

FORENSIC EFFICACY AND LIMITATIONS OF BEHAVIOURAL ATTRIBUTES AND BIOLOGICAL SAMPLES IN CRIMINAL PROFILING: A STUDY IN LIGHT OF THE CRIMINAL PROCEDURE (IDENTIFICATION) ACT, 2022

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Abstract

For almost a hundred years, Indian criminal investigations depended on a solitary, concise regulation to permit the acquisition of a suspect's body as evidence: the Identification of Prisoners Act, 1920. The Criminal Procedure (Identification) Act, 2022 (CPIA) eliminates the restrictive inheritance and introduces an expansive directive that encompasses both fingerprints and iris scans, integrating handwriting, voice samples, and behavioral characteristics into a unified legal classification termed 'measurements.' This article poses the evidentiary worth of what the Act allows the state to gather correspond to the constitutional implications of its collection? Employing a doctrinal approach rooted in statutory interpretation, comparative case examination, and an analysis of forensic science literature, the article delineates the CPIA's divergence from its colonial antecedent, assesses the scientific validity of DNA profiling in contrast to the more tenuous foundations of narco-analysis, polygraphy, and brain-mapping, and scrutinizes the 2022 Act in relation to the protections against self-incrimination enshrined in Article 20(3) and the established right to privacy under Article 21. It concludes that although biological sampling, primarily DNA, possesses a justifiable, albeit flawed, evidentiary lineage acknowledged by the Supreme Court in cases from Krishan Kumar Malik to Pattu Rajan, the Act's inclusion of 'behavioural attributes' is incongruous with *Selvi v. State of Karnataka*, which eliminated consent-free psychological assessments from the state's investigative arsenal in 2010. The seventy-five-year detention period, specifically, conflicts with the proportionality criterion established in *Puttaswamy*. The article asserts that the efficacy claims of the CPIA are genuine but more limited than its creators imply, and that its constitutional longevity relies on protections judicial scrutiny, tiered retention, and a mandatory destruction protocol which the legislation presently delegates to executive judgment.

Keywords: *Criminal Procedure (Identification) Act, 2022, self-incrimination, right to privacy, DNA profiling, behavioural attributes, forensic evidence, proportionality*

1. Introduction

In forensic science terms, criminal profiling is the process of making inferences about an offender, or establishing the identity of a suspect by systematically studying the physical traces and behavioural signatures left behind by criminal behaviour. It occupies a distinctive intersection part lab science, part legal process, responsible to both. A fingerprint found at a crime scene is of

any legal significance in only if there is a statute that specifies whose fingerprints may be taken and how and under whose authority. India's law on that narrow but momentous question remained still for more than a century. The Identification of Prisoners Act, 1920 allowed the police to take only finger impressions and footprints of a limited class of convicted persons only. Everything else blood, semen, hair, voice, handwriting, the electrical signature of a suspect's own brain under a polygraph needle was outside its four corners. The Criminal Procedure (Identification) Act, 2022 changes that arrangement in a single legislative stroke. It replaces the 1920 statute with a single fingerprints, palm prints, footprints, photographs, iris and a single comprehensive definition of 'measurements' that incorporates retina scans, physical and biological samples and - in its most contested clause - 'behavioural attributes', a category that includes signatures and handwriting and, by cross-reference to Sections 53 and 53A of the Code of Criminal Procedure, 1973, examinations that have been historically read to include narco-analysis and brain-mapping. It expands the category of persons from whom such measurements can be taken to include not only convicts but also arrestees, undertrials and persons detained under preventive laws. The National Crime Records Bureau may preserve the data generated for a period upto seventy five years. There was the measure attracted significant controversy. The parliamentary debate on the Bill was unusually prolonged, and petitions challenging the validity of the Act had reached the Madras High Court, the Delhi High Court and briefly the Supreme Court itself within months of the Act coming into force on 4 August 2022.

The Article raises a question largely ignored in the parliamentary debate whether the forensic benefit of the 2022 Act's expanded scope is commensurate with its cost to the individual whose body and behaviour are now subject to state scrutiny. The inquiry splits into two tracks, which the statute itself maintains curiously apart. The first is empirical. How reliable are the techniques that the Act authorises, and is that reliability meaningfully different between a DNA swab and a narco-analysis session? The second is constitutional - what is the place of the Act alongside the guarantee against self-incrimination in Article 20(3), the right to privacy under Article 21 and the evidentiary thresholds that will determine whether any of this material can be used against an accused at trial? The argument of this paper is that the CPIA conflates two categories of evidence that Indian constitutional law has treated quite differently. Biological measurements are on a relatively well-tested scientific foundation and occupy a constitutional space that *Kathi Kalu Oghad* cleared decades ago. Behavioural attributes especially the neuroscientific techniques grouped under that label through the CrPC cross-reference enter territory the Supreme Court specifically closed off in *Selvi v. State of Karnataka*. It is not merely a modernisation exercise. A statute that treats both under one label, and allows both to be taken by executive order rather than judicial sanction, is constitutes a qualitatively different legislative instrument. This is a case where legislative drafting has outpaced constitutional settlement.

The analysis is elaborated in other five parts. Part II follows the statute down from the 1920 Act. Part III considers the scientific reliability of the techniques envisioned by the Act. Part IV is the argumentative core of the piece and tests the Act against the doctrine of self-incrimination, privacy jurisprudence and law of evidence. Part V discusses the ethical and data-protection issues

of a centrally held forensic database with seventy-five years of coverage. Part VI concludes with recommendations, not so much for repeal as for the safeguards omitted by the drafters of the Act.

2. Research Methodology

The study adopts a doctrinal, black-letter approach to legal research, suitable for a question that is mainly answered by statutory interpretation and case-law analysis, rather than empirical fieldwork. The analysis is structured along three complementary tracks. First, statutory and rule-based interpretation is adopted to trace the definition of ‘measurements’ under Section 2(1)(b) of the Criminal Procedure (Identification) Act, 2022 and its subordinate Rules, and its continuity under Sections 51–54 of the Bharatiya Nagarik Suraksha Sanhita, 2023, Section 221 of the Bharatiya Nyaya Sanhita, 2023, and Section 39 of the Bharatiya Sakshya Adhiniyam, 2023. Second, a comparative and chronological case analysis places the Act within the constitutional jurisprudence on self-incrimination and privacy (from *Kathi Kalu Oghad* and *Selvi* to *Puttaswamy*) and the evidentiary case law on DNA and behavioural evidence, including the 2023–2025 decisions on narco-analysis, laboratory reliability and obstruction. Third, the reliability that the Act assumes for each category of ‘measurement’ is subjected to scientific validity testing in an interdisciplinary review of forensic-science and criminological literature. The study relies solely on secondary, publicly available material – legislation, delegated rules, judicial decisions, Law Commission reports and peer-reviewed and policy literature – and does not involve any collection of primary or personal data, field work or human-subject interaction.

3. Review of Literature

The literature on the CPIA is divided into three loosely connected strands, and the disconnection between them is part of the problem this article identified. The technical premises of biological sampling, (blood grouping, serological analysis and more recently STR-based DNA typing) are based almost exclusively on standard Indian forensic-medicine texts, the kind traditionally relied upon by investigators and trial courts works in the tradition of Modi’s *Medical Jurisprudence and Toxicology*. On method they are authoritative but on the constitutional and evidentiary consequences of collection they are largely silent and this is left to a separate body of legal-journal writing.

That legal-journal literature, in turn, is both recent and sparse. The evidentiary standards introduced by the Bharatiya Sakshya Adhiniyam, 2023 and both support an Indian version of the Daubert gatekeeping standard, but neither considers the collection-stage architecture of the CPIA they consider only the admissibility of the evidence after the fact, not the lawfulness of the measurement itself. The commentary on the CPIA mostly law-firm client notes and case-law digests, not peer-reviewed scholarship tends to repeat the statutory scheme and the pending High Court challenges without testing the Act against the wider literature on criminal profiling.

A third strand, from International Criminology and Investigative Psychology (the offender-profiling literature associated with writers such as Turvey and Canter), is sometimes invoked in Indian writing to justify the inferential logic behind ‘behavioural attributes’. However, this literature was developed and validated on Western offender populations and crime-scene datasets. It is used in Indian discourse more as a rhetorical borrowing than as a body of tested method. No

published Indian study has attempted to validate behavioural or handwriting based inference techniques against an Indian sample of comparable size.

Reading these three strands together highlights gaps that have not been addressed by the existing literature on the CPIA and which this article treats as a research agenda rather than a settled matter. The uneven network of forensic laboratories, and certainly not for handwriting comparison or the behavioural techniques cross-referenced via Sections 53 and 53A of the CrPC/ Section 52 of BNSS. Constitutional Law writing treats Article 20(3) and Article 21 in isolation from the forensic-science literature on reliability, Magistrates actually exercise Section 5 of the CPIA in practice, or of state-wise variance in implementation of the Criminal Procedure (Identification) Rules, 2022 a gap that mirrors the absence of NCRB audit data noted in Part V below.

These gaps are important because the CPIA was enacted on the assumption that 'measurements' is a scientifically homogenous category. But the literature to test that assumption –whether biometric, doctrinal or empirical simply does not yet exist in a form adequate to the scale of the statute, which is itself a reason for the calibrated, cautious reading of the Act urged in Part VI.

4. Legislative Evolution: From the Identification of Prisoners Act, 1920 to the Criminal Procedure (Identification) Act, 2022

a. The Colonial Framework and Its Limits

The Identification of Prisoners Act of 1920 was established for a law enforcement system that had just recently been utilizing fingerprinting as a method of investigation. Section 3 authorized a police officer to obtain the fingerprints and footprints of individuals convicted of crimes punishable by rigorous imprisonment for one year or longer; Section 4 broadened a limited version of this authority to specific arrested individuals; Section 5 empowered a Magistrate to mandate the collection of measurements or photographs when deemed necessary for investigative purposes. In light of a century of forensic progress, the Act appears more as a historical artifact than a regulatory tool – it omits any mention of blood typing, vocal analysis, or the genetic evidence that would later prevail in late-twentieth-century forensic research.

Proposals for reform were submitted promptly but were predominantly overlooked. The Eighty-Seventh Report of the Law Commission of India, presented in 1980, advocated for an expanded definition of measurements to encompass palm impressions and samples of signatures, handwriting, and voice, influenced by the Supreme Court's remarks in *State of U.P. v. Ram Babu Misra* (1980) regarding the insufficiency of the current investigative framework. A span of forty years exists between that study and the legislation that ultimately addressed it. The Criminal Procedure (Identification) Bill, 2022 was presented in the Lok Sabha on 28 March 2022, approved by both Houses in a span of two weeks, received presidential approval on 18 April 2022, and was enacted on 4 August 2022 a rapid legislative process that contrasts with the thorough examination the topic likely required.

b. Defining 'Measurements' Under the 2022 Act

The CPIA in Section 2(1)(b) defines ‘measurements’ as finger impressions, palm-print impressions, foot-print impressions, photographs, iris and retina scans, physical and biological samples and analysis thereof, behavioural attributes such as signatures, handwriting or any other examination referred to in Section 53 or Section 53A of Code of Criminal Procedure, 1973 a cross-reference that by implication imports techniques such as narco-analysis and brain-mapping which those provisions came to be interpreted to cover. 3. A specific category of persons convicted persons, persons arrested for an offence punishable with rigorous imprisonment for a term not less than seven years or committed against a woman or a child, persons detained under preventive detention laws, and certain other classes is mandated to enable such measurements to be taken. A proviso permits an arrestee whose alleged offence is less than the threshold to refuse to give biological samples, but this concession, when scrutinized in detail, still leaves the police free to take fingerprints, photographs and other physical measurements from almost anyone who is taken into custody.

Section 5 provides that a Magistrate may direct any person to produce measurements for the purposes of an investigation or proceeding even if no arrest has been made. Section 4 empowers the National Crime Records Bureau to collect, collate, preserve, retain, destroy, process and disseminate the resulting records to other law-enforcement agencies. It also provides for a period of retention of seventy-five years from the date of collection, with destruction earlier only contemplated where a person is acquitted, discharged or released without trial after all appeals are exhausted and even then only on the recommendation of the concerned officer. Section 6 empowers the Central Government to make rules in respect of the manner of taking measurements and the Criminal Procedure (Identification) Rules, 2022, notified on 19 September 2022, complete the details. They prescribe who may take measurements: a ‘authorised user’, a person skilled in the task, or a registered medical practitioner. They require prior written approval of an officer not below the rank of Superintendent of Police in respect of certain categories of offence and lay down the procedure for requesting destruction of records.

Under Section 186 of the Indian Penal Code / Section 221 of Bharatiya Nyaya Sanhita, the refusal to allow measurements to be taken is itself an offence obstruction of a public servant in the discharge of public functions. This means that the coercive machinery behind the Act goes beyond the civil consequence of an adverse inference, into the territory of criminal liability for the act of resistance itself. In short, the 2022 Act does three things at once: it increases the number of categories of information the state can collect, it increases the number of categories of people from whom it can be gathered, and it increases the number of officers authorized to order the collection. Each of these expansions has its own constitutional question, and each is considered in turn below.

c. Continuity Under the New Criminal Codes: The Bharatiya Nyaya Sanhita and Bharatiya Nagarik Suraksha Sanhita, 2023

When the CrPC was repealed, the reference to “Section 53 or Section 53A of the Code of Criminal Procedure, 1973”, was not an orphaned reference, because the CPIA cross-referenced it. The Bharatiya Nagarik Suraksha Sanhita, 2023 (BNSS) carries the same power forward in Sections 51-54 examination of an arrestee at the request of a police officer, examination of a person accused

of rape, examination of an arrested person by a medical officer. “Examination” has been explained in these sections to include analysis of blood, semen and hair “by the use of modern and scientific techniques including DNA profiling and such other tests which the registered medical practitioner thinks necessary in a particular case.” That residual phrase is literally the same open-ended formula used in section 53A of the CrPC, and identified in Part IV of this article as the textual hook on which cognitively invasive techniques could be read into the CPIA’s definition of ‘measurements.’ So the recodification exercise has only continued the ambiguity, not resolved it. Any legislative fix designed to address the Selvi problem highlighted in this article will need to apply to Sections 51 to 53 of the BNSS, and not simply Section 2(1)(b) of the CPIA, otherwise the old tension will just carry on under a new numbering.

The enforcement mechanism has also moved without change. Section 186 of the Indian Penal Code, 1860, which itself makes an offence of refusing to allow measurements, has been re-enacted with the same ingredients and the same punishment of imprisonment up to three months or fine or both as section 221 of the Bharatiya Nyaya Sanhita, 2023 (BNS). The substantive scope of the offence has not narrowed in the transition; rather, it has been construed more broadly. In 2025, the Supreme Court clarified that ‘obstruction’ under this section is not only physical force but also includes threats, intimidation or wilful non-cooperation that impedes a public servant in the discharge of his duty. Applied to the CPIA, this means that the criminal liability for resisting a measurement direction is, if anything, wider than a plain reading of ‘obstruction’ might suggest, sharpening rather than easing the self-incrimination concern raised in Part IV, since even passive non-cooperation with a direction to undergo a behavioural-attribute examination could attract liability independent of whatever protection Selvi affords the underlying test itself.

5. Forensic Efficacy of Biological and Behavioural Profiling

a. Biological Samples: DNA, Blood, and Semen

Of anything, DNA profiling has the strongest claim to scientific reliability in the CPIA’s definition of measurements. The basic technique involves comparing short tandem repeat sequences at specific loci in a DNA sample against a reference profile to produce a random match probability which, in the case of a full profile, can reach levels which effectively rule out coincidental matches; the Supreme Court in *Krishan Kumar Malik v. State of Haryana* (2011) thought the availability of DNA evidence to be sufficiently important that its absence, where it could reasonably be obtained, invited adverse comment on the investigation. But Indian courts have not accepted a DNA report as conclusive proof in itself. In *Pattu Rajan v. State of Tamil Nadu* (2019), the Supreme Court had observed that the probative value of DNA evidence, like other opinion evidence, depends on the facts of each case and that not having DNA profiling does not, in itself, negate a prosecution based on other cogent material.

That prudence is well grounded in the science itself. The amount of information a DNA match can actually provide is entirely dependent on the integrity of the sample: degradation, cross-contamination at the scene or in the laboratory, and the absence of a mandatory, standardised set of loci and an exhaustive criminal database in India for comparison to be run, all of which limit the utility of a positive result in a particular case. A profile that has been compared to nothing is

only as good as the chain of custody that delivered the sample to the lab, and Indian forensic labs do not all operate under the certification criteria that would guarantee that chain. The older biological techniques which the Act also catches up with blood grouping and semen analysis have less individualising power than DNA (a blood group narrows a pool of suspects rather than identifying one) but remain useful for corroboration, particularly in sexual assault prosecutions where semen analysis has long served evidentiary functions under Section 53A of the CrPC. There is nothing controversial here as a matter of forensic science. The difficulty, explored in Part IV below, is not whether biological evidence works, but how much of a person's bodily material the state may take, and for how long, before the collection itself becomes the constitutional problem.

b. Behavioural Attributes: Handwriting, Signature, Brain-Mapping, and Narco-Analysis

The second category of the Act is on far less solid ground. Handwriting and signature comparison is a well-established, if imperfect, forensic discipline. Document examiners compare stroke formation, pressure and habitual letterforms against known exemplars. Indian courts have long treated expert opinion on the point as admissible corroborative evidence under Section 45 of the Indian Evidence Act, 1872 (now Section 39 of the Bharatiya Sakshya Adhiniyam, 2023) but have warned that such opinion, standing alone, rarely suffices to convict. The cross-reference to Sections 53 and 53A of the CrPC introduces a distinct order of concern in the techniques grouped together as 'behavioural qualities'. Narco-analysis involves administering sodium pentothal or a similar barbiturate to reduce the subject's inhibitions in the hope of getting a truthful disclosure. Polygraphy measures physiological indicators pulse, respiration, galvanic skin response on the premise that deception creates detectable physiological stress. Brain electrical activation profiling, or BEAP, measures electrical activity in response to stimuli associated with a crime, based on the theory that recognition leaves a distinctive neural signature. In *Selvi v. State of Karnataka* (2010) the Supreme Court itself reviewed the scientific literature and deemed each of these procedures deficient. The Court observed that narco-analysis does not reliably block the ability to deceive or fabricate, and that drug-induced disinhibition can cause confabulation as easily as truth. The underlying premise of polygraphy – that the physiological signature of lying is both stable and universal – has never been universally embraced by psychologists; the technique is also vulnerable to countermeasures, as well as to the subject's own anxiety, which can produce a signal similar to that which the test is designed to detect. Even less studied than BEAP, it depends on inferences about memory and recognition that the Court concluded had not been validated to a standard suitable for judicial reliance. The Court found that none of the three could be regarded as a dependable technique of collecting genuine information, whatever its residual relevance as an investigation lead. A statute that groups these techniques with a fingerprint or iris scan in the same definitional basket, with the same suggestion of the same evidential standing, is incompatible with the very judgment that appraised their reliability nine years before the Act was established.

6. Constitutional and Legal Limitations

a. The Right Against Self-Incrimination: Article 20(3)

Article 20(3) of the Constitution specifies that no person accused of an offence shall be forced to give evidence against himself. The scope of that promise is determined by two rulings from which the CPIA cannot escape. In *State of Bombay v. Kathi Kalu Oghad* (1961) an eleven-judge bench held that the forced production of a thumb impression or a palm or foot print, or of a specimen of handwriting does not amount to 'being a witness' against oneself, because the accused person is not thereby conveying personal knowledge; he is merely furnishing material for identification or comparison. With an Oghad reading, self-incrimination refers to the imparting of information based on personal knowledge, a testimonial act, and a bodily specimen given without such imparting is outside the phrase totally. On that rationale, the fingerprint, footprint, palm print, iris scan and photograph components of the CPIA's definition of measures stand on relatively settled constitutional ground: Section 5 of the 1920 Act had already survived review on similar basis, and nothing in the 2022 Act's treatment of these groups asks the Court to rethink that position.

In *Selvi v. State of Karnataka* (2010), the situation is even more complicated. A three-judge bench found there that the involuntary administration of narco-analysis, polygraph examination and BEAP violates Article 20(3) and Article 21 because these techniques force the subject's mind, and not just his body, to reveal information and because the very techniques employed to extract disclosure blur the distinction between testimonial and non-testimonial evidence in a manner that Oghad's physical-specimen category never had to contend with. The Court ordered that any testing given must be done only with the informed, voluntary consent of the subject, noted with a lawyer present and under safeguards like those applied to custodial confessions.

The CPIA makes no distinction between them. Its concept of 'measurements' conflates physical specimens and cognitively invasive techniques into one category, subject to one system of compulsion, with resistance criminalised under Section 186 of the Indian Penal Code regardless of the sub-category involved. The Act's cross-reference to Section 53A of the CrPC, which itself provides for 'any other test which the registered medical practitioner thinks necessary' in certain investigations, could be read literally to authorise compelled participation in techniques that Selvi placed beyond the pale of state compulsion. Petitioners before the Madras and Delhi High Courts have specifically raised the question of whether courts will infer a Selvi-type exception into the CPIA, treating consent as an implicit precondition for any measurement that engages the subject's cognitive processes, rather than merely his physical form. The text of the statute does not help resolve this question. Until that chasm is bridged – either through judicial reading-down or legislative revision – the Act contains a latent, and mostly unremarked upon, tension with binding Supreme Court precedent.

b. The Right to Privacy: Article 21 and the Proportionality Standard

The Supreme Court's ruling in *K.S. Puttaswamy (Retd.) v. Union of India* (2017) clarified what was left open in *Kharak Singh v. State of Uttar Pradesh* (1963) and *M.P. Sharma v. Satish Chandra* (1954): that privacy is an integral part of the right to life and personal liberty under Article 21, which is also derived from Articles 14 and 19, and that any state action infringing it must meet a three-part test of legality, legitimate aim, and proportionality with adding a requirement of

necessity, meaning that the measure chosen must be the least intrusive one reasonably available to achieve the state's purpose.

It is a lawfully enacted law and Section 3 provides a textual basis for the collection it authorises, unlike the simple executive directive struck down in *Kharak Singh*. The second limb, legitimate objective, is similarly easily satisfied, the prevention and investigation of crime is one of the archetypal examples of a valid state interest anticipated by *Puttaswamy* itself. The Act runs into its most serious challenge in the third limb, proportionality and need. The scope of the retention clause in Section 4 both compounds and does not overcome the difficulty.

There are three features of the statute that push back on the necessity requirement. The seventy-five-year retention period is applied uniformly, regardless of the seriousness of the offence for which the individual was investigated, the outcome of the proceeding, or any demonstrated ongoing law-enforcement need for the particular record retained. A person acquitted has a statutory pathway to seek destruction, but that pathway is dependent upon the recommendation of the very officer whose department benefits from retaining the data and offers no independent adjudicatory check. Secondly, the definition of 'appropriate authority' empowered to specify the manner of taking measurements is left substantially to executive notification. This design is challenged by the petitioners in the Madras High Court *V. Adarsh v. Union of India* (2022) who specifically characterise it as an impermissible transfer of what has historically been treated as a judicially supervised function to unchecked executive discretion. Third, the class of persons whose measurements may be taken includes not only convicts but also arrestees and preventive detainees who may never be convicted of any offense at all, a category the Internet Freedom Foundation's petition to the Supreme Court - since redirected to the jurisdictional High Courts - specifically flagged as disconnecting the scope of data collection from any demonstrated nexus to established criminality. None of this means that the Act is doomed to fail constitutional review in its entirety. *Puttaswamy* itself cautioned that privacy is not absolute, and yields to appropriately calibrated state interests. A number of commentators have pointed to earlier decisions upholding similar provisions in the CrPC and the Indian Evidence Act as a basis for the basic architecture of the CPIA. What the proportionality standard requires, however, is calibration – retention periods graduated by offence severity and case outcome, destruction triggered automatically rather than by departmental recommendation, and independent oversight of the 'appropriate authority's' rule-making power. Calibration that the statute, as presently drafted, largely leaves to executive goodwill rather than legal obligation.

c. Evidentiary Value Under the Indian Evidence Act and the Bharatiya Sakshya Adhiniyam

A lawfully-taken measurement is not a lawfully-used measurement. The CPIA regulates collection; admissibility is regulated independently, first by the Indian Evidence Act, 1872 and now since 1 July 2024 by the Bharatiya Sakshya Adhiniyam, 2023 (BSA). Section 39 of the BSA, which came into force in place of Section 45 of the 1872 Act, states that the opinion of a person exceptionally versed in a science or art, including the identification of handwriting or finger impressions, is a relevant fact when the court needs to develop an opinion on such a point. DNA and biological evidence comes in through the same expert-opinion channel, supplemented, in the

case of electronic and digital forensic material, by the BSA's expanded treatment of electronic records as primary rather than just secondary evidence.

It's a structural problem, not a technical one. Neither the 1872 Act nor its 2023 replacement provides a statutory reliability standard like Rule 702 of the Federal Rules of Evidence in the United States, or the Daubert standard that Rule 702 codifies a gatekeeping function that requires a trial judge to determine whether an expert's methodology is testable, peer-reviewed and generally accepted before allowing it before the fact-finder at all. Indian courts, on the other hand, have developed a case-by-case methodology of weighing expert evidence against the whole of the evidence, as exemplified by Pattu Rajan for DNA evidence, which allows for post-hoc review of weight by the court, but does not have a similar gatekeeping mechanism to prevent the presentation of untested or unreliable methodology in the first instance. That gap is less of an issue with DNA evidence, the underlying science of which is thoroughly verified. The absence of any statutory reliability threshold for behavioural attributes such as narco-analysis or brain-mapping, whose scientific standing Selvi itself found wanting, means that the primary bulwark to prevent unreliable evidence from entering a criminal trial is judicial discretion exercised on a case-by-case basis, rather than a settled evidentiary rule that can exclude the category altogether.

d. Recent Supreme Court Guidance and Emerging Case Law on Criminal Profiling Techniques

Re-affirmation of Consent and Narco Analysis: The doctrinal position taken in Selvi has not only weathered the storm, but has been actively reapplied. In Amlesh Kumar v. State of Bihar (2025 INSC 810), the Supreme Court overruled a Patna High Court decision allowing an involuntary narco-analysis test on the ground that the NHRC guidelines adopted in Selvi continue to be binding on investigators: such a test cannot be administered without the free and informed consent of the subject, which must be recorded before a Judicial Magistrate with access to a lawyer, and the results, even if volunteered by the subject, have no independent evidentiary value and must be corroborated by other material. The same requirement of corroboration is reiterated in Manoj Kumar Saini v. State of M.P. (2023) and Vinobhai v. State of Kerala (2025). In practice, the cross-reference to Section 53A of the CrPC (now Sections 51–53 of the BNSS) for the CPIA cannot be seen as conferring an independent, compulsion-backed power to administer these tests; Amlesh Kumar confirms that whatever the CPIA's drafting might imply, the consent regime established in Selvi is the binding constitutional floor.

Laboratory Quality Control and DNA Proof: Another, less discussed line of authority is the reliability of DNA analysis itself, rather than its constitutional collection. In Rajiv Singh v State of Bihar, the Supreme Court declined to rely on DNA evidence which has not been properly handled or analysed. This reiterates the concerns of chain of custody and laboratory standardisation that have been raised in Part III of this article. Now, read along with Pattu Rajan, the case law speaks with a consistent voice: Indian courts regard DNA evidence as probative but not self-authenticating, and a sample from a CPIA that cannot be traced through a continuous, well-documented chain of custody is of little more evidentiary value than the behavioural material the Act houses in the same definitional clause.

Obstruction and Criminalisation of Dissent: In *Devendra Kumar v. State (NCT of Delhi)* (2025), the Court has continued to treat Section 186 IPC/Section 221 BNS (as noted above) as attracting criminal liability for non-cooperation with a lawful direction, and not merely for physical resistance. Read in the light of *Umashankar Yadav v. State of Uttar Pradesh*, which cautions that the offence still involves a bona fide, non-vexatious exercise of public function, the emerging picture is one in which a person asked to undergo a CPIA measurement has very little room to refuse without legal risk, whether or not the particular measurement in question invokes the cognitive protections recognised in *Selvi*.

7. Ethical, Social, and Data Protection Concerns

The CPIA's centralisation of measurement data with the National Crime Records Bureau raises concerns that are adjacent to, yet separate from, the constitutional analysis above. A single, digitally networked repository of fingerprints, iris scans, biological samples, and behavioral records shared across law enforcement agencies and holding data for up to seventy-five years creates precisely the kind of aggregation risk that privacy scholarship has long identified as more dangerous than the collection of any single data point in isolation. A fingerprint is identifiable on its own; a fingerprint connected to an iris scan, a DNA profile, and a behavioral record, retained for seventy-five years and shared between agencies, allows for a kind of perpetual identifiability that survives the criminal case that originally justified its collection.

India's first comprehensive data privacy statute, the Digital Personal Data privacy Act, 2023 (DPDPA), offers little to close this gap. Section 17(1)(c) exempts personal data processed for the purposes of prevention, detection, investigation or prosecution of any offence from the majority of the obligations that Chapter II of the Act would otherwise impose on a data fiduciary meaning the NCRB's handling of CPIA records largely falls outside the DPDPA's rights framework for data principals, including the rights to correction, erasure and grievance redress that apply to ordinary commercial data processing. The two statutes were not written to function together, and the consequence is a criminal-records database with fewer legislative privacy guardrails than a commercial company's customer database would have to endure. Bias is a related topic, but one less examined in the Indian literature than in comparable arguments worldwide about predictive policing. For handwriting analysis, document examination and behavioural profiling the examiner's training, experience and inevitably subjective judgement are paramount. Forensic document examination has faced sustained methodological criticism internationally precisely because inter-examiner agreement on contested samples is imperfect and rarely subjected to blind proficiency testing in Indian laboratories. A database that is disproportionately populated by arrestees rather than convicts risks encoding at scale whatever demographic skew already exists in patterns of arrest a concern with particular resonance in India given the legacy of the Criminal Tribes Act, 1871, whose colonial logic of hereditary criminality by community the drafters of the 1920 Act were, at least nominally, trying to move away from.

These risks are compounded by laboratory standardization. There is no single, statutorily mandated accreditation regime in India that requires all forensic laboratories handling CPIA samples to adhere to a common quality standard, no mandated blind proficiency testing of

examiners, and no independent body auditing the NCRB's data sharing practices with the authority or resources a dedicated data protection authority, acting outside the law enforcement exemption of the DPDPA, could otherwise provide. The result is a data ecology in which the amount of information the state can legitimately collect has increased much faster than the institutional mechanisms needed to ensure that the information collected is accurate, securely stored, and used exclusively for the reason for which it was collected.

8. Analytical Findings

The doctrinal and comparative analysis yields five principal findings that clarify the scientific and constitutional status of the measurements authorised by the Criminal Procedure (Identification) Act, 2022.

- I. biological samples particularly DNA profiling based on short tandem repeat (STR) analysis—rest on a comparatively robust scientific foundation. Indian courts have consistently recognised their probative value while insisting on strict chain-of-custody and laboratory integrity (*Krishan Kumar Malik v. State of Haryana* (2011) 7 SCC 130; *Pattu Rajan v. State of Tamil Nadu* (2019) 4 SCC 771; *Rajiv Singh v. State of Bihar*). Blood grouping and semen analysis, though less individualising, retain legitimate corroborative utility, especially in sexual-offence prosecutions under the framework now carried forward in Sections 51–53 of the *Bharatiya Nagarik Suraksha Sanhita*, 2023.
- II. behavioural attributes, when understood to include narco-analysis, polygraphy and brain electrical activation profiling (BEAP) through the cross-reference to Sections 53 and 53A of the former Code of Criminal Procedure (now Sections 51–53 BNSS), rest on scientifically tenuous ground. The Supreme Court in *Selvi v. State of Karnataka* (2010) 7 SCC 263 expressly found these techniques unreliable and constitutionally impermissible when administered without free and informed consent. Subsequent decisions (*Amlesh Kumar v. State of Bihar* (2025) INSC 810, *Manoj Kumar Saini v. State of M.P.* (2023), *Vinobhai v. State of Kerala* (2025)) have reaffirmed that the consent regime laid down in *Selvi* continues to operate as a binding constitutional floor. The CPIA's undifferentiated treatment of these techniques alongside fingerprints and iris scans therefore creates a direct conflict with binding precedent
- III. The right against self-incrimination under Article 20(3) permits the compulsory taking of physical specimens (fingerprints, palm prints, footprints, photographs, iris/retina scans and biological samples) under the ratio of *State of Bombay v. Kathi Kalu Oghad* AIR 1961 SC 1808. The same provision, however, prohibits the compulsory extraction of testimonial responses through neuroscientific techniques. By placing both categories under a single statutory label of “measurements” and subjecting both to the same coercive machinery (including criminal liability for non-cooperation under Section 186 IPC / Section 221 BNS), the Act blurs a distinction that constitutional jurisprudence has carefully maintained.

- IV. The seventy-five-year uniform retention period under Section 4 of the CPIA fails the proportionality and necessity limbs of the test articulated in Justice K.S. Puttaswamy (Retd.) v. Union of India (2017) 10 SCC 1. The retention regime is not graduated according to the seriousness of the offence, the outcome of the proceedings, or any demonstrated ongoing investigative need. Destruction remains dependent on departmental recommendation rather than automatic or independently supervised triggers. This design is further weakened by the near-total exemption of law-enforcement processing from the Digital Personal Data Protection Act, 2023 (Section 17(1)(c)).
- V. The absence of a statutory reliability threshold comparable to the Daubert standard (or Rule 702 of the U.S. Federal Rules of Evidence) leaves the admission of behavioural-attribute evidence dependent solely on case-by-case judicial discretion under Section 39 of the Bharatiya Sakshya Adhiniyam, 2023. While this discretionary approach is workable for DNA evidence whose underlying science is well-established, it provides inadequate protection against the introduction of techniques already found scientifically deficient in Selvi.

9. Conclusion and Recommendations

The Criminal Procedure (Identification) Act, 2022 meets a genuine institutional need. The tools available to investigators under the Identification of Prisoners Act, 1920 were inadequate in comparison with those available to twenty-first-century forensic science. The more than four-decade lag between the Law Commission's 1980 recommendations and the legal response to them left Indian criminal investigation dependent upon a statute that had no terminology for DNA, iris scans, or voice samples. The principal deficiency of the CPIA is not procedural but definitional. It groups together a well-validated biological toolkit and a poorly-validated behavioural toolkit into a single legal category, "measurements," and subjects both to the same compulsion and the same seventy-five-year retention clock, without pausing to ask whether the constitutional and scientific standing of a fingerprint is even remotely comparable to that of a narco-analysis session.

Modern definition that incorporates iris scans, palm prints and biological samples, closing an investigative gap that the Law Commission had already identified in 1980. Its treatment of DNA and biological evidence is based on a scientifically well-tested basis, one that has been repeatedly acknowledged by the Supreme Court from Krishan Kumar Malik down through Pattu Rajan, and more recently reinforced by the Court's insistence on proper chain-of-custody handling in Rajiv Singh. The Act also broadens the class of persons and offences from whom identification data can be collected. The state can legitimately contend that this enhances the evidentiary base for serious crime investigation, a legitimate objective, which falls easily within the Puttaswamy proportionality paradigm. The Act shares this rationale with the long-pending DNA Technology Regulation Bill, which also aims to facilitate cross-referencing by centralising records with the NCRB to help identify repeat offenders and solve cold cases. Finally, the criminalisation of refusal under Section 186 of the Indian Penal Code, now Section 221 of the Bharatiya Nyaya Sanhita,

gives the collection regime practical teeth that addressed a real enforcement weakness under the 1920 Act.

But each of these gains is counterbalanced by a corresponding and largely unaddressed cost. By cross-reference, the same definitional clause that modernises the Act's biological provisions imports techniques that *Selvi v State of Karnataka* found scientifically and constitutionally deficient nine years before the Act's passage, into "behavioural attributes". There are no statutorily mandated forensic-laboratory accreditation regime and no mandated blind proficiency testing. Thus, the reliability that the underlying science allows is not guaranteed in practice across India's uneven laboratory network. This retention period of seventy-five years is uniform across offences regardless of the severity of the offence, acquittal or discharge, and destruction is at the discretion of the recommending officer's own department and not some independent authority, a design that fails the necessity limb of the *Puttaswamy* test even though the Act comfortably clears its legality and legitimate-aim limbs. The centralisation of fingerprint, iris, DNA and behavioural data in a single digitally networked repository, and the exemption granted to law-enforcement processing under Section 17(1)(c) of the Digital Personal Data Protection Act, 2023, create the very aggregation risk that privacy scholarship considers more dangerous than any single data point in isolation. This aggregation risk is left without a dedicated oversight body. And the 2025 judicial broadening of 'obstruction' to include non-physical non-cooperation adds to the practical pressure on an individual to submit to even a cognitively invasive measurement. It exacerbates rather than cures the tension between the Act and Article 20(3) that *Selvi* was meant to resolve.

These problems, taken together, are not diffuse, but each attach to a specific, identifiable provision and each is amenable to a specific legislative fix. The roots of the conflation of biological measurements with cognitively invasive behavioural attributes lie in Section 2(1)(b) of the CPIA, read with Sections 53 and 53A of the former Code of Criminal Procedure and now Sections 51 to 53 of the *Bharatiya Nagarik Suraksha Sanhita*. The solution is to amend Section 2(1)(b) so that narco-analysis, polygraphy and brain-mapping are excluded from "behavioural attributes" unless administered with recorded, Magistrate-supervised consent along the lines *Selvi* and *Amlesh Kumar* require. The remedy is a tiered retention regime with shorter default periods for undertrials and detainees who are acquitted or discharged, longer periods for conviction in serious offences, and automatic destruction, instead of destruction left to departmental recommendation. The unregulated delegation of rule-making authority is rooted in Section 6 of the CPIA and the 2022 Rules. Section 39 of the *Bharatiya Sakshya Adhiniyam* does not provide any reliability threshold for evidence before it reaches the fact-finder. The solution is to insert a *Daubert*-style gatekeeping requirement that requires a threshold judicial finding of testability and general acceptance before behavioural-attribute evidence is admitted. The near-total exclusion of CPIA records from data-principal rights is due to Section 17(1)(c) of the Digital Personal Data Protection Act. The remedy is either a narrowing of the law enforcement exemption, or a dedicated statutory oversight and audit mechanism for the NCRB's database along the lines of an independent data protection authority. And, the undifferentiated criminalisation of refusal is traceable to Section 186 of the

Indian Penal Code, now Section 221 of the Bharatiya Nyaya Sanhita. The solution is to read down or amend such a provision so that it does not criminalise refusal to undergo a measurement falling within the Selvi category without recorded consent. This would decouple the physical identification measures, where Kathi Kalu Oghad continues to apply, from the cognitive ones, where it does not.

The 2022 Act was intended to update Indian criminal procedure for modern forensic science, and in that narrow, technical sense it does so to a large extent." Its constitutional success, however, will depend not so much on the breadth of what it authorises the state to collect, but on whether Parliament, the judiciary, or both, are willing to build the safeguards this article identifies consent, tiered retention, independent oversight, evidentiary gatekeeping and a narrowed compulsion power into the specific provisions named above, across the CPIA, the BNSS, the BNS, the BSA and the DPDPA alike. Until that calibration takes place, the constitutional durability of the Act rests on protections that the Act itself now affords to executive discretion instead of establishing as legal obligation.

Ethical Considerations

This paper does not use any form of primary data or human interaction for that matter, such as interviewing people, conducting field work, doing surveys, or collecting any type of personal information from individuals. This paper relies solely on secondary sources of data that are available to all and are publicly known. These include laws and government documents, judicial cases, academic literature, and policy reports. AI has been used purely for polishing the language and improving structure and nothing else.

Data Availability

All sources used in this research have been publicly sourced from legal enactments, official government documents, judicial decisions, academic journal articles, policy papers, and scholarly reports. These sources can be found in official government libraries, legal libraries, law school libraries, and other academic sites. All sources have been duly cited in the paper.

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Conflict of Interest

The author declares no conflict of interest.

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