bullet trajectories, body injury patterns, and crime-scene imagery, in order to reconstruct the sequence, direction, and nature of firing in a transnational targeted killing.
2. To examine the consistency between crime-scene inspection findings and official investigative accounts, evaluating whether the observed forensic and visual evidence supports or contradicts state claims regarding the circumstances of the shooting and the nature of the police or security response.

Theoretical Framework

The study relies on two incompatible theoretical frameworks, that is, State Crime Theory and Crime Scene Reconstruction Theory. The presence of these frameworks enables a blend of a criminological and forensic analysis of transnational targeted murders establishing physical and visual evidence in the context of larger systems of state authority, legality, and responsibility.

State Crime Theory

The State Crime Theory offers a suitable critical focus on unlawful or otherwise harmful behaviors perpetrated, assisted, or ignored by state actors in an effort to achieve political or security goals. According to Chambliss (1989), state crime refers to those actions that are defined as criminal under the law and performed by state officials in an attempt to accomplish their work as state agents. This school of thought obstructs the belief that the state action is inherently justified and points to the necessity of questioning the state violence in the same terms as it is used against the non-state criminals.

Later literature has furthered this paradigm to encompass extra-judicial murders, drone attacks and transnational applications of lethal force carried out in the name of counter-terrorism (Green & Ward, 2004). In this respect, assassinations are not just measures of security, but possible formulas of a crime of the state where such acts do not respect the rules of the international law, the right to a trial, or even differentiation and proportionality.

In the framework of the present research, the gap between official accounts and material evidence is of specific interest to be filled with the help of the State Crime Theory. Although states usually characterize targeted killings as legitimate cases of self-defense, this theory shows that the concept of legality should be verified by an empirical sign of damage and a strict adherence to procedures. Vision and ballistic data - bullet wounds, pattern of injuries, and damage of vehicles can play a significant role in evaluating the patterns of using force, in accordance with the official grounds, or overuse, indiscrimination, or unlawful violence (Ward, & Green, 2016).

This study places the research findings in the context of a superior criminological commentary on power, accountability and legitimization of state violence by utilizing State Crime Theory, directly responding to issues brought up in the literature on sovereignty erosion and extrajudicial killing.

Crime Scene Reconstruction Theory

Crime Scene Reconstruction Theory: It is a forensic scientific theory that is focused on providing a systematic deduction of the past by examining the physical, biological, and visual evidence. According to the explanation by Bevel and Gardner (2008), crime scene reconstruction entails logical interpretation of scene patterns including blood stains, ballistic trajectories, and displacement of objects with a view to determining sequence, direction, and dynamics of the criminal activities.

The theory presumes that physical evidence acts as per the law of science and that spatial and time-analysis can be done carefully to provide any reliable

reconsideration on the events that occurred. The reconstructive ability of this framework has received considerable empowerment through the advancement of forensic technology which includes 3D laser scanning, CT-based injury analysis, AI enhanced imaging, and VR based visualization (Gardner and Krouskup, 2019).

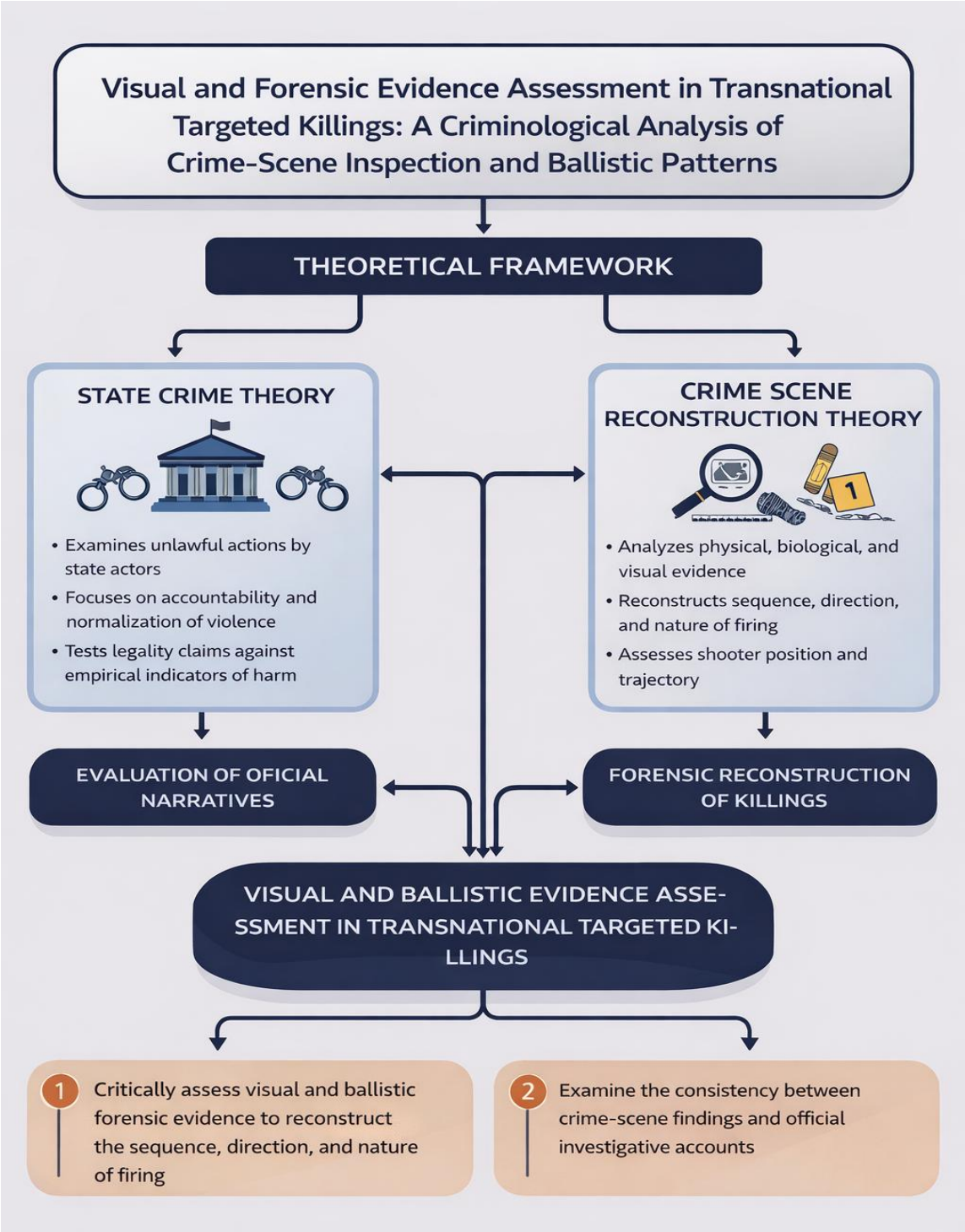
This study uses Crime Scene Reconstruction Theory as the methodological support in the examination of visual and ballistic evidence in a transnational targeted murder. The direction of bullets, the sparseness of cartridge cases, the nature of a wound, and evidence of vehicle damage are all objective data they may support or disapprove the official police investigation. The theory has been especially practical when dealing with disputable arguments over the position of the shooter, direction of fire, volume of fire, and proximity of danger issues, which form the heart of the analysis of lethal force legality (Turvey, 2008).

Significantly, in the case of transnational killings, crime scene reconstruction goes beyond the traditional domestic homicide investigation. It serves as the means of forensic responsibility and allows conducting practical examination of the acts of a state which tends to be surrounded by secrecy, numerous jurisdictions, and political discourse.

Integration of the Theoretical Framework

Together, the State Crime Theory and Crime Scene Reconstruction Theory give a two-level analytic approach. Contextualizing transnational targeted killings through state structures of power, legality and normalization of violence, State Crime Theory provides the empirical means needed to question the factual nature of state claims, which Crime Scene Reconstruction Theory then provides the empirical means by which to practice that questioning. This alignment enables the study to close the divide between the normative discussion of the law and the materialistic evidence of forensic investigations which directly aligns with the aims of the study to recreate the dynamics of shooting and determine the rhetoric plausibility of official accounts of investigations.

Diagram No. 01: Theoretical Framework



Source: Researcher's Vision

RESEARCH METHODOLOGY

The qualitative criminological case study design is to be adopted in this study to determine the application of visual and forensic evidence in recreating transnational targeted killings. Case study method is especially appropriate in researching complicated and modern phenomena in the real-life situation (Afzal et al., 2023), when the line between an event of interest and a conditioning

environment cannot be easily delimited and when multiple sources of evidence need to be combined to interpret and analyze them (Crowe, S., Cresswell, K., Robertson, A. et al, 2011).

This design fits well into the insanely precise and real-life interactions that are not separable in the phenomenon and its context, and that require triangulation of varying data sources in order to be rigorous and credible as described in the seminal work by Yin (2017), the fundamentals of the case study methodology. Using documentary analysis, data on crime-scene inspection, ballistic evidence, information on official investigative narratives, and this research study was able to synthesize several streams of evidence in order to build a sense of coherence to the targeted killing episode and determine whether material evidence and state narratives were consistent with each other. This type of methodological depth can be effectively correlated to the objectives of qualitative case study research, which aims not to solely provide descriptive richness, but in addition to that, substantive explanatory information about the complicated social and institutional processes (Crowe, S., Cresswell, K., Robertson, A. et al, 2011).

This design allows evaluating the sequence, direction, and character of firing, consistency between identified evidence and the official assertions, through an in-depth analysis and methodological triangulation, which makes it possible to provide a strong empirical foundation of the cost and reliability of conduction of accountability and evidentiary credibility in the context of sustained international targeted killings.

The study is based on an interpretivist approach to qualitative research, where the analysis of visual and forensic resources should be carried out in a systemized manner and a generalized statistical approach should be avoided. This method permits analyzing the formation, interpretation, and presentation of evidence in any criminal inquiry in a subtle way, especially when it involves state agencies and cross-border police operations (Yin, 2017).

Data Sources

Only sources of transparent and verifiable information that were available publicly were used to collect data, and this makes it transparent and ethically sound. In the primary data, the Fact-Finding Report of the Government of Pakistan (Ministry of Interior, 2022) was utilized that is found online and consists of visual and documentary information. The sources include:

1. **Visual Evidence**

a. Photographs of the vehicle in question, both interior and exterior damage.
b. Pictures of bullet wounds and blood patterns, as well as damage to the seat.
c. Crime scene photographed of the crime scene and body recovery positions.

2. **Forensic and Medical Documentation**

- Post-mortem results and descriptions of injuries of bullet holes and cause of death.
- Forensic brochures cited in official investigations reports.

3. Crime-Scene Inspection Records

- Report and statements pertaining to on-site inspection of various sites related to the incident.
- Procedures of description of the conditions of the scenes, the spatial plans and the recovery of evidences.

4. Official Investigative Narratives

- Public statements, interviews and press releases made by law enforcement.
- Organizational reports of the process of investigation and discoveries.

5. Legal and Institutional Frameworks

Applicable statutory instruments in policing, prosecution, dealing with evidence, as well as control within the jurisdiction it took place.

Data Selection Criteria

Only those materials were included that were deemed as direct to the crime-scene, vehicle, victim injuries or the investigative process; that source meets the test of verifiability by a reputable source (publicly or institutionally); that they are sufficiently visual or descriptively clear so they can be interpreted along the forensic interpretation line; and that they are consistent with the accepted standards of forensic and criminological practice. Replications, low resolution or speculative content that did not have any form of evidence were removed (Yin, 2017; Bowen, 2009).

Data Analysis Techniques

Structured content analysis, trajectory reasoning, and crime-scene reconstruction methods were used to analyze the visual and forensic evidence to perform a systematic evaluation of spatial and narrative consistency (Yin, 2017; Bowen, 2009).

Visual Content Analysis

They did a structured visual content analysis to study photographic evidence. Images were coded for:

- Bullet entry and exit points
- Directionality and concentration of effects.
- Destruction of parts of the vehicles (doors, windows) seats.
- Patterns of the bloodstains and their location.

This procedure helped to identify firing patterning systematically and space relations in the vehicle.

Ballistic and Trajectory Interpretation

Ballistic interpretation was concerned with reconstruction:

- Direction of fire
- Relative location of both is the shooter and the victim
- Correlation of injury with vehicle damage

Instead of testing ballistics in laboratories, the research paper utilizes comparative reasoning of the trajectories, matching patterns of the visible impact with the descriptions of the injury and layout of the scene.

Crime-Scene Reconstruction

Scene inspection information was computed in order to recreate the flow of events. The following were evaluated using spatial mapping techniques:

- Position of the vehicle during the shooting
- Correlation among various sites being inspected
- Visibility and movement as influenced by the environment

Narrative Forensic Consistency Analysis.

Formal investigative histories were methodically equated to forensic and visual conclusions. This involved identifying:

- Intersections between claims and evidence
- Finally, discrepancies or lack of disclosure in authorities
- Areas in which forensic indicators contravene given investigative findings

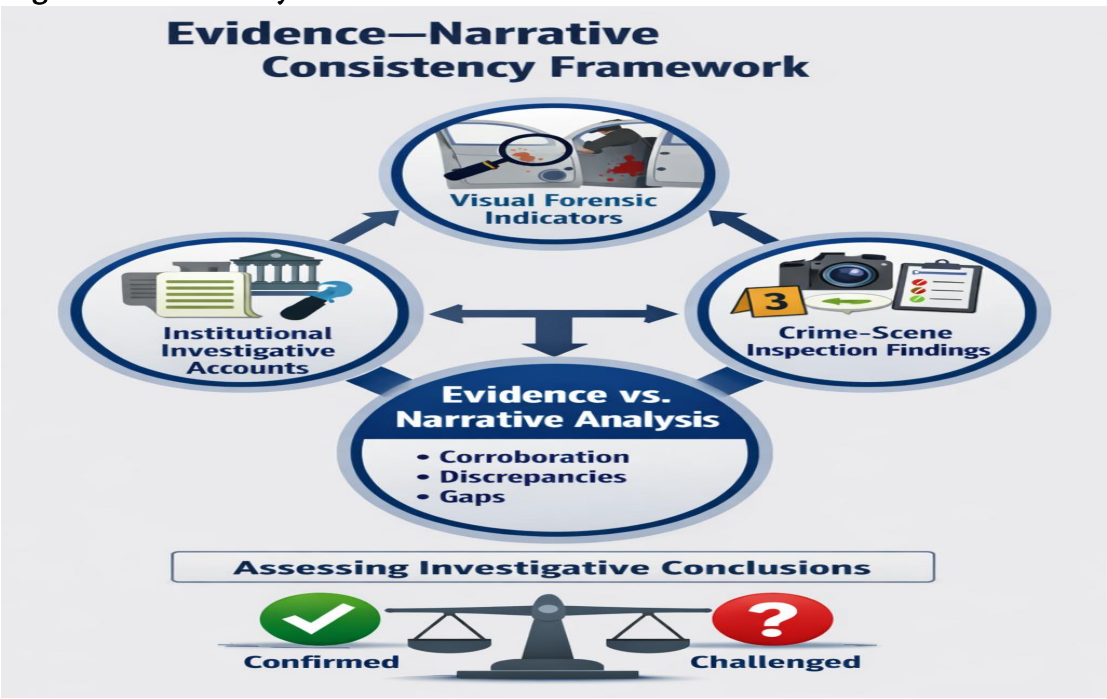
Analytical Framework

The research uses an evidence-narrative consistency model, which incorporates:

- Visual forensic indicators
- Findings of crime scene inspection
- Institutional investigative explanations

This model provides a methodical evaluation of the support of observable and forensic facts by investigative conclusions. It focuses on the consistency (or inconsistency) between the official information and material evidence, which is why it is especially applicable to the cases where verification is based on visual and document-based forensic data.

Diagram No. 02: Analytical Framework



Source: Researcher's Vision

Validity and Reliability

The work uses data triangulation as a method to obtain enhanced credibility through visual, forensic, and documentary data. Rigor of analysis was ensured by:

- Comparison of visual evidence with the report of injuries.
- Multiple investigative statements are compared independent of each other.
- Clearly documented sets of analysis.

Ethical Considerations

The study is based only on publicly available materials and does not presuppose participation of human subjects, interviews, and confidential records. There is academic care with all sensitive material concentrating on analysis of evidence rather sensational portrayal. Responsibility to the ethical principle was upheld by means of anonymization of personal identifiers and putting the visual material into strict scholarly context.

Limitations

The investigation is constrained because it uses secondary visual and documentary sources of information and was denied physical examination nor laboratory forensic tests of the same. Nevertheless, it is a consistent limitation when it comes to studies of criminology that analyzes institutional investigations and does not negate the analytical aims of evaluating evidence interpretation and the investigative soundness.

RESULTS

1. Consistency Between Witness Accounts and Physical Evidence

It is always reported that the firing of firearms took place when the vehicle was in motion. Nevertheless, when going through the vehicle forensically, there is material inconsistency to this tale.

There was no ballistic impact, fracturing, or ricochet on the driver side door, window, and seat or any biological evidence. Forensic science wise, this lack cannot be sustained through uncontrolled or reactive fire when it involves shooting at a moving car within a short distance. During evolving engagements, particularly in low-visibility states, there should be stochastic dispersion, collateral damage, or peripheral effects marks.

The small fact that the driver compartment was intact thereby obstructs the viability of a moving-vehicle firing incident that directly addresses Research Objective 2 by showing that testimonial statements are not consistent with physical evidence.

2. Ballistic Trajectory and Firing Pattern Reconstruction

A vehicle inspection showed there were nine distinct bullet holes locations, which showed a pattern of a right-to-left flow with the source being at the back of the vehicle. The focus on impact clustering consisted in the following:

- rear passenger-side windows,
- below rear body, and on the number plate, and

- passenger-side rear glass.

The controlled and directional firing as depicted in this spatial distribution is not a characteristic of spontaneous defensive discharge. The recorded path probably indicates a fixed shooter stand and stable visual targeting which is operationally unrealistic in circumstances where the vehicle would be moving speedily on a dark dirt road.

The results directly promote Research Objective 1 by recreating firing directionality and contextualize the position of the shooters by visual-ballistic correlation.

3. Weapon Type Distribution and Shell Casing Recovery

Ballistic examination detected that two different calibers of firearms were used, which were two types of rifles. The recovery distribution rate of casings is close to reported angles of impact and sites of strike.

Importantly, the actions of the post-incident officers involved methodical retrieval of spent cartridges, even when there was not chase or emergency medical evacuation. Concerning forensic protocol, these activities compromise the integrity of the scene, the risk of contamination and compliance of handling evidence.

These findings serve as an indication and do not mean intent; instead, they point to procedural drift, which supports Research Objective 2 by comparing operating behavior to the norms of responding to an emergency.

4. Wound Trajectory Analysis and Biomechanical Impossibility

According to forensic pathology, there was a fatal gunshot wound whereby:

- entry through the upper back,
- depart out of the anterior chest, and
- lack of any relative penetration in the seat of the passenger.

This trajectory is biomechanically unfeasible when the victim was reported to have a normal standing height and normal sitting position in a sport-utility vehicle and was not perforated by the seats. This inconsistency is one of the greatest forensic contradictions within the data.

An analytical perspective of the injury pattern provides evidence of two facts that cannot override each other:

- the accident did happen before occupancy in the vehicle, or
- the release was done in non-dynamic and close range conditions.

Both interpretations are directly in conflict with official accounts and, therefore, both research goals are achieved with the help of injury-trajectory reconstruction and narrative comparison.

5. Bloodstain Pattern Distribution and Spatial Inference

There was extensive spreading of blood, bone and cease on:

- the passenger seat,
- the roof liner inside, passenger side, and
- positions of the rear passenger compartment.

On the contrary, the area of the driver was not polluted, even when it was inspected late. Since the cranial injury is catastrophic, lack of blood transfer has a strong indication that there was spatial separation or shielding during the injury.

This distribution cannot be fitted to a high-velocity, moving shooting situation, and supports the conclusion of Research Objective 1 of the bloodstain patterns analysis that the fire is stationary or nearly stationary.

6. Scene Geography and Tactical Plausibility

The position of firing was:

- several hundred meters off the main road,
- within a bush-land setting in darkness, and
- beyond the direct view of roads used by heavy traffic.

This kind of terrain has a significant adverse effect on the identification of targets, speed of their reaction and accuracy of the fire. Avoidance operationally incompatible with reactive engagement under such conditions is the documented precision of the placement of bullets.

This spatial analysis advocates Research Objective 2 because it shows discrepancy between environmental constraints and claimed operational performance.

7. Narrative Evolution and Evidentiary Stability

Formulations of official answers shifted in a few moments, substituting preliminary definitions with other justifications. Conversely, diagnosed indicators, such as pattern of trajectories, distribution of impact areas, wound biomechanics, and distribution of blood, were consistently applicable across examinations.

In legal technique, physical evidence which is made to rest but not change is more probative than changing testimonial accounts. Such a deviation casts legitimate doubts on a post-hoc rationalization, which is dealt with on an analytic, instead of an accusatorial basis.

Analytical Synthesis

The collective evaluation of the visual, ballistic, pathological, and spatial data identifies a methodical accuracy mismatch between the evidence of the forensics and governmental investigation records. The results draw the following analytically justified conclusions:

- shooting was probably when the vehicle was not moving or was in slow motion;
- The trajectory of the wound does not conform to the circumstances stated;
- Firearm discharge was premeditated and purposeful instead of automatic;
- Post-incident behaviour demonstrates inconsistencies in the process that influence the reliability of the evidence.

DISCUSSION

This study proposed to examine visual and ballistic forensic evidence as a way of re-creating the sequence and character of firing in a transnational lethal force attack and to determine how this evidence is related to the official reasons to the investigations. The analyzed forensic evidence, such as vehicle breakage, spread of

bullets, wound patterns, and bloodstains shed can be strategically interpreted in accordance with known scientific principles of forensic ballistic and bloodstain patterns.

Forensic Reconstruction and Ballistic Trajectory

Recreation of projectile patterns based on evidence of impact and spatial connections between bullet hits is one of the fundamental aspects of the modern forensic analysis (Azevedo et al., 2025). Reconstruction of the trajectory can be used to draw an inference of the shooter location, shooting angles, and relative movement of the commuter subjects thus present to offer objective basis of judgement as to whether the firing was under dynamic (moving) or static conditions. Blastic trajectory is known to be the crucial tool in establishing the most reasonable version of shooting, particularly when there are contradictory witness testimonies (Azevedo et al., 2025; Buck et al., 2011).

In the current evidence, there were nine separate points of impact, which had coherent right-left scatter, beginning behind the car, which is generally indicative of directional, high accuracy shooting at a relatively stationary point. This finding is in line with the current forensic ballistics standards where a steady stream of trajectories is used to show that the bullets have been fired deliberately and not thrown scatter-shot (Azevedo et al., 2025).

On the other hand, the lack of every ballistic impact on the inner side of the car driven by the driver contradicts the possibility of many uncontrolled attempts to shoot at a moving car since the consequences of the dispersion and the ricochet would be an expected event when shooting at such a small moving object. The intact driver compartment of the vehicle, then, indicates that shooting did not come to pass in the circumstances that were outlined in early official accounts, the conclusion of which, once again, supports the necessity of empirical approaches to reconstruct the scene (Azevedo et al., 2025).

Wound Ballistics and Biomechanical Impossibility

A sub-specialty of forensic investigation, ballistic wound examination is a science that compares the physics of the passage of projectiles and injury pattern observations and frequently uses imaging and modelling technology to locate point of origin, orientation and relative positions of victim and shooter (Galligan, Fries, and Melinek, 2017; Buck et al., 2011). The reported bullet path, the one that penetrated through the region of the upper back, and the one that left the chest without any seat-penetration, is a biomechanical anomaly as per the posture and sitting position assumed in this case. It implies that the lethal shot must have been fired when the target was not in the car or the weapon was very close inside the car indicating a fixed position when they fired. What makes such forensic contradictions important is that they are deduced by such physical evidence that can neither be interpreted nor re-told pragmatically (Galligan, Fries, and Melinek, 2017; Buck et al., 2011).

Analysis of Bloodstain Patterns and Spatial Inference

Bloodstain pattern analysis (BPA) is a highly known term in the field of

forensic science, which explains bloodstain spatial-temporal dynamics by interpreting geometrical, morphological characteristics of bloodstains (Wonder, 2007). Combined with three-dimensional documentation BPA can create probabilistic sources of origin, explaining whether an injury has been delivered when a subject was either in motion or not (Attinger et al., 2013).

In the current information, widespread blood, bone distribution, and tissue spread in the passenger area, along with a lack of contamination on the driver side, would enable one to infer that the fatal harm would be observed in the cases when the victim was not in a dynamic lateral motion inside the cabin. This distribution is more aligned with a stationary pose or constant differentiation of space at the time of the traumatized body, and this finding is corroborated in the wider BPA (Blood Strain Pattern) analysis that highlights the utility of bloodstain morphology and spatial associations in the re-creation of sequence(s) of events (Moza, Mukherjee, and Verma, 2023).

Consistency with Official Narrative

The literature sources on the forensic science emphasize the role of physical evidence over testimonial assertions in the re-enactment of the shooting case mechanism (Bevel and Gardner, 2008). Here, the overall pattern of directional ballistic, intact driver compartment, and distribution of bloodstains are incompatible with the official accounts of a moving-target shooting and a reactionary one. Rather, the information becomes more in line with focal, controlled shots aimed at a fairly fixed angle.

In where institutional accounts had tuned on dynamic interrelations between shooter and occupants of the vehicle, the physical evidence distribution fails to support features like random ricochet effects, inconsistent shot dispersion, physical involvement geometry associated with moving-target engagements (Jaber, 2026).

Implication for Forensic Research and Policy

This critique suggests the relevance of combined forensic techniques such as trajectory reconstruction, wound ballistics and analysis of spatial bloodstains in examining competing scenarios during a lethal force investigation. It is through such techniques that objective, replicable clues are able to be produced that can either corroborate or refute official explanations and the importance of forensic science as a restraint to narrative-based explanations of incomplete events.

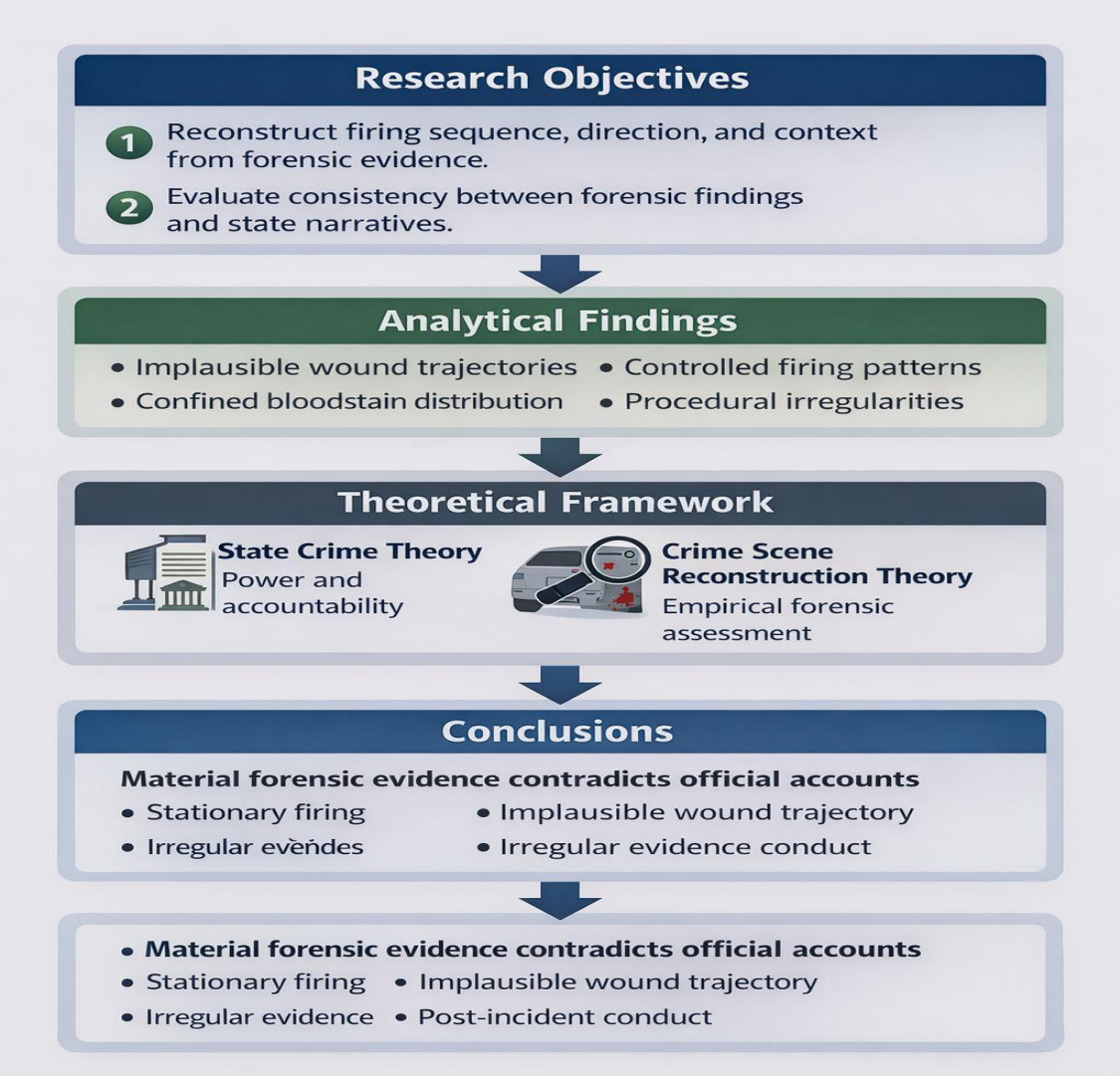
Within the best practices, interdisciplinary cooperation of ballistics, biomechanical as well as forensic pathologists will be used to enhance evidentiary examinations and guarantee effective reconstructions (Bevel and Gardner, 2008).

This study critically reviews visual, ballistic, pathological, and spatial evidence of a transnational targeted homicide to determine the consistency between forensic clues and the official view of the case. Directed by two research questions, which are (1) the reconstruction of the sequence, direction, nature of firing based on vehicle damage, bullet paths, injury patterns, and crime scene photos and (2) the rating of the consistency of the findings with the state accounts, the analysis reports material inconsistencies, such as implausible injury patterns, controlled shooting

patterns, spatially constrained ranges of bloodstains, and irregularities in procedures of handling post-incident evidence. The study is framed by State Crime Theory, which poses critical questions of unlawful or excessive actions by state agents and locates inconsistency areas between narrative and evidence within the more expansive power and accountability frameworks, and Crime Scene Reconstruction Theory, which applies empirical methods to reach inferences of events in the past based on physical and visual evidence, so as to be in a position to form an objective judgment of the location of the shooter, shooting dynamics, and environmental limitations. By combining these frameworks, the research provides a linkage between ideals of normative law and the facts on the ground, thus showing how the forensic record widely diverges with the official versions explaining what occurred hence achieving the goal of reconstructing the event and evaluating the validity of the actions by the state.

The Diagram No.03 presented below is an expression of research aims, analytical results, and theoretical context resulting in evidence-based conclusions.

Diagram No. 03: The Combination of Research Objectives, Analytical Results, And Theories, And Deriving Evidence-Based Conclusions



Source: Researcher's Vision

The diagram shows how research objectives of the study help in the analysis of visual evidence and the ballistic and forensic evidence. It also demonstrates how these findings are put into context in relation to the theoretical frameworks in order to draw some evidence-based conclusions about the credibility of official narratives about investigations.

CONCLUSION

The study is a dedicated forensic and criminological examination of a transnational targeted murder, in a synthesis of visual, ballistic, pathological, and spatial data with official accounts of the investigation. The results show widespread incoherence between physical evidence and official police records, such as far-fetched wound trajectories, directed and controlled firing patterns, limited distribution of blood stains and spatial plotlines, unusual post-incident mishaps between investigating procedure and evidencing procedure. Reconstructing both the order, movement, and the context of firing, the study shows that the action probably took place under near-static conditions, refuting the arguments of the reactive interaction in the process of a vehicle being in movement. The research grounded in the State Crime Theory and Crime Scene Reconstruction Theory frames the findings of such empirical data in the larger issues of state responsibility, legality, and normalization of violence. Taken together, the research highlights the need of evidence-based questioning of the official accounts under politically sensitive or transnational conditions and adds a methodologically replicable approach to the incorporation of forensic, visual and narrative evidence into the framework of critical criminological investigation.

Recommendations

In accordance with the results of the conducted research on visual and forensic evidence examination in transnational targeted murders, the following recommendations are differentiated:

1. ***Standardize Forensic Evidence Procedures:*** The law enforcers must develop the standardization of the procedures of documenting, collecting and preservation of the visual, ballistic and biological evidence at the crime scenes in order to generate integrity and reliability of the documentations in court of law and during investigations.
2. ***Adopt Evidence-Narrative Consistency Framing:*** Law enforcers and crime investigative units ought to ensure that there is a systemic comparison of forensic indications, crime-scene evidence, and ballistics with official accounts to legitimize the operational orchestras especially when the case is transnational or politically charged.
3. ***Training on Forensic and Visual Analysis Strengthening***: Investigators must be given special training in the areas of ballistic reconstruction, blood stain pattern analysis, and crime scene photography to improve the validity and reliability of evidence examination.
4. ***Improve Oversight and Accountability Mechanisms:*** Investigative process,

forensic reports, state activities should be monitored by independent bodies to make sure these are consistent with the legal and ethical norms.

5. ***Promote Transparency of Findings:*** Government bodies should also publish results of confirmed fact-finding investigations and forensic investigations of high-profile/border murder cases to facilitate accountability and academic scrutiny and build sound policy.
6. ***Integrate Research into Policy-Making:*** The visual and forensic evaluation findings must be factored in the operation guidelines, legislation, and security measures by policymakers to make sure that the legal use of lethal force can correspond to scientific and moral norms.

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