

Unmasking Deception: A Global Analysis of Forensic Psychology and the Legal Limits of Deception Detection Techniques

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ABSTRACT

This paper critically examines deception detection techniques (DDTs), i.e., polygraph tests, brain mapping, and narco-analysis by analyzing their scientific foundation and legal admissibility across jurisdictions. The research explores the historical evolution of forensic psychology, tracing developments in deception detection from traditional interrogation to modern neuroscience-based evaluations. It evaluates key forensic principles used in criminal trials and their evidentiary significance.

The study employs a comparative legal methodology, examining admissibility frameworks in India, the USA, the UK, and Singapore, highlighting jurisdictional variations in forensic reliance. In India, landmark cases like *Selvi v. State of Karnataka* affirm that involuntary administration of DDTs violates fundamental rights under Articles 20(3) and 21 of the Constitution. In contrast, countries like the USA impose stringent scientific reliability standards, rejecting polygraph results as inadmissible. The UK and Singapore adopt a more case-specific approach, allowing forensic psychological tests under regulated procedural safeguards.

Findings reveal ethical and constitutional challenges in forensic deception detection, questioning the credibility and voluntariness of confessions obtained through such techniques. The study identifies gaps in forensic regulation and calls for standardized protocols, judicial oversight, and enhanced forensic infrastructure. It recommends scientific validation of DDTs to improve legal applicability while balancing forensic innovation with privacy and self-incrimination rights. Ultimately, this research advocates judicial reform and interdisciplinary collaboration to optimize forensic psychology's role in criminal investigations while ensuring compliance with human rights standards.

KEYWORDS

Forensic Psychology, Deception Detection Techniques (DDTs), Narco-Analysis, Legal Admissibility of Evidence, Comparative Criminal Justice, Human Rights and Self-Incrimination, Judicial Oversight and Forensic Regulation

Introduction

In the evolving landscape of criminal investigation, Deception Detection Techniques (DDTs) have emerged as pivotal tools in uncovering concealed truths.¹ These scientific methods aim to aid law enforcement when conventional interrogation fails,² Offering insights into the psychological and physiological cues of deception. While these techniques hold promise in solving complex crimes and guiding investigative leads, their application raises significant legal, ethical, and constitutional concerns. Jurisdictions worldwide, including India, the United States, the United Kingdom, and Singapore, employ varied approaches to the admissibility of DDTs in judicial proceedings. Central to the debate is the tension between the pursuit of truth and the protection of individual rights, particularly concerning self-incrimination and bodily integrity. This paper critically analyses the scope, utility, and limitations of DDTs within legal frameworks, shedding light on their role in modern justice systems and their contentious admissibility in both criminal and civil contexts.

Concept of Deception Detection Tests (DDT)

In the pursuit of truth and justice, particularly when conventional interrogation techniques prove inadequate, law enforcement has increasingly turned to scientific methodologies known as Deception Detection Tests (DDTs).³ These include the Polygraph Test, Brain Mapping (P300 test), and Narcoanalysis. Each of these techniques is designed to detect deception by evaluating physiological, neurological, or psychological responses of a subject during questioning. While they promise investigative breakthroughs, their use raises complex legal, ethical, and constitutional issues, especially in democracies committed to the protection of individual rights.⁴

1. Polygraph Test

The polygraph, commonly known as the lie detector, operates on the premise that physical responses such as rate of heart rate, blood pressure, respiration, and skin conductance change when a person is deceptive.⁵ Developed in the early 20th century, the polygraph has evolved into a multi-channel diagnostic tool used globally.⁶ Despite its popularity in criminal investigations and employment screenings, its scientific validity remains contested. Critics argue that it measures stress or fear rather than deception itself, rendering its results unreliable as conclusive evidence in court.⁷

¹ David T. Lykken, *A Tremor in the Blood* 145 (2d ed. 1998).

² Journal of the Royal Soc’y of Arts, vol. 93, no. 4689, at 228–44 (Apr. 13, 1945), available at <https://www.jstor.org/stable/41361975> (last visited Feb. 23, 2025).

³ *Selvi v. State of Karnataka*, (2010) 7 S.C.C. 263 (India) (holding that involuntary administration of narcoanalysis, polygraph, and brain mapping violates the right against self-incrimination under Article 20(3) of the Indian Constitution).

⁴ John A. Larson, The Cardio-Pneumo-Psychogram in Deception, 6 *J. Experimental Psychol.* 420 (1921).

⁵ Cesare Lombroso, *Criminal Man* (1895) (demonstrating physiological changes in criminal suspects during deception).

⁶ John A. Larson, The Cardio-Pneumo-Psychogram in Deception, 6 *J. Experimental Psychol.* 420 (1921). ⁷

⁷ Leonarde Keeler, Apparatus for Recording Physiological Changes, U.S. Patent No. 1,788,434 (filed Jan. 13, 1931).

2. Brain Mapping (P300 Test)

Brain Mapping is a neuro-cognitive technique that relies on detecting the P300 wave, a specific event-related potential generated by the brain approximately 300 milliseconds after recognition of familiar stimuli.⁸ By recording neural responses through EEG electrodes placed on the scalp, this technique can indicate whether a suspect recognizes details of a crime, even if they do not verbally confess. Though less invasive than other methods and considered more objective than the polygraph, its admissibility in court remains limited.⁹ Furthermore, ethical debates continue regarding the interpretation of subconscious recognition as evidence of guilt.¹⁰

3. Narco-Analysis

Narco-analysis involves the intravenous administration of sedatives such as Sodium Pentothal that suppress higher cognitive functions, thereby making the subject more likely to speak without inhibition. Investigators use it on uncooperative suspects, especially in cases involving terrorism or organized crime.¹¹ Although it can reveal leads and details otherwise inaccessible,¹² Narco-analysis poses significant concerns related to consent, the right against self-incrimination (Article 20(3) of the Indian Constitution), and the possibility of false confessions under semi-conscious states. Its evidentiary value is minimal unless corroborated by independent findings.¹³

Admissibility of DDTs: A Comparative Analysis (India)

In India, the legal admissibility of Deception Detection Techniques (DDTs) such as Polygraph Tests, Brain Mapping (P300), and Narco-Analysis is a nuanced subject governed by judicial precedents, statutory frameworks, and constitutional mandates. The admissibility of such techniques hinges primarily on two prerequisites: judicial authorization and the voluntary consent of the subject. In the absence of these, the statements derived from such procedures are not legally admissible.

A significant document shaping the discourse is the Draft National Policy on Criminal Justice (2007). This policy challenges the conventional understanding of the "right to silence" under Article 20(3) of the Indian Constitution, particularly in the context of terrorism and national security threats. It proposes a reconsideration of the absolute nature of this right in certain exceptional cases, advocating a balanced approach where courts may compel disclosure from the accused if it serves the interests of justice. It emphasizes that while protecting constitutional liberties remains vital, this must be harmonized with the rights of victims and society's need for

⁸ Journal of the Royal Society of Arts, vol. 93, no. 4689, at 228-44 (Apr. 13, 1945), available at <https://www.jstor.org/stable/41361975>, Last Visited 23rd February 2025.

⁹ See 2006 Cri LJ, Journal Section, At Page 184.

¹⁰ National Research Council, *The Polygraph and Lie Detection* 1-2 (Nat'l Acads. Press 2003); B.S. Choudhary, *Narco Analysis, Brain Mapping, and Lie Detector Tests in India*, 50 *JILI* 432 (2008).

¹¹ Quoted in Andra Law Times, 2008, 14(Jr.), p.34.

¹² David T. Lykken, *A Tremor in the Blood* 145 (2d ed. 1998).

¹³ Sarkar's Law of Evidence 189 (19th ed. 2016).

security, particularly in combating organized crime and terrorism.¹⁴

The policy suggests a systemic shift towards empowering courts, rather than investigative agencies, to authorize such techniques, thereby ensuring a fair and transparent process. It also draws upon comparative legal frameworks in common law countries, highlighting examples where adverse inferences from silence or burden shifts are permissible.¹⁵

In recent years, India has selectively integrated advanced forensic techniques such as cyber forensics, DNA analysis, polygraphs, and brain mapping into investigative protocols, particularly in high-profile or complex cases. However, this integration requires substantial investment in infrastructure, training, and coordination between central and state authorities.¹⁶ The policy further recommends the networking of forensic laboratories nationwide and elevating them to the status of independent scientific organizations to attract top-tier talent and ensure impartiality in investigations.

The Bhartiya Sakshya Adhiniyam (BSA), 2023,¹⁷ Which has replaced the Indian Evidence Act, 1872, offers critical insights into the legal status of DDTs. According to Section 2(1)(e), evidence includes statements and documents relevant to the matter at hand. Sections 3 through 14 elaborate on the admissibility of facts in issue and relevant facts, while Section 45 specifically allows expert opinions, including those from medical or forensic professionals conducting deception tests.

Sections 22 to 24 of the BSA deal with the admissibility of confessions, particularly emphasizing that any coerced or involuntary statement is inadmissible. Section 14 enshrines the principle that statements obtained through duress cannot be relied upon. However, Section 23(2) provides a crucial exception: if any material or fact discovered because of such tests proves useful or leads to corroborative evidence, it may be admissible in court so long as the test was conducted voluntarily and under judicial supervision.

Judicial decisions have played a central role in shaping the admissibility standards. In *Ramchandra Ram Reddy v. State of Maharashtra*, the Bombay High Court upheld the use of brain mapping and narco-analysis, ruling that evidence obtained through these methods could be permissible when administered lawfully and voluntarily. Similarly, in *Selvi v. State of Karnataka* (2010), the Supreme Court held that involuntary administration of these tests violates Articles 20(3) and 21 of the Constitution. Nonetheless, it allowed for admissibility if new evidence or material facts are discovered as a direct outcome of voluntary testing.

The case of *Mohinder Singh Pandher and Surender Singh Koli v. State of U.P.*¹⁸ (Nithari serial murders) illustrated the practical utility of narco-analysis in uncovering critical evidence. Although the statements made under such influence were not themselves admissible, the

¹⁴ Raghavan Ramaswamy, *Truth Machines, and the Law in India: A Tale of Three Technologies*, 8(2) *Law, Innovation & Tech.* 277 (2016); Michael S. Pardo, *The Nature, and Purpose of Evidence Theory*, 66 *Vand. L. Rev.* 547, 582–83 (2013).

¹⁵ Ratanlal & Dhirajlal, *The Law of Evidence* 256 (25th ed. 2016).

¹⁶ Gerald Posner, *Confessions of a Terrorist*, *New Republic* (2003).

¹⁷ *Bharatiya Sakshya Adhiniyam*, No. 50 of 2023, (India).

¹⁸ *Mohinder Singh Pandher and Surender Singh Koli v. State of U.P.*, (2011) 3 SCC 243.

discoveries made based on those statements significantly aided the investigation.¹⁹

Another high-profile example is the Aarushi-Hemraj double murder case.²⁰, where the Central Bureau of Investigation (CBI) sought judicial permission to conduct narco-analysis. The request was granted, reinforcing the notion that courts are increasingly recognizing the evidentiary potential of these methods within investigative boundaries. A similar instance occurred in the Shraddha Walkar murder case, where the Delhi High Court approved narco-analysis to aid the probe.

Section 39 of the BSA further strengthens the legal footing of expert opinion, recognizing it as a relevant fact in judicial proceedings. This provision is crucial in validating the role of medical and scientific professionals who administer and interpret DDTs.

United States of America

In the United States, Deception Detection Tests (DDTs) results are generally not admissible due to privacy issues and concerns about their reliability.²¹ They may also violate the Fifth Amendment, as discussed in detail above.²² These rights are typically upheld in Federal Courts, but not necessarily in State Courts.²³

It is imperative to comprehend that the admissibility of a confession is a multifaceted issue, complicated by numerous exceptions and nuances related to the Miranda rules. Additionally, state legislation or judicial rulings may provide further safeguards and directives concerning the admissibility of confessions. Thus, it is incumbent upon law enforcement agencies to adhere strictly to Miranda guidelines, and for courts to meticulously review each situation surrounding confessions on a case-by-case basis.²⁴ The same scrutiny applies to the Narco-analysis test, as evidenced by the US congressional investigation of the 9/11 attacks, which employed narco-analysis as a tool of inquiry.²⁵ For instance, in 2003, when the CIA apprehended Abu Zubaydah, coercive measures during narco-analysis interviews were reported.²⁶

This assertion is elucidated in an article titled "Confessions of a Terrorist," authored by Gerald Posner in 2003, which posits that the United States' clandestine administration tacitly believes that the US Supreme Court has implicitly sanctioned the use of such methods in matters concerning

¹⁹ Dr. V Nageshwara Rao, *The Indian Evidence Act; A Critical Commentary Converting Emerging Issues and International Development* (3rd Ed. 2019), Chapter VI; Relevant Facts, Page no.- 301-321. ²⁰ Dr. (Smt.) Nupur Talwar vs State Of U.P. And Anr: (1984) 2 SCC 627.

²⁰ Dr. (Smt.) Nupur Talwar vs State of U.P. And Anr: (1984) 2 SCC 627.

²¹ *United States v. Scheffer*, 523 U.S. 303 (1998) (polygraph); *Townsend v. Sain*, 372 U.S. 293, 307-09 (1963) (narco-analysis); Donald N. Burkholder & Steven G. Brand, *Lie-Detection in the Twenty-First Century: Reliability of Polygraph and Brain Fingerprinting*, 42 Am. Crim. L. Rev. 25, 30-32 (2005).

²² U.S. Const. amend. V; *Miranda v. Arizona*, 384 U.S. 436, 461-66 (1966).

²³ *Compare People v. Mason*, 22 Cal. 3d 83, 583 P.2d 133 (Cal. 1978) (excluding polygraph) with N.M. R. Evid. 11-707 (permitting polygraph by stipulation).

²⁴ *Dickerson v. United States*, 530 U.S. 428, 435-41 (2000); Richard A. Leo, *Police Interrogation and American Justice* 164-213 (2008).

²⁵ Nat'l Comm'n on Terrorist Attacks Upon the U.S., *The 9/11 Commission Report* 146-48 (2004).

²⁶ Dana Priest & Barton Gellman, *U.S. Decries Abuse but Defends Interrogations*, Wash. Post, Dec. 26, 2002, at A1.

public safety.²⁷

United Kingdom

In the United Kingdom, the confession can be articulated to any individual, including a Police Officer, during the course of an investigation, provided it is made voluntarily. The same principle applies to the admissibility of Deception Detection Tests (DDTs). As previously discussed, if this standard is adhered to, non-invasive Forensic Psychological Tests cannot be considered as infringing upon the “right against self-incrimination.”²⁸ Notably, the right to silence in the UK is not absolute.²⁹ Adverse inferences may only be drawn from the accused's silence if a *prima facie* case has been established, and procedural safeguards, such as allowing the accused to consult an attorney, are satisfied.³⁰

Singapore

In Singapore, the rules governing the admission of evidence are meticulously outlined in this section and apply to Deception Detection Tests concerning their admissibility.³¹ The two primary legal frameworks on evidence admissibility are enumerated in the Singapore Evidence Act (EA) and the Criminal Procedure Code 2010³². These provisions are a modified form of common law principles. Exclusions from admissibility include hearsay, character evidence, and similar fact evidence.³³ The police possess the authority to interrogate and obtain confessions from detainees, and are liable for punitive damages under section 258(1)³⁴ Of the Criminal Procedure Code of Singapore 2010, provided the stipulated conditions are met. Initially, the evidence leading to the arrest must have been obtained by an officer of sergeant rank or higher. Additionally, the conditions for statements to be admissible must be satisfied. However, the court, exercising its discretion, may exclude statements obtained through undue force, thus ensuring the integrity and truthfulness of the evidence presented.

Evidentiary Value in the Civil Suits:

When deliberating upon forensic psychological evaluations such as the Narcoanalysis test, the admissibility or relevance thereof is confined to the domain of criminal proceedings alone, with scant discourse surrounding their applicability in civil suits. As in India, both earlier the Indian Evidence Act, 1872, and now Bharatiya Sakshiya Adhiniyam, 2023, encompass provisions applicable to both civil and criminal cases. However, when adjudicating the admissibility of such

²⁷ Gerald Posner, *Confessions of a Terrorist*, TIME, Oct. 14, 2003, at 44.

²⁸ Police & Criminal Evidence Act 1984, c. 60, § 76(2) (UK) (PACE).

²⁹ R. v. Director of Serious Fraud Office, [1993] A.C. 1 (H.L.); Aileen McColgan, *Silence and Self-Incrimination*, 50 N. Ir. Legal Q. 17 (1999).

³⁰ Criminal Justice & Public Order Act 1994, c. 33, §§ 34–39 (UK); Murray v. United Kingdom, 1996-I Eur. Ct. H.R. 30; R. v. Roberts, [1998] Crim. L.R. 432 (Eng. C.A.).

³¹ Evidence Act (Cap. 97, 1997 Rev. Ed. Sing.); Criminal Procedure Code 2010 (Sing.), No. 15 of 2010. ³²

³² Criminal Procedure Code 2010, No. 15 of 2010, 2020 Revised Edition (Sing.), Available at <https://sso.agc.gov.sg/Act/CPC2010>, Last Visited 16th March 2025.

³³ Evidence Act (Cap. 97) §§ 24–25 (Sing.); Public Prosecutor v. Mazlan bin Maidun, [1992] 1 S.L.R.(R.) 409, 416 ¶ 29 (Ct. App.).

³⁴ Supra Note 33, at § 258(1).

tests, predominant emphasis is laid upon criminal matters, particularly during investigations or confessions rendered to police authorities.

A discernible lacuna in research emerges when examining the admissibility of

DDTs as evidence in civil contexts. This lacuna begets critical inquiries such as, “Are DDTs as evidence not indispensable during civil litigation?” or “Is there an implicit prohibition on the admissibility of information procured through narco-analysis in civil courts?” Given that evidentiary statutes address the admissibility of materials presented before the judiciary in both realms, an inquiry remains unaddressed: “Could forensic psychological assessments be deemed admissible in civil litigation?”

In the context of three common law nations, along with India, the admissibility of DDTs in civil litigation remains an uncharted subject, as elaborated below:

- In the USA: The Fifth Amendment to the U.S. Constitution, enshrined within the Bill of Rights, safeguards accused individuals against self-incrimination, precluding compulsion to testify in both criminal and civil disputes. Owing to the induced state of reduced consciousness in narco-analysis, significant reservations arise regarding the reliability and voluntariness of such evidence.
- In the UK, owing to the absence of legislation governing narco-analysis, judicial determinations exhibit parallels, with skepticism surrounding the scientific veracity of the test, the coercive element, and the reliability of evidence procured under the influence of narcotics.
- In Singapore, the Singapore Evidence Act governs the admissibility of evidence, underscoring the necessity for credible and dependable proof. Similar to the UK, reservations persist concerning the scientific reliability, distortion, and potential manipulation inherent in narco-analysis tests.
- In India, Provisions embedded within Bhartiya Sakshya Adhiniyam, 2023, elucidate the admissibility of pertinent facts in civil suits, as illustrated herein:
 - Relevancy: Section 3 posits evidence as probative of existing factual disputes, emphasizing the inadmissibility of irrelevant evidence as epitomized in *Sukh Ram v. State of Himachal Pradesh*³⁵.
 - Opinion Evidence: Section 39 precludes the opinions of laypersons, save for those of experts in disciplines such as science, art, and trade, as affirmed in *Ramesh Chandra Agrawal v. Regency Hospital Ltd*³⁶.

³⁵ Sukh Ram v. State of Himachal Pradesh, AIR 1997 SC 1768.

³⁶ Ramesh Chandra Agrawal v. Regency Hospital Ltd, (2010) 9 SCC 687.

- Illustrations of civil litigation exist wherein courts refrained from issuing a definitive ruling on the evidentiary legitimacy of narco-analysis results. Nevertheless, principles governing criminal cases remain applicable, even as emerging technological evidence cannot be directly admitted, thereby not impairing the fact-finding process.

Conclusion

The integration of Deception Detection Techniques (DDTs), namely polygraph tests, brain mapping, and narco-analysis, into investigative processes reflects an ongoing quest for truth in modern criminal justice systems. These methods, while scientifically intriguing and occasionally operationally effective, inhabit a legally grey and ethically fraught terrain. As the comparative analysis demonstrates, jurisdictions such as India, the United States, the United Kingdom, and Singapore differ sharply in their standards of admissibility, often balancing societal interests with individual constitutional protections.

India's evolving legal framework, particularly under the Bharatiya Sakshya Adhiniyam, 2023, attempts to navigate this tension by emphasizing voluntary consent, judicial oversight, and corroborative value. Nonetheless, judicial precedents like *Selvi v. State of Karnataka* underscore the primacy of personal liberty and bodily autonomy. In contrast, the U.S. and U.K. tend to err on the side of caution, rejecting these methods outright as evidence due to concerns about reliability and coercion. Singapore adopts a more technocratic approach, emphasizing procedural integrity and statutory authorization. The civil domain, however, remains largely uncharted. While statutory language appears broad enough to potentially admit DDT-derived material, judicial hesitance and ethical reservations suggest a cautious path forward. The absence of clear guidance in civil litigation highlights an urgent need for doctrinal clarity and empirical research. Ultimately, the deployment of DDTs must be approached with judicial prudence, scientific rigor, and unwavering respect for human dignity. Their use may assist law enforcement, but their evidentiary admissibility must never compromise the foundational principles of justice. As forensic science advances, the legal fraternity must evolve equally, ensuring that every stride toward truth does not come at the cost of fundamental rights.