

Better Forensics, Fewer Solved Murders? Explaining the Homicide Clearance Paradox

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ABSTRACT

Homicide investigation operated in an evidentiary environment far richer than that available to earlier generations of detectives, yet improved forensic visibility did not restore historically high clearance levels. This article examined that mismatch as a problem of conversion rather than a failure of forensic science. Drawing on peer-reviewed journal articles published between 2020 and 2026, together with selected foundational studies on homicide solvability and investigative workload, the analysis distinguished technical capacity from case-conversion capacity. It developed evidence convertibility as the central mechanism: the extent to which an available trace reduced uncertainty about offender attribution soon enough to alter investigative action. DNA profiles, video, ballistic links, digital records, and witness statements could be accurate while remaining operationally weak when they could not be connected to a person, interpreted within a relationship, integrated across units, or acted upon in time. The analysis therefore located the solvability gap in the distance between what an investigative system could detect and what it could convert into an attributable case. Solvability was partly inherited from the homicide, but investigative decisions could preserve, enlarge, or erode it.



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INTRODUCTION

Homicide is investigated with tools that were unavailable to most detectives a generation ago, but the ability to resolve murder has not risen in proportion to that change. The historical comparison needs care. U.S. homicide clearance fell sharply from the exceptional levels reported in the early 1960s and then entered a long period of relative stability rather than continuing downward in a simple line (Cook & Mancik, 2024). The question is therefore not whether each new forensic advance coincided with fewer solved murders. It is why a richer investigative environment has failed to restore anything close to the earlier level of case resolution. DNA databases, digital records, surveillance systems, and ballistic technologies have altered what investigators can recover and connect, yet the gap between visibility and resolution remains. That gap is difficult to explain if technological capacity is treated as though it should translate directly into clearance. Technology is better understood as an expansion of investigative possibilities, each of which still has to enter a case and acquire practical meaning.

The expectation of a mechanical technology-to-clearance effect is itself too strong. A forensic tool can improve one stage of an investigation while leaving the rest untouched, and a change in homicide composition can make aggregate clearance move differently from the effectiveness of any particular technique. The puzzle survives that objection because forensic progress has enlarged the amount of potentially useful information without producing equally large gains in offender attribution. Recent case-level work in Los Angeles shows that forensic evidence has effects that depend on its form and investigative context rather than a uniform relationship with clearance (Uchida & Swatt, 2026). The relevant comparison is consequently not technology versus no technology. It is between technical

visibility and the capacity to turn what becomes visible into a legally and factually persuasive account of who killed whom, at a point when that account can still redirect investigative action.

A biological profile can be scientifically strong and still be investigatively weak when there is no useful reference sample, no database hit, or no chronology that explains the contact. Homicide research confirms that DNA contributes differently across case configurations rather than operating as a universal clearance mechanism (Chamberlain et al., 2025). Investigators solve cases through attribution, not through the accumulation of accurate observations, so the evidentiary question is always what a trace can establish about a person in this killing (Kadir, 2026d).

Clearance research had already identified the tension long before the present generation of forensic technology. Comparative and incident-level studies showed that victim-offender relations, witnesses, scene circumstances, and other features can shape solvability before police effort begins, while competing accounts asked whether discretionary treatment changes which cases receive the benefit of investigative attention (Regoecki et al., 2000; Puckett & Lundman, 2003). Multilevel work later demonstrated how neighborhood context and witness information can blur the apparent boundary between case difficulty and police choice (Litwin, 2004), and event-history research reinforced the importance of incident circumstances when time to clearance is considered (Roberts, 2007). Riedel's (2008) review made clear that neither a simple devaluation account nor a purely technical solvability account resolves the literature. Workload adds another complication because investigative capacity can vary within the same agency as active cases accumulate. The present article does not treat those ideas as new. It focuses on the conversion stage between an available trace and an attributable offender.

Unequal clearance also makes the conversion question difficult to dismiss as a technical detail. Homicides involving Black victims remain less likely to be cleared in U.S. data after extensive adjustment for case characteristics (Campedelli, 2024). The same forensic capacity can therefore operate inside different social environments, with different amounts of witness cooperation, local knowledge, and investigative time. Disparity may arise before evidence is generated or during the process that gives evidence practical value, which is why outcome differences cannot be read directly as either case difficulty or discretionary neglect.

The solvability gap refers here to the distance between technical detection and case resolution, but the phrase has value only if that distance can be traced to observable processes rather than inferred from failure after the fact. Evidence convertibility is the mechanism at the center of the argument. It concerns whether a trace, image, link, record, or statement can discriminate among suspects, acquire meaning within the circumstances of the killing, and reach investigators soon enough to change what they do. Solvability remains partly inherited from the event; stranger shootings and intimate-partner killings do not begin with the same informational structure (Kadir, 2026g). Police and community action can nevertheless preserve, enlarge, or erode the opportunities that remain. The paradox is therefore not a contest between good technology and poor policing. It is a mismatch between the growth of technical visibility and the more contingent capacity to turn that visibility into offender attribution.

RESEARCH METHODS

The article uses a conceptual synthesis rather than a systematic review designed to estimate a pooled effect. Searches were organized around homicide clearance, homicide solvability, forensic evidence, digital investigation, ballistic intelligence, investigative workload, witness cooperation, police legitimacy, neighborhood disadvantage, and the timing of investigative action. The empirical update window was limited to 2020–2026 so that the discussion reflects the generation of forensic and digital systems. Searches and citation chaining were used to locate studies that dealt directly with homicide clearance or with a process through which investigative information becomes usable. Selected earlier studies were retained when they established concepts that recent research still relies on, particularly solvability, investigative difficulty, discretionary explanations, and workload. Older work is therefore used for theoretical positioning rather than as a substitute for the current evidence base.

Selection followed the problem rather than a list of technologies. Homicide-specific research was given priority, while digital-forensic and policing studies were retained only when they clarified a conversion process such as information handoffs, validation, legal access, or delay. The unit of analysis was the movement from available information to offender attribution. This avoided a variable-by-variable inventory of clearance predictors and kept the review focused on mechanisms that can be

observed during an investigation. No source was retained merely because the technology was novel; explanatory relevance to conversion remained the deciding criterion.

Findings were compared across case, organizational, and community levels without forcing them into a fixed variable scheme. Case research supplied evidence on inherited difficulty, victim-offender relations, weapons, witnesses, and forensic traces. Organizational studies were read for staffing, workload, review practices, and the integration of information, while community research was used to examine cooperation, legitimacy, and neighborhood conditions. Attention was given to where studies disagreed as well as where they converged, because the proposed framework would be weak if it merely renamed established correlates of clearance. Concepts were retained only when they clarified a recurring transition between levels. The resulting argument is interpretive and theory-building. It does not claim that a single mechanism explains the national trajectory of homicide clearance, and it leaves open the possibility that changes in the composition of homicide account for part of the apparent paradox.

RESULTS AND DISCUSSION

1. The Homicide Clearance Paradox

Some killings are difficult before any investigator has an opportunity to help or harm the case. A domestic homicide may present an intimate relationship, a known dispute, and a narrow suspect pool almost immediately, while a public shooting can leave several cartridge cases and a precise location without producing a credible name (Kadir, 2026c, 2026a, 2026b). Italian evidence likewise shows that clearance varies with circumstances outside police choice, particularly where homicides arise within criminal environments or weak victim-offender connections (Aziani & Persurich, 2023). These are not small differences at the margins of an otherwise uniform investigative task. They determine what questions can be asked during the first hours, whether police know whom to interview, and whether a forensic result has anyone against whom it can be interpreted. A scene can be technically rich but relationally empty. Conversely, a scene with little physical evidence can be easier when the victim's relationships immediately narrow the field. Forensic tools sharpen whatever pathway exists; they do not guarantee that the event leaves a pathway from trace to person.

Neighborhood context changes the same problem without turning place into destiny. Unsolved homicide varies substantially across Indianapolis neighborhoods, and national work across large U.S. cities has likewise linked clearance to neighborhood disadvantage and racial context (Magee et al., 2020; Stansfield & Parker, 2025). Investigators enter places with different densities of social ties, different histories of police contact, and different risks attached to speaking. A witness who knows the offender may still be functionally unavailable when cooperation carries a credible threat of retaliation or little expectation of a useful police response. Relevant knowledge can therefore exist outside the case file while the formal investigation appears information-poor. The technical value of a trace changes accordingly because a profile or image is more discriminating once the field of plausible persons has narrowed. The same physical trace can therefore carry different investigative value depending on how much relational structure already surrounds it.

Small-area inequalities in unsolved crime outside homicide reinforce the point (Braakmann et al., 2025). The same laboratory or camera network can serve neighborhoods where witnesses are differently exposed and investigators possess different levels of local knowledge. Technical equality at agency level can therefore coexist with unequal access to interpretation. A trace that becomes decisive once a suspect is known may remain almost inert while the suspect pool is undefined. This matters most in the early phase, when investigators are still deciding which names and associations deserve scarce follow-up time. A technically identical lead can thus enter two cases with very different prospects of becoming actionable.

Police diversity has been associated with clearance outcomes for Black and Hispanic victims, suggesting that organizational composition can affect how information moves between police and communities (Roberts & Smith, 2023). Representation is not an automatic homicide-solving mechanism, and a disparity does not establish discriminatory intent. It does show why investigative capacity cannot be measured through databases and laboratory access alone. Agencies also need reliable routes into socially held knowledge, especially when physical traces do not identify a person by themselves.

Cooperation reacts to the history of case resolution as well as to the circumstances of a particular killing (Kadir, 2026f). Chicago neighborhood research finds that both actual and perceived homicide clearance are associated with willingness to call police or provide suspect information, producing a feedback problem in which poor clearance can weaken one of the conditions needed to improve it (Bocanegra & Gottlieb, 2026). Small-area research on police legitimacy likewise shows that norms of cooperation vary within cities rather than operating as a single public attitude (Jackson et al., 2021). A camera can answer whether someone entered a street at a certain time, but it may not reveal an alias, a retaliatory sequence, or why a victim agreed to meet another person. Those facts are often social before they become evidentiary, and a technologically advanced investigation may still depend on someone deciding that sharing them is safe.

Resource constraints become more visible once technology generates material faster than a homicide unit can absorb it. Personnel allocation is associated with clearance, while detailed process mapping shows how investigative time is divided among interviews, records, scene work, follow-up, evidence handling, coordination, and administrative demands (Hsu et al., 2024; Kuhns et al., 2025). More video can mean more footage to review, and more device extractions can leave more records requiring interpretation. A unit may therefore become information rich and time poor. Community violence-reduction efforts add another dimension because interventions outside the detective bureau may improve the conditions under which witnesses and local knowledge reach police (Roman et al., 2025). The paradox is no longer simply that sophisticated tools coexist with unsolved cases. It is that technical capacity is often counted at the moment information is generated, whereas investigative capacity is tested later, when someone must decide whether that information deserves action and still has enough time to act on it.

2. From Evidence Availability to Evidence Convertibility

Criminal cases are assembled from evidence that performs different jobs, which is why a larger evidentiary volume does not necessarily shorten the route to clearance. An observational study in South Korea found testimonial material to be more common than DNA or fingerprints, while video was the most frequent form of physical evidence in the cases examined (Jang, 2024). The setting is broader than homicide, but the pattern is useful. A video can place someone near a scene without explaining the relationship; a statement can supply a conflict while getting the time wrong; biological material can associate a person with an object while leaving innocent contact unresolved. Convertibility increases when separate items constrain one another enough to reduce the range of plausible offenders. The problem for homicide investigators is often not a complete absence of information but a collection of fragments that remain compatible with several stories. Modern systems generate more of those fragments, so the decisive question becomes whether they converge before attention, access, or evidentiary value decays.

Video makes that conversion work visible because homicide detectives do not receive CCTV as a finished account. They locate cameras, recover footage before deletion, compare sequences, and decide what an image means alongside other material. Ethnographic research shows how the evidentiary value of video is constructed through searching and interpretation rather than supplied by the camera itself (Brookman & Jones, 2022). Computer vision can reduce the burden by finding vehicles, clothing, or movements across large volumes of imagery, and its use in gun-violence research is sophisticated (Houser et al., 2024). Even accurate recognition leaves identity, relevance, and chronology to be established. A technical system can reduce thousands of minutes of footage to a plausible sequence while the harder attribution problem remains almost intact. The investigative gain depends on whether the reduced search space can be linked quickly to records, witnesses, or other evidence that can test identity.

Forensic genetic genealogy appears much closer to the ideal of technology transforming solvability because it has produced identifications where conventional DNA databases could not. Reviews document cases solved through genealogical searching, while scholarship describes a field that has formed rapidly across genetics, genealogy, and forensic practice (Dowdeswell, 2022; Glynn, 2022). Yet the identification pathway is long (Kadir, 2025). A suitable profile must exist, a database search must be legally permissible, family links have to be reconstructed through records, and the resulting lead still requires confirmatory investigation. Misunderstandings about what investigative genetic genealogy can establish are important because a genealogical inference is not itself proof that the

identified person committed the homicide (Guerrini et al., 2021). The technology can open a pathway that did not previously exist, but convertibility depends on whether investigators can move from genetic relatedness to a person, then from that person to evidence about this event. The technique narrows uncertainty in stages rather than solving the whole investigation at once.

Digital evidence is similarly abundant before it is useful. Phones and cloud accounts may preserve communications, locations, images, and metadata, but extraction is only one stage in a managed investigative process. Digital-forensic research shows how bottlenecks can arise during prioritization, interpretation, validation, and reporting, while legal questions around genetic genealogy increasingly overlap with digital access and evidentiary handling (Horsman & Sunde, 2022; Nogel, 2024). A device becomes valuable when relevant material can be identified and returned in a form that changes the case, not merely when data have been copied from it.

Ballistic intelligence demonstrates a different conversion failure because the immediate product is often a link between incidents rather than a named offender. Crime gun intelligence centers can connect firearms, cartridge cases, shootings, and investigative information more quickly than fragmented workflows, and evaluations report improvements in the usefulness of those links (Flippin et al., 2022). Investigators across several cities similarly rate ballistic imaging more highly when results arrive early enough to direct interviews, searches, or other follow-up (Huff et al., 2026). Linking two shootings changes the map of the inquiry, but it does not tell detectives who should be arrested. The investigative benefit appears only when the link alters whom they question, which vehicle they seek, which device they examine, or which earlier incident they reinterpret. Evidence convertibility is therefore visible in changed decisions rather than in the existence of the link itself.

Gunshot detection shows how a modest gain in time can sometimes matter more than a richer forensic output. The technology does not identify a shooter. It shortens notification and improves spatial precision. Kansas City research links those gains to evidence collection and case outcomes because earlier arrival changes what officers can still recover or learn (Piza et al., 2025; Piza et al., 2023). Witnesses disperse, vehicles move, and injured victims lose the ability to speak. Minutes can alter the evidence environment before any laboratory analysis begins.

Forensic intelligence is useful when traces change a decision while that decision still matters. Work on forensic document examination, although not homicide-specific, argues for treating forensic material as information that can support linkage and prioritization rather than as an isolated product waiting for court (Devlin et al., 2024). The same logic applies to homicide evidence. A sound result returned late, stripped of context, or delivered to a unit that cannot act may remain scientifically valid and operationally weak. Evidence convertibility is therefore temporal and organizational as well as technical. It asks what information can do inside an investigation, including whether it narrows uncertainty at the point where investigators still have more than one credible course of action. The practical loss occurs when scientific certainty and investigative usefulness separate in time.

3. How Investigations Change What Remains Solvable

Real-time crime centers show how an organization can alter what remains solvable without changing any fact about the homicide itself. Their practical value lies in bringing video, records, license-plate data, analysts, and other information into the early investigative window, and recent evaluation suggests that rapid integration can improve the resolution of homicide and shooting cases (Barao & Mastroianni, 2025). The finding makes a broader process easier to see. Scattered information acquires greater value when it is assembled before the opportunity attached to it disappears. A vehicle identified days later may already be gone, while the same identification during the first hours can redirect patrol officers or support an immediate search. The homicide has not become objectively easier. The organization has preserved more options for testing competing explanations. This is the limited sense in which investigative practice can produce solvability: not by manufacturing evidence, but by changing how much of the evidence environment remains accessible.

Cold-case review reveals the reverse movement. Detectives describe investigations becoming cold through exhausted leads, evidentiary limitations, resource pressure, and judgments about when continued effort is justified, yet later review can expose material that was unavailable, misunderstood, or insufficiently pursued earlier (Bennett & Roach, 2024). A cold case is therefore not simply a murder with low intrinsic solvability. It is an investigation at a particular point in its informational history. New technology can reopen that history, but so can a new witness, a changed relationship, or a better

connection between records that were already present. Retrospective judgment has to remain cautious because later investigators know which early leads failed, whereas the original team allocated time without that hindsight. Review can also reveal where an earlier technical result lacked the surrounding context needed to become useful, which is different from the result being wrong.

Perishable opportunities explain why solvability can shrink without a dramatic error. Witness memory changes, suspects discard devices, footage is overwritten, and people who initially seem irrelevant become difficult to locate. Investigators act while the environment that gives evidence meaning is changing. Delay can close future pathways even when each individual decision is defensible, while preserving material whose importance is not yet understood can make a later breakthrough possible. What was unavailable from the start and what became unavailable through time are different forms of difficulty.

Caseload affects that distinction because follow-up competes for finite attention. A detective carrying several active homicides has less time to revisit a reluctant witness, retrieve marginal video, check a weak association, or coordinate a forensic submission whose value is uncertain. Technology may reduce one task and create another: device extraction saves investigators from manually recovering records but still produces material that someone must review, and automated systems generate candidate links that require validation. The older workload literature found that short-term fluctuations in investigative demand can depress clearance even where average staffing appears adequate (Roberts & Roberts, 2016). The contemporary version of the problem is sharper because evidence generation can accelerate without a parallel increase in interpretive capacity. A backlog is therefore more than an administrative delay when the value of the information declines with time. Staffing matters most when new information arrives and a live case needs immediate attention.

Relational knowledge matters most where technical information remains ambiguous. A detective familiar with local groups, family ties, or recurring conflicts may recognize the importance of a nickname or association that means little in a database. Familiarity can also produce tunnel vision, so it has to remain corrigible and testable against evidence. Its value lies in supplying hypotheses that physical traces do not contain. A city may know that shots were fired at 10:14 p.m., recover cartridge cases, and follow a vehicle across several cameras while still not knowing who occupied it or why the victim was targeted. The investigation is data rich but socially opaque. More sensors can improve reconstruction of the event while uncertainty about the person barely moves. That interpretation may come from a relative, a patrol officer, an analyst, or a detective rather than from the forensic source itself.

Institutional handoffs can dissipate value even when every unit performs competently. Homicide teams depend on laboratories, patrol officers, analysts, prosecutors, medical examiners, and digital specialists. A ballistic link can arrive after the relevant vehicle disappears, or a digital result can be reported without the relational detail that makes one message significant. The problem is not bureaucracy in the abstract. It is the loss of timing or context between units. Technological sophistication at component level can therefore coexist with weak case-level conversion.

Produced solvability should be understood only as a proposition about those changes, not as a claim that police create the underlying difficulty of a homicide. Investigators do not choose the offender relationship, the weapon, the distribution of witnesses, or the physical traces left at the scene. Some killings begin with severe informational disadvantages that reasonable effort cannot remove. What an investigation can do is preserve, enlarge, or degrade the credible pathways from evidence to attribution. This formulation avoids blaming detectives for every uncleared murder while also rejecting the idea that solvability arrives as a fixed score waiting to be read from the scene. The empirical test is whether an intervention changes the set of options still available later, regardless of whether the case is ultimately cleared. It also permits comparison across agencies because the same inherited difficulty can be followed through different investigative responses.

The same reasoning explains why forensic progress can coexist with historically lower clearance without assuming that modern technology has somehow failed. Technology raises the ceiling of what can be detected, whereas realized investigative capacity depends on organizational absorption and on the social information surrounding a case. Ten additional leads that cannot be reviewed before they expire may add less practical solvability than one discriminating lead that reaches the detective immediately and can be checked against a cooperative witness. The solvability gap is the measurable distance between those capacities. It should appear in delays between detection and action, failed

handoffs, unreviewed analytical outputs, weak contextualization, or leads that never alter the course of inquiry. Tests should follow information through the investigation rather than infer value from the final outcome. Under that design, an agency could improve its technology while the conversion rate of technical outputs remained stagnant, which is the condition the paradox seeks to capture.

4. Discussion

Perhaps there is no homicide clearance paradox at all. Aggregate clearance may remain below historical levels because the mix of homicide changed toward firearm killings, public-space incidents, loosely connected offenders and victims, or other circumstances that are intrinsically harder to solve. Police could then become more effective within each category while the national rate stays flat. This prevents technology and clearance from being treated as lines that must move together (Kadir, 2026e). It also identifies the correct comparison: evidence convertibility should be tested among similar cases, with inherited difficulty measured before investigators act. If richer technical information does not produce more timely or discriminating leads within those comparisons, the mechanism proposed here would lose its force. Comparable cases should be matched on the main pre-investigative conditions before their information trajectories are compared.

The solvability gap becomes circular if it is defined by the outcome it is supposed to explain. Saying that an unsolved case lacked enough convertible evidence adds nothing unless convertibility can be observed before clearance. Measures could include the time between a forensic result and investigator receipt, whether the result narrowed the suspect pool, whether it triggered a new interview or search, the amount of relational knowledge available at that point, and whether follow-up occurred while the lead remained live. Information that merely confirms an existing theory should also be separated from information that changes the direction of inquiry. Without that distinction, successful cases will always appear retrospectively more convertible simply because the offender is already known. Temporal ordering matters because evidence may look decisive only after later information reveals its significance.

Clearance is also an imperfect endpoint. Arrest and exceptional clearance do not mean the same thing, reporting practices vary, and neither measure guarantees a sustainable prosecution. Future research should follow cases through identification, arrest, charging, and adjudication where the data permit. Time to each stage matters because a homicide cleared after several years reflects a different investigative process from one in which offender attribution occurs during the first week. A stage-based outcome would also show whether forensic advances mainly help identify suspects, strengthen charging decisions, or reduce the time required to move between those points.

Racial and neighborhood disparities require a sharper test than the observation that several mechanisms may operate together. If gaps disappear after inherited difficulty, witness availability, staffing, timing, and investigative inputs are compared, a devaluation explanation becomes less necessary. If they persist among closely comparable cases receiving similar technical resources, the claim that disparity merely reflects solvability becomes harder to sustain. Long-run stratification in clearance and arrest makes that distinction consequential (Slepicka, 2025). The important evidence would show when unequal investigative opportunity first appears: before a suspect is known, during the allocation of follow-up, or only after one case has already become easier because it produced a promising lead. This would locate disparity closer to the process that produced it.

Forensic investment should be judged by conversion rather than procurement. Counting laboratory capacity, camera coverage, searches, or analytical hits says little about whether those capabilities alter a homicide inquiry. A better performance question is how often an output becomes an actionable lead, how quickly it reaches the case team, and whether follow-up occurs while the information still matters. This does not argue for less technology. It asks agencies to measure the work required to turn technical gains into case-level effects. Agencies could then distinguish technologies that create large volumes of low-yield information from those that repeatedly alter live investigative decisions.

Evidence convertibility is falsifiable in a way that a broad claim about contextual solvability is not. The argument would be weakened if timely delivery of forensic information failed to alter investigative decisions, if information integration produced no advantage after case difficulty was controlled, or if relational knowledge and witness cooperation added nothing once technical evidence was measured. It would also be weakened if comparable agencies with substantially different

conversion practices produced indistinguishable case trajectories. These tests are necessary because convertibility should describe observable transitions, not become another label attached to every successful investigation after the offender has been identified. Null findings at those intermediate stages would be theoretically important even if aggregate clearance later differed for unrelated reasons.

The policy consequence is narrower than a general call for better policing. An agency can acquire increasingly sophisticated tools while remaining institutionally poor at turning their outputs into offender attribution. The bottleneck may sit in review capacity, local knowledge, witness access, analytical integration, or the timing of a handoff, and those bottlenecks will differ by homicide type and jurisdiction. What changes is the unit of evaluation. Instead of asking whether a technology works in the abstract, researchers can ask what information it creates, how that information travels, where meaning is added or lost, and whether it changes a decision before the investigative opportunity closes. Cross-jurisdiction comparison can then identify where conversion fails despite similar tools.

CONCLUSION

Modern homicide investigation can detect and preserve far more than earlier systems, yet murder is not solved by visibility alone. The difficult step is offender attribution, which depends on whether traces can be connected to people, relationships, and timelines while investigators still have meaningful choices. Some homicides begin with disadvantages no technology can erase; others become harder because useful information arrives late, loses context, or never reaches the point where it can change action. Evidence convertibility captures that difference more precisely than a count of forensic resources. The distinction is directly practical as well as theoretical for investigators.

The homicide clearance paradox is better understood as a gap between technical and realized investigative capacity than as proof that forensic progress has failed. Solvability is partly inherited from the killing, but the investigation that follows can preserve, enlarge, or erode the pathways from evidence to offender attribution. The research task is to observe those pathways before the outcome is known and compare them across otherwise closely similar cases, with attention to timing, handoffs, investigative decisions, and witness cooperation. If agencies with stronger conversion practices consistently turn the same kinds of evidence into earlier attribution, the framework gains support. If they do not, the solvability gap adds little. A police organization may be technologically advanced while remaining weak at conversion, and that weakness should be visible in the route between forensic output and investigative action rather than only in the clearance rate.

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