

NEURO DEVELOPMENT AND CRIMINAL RESPONSIBILITY – A JUVENILE PERSPECTIVE

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ABSTARCT

Juvenile delinquency refers to illegal activities by a minor – a person who is under the age of 18. The child, if found guilty of a crime, is tried under the Juvenile Justice (Care and Protection of Children) Act 2015. Juvenile crime has recently increased and is a concern to society, as youths are the nation's future. This research looks into the factors of neuro psychology, brain development, disorders and other socio-economic factors that influence juvenile crime. It also discusses theories that aim to explain the abnormal behaviour in children. The study also highlights the difference between the child in conflict with the law and the child in need of care and protection, explaining their different legal treatment and implications of criminal responsibility.

The study uses a deductive method and a doctrinal research approach to understand the legal provisions, statutes and case laws to understand juvenile cases and the method of implication of criminal responsibility in relation to age. It also addresses the concept of the illusion of free will and normative standards in determining criminal responsibility. The study further analyses the establishment of criminal responsibility and mens rea in juveniles, where the cognitive ability is still developing. The research findings conclude that although the rights of children and juveniles are protected, there is a lack of infusion of neuropsychology and legal principles, which is required for a balanced legal framework between rehabilitation and accountability.

KEYWORDS – juvenile delinquency, cognitive ability, criminal responsibility, neuro-development and mens rea

1. INTRODUCTION

Crime remains a fundamental problem within every society and nation-state. Crime does not only entail breaking the law but also an offense that violates the social norms, laws, and organization of society. In this regard, most of the members of the society are the youth, followed by children (National Statistical Office, Ministry of Statistics and Programme Implementation, Government of India, 2022). As such, they are the main people who will hold the future of the country. Nevertheless, even though they represent the future of society, during the

last decade, there have been a significant increase in criminal behaviour among young individuals (Saxena, 2025). Juvenile delinquency remains one of the main problems faced in society today (CNBCTV18, 2025a).

A lot depends on the mental nurturing and development of a child. In fact, adolescents across the globe develop their own unique perspectives while growing up, based on their comprehension and intellect (Agarwal, 2018) Apart from that, the question of criminal liability, coupled with the fact that brain development in juveniles is still incomplete, can result in their

behaviour, activities, and decisions being influenced by external and psychological factors.

Consequently, juvenile crime should be addressed not only as a means of prevention but also for safeguarding the future generation from becoming criminals. “The child of today is the father of tomorrow. A nation cannot have development without offering a healthy environment to its children” (Nisar M et al., 2015).

1.1 AIMS AND OBJECTIVES

Aims

- ✓ This research aims to analyse the role of cognitive neurological behaviour of juveniles in decision-making
- ✓ To explore how the social and biological factors influence the criminal behaviour of a juvenile delinquent
- ✓ To understand the role of cognitive neuro psychology in deciding the act of intent (mens rea) in committing a crime by a child

Objectives

- ✓ To understand the concept of cognitive neuro- psychology relevant to young offenders.
- ✓ To understand the importance of juvenile delinquency. – in relation to brain development, impulse control and decision making.
- ✓ To signify the importance of how Cognitive control, behavioural patterns and brain disorders affect the decision-making of a juvenile delinquent.

1.2 RESEARCH GAP

- ✓ Limited application of cognitive psychology while determining a child's intent while committing a crime.
- ✓ Lack of Understanding regarding how mental and behavioural disorders affect the thinking pattern of a child, leading him to commit a crime.
- ✓ Less stress on how the social, environmental, and biological factors

collectively affect the juvenile's decision-making and impulse control.

- ✓ Limited Understanding of how age can be a factor in assessing criminal responsibility.
- ✓ Uncertainty whether juvenile cases are truly decided based on child psychology or influenced by the Fear of Long-Term Criminal Outcomes?
- ✓ Absence of combined integration of neurodevelopment/neuropsychology and law in asserting criminal responsibility under the Juvenile Justice Act (Care and Protection of Children) Act 2015.

✓ 1.3 LITERATURE STUDY

Sigmund Freud (19th – 20th century) clarified through his theory that our unconscious mind shapes our outer behaviour. He demonstrates the balance of the id, ego and superego, which are crucial to control the aggressive conduct towards others, through his psychodynamic theory. This theory suggests that children with trauma and neglect from close ones often indulge in delinquent behaviour in the adult period. While some scholars support his view due to his insight into childhood psychology, others argue that social factors also play a significant role.

Albert Bandura (1977) observed that how child reflects aggressive and violent behaviour of adults through observation or imitation. Social environment plays a crucial role in influencing actions, thoughts and intentions of youth, which is important in understanding juvenile conduct.

He explicitly shows through the Bobo Doll experiment how children adopt violent behaviour and normalise it in adolescence period. Some scholars opposed this idea by arguing that he mainly focuses on the social environment, neglecting biological factors, which are controlled by the autonomic nervous system.

Howard Becker (1963) found that deviant acts are not inherited in youth, it usually develops from society's reaction towards certain

behaviour or performance of an individual who breaks the defined rules or established norms in his labelling theory. Therefore, arguing that a child becomes delinquent not just by committing an unlawful act, but one that society also labels them as deviant, pushing them into committing more heinous crimes. Later, he classified juvenile delinquency, which provided a complete description of juvenile crimes.

Jean Piaget (1896-1980): He proposed that children develop their cognitive ability till adolescence period, where he shows how youth think differently from adults and how their mental and emotional understanding is less developed than adults. He emphasises the difference between the brain of a child and an adult, which shows why the child may not have mens rea while committing an unlawful act.

2. JUVENILE DELINQUENCY

Juvenile delinquency involves illegal or antisocial acts by minors under 18, reflecting a criminal mindset that violates societal norms. The state focuses on rehabilitation due to minors' developmental immaturity, aiming to protect their future rather than impose severe punishments. However, under the Juvenile Justice (Care and Protection) Act, 2015, minors aged 16 to 18 who commit heinous offences may be treated as adults.

Delinquency also includes hostile behaviour, but aggressive actions aren't crimes unless unlawful under current laws. Serious offences like murder, assault, rape, theft, and kidnapping meet this criterion.

Definition: Under frameworks like India's Juvenile Justice (Care and Protection of Children) Act, 2015, it refers to a "child in conflict with law" (under 18) alleged to have infringed any law, focusing on acts like theft or violence requiring specialised intervention. The UN Congress (1960) describes it as a criminal for adults but needing child-specific treatment. U.S. law, per the Juvenile Justice and Delinquency Prevention Act (1974), covers law violations by those under 18.

2.1. THEORIES ON DEVELOPMENTAL CHARACTERISTICS OF JUVENILE:

Adolescence era is characterised by a transitional period where teenagers connect more with peers than the family. They vigorously explore their identity and purpose, managing their place in the wider social world [¹⁵⁸⁰(Steinberg & Morris, 2001)]. Juvenile offenders often exhibit neuro- developmental glitches like emotional instability, low self-esteem, and resentment issues.

Several psychological theories associated with mental illness and neurological development to juvenile delinquency focus on brain immaturity, unresolved conflicts, and cognitive distortions.

A. Sigmund Freud's Psychodynamic Theory:

Sigmund Freud's psychodynamic theory says our outer appearance comes from hidden thoughts and feelings in the unconscious mind, shaped by childhood conflicts, trauma, and neglect. This theory outlines juvenile development through five psychosexual stages (¹⁵⁸¹Cherry, 2025).

Stage (Age)	Focus/Erogenous Zone	Juvenile Developmental Risk
Oral (0-1)	Mouth	Dependency issues, aggression if frustrated
Anal (1-3)	Anus	Obsessiveness or defiance from harsh training
Phallic (3-6)	Genitals	Oedipal conflicts, guilt, and sexual

¹⁵⁸⁰ (Steinberg & Morris, 2001)

¹⁵⁸¹ (Cherry, 2025).

Stage (Age)	Focus/Erogenous Zone	Juvenile Developmental Risk	Process	Role Aggression	in	Youth Example
		misconduct	Attention	Noticing model's acts	the	Watching parental fights
Latency (6-Puberty)	Dormant drives	Social withdrawal, poor peer skills	Retention	Remembering via mental rehearsal		Recalling violent TV scenes
Genital (Puberty+)	Mature sexuality	Immature relationships from prior fixations	Reproduction	Physically mimicking		Hitting peers like the Bobo Doll
			Motivation	Reinforcement triggers action		Rewarded bullying in gangs

In adolescence, unresolved conflicts can exhibit delinquent or antisocial behaviour, which weakens the ego-superego balance and can indicate aggression and weak moral control. This outline connects early trauma to later behavioural issues, which influence wrongdoings.

B. **Albert Bandura's Social Learning Theory:**

He clarified how youth adopt aggressive behaviour through observation, imitation from representatives like parents, peers or social groups, which placed emphasis on poor self-regulation. Children assumed that repeated exposure to violence resolves conflicts, though they indulge in illegal activities.

Juveniles acquire aggressive conduct via four processes- **attention, retention, reproduction, and motivation** leading to a lack of self-control when models normalise violence, as shown in the Bobo Doll experiments, where children mimicked adult aggression. (1582Sylvia, 2024)

2.2 EXISTING FORMS OF JUVENILE DELINQUENCY:

Adolescents below the age of 18 years old indulge in illegal and deviant behaviour which violates social norms or law. 1583Howard Becker classifies juvenile delinquency into four broad types: individual, group-supported, organised, and situational, based on the manner of law-breaking acts, and these reflect developmental impulsivity more than estimated adult crime.

The following are the 4 types: -

- A. **Individual Delinquency:** It signifies a minor who indulges in criminal or wrongdoing activities on their own accord without anyone's assistance. According to psychiatrists, psychological problems are the cause of individual delinquency. Emotional instability and poor coping skills make a child unable to adopt or conform to social and moral norms set by the people of the society, which compel him to adopt deviant behaviour. Instances like theft, burglary, or robbery.

1582 (Sylvia, 2024)

1583.

B. **Group- Supported Delinquency:** It refers to the conduct of a child who is involved in anti- social activities with the companionship of others. Criminals often adopt this behaviour under peer influence or in their immediate neighbourhood.

Individuals of the same age form peer associations, spending more time with peers than families. Adolescents are likely to adopt criminal behaviour due to a lack of adult-level mental and intellectual maturity. Illustrations like petty theft, vandalism.

C. **Organised Delinquency:** It refers to structured juvenile groups who commit criminal acts like gangs, which promote delinquent behaviour. Teenagers of this group committed unlawful acts in a planned and organised way, unlike impulsive individuals.

Frederic Thrasher, in his "Gang Theory," examines group-supported delinquency, noting that each gang develops a distinctive behavioural pattern unique from others, which members internalise into their personal identities. In this process, gangs foster mutual hostility and transfer criminal methods to protect and advance their own interests. Resembling murder, rape, assaults, and drug trafficking.

D. **Situational Delinquency:** It indicates that a juvenile acts spontaneously due to immediate circumstantial pressure, emotional instability, and weak impulsive control. There is no deep-rooted commitment or malicious intention to crimes by juveniles. Hence, it reduces the chances of repetition of crime without equivalent triggers. Similar to group fighting at a party without any motive.

2.3 FACTORS ACCOUNTABLE FOR JUVENILE DELINQUENCY:

A. **Social factors:** Cloward and Ohlin (1960) feel that juveniles develop different

delinquent tendencies depending upon what opportunities are available in their surroundings. Clifford Shaw and Henry D. McKay (1940) clarify that a youth's personality is built upon surroundings rather than an individual's traits. Poverty, lack of access to education, unemployment, peer neglect, which leads to frustration and hopelessness, and it leads to a higher risk of criminal behaviour. The negative role of family has also been studied in other studies (¹⁵⁸⁴World Youth Report, 2003).

B. **Psychological factors:** David Brandt (2006) has extensively talked about the social and psychological factors responsible for delinquency in India. Psychological explanations can be well understood through Sigmund Freud's (1923) concept of the id, ego and super-ego. When the id (the instinctive element of an individual's personality) becomes too strong, and the super- ego becomes weak (the socially taught element of personality), the ego develops into an antisocial person (¹⁵⁸⁵K. S. Williams 2012).

C. **Biological factors:** It is fascinating that an individual is influenced by their biology or genetic factors. During the adolescent period, hormonal shifts often spark impulsive decisions and emotional dysfunction. S. Williams 2012, and abnormal behaviour due to mental health issues. Besides this, academic pressure, environmental disruption, and financial crisis can also be the cause to indulge in illegal activities like addiction to drug substances.

3. ¹⁵⁸⁶RELEVANT SECTIONS UNDER JUVENILE JUSTICE (CARE AND PROTECTION OF CHILDREN) ACT, 2015:

Section 2(13)– "child in conflict with law" means a child who is alleged or found to have

¹⁵⁸⁴ World Youth Report, 2003

¹⁵⁸⁵ K. S. Williams 2012

¹⁵⁸⁶ (JUVENILE JUSTICE (CARE AND PROTECTION OF CHILDREN) ACT, 2015, 2016, sec. 2(13)(14),4,10,12,14,15,17,18,19,21,22,74)

committed an offence and who has not completed eighteen years of age on the date of commission of such offence.

Section 15. Preliminary assessment into heinous offences by Board- (1) In case of a heinous offence alleged to have been committed by a child, who has completed or is above the age of sixteen years, the Board shall conduct a preliminary assessment with regard to his mental and physical capacity to commit such offence, ability to understand the consequences of the offence and the circumstances in which he allegedly committed the offence, and may pass an order in accordance with the provisions of sub-section (3) of section 18: In case of evaluation, the Board may take the aid of professional psychologists or psychiatrists.

: A child also has been categorised as – **Child in Need of Care and Protection.**

According to section 2(14): child in need of care and protection” means a child

– (i) who is found without any home or settled place of abode and without any ostensible means of subsistence; or

(ii) who is found working in contravention of labour laws for the time being in force or is found begging, or living on the street; or

(iii) who resides with a person (whether a guardian of the child or not) and such person—

(a) has injured, exploited, abused or neglected the child or has violated any other law for the time being in force meant for the protection of the child; or

(b) has threatened to kill, injure, exploit or abuse the child and there is a reasonable likelihood of the threat being carried out; or

(c) has killed, abused, neglected or exploited some other child or children and there is a reasonable likelihood of the child in question being killed, abused, exploited or neglected by that person; or

(iv) who is mentally ill or mentally or physically challenged or suffering from terminal or incurable disease, having no one to support or look after or having parents or guardians unfit to take care, if found so by the Board or the Committee; or

(v) who has a parent or guardian and such parent or guardian is found to be unfit or incapacitated, by the Committee or the Board, to care for and protect the safety and well-being of the child; or

(vi) who does not have parents and no one is willing to take care of, or whose parents have abandoned or surrendered him; or (vii)

who is a missing or runaway child, or whose parents cannot be found after making a reasonable inquiry in such manner as may be prescribed; or

(viii) who has been or is being or is likely to be abused, tortured or exploited for the purpose of sexual abuse or illegal acts; or

(ix) who is found vulnerable and is likely to be inducted into drug abuse or trafficking; or

(x) who is being or is likely to be abused for unconscionable gains; or

(xi) who is victim of or affected by any armed conflict, civil unrest or natural calamity; or

(xii) who is at imminent risk of marriage before attaining the age of marriage and whose parents, family members, guardian and any other persons are likely to be responsible for the solemnisation of such marriage;

In other words, these children are those who are abused, threatened, neglected and exploited, leading them to commit crime; they are not seen as offenders but as victims of other social harm inflicted upon them.

4. CASES OF JUVENILE DELINQUENCY

A. PUNE PORSCHE CASE (2015) ⁽¹⁵⁸⁷⁾(Gupta, 2025)

Fact: 'Pune Porsche case' is a high-profile case involving a drunk 17-year-old boy who crashed a luxury car and killed two people in Pune, India, in May 2024. It involved several issues, such as rash and negligent driving, drunk driving, and hiding evidence.

Judgement: The Bombay High Court ordered the release of the minor from the observation home, ruling that he should be treated separately from adults. The Court said that it was bound by law and the Juvenile Justice Act and that it must treat the minor as any child in conflict with the law. The Juvenile Justice Board, within 15 hours of the crash, granted bail to the boy and also ordered him to write a 300-word essay on the effects of road accidents.

B. AMARJEET SADA CASE (2006-2007): ⁽¹⁵⁸⁸⁾(Harvey, 2025)

Fact: Amarjeet Sada, an 8-year-old boy from Bihar, India, is mostly known as the world's youngest serial killer for confessing to three infant murders between 2006-2007. At the age of 07, he killed his 6-month-old sister and 9-month-old cousin by hitting their heads with a rock and bricks. At the age of 08, he killed his neighbour at school by strangling and beating her.

He committed a crime without any remorse. Furthermore, he was diagnosed with severe conduct disorder under which he committed a crime.

Judgement: Under Indian law (Juvenile Justice Act), children under 7 cannot be prosecuted; at 8, Sada was below the age of criminal responsibility for severe punishment. Later on, the Board under Act, 2000, treated him solely as a child in conflict with the law and no strict punishment was given to him. Police sent him to a juvenile reform home for counselling and observation until age 18, after which his identity

was sealed, and he was released with a new identity.

5. CRIMINAL RESPONSIBILITY

Criminal responsibility is a key characteristic in criminal law; it implies a certain level of awareness of the criminal regarding the unlawful act, understanding the consequences of the offence and the psychological ability to differentiate whether the act committed is right or wrong ⁽¹⁵⁸⁹⁾Valentina, 2024). Criminal responsibility can be understood in two ways: **Responsibility as Capacity** and **Responsibility as Answerability**, i.e., the capacity of a person to engage in criminal conduct and where a person is to be held answerable ⁽¹⁵⁹⁰⁾Maher, 2005). In other words, can this person be blamed for their act?

The modern justice system tries to balance the principle of people's need to punish the person who commits the crime and the moral responsibility of the person who committed the crime, i.e. whether the person actually intended to cause harm or it was due to accident, negligence, under influence (intoxication), self-defence, or not having the mental capacity to understand the act.

Criminal responsibility also relies on the concept of illusion of free will and normativity, illusion to free will which says that although we may choose are action, in reality, we may be influenced by brain development, environment and disorders.

Criminal responsibility is not only limited to violent heinous crime but also extends to corporate and white-collar crimes, where not only individuals but also organisations are held responsible for unlawful acts. In ¹⁵⁹¹India More (2025a) The legal system looks into the requirement of the principle of actus reus and mens rea, that is, the guilty act and guilty mind in establishing the criminal responsibility of an individual or the accused. The problem arises in the case of juveniles, as their cognitive and

¹⁵⁸⁷ (Gupta, 2025)
¹⁵⁸⁸ (Harvey, 2025)

¹⁵⁸⁹ Valentina (2024)
¹⁵⁹⁰ Maher (2005)
¹⁵⁹¹ (More, 2025b)

psychological development is still taking place; it is difficult to determine their actions and intentions.

5.1 CRIMINAL MAJORITY AND AGE-

According to¹⁵⁹² Anushka (2017) the criminal majority is the legal requirement for a person to be tried as an adult. It is the minimum age (juvenile) at which a person can be held and tried as an adult with more severe punishment.

A question arises in the determination of criminal responsibility: when an individual falls between the age brackets of criminal majority and criminal responsibility, when this individual commits an offence, he or she may not be punishable as an adult, as is protected under the juvenile act and the UN Convention on the Rights of right of child. Therefore

In India, criminal responsibility is closely connected with age (criminal majority). Although worldwide, there is no age limit at which a child is considered to be mature enough to understand the consequences of their offence or action. Although there is a minimum age requirement set by each country. If the child falls under that age, he or she is seen to be incapable of understanding the seriousness of their crime or offence and is incapable of being held accountable. The IPC sets the minimum age of criminal responsibility in India at 7 years, as well as says that children between the 8 and 12 are not criminally responsible if the juvenile or the child has not psychologically or mentally achieved the age of maturity in such a manner that they are unable to understand the consequences of their actions. BNS retains this provision (¹⁵⁹³PRS Legislative Research, 2024).

Furthermore, according to ¹⁵⁹⁴Bhatia (2023), India has enacted and enforced the Juvenile Justice (Care and Protection of Children) Act 2000, 2015, which defines a juvenile as a person below the age of 18, the age threshold at which children above that are tried as adults. Section

10 of the JJ Act states that if any juvenile is detained by the authorities, he or she is to be kept under the supervision of a special juvenile police unit and produced to the board within 24 hrs. The JJ Act, hence, has a framework to try any case of a person under the age of 18 as a juvenile.

It is important to note that the minimum age of criminal responsibility in India is comparatively lower than in the rest of the world. For example, in Germany, the age is 14 years, whereas in England, Wales and Northern Ireland, it is 10 years. In Scotland, the age was recently increased from 8 to 12 years (¹⁵⁹⁵Houses of Parliament, 2018). This undermines the capacity of the Indian judiciary to fairly hold young individuals accountable. Thus, the question of whether the cases are decided through juveniles' mental capacity and cognitive ability to establish mens rea to thereby justify criminal responsibility.

5.2 MENS REA & JUVENILE RESPONSIBILITY

. In many legal systems, as well as in India, a person accused of any crime is presumed to be innocent until proven guilty; hence, the burden of proof lies on the prosecution to establish that the person is criminally responsible/liable. And to do so, it requires essential elements for mens rea and actus reus. and concurrence of both

'Mens rea', otherwise 'guilty mind'- the intent behind the crime, according to ¹⁵⁹⁶More (2025a), "Mens Rea is a state of mind which indicates culpability which is required by the statute as an element of crime" Hence, to hold someone criminally responsible, the law requires mens rea (one of the most important elements), which shows awareness and control over the act. This is necessary to differentiate an act committed deliberately, by accident or without full knowledge. However, when this theory is imposed on juvenile offenders, a series of questions and complexities arise, because establishing mens rea in an individual(adult) requires a full cognitive ability, but since juvenile

¹⁵⁹² Anushka (2017)

¹⁵⁹³ PRS Legislative Research (2024)

¹⁵⁹⁴ Bhatia (2023)

¹⁵⁹⁵ Houses of Parliament (2018)

¹⁵⁹⁶ More (2025a)

offenders are in a developing stage, the ability to understand is incomplete or absent. And if there is no mens rea, the juvenile can't be held criminally responsible; hence, requiring careful assessment of the mental state of the juvenile during the commencement of the crime (¹⁵⁹⁷Bhardwaj, 2022).

Furthermore, the establishment of mens rea differs in the case of a **child in conflict with the law** and a **child in need of care and protection**. When a child in conflict with the law is assessed for their criminal behaviour, it looks into the cognitive capacity, the intention or motive of their actions, of the child in determining mens rea, which generally lacks due to developmental immaturity, whereas when a child in need of care and protection is assessed for its criminal behaviour, its actions are mostly driven by abuse, exploitation, lack of guidance and neglect, which affects their emotions and impulse control, hence mens rea is seen to be almost absent as the actions are due to environmental pressure or survival instinct, therefore although there is an unlawful act but the force/degree of mens rea is completely different. Now it is on the courts and juvenile justice board to determine whether the child is in conflict with the law or in need of care and protection.

When a case involving a juvenile comes before the juvenile justice board under the JJ Act 2000, 2015, it requires not only looking into the age and commitment of the offence but also the mental capacity of the juvenile offender, where the neuropsychological element and assessment become relevant to determine the decision-making, brain development, impulse control, and emotional capacity. The well-scientific research shows that emotional ability, cognitive understanding, long-term judgments and risk-taking develop until early adulthood, hence questioning the interpretation of traditional mens rea in juvenile cases, which involve a full form of cognitive intent. In India, earlier juvenile offenders were not subject to a

death sentence, imprisonment, or severe punishment, but were instead placed under special observation under the juvenile system. In certain cases, where a juvenile is tried as an adult, in the nature of their crime, the establishment of mens rea is important to determine culpability.

In other words, the establishment of mens rea and mental ability is not only important to understand legal liability in juvenile cases but also to determine whether the offender committing a crime is a child in conflict with the law, a child in need of care and protection, or a youth who is to be tried as an adult.

5.3 NIRBHAYA CASE – Criminal Responsibility Questioned

Fact – this case shook the whole nation altogether, the 2012 Delhi gang rape and murder case, also known as the Nirbhaya case. The incident occurred on 16 December 2012 when the victim, along with her friend, was gang raped by six people in a bus, of which one was a minor, when the incident took place. The victim suffered severe injury and later died (¹⁵⁹⁸sharma, 2024).

Judgement – the adults accused were tried on fast-track cases and were found guilty, and later sentenced to the death penalty. However, the juvenile was tried under the JJ Act 2000 and, after an inquiry by the juvenile justice board, was found guilty. He was sent to the juvenile reform home for 3 years, the maximum punishment at that time under the law and was later released in 2015 (¹⁵⁹⁹BBC News, 2020).

The Nirbhaya Case is another pivotal case in the Indian judicial system that led to legal reform in the JJ Act 2000. Case raised an important question of to which extent a minor should be held responsible for heinous crimes, cause one of the accused was a juvenile (17 yrs old) and according to the JJ Act 2000, at that time any person under the age of 18 cannot be tried as an adult and could only be held under

¹⁵⁹⁷ Bhardwaj (2022)

¹⁵⁹⁸ (sharma, 2024)
¹⁵⁹⁹BBC News (2020)

surveillance in juvenile reform homes for maximum of 3 years regardless of the seriousness of the crime. This situation led to a nationwide debate and filing of multiple PILs, further questioning the decision-making of courts, their adjudicating power and the regulating framework of the JJ Act 2000.

This incident also brought light to the conflict between the principle of justice, retribution and the principle of rehabilitation. Many argued whether age should be the only factor in deciding criminal responsibility, especially if the crimes committed are heinous, like murder and rape. It also highlighted that if a juvenile who is clearly able to understand the situation, intention and the consequences of actions committed, should he be exempted from being tried as an adult (as per JJ Act) due to his age, henceforth pushing forward the need for legal reform in the framework of JJ Act 2000 ultimately leading to the introduction of JJ ACT 2015 which allowed juveniles between the age of 16 to 18 to be tried as an adult for heinous offences, may be tried as adult if apprehended after attainment of the age of 21, providing with the punishment of 7 years imprisonment for heinous offences.

6. COGNITIVE NEUROPSYCHOLOGY

Cognitive neuropsychology is the interdisciplinary field of study that emphasises the relationship between the brain and cognitive thinking. It analyses how specific brain structures and systems reinforce mental processes like attention, execution, memory, language, and emotions.

The field aims to explain the normal and abnormal behaviour of individuals by typically using detailed case studies on neurodevelopmental disorders. It helps to figure out how our brain cells, neurons, function mutually to manage thoughts and actions, leading to a deeper understanding of the human brain. ("Cognitive Neuropsychology," n.d.)

It plays a crucial role in creating consciousness about brain disorders and human behaviour among people. As this research evolved, it indicates effective treatments and improved clinical settings.

Central issues:

- ✓ Execution deficit: Delinquent youth with frontal lobe problems often lack control over emotions, verbal memory, and adequate implementation skills. Example: A smart student grasps math but misses deadlines due to forgetting steps, despite effort.
- ✓ High Impulsivity: Children with high impulsivity demonstrates fragile brain control than normal children, due to which they proceed to take rash decisions without recognising further consequences. Example: Yelling at a coworker during a minor disagreement.
- ✓ Interaction with environment: Anti- social behaviour in a child doesn't arise from neuro- developmental issues alone, tough surroundings like abuse, neglect, or peer ignorance are responsible for it. Example: 14-year-old children are often involved in frequent lying and fighting.

6.1 NEURO- DEVELOPMENT OF BRAIN:

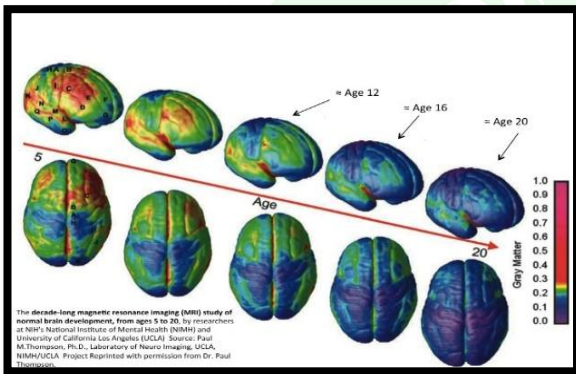
Neurodevelopment refers to the brain's developmental processes of the networks responsible for memory, learning, social skills, interpretation and overall brain development. It refers to the brain behaviour in the context of an immature but rapidly growing brain. In a simple context, it is the process by which a nervous system grows, develops and matures. It underlines the formation of emotional, motor, social, and cognitive functions in an individual (¹⁶⁰⁰Infante, 2024).

- A. **Prefrontal cortex (PFC):** The prefrontal cortex is held accountable for executive functions similar to decision- making, self- control, impulse control, memory, and moral reasoning. These crucial

¹⁶⁰⁰Infante (2024)

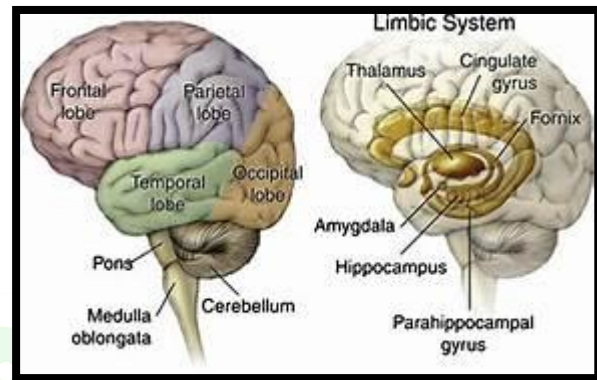
developments take place during an adolescence period (mid-20s). Cognitive control develops gradually and makes improvements in control over childhood.

It also contributes to higher cognitive function, as measured by tests of reasoning, problem-solving, and IQ (1601Bunge et al., 2002). Delayed PFC maturation can cause ADHD (Attention-Deficit/Hyperactivity Disorder). Juveniles with delinquent behaviour often lack cognitive control.



(1602“Brain Development Image,” 2026)

B. Limbic Structure: There are two amygdalae, each located close to the hippocampus, situated in the frontal portion of the temporal lobe on each side – the left and the right – of the brain. Amygdalae control how you feel, such as fear or lack of fear, physical reactions and other emotions. It connects to dopamine pathways, which act as a reward and pleasure system. Overactive amygdala and weak PFC regulation cause excessive anxiety disorders, hormonal shifts and accelerated stress.



(1603Braun, 2011)

C. Balance of Neurotransmitters: Balance of neurotransmitters is essential in our day-to-day life. Dopamine acts as a chemical messenger, communicating between nerve cells. It is known as a “feel- good” hormone; it is part of the reward system. Another neurotransmitter which is essential is serotonin. It is a chemical that carries messages between nerve cells in the brain and throughout the body. It performs various roles in our body, like sleep, memory, happiness, regulating body temperature, sexual behaviour and hunger. Disrupted neurotransmitter balance (serotonin, dopamine) and limbic hypersensitivity lead to depression, withdrawal, and hopelessness.

D. Behavioural consequences: Behavioural consequences refer to the outcomes that follow a specific behaviour, shaping whether that behaviour is likely to happen again. It describes how actions lead to reinforcement or punishments that influence future conduct. Adolescents who are connected to trauma, neglect from family or peers, preferring isolation over social gatherings, or abuse, are capable of experiencing poor emotional regulation. Juveniles who get involved in drug addiction and car crashes have uneven brain development. PFC-limbic

1601 Bunge et al., 2002

1602 (“Brain Development Image,” 2026)

1603 (Braun, 2011)

imbalance boosts reward-seeking and aggression, which causes Conduct Disorder/Antisocial Behaviour.

7. NEURO- DEVELOPMENTAL DISORDERS

Neurodevelopmental disorders are conditions that affect how the brain grows and works, starting in early childhood and often lasting into adulthood. They impact skills like learning, behaviour, social interactions, and movement due to differences in brain development. These can occur in children, teens, and adults, often overlapping, and early understanding helps with management.

A. ADHD (Attention-Deficit/Hyperactivity Disorder):

People with ADHD might daydream a lot. Symptoms include trouble focusing, hyperactivity (restlessness), and impulsivity (acting without thinking). Causes involve genetics, brain structure differences, low birth weight, or prenatal toxin exposure like alcohol. Treatment combines medication, behavioural therapy, and parent training for better focus and self-control.¹⁶⁰⁴Blain, 2022)

B. Autism Spectrum Disorder (ASD)

It includes challenges in social interaction (e.g., avoiding eye contact), repetitive behaviour (hand-flapping), and communication delays. Causes include older parents or environmental factors during pregnancy. Treatment uses behavioural therapies (ABA), speech/occupational therapy.¹⁶⁰⁵Blain, 2022)

C. Anxiety Disorder

Anxiety disorders involve excessive, hard-to-control worry or fear that feels overwhelming, even without real danger. Symptoms include restlessness, fast heartbeat, trouble sleeping, or avoiding situations like

crowds; types include generalised anxiety (constant everyday worries) and panic attacks (sudden, intense fear).

D. Depression

Depression is more than sadness; it's a persistent low mood that drains energy, joy, and motivation for weeks or longer. Common signs are hopelessness, changes in sleep or appetite, trouble concentrating, and withdrawing from activities or people once enjoyed.¹⁶⁰⁶Reed-Guy, 2012)

E. Conduct Disorder/ Anti- Social Behaviour

Conduct disorder shows as repeated rule-breaking, aggression, or disregard for others' rights, often starting in childhood or teens like lying, fighting, stealing, or destroying property. It's linked to antisocial behaviour patterns that can persist if untreated, differing from typical kid mischief by being persistent and harmful.

F. Intellectual Disability

Symptoms of intellectual disability demonstrate delays in thinking, problem-solving, and daily skills (e.g., dressing, learning basics). Causes range from genetic conditions (Down syndrome, Fragile X), prenatal infections/toxins, birth complications, or brain injuries.

8. METHODOLOGY

To carry out a structured approach for this study and understand the decision-making and strategies undertaken throughout the study, I have adapted a research onion model, developed by Saunders, Lewis, and Thornhill (2007).¹⁶⁰⁷Saunders et al., 2007).

This model provides a step-by-step framework for designing coherent research sections by organising them into distinct

¹⁶⁰⁴ (Blain, 2022)
¹⁶⁰⁵ (Blain, 2022)

¹⁶⁰⁶ (Reed-Guy, 2012)
¹⁶⁰⁷ (Saunders et al., 2007)

phases of the research process when observed from the outside.

A. Research Philosophy

This study uses positivism, which advocates the use of observed facts and empirical data to discover the truth and the application of already established laws (1608Dudovskiy, 2024). In this research, the concept is approached through codified laws, legal interpretation and judicial precedent rather than a subjective understanding. Thus, the research examines in depth how neurodevelopment affects legal interpretations of culpability.

B. Research Approach

The following study uses the inductive research approach, which is a process of reasoning and insights are developed from existing literature, case laws and studies.

It examines how neurodevelopmental sciences inform juvenile criminal responsibility using general legal concepts, rather than testing a predefined hypothesis, and how they are used in practice or in a specific case.

C. Research Strategy

This research employs a doctrinal and analytical strategy to achieve the study's objective. This strategy promotes a structural examination and critical evaluation of legal rules and regulations that determine the culpability of juveniles. This helps to better comprehend how present governing laws interpret and judge in cases involving juveniles, and whether they reflect the cognitive development of juveniles.

D. Methodological Choice

This research adopts a qualitative data approach rather than numerical; it focuses on subjective, interpretative and

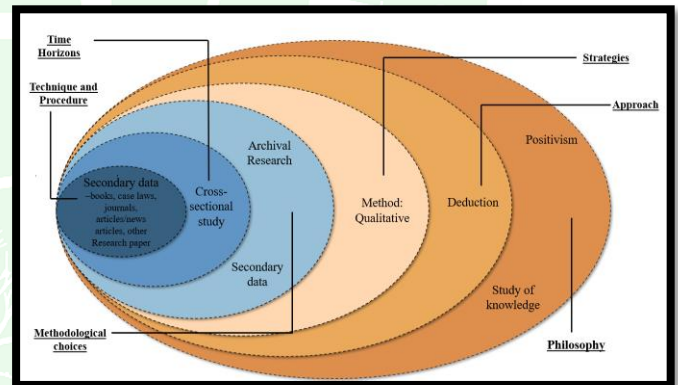
analytical evaluation of data. Since the study deals with theoretical and conceptual issues, this method is the apt one. It helps identify similar patterns, themes, and instances to derive a meaningful conclusion. RCHIVAL RESEARCH

E. Time Horizon

The Time Horizon is the period in which the project is meant to be finished. It is a cross-sectional study, as it collects and analyses data at a specific point in time rather than over a prolonged period.

F. Data Collection

This research relies on secondary data collection methods that involve using existing pre-researched information. The data sources include established theories, books, journal articles, news articles, and case laws. It uses the interpretation from books, articles, cases and legal texts.



(Saunders, Lewis, and Thornhill, 2007)

After reviewing already existing scholarly works, articles and prior research, I identified a research gap which analyses the criminal responsibility of juveniles, particularly in relation to intention, social factors and the question of understanding cognitive ability. Therefore, this research uses qualitative and deductive methodology to interpret the legal provisions and provides an understanding of the neurodevelopment in children (juveniles).

¹⁶⁰⁸ Dudovskiy, 2024

9. ANALYSIS AND DISCUSSION

Juvenile crime and juvenile criminal responsibility are complex issue/connection of legal, psychological and social elements. Psychology shows how a child grows from childhood to the adolescent period and from engaging more with family to peers. Neuroscience clarified how a child's brain develops over a period. It revealed different patterns of immaturity of the brains of children from ages 8 to 16. Child with neuro-developmental brain, especially the prefrontal cortex and limbic system, which help to control impulses, reasoning, and emotional responses, often experience difficulty with their behaviour. Other factors, such as social or biological, also play a crucial role in making them deviant.

These challenges can be overcome through measures such as (¹⁶⁰⁹Saxena, 2025):

1. **Support from legal framework:** Policies or schemes like India's Mission Vatsalya for child protection, alongside they should make awareness about indulging in illegal activities and the further consequences of it.
2. **Educational and Vocational Training:** Provide access to quality education and vocational training to teenagers to reduce poverty and crime rates. Also creating awareness among parents about how their behaviour impact on child.
3. **Psychological Intervention:** Therapeutic approaches like Cognitive Behavioural Theory (CBT) can really be helpful for child to improve their behaviour. That can help people to identify and change dysfunctional beliefs, thoughts, and patterns that contribute to problem behaviour.
4. **Parental and Community training:** Encouraging positive parenting, conflict resolutions, and mandatory workshops to interact with the community can

assist youth to improve their deviant behaviour.

5. **Strengthening the juvenile justice system:** The juvenile justice system should formulate robust laws that provide flawless rules and regulations regarding children.

The justice system should prioritise psychological interventions and make friendly environment in rehabilitation and juvenile observation homes for 'children in need of care and protection' and 'children in conflict with the law'. These findings suggest that juvenile delinquency is a major concern in the current period.

10. CONCLUSION

Currently, every country is facing the problem of increased juvenile delinquency, which stems largely from the immature development of teenager brain, particularly the prefrontal cortex, which is responsible for reasoning, execution, impulse control and decision-making power. Due to immaturity of their brain, they lack mala fide intention or mens rea required for criminal responsibility similar to adults, which makes them separate in culpability and capacity of change. Therefore, juvenile responsibility remains a complex yet evolving idea that demands a careful balancing act between reform and accountability. While it is important to uphold the law, it is also important to impart judgment which prevails justice; hence, it is important to recognise juveniles as individuals who are in a formative stage of life and are capable of change.

Moreover, juvenile delinquents cannot be viewed only through a one lens, but also should take into account other factors such as family environment, socioeconomic condition, lack of education and exposure to violence, which can also shape criminal behaviour. Therefore, rather than labelling a child as a criminal or delinquent, more emphasis should be made toward the solutions to stop juvenile crime and

¹⁶⁰⁹ (Saxena, 2025)

criminal behaviour of the child in conflict with the law.

In the end, a balanced approach to integrate legal reforms, neuro psychology and social responsibility in deciding juvenile delinquencies. More strict enforcement of the law and addressing the root cause that led to the criminal act of the child, therefore need for more periodic revision of laws to ensure justice is both fair and developmentally appropriate.

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