

**Original Article****NEUROLAW AND CHILD AGE LIMIT IN CRIMINAL RESPONSIBILITY**

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ABSTRACT

Background. Currently, research and reviews on the human brain are increasingly supported by continuously developing technological advancements. Thus, children's brain development is more easily comprehended along with the rapid growth of science. In criminal law, this supports the understanding of children's ability to control impulsive behavior. This research aimed to observe children's age limit in taking responsibility for crimes in the Indonesian law system by considering legal theories and science related to the cognitive neural system from the perspective of neurolaw.

Research Method. In this research, the data is obtained from a literature study and analyzed conceptually based on legal regulation in Indonesia usually it's namely normative legal research.

Findings. The result of this research showed that in Indonesia, children can be imposed with criminal responsibility from the age of 12 until before they reach the age of 18. Meanwhile, from the perspective of neurolaw, the brain has not completely developed within that age range, and its shifts are reflected in human behavior. However, due to the gradual transition of brain development, it is impossible to determine an absolute age limit for brain maturity in the range of 12-17 years old, and thus children's criminal cases must be reviewed individually. Therefore, the assistance or explanation of neural/psychiatric experts, besides legal experts, is required in handling children's criminal cases.

Conclusion. Children can be charged with criminal responsibility from 12 to 18 years old, due to brain development shifts.

Keywords: Age, Children, Criminal Law, Neurolaw.

BACKGROUND

The future of this nation is in the hands of the next generation, namely children so the care and handling of children need to always be considered. The preservation of children's rights, including the right to legal protection, needs special attention, especially to create a good person who is physically and mentally healthy in their growth and development [1]. The definition of a child according to the Convention on the Rights of the Child adopted in UN General Assembly Resolution 44/25 on November 20, 1989, is a person under the age of 18, and this definition is also adopted by many countries in the world [2].

In some countries, children are responsible for crimes at a very young age, such as in Brunei at 7 years [3] and Bangladesh which is 9 years [4]. Meanwhile, UNICEF's official document on the systematic response to the minimum limit of child criminal responsibility states that dozens of countries in Europe and five countries in Asia apply a minimum limit of 14 years. The UNICEF document also mentions the General Comment of the Committee on the Rights of the Child, in which General Comment No. 10 of 2007 states that the minimum limit of criminal responsibility of children under 12 years old is not internationally acceptable. This comment was further replaced by General Comment No. 24 of 2019 which recommended countries raise the minimum limit of criminal responsibility for children to 14 years [5].

According to Prof. Judy Cashmore from Sydney Law School, University of Sydney, considerations related to the age of children to account for criminal acts should first be a general health response, because the behavior of children aged 10-14 years is more in need of response and handling in terms of health [6]. Viewed from the psychological side, environmental factors can affect children's brain development, such as environmental factors [7], And thus socioeconomic difficulties also have an impact on children's brain development. This is due to the impact of *toxic stress* [8] caused by socio-economic problems such as violence, poverty, instability in the family, lack of access to early childhood education, and other difficulties.

In criminal theory itself, there are *actus reus* and *mens rea* factors in criminal liability, namely external actions that are objective facts of the crime (*actus reus*) and mental states, intentions, or mental conditions that focus on the subject / subjective that is the background of the crime (*mens rea*) [9]. Thus, criminal liability is influenced by a person's cognitive condition, whereas, cognitive abilities at the age of children and adolescents are still in the developmental stage according to brain development. It is undeniable that biological factors are the *blueprint* of human brain development [10], So a combination of neuroscience and legal (neurological) perspectives is needed in reviewing the minimum age at which children are considered to be able to account for a criminal act.

Motivated by the above conditions, understanding, and considerations, this study will conduct discussions based on the following problem formulation 1) How do regulations in Indonesia regulate the minimum age of children in criminal liability?; 2) What is the neurolegal view regarding the minimum age limit for children in criminal liability? so this research aimed to observe children's age limit in taking responsibility for crimes in the Indonesian law system by considering legal theories and science related to the cognitive neural system from the perspective of neurolaw.

B. METHODOLOGY

The method used in this study is normative legal research with a legislative approach and neuroscience in reviewing data. The primary data in this study is a source of positive law in Indonesia, while the secondary data is in the form of literature sources which include scientific journals, articles, and books obtained by search engines. The analysis is carried out conceptually by examining, distinguishing, and presenting theories and concepts related to the issue of the minimum age for children to carry out criminal responsibility in a neurological view. The legal regulations are Law No. 1 of 1946 concerning Criminal Law Regulations, Law No. 3 of 1997 concerning Children's Courts, Law No. 11 of 2012

concerning the Juvenile Criminal Justice System, and Law No. 1 of 2023 concerning the Criminal Code.

FINDINGS

Regulations related to the Minimum Age Limit for Children in Accountability for Criminal Acts

In the Criminal Code which is the source of material law in Indonesia, criminal acts that make a person can be threatened with criminal sanctions are unlawful in nature. Based on the provisions of Article 45 of Law No. 1 of 1946 concerning the Regulation of Criminal Law, when a person commits an unlawful act, he cannot be held criminally liable if he is not yet 16 years old but is returned to his guardian, parents, or caregivers.

Furthermore, if the unlawful act violates Articles 489-490, Article 492, Articles 496-497, Articles 503-505, Article 514, Articles 517-519, Article 526, Articles 531-532, Article 536, and Article 540, the child offender will be handed over to the government to be placed in a state education house or persons, charitable institutions, foundations, or legal entities in Indonesia no later than the age of 18 years. Then, Article 47 of Law No. 1 of 1946 concerning the Regulation of Criminal Law stipulates a one-third reduction from the maximum principal crime, and if the crime is punishable by life imprisonment or the death penalty, the crime can only be imposed for a maximum of 15 years. In addition, additional crimes cannot be imposed on child offenders under 16 years old, only the principal crime [11].

Furthermore, in 1997, a formal legal source was established that regulates the age limit for criminal responsibility of children who commit unlawful acts, namely Law No. 3 of 1997 concerning Juvenile Court (Juvenile Court Law) which was later replaced by Law No. 11 of 2012 concerning the Juvenile Criminal Justice System (SPPA Law). In the Concluding Provisions of Article 67, the Juvenile Court Law states that Articles 45-47 of the Criminal Law are no longer valid when the Juvenile Court Law comes into force.

Coming into force in 1998, the Juvenile Court Law states that children who commit crimes are called "Delinquent Children", with an age range of 8 years to before 18 years and with the criteria of never having married. Compared to the provisions in Law No. 1 of 1946, the Juvenile Court Law has a minimum limit of 8 years, which was not previously stipulated. Furthermore, if the Delinquent Child who commits the crime is under the age of 12, the child is only subject to the act and not the crime. The actions referred to here are return to guardians/parents/foster parents, submission to the state for further coaching, education, and training, or submission to social departments or social community organizations in the field of coaching, education, and job training.

Regarding the form of crime, according to Article 23, the Juvenile Court Law states that delinquent children can be sentenced to basic and additional crimes, with the main crime which includes imprisonment, confinement, fines, or supervision, as well as additional crimes, namely the confiscation of certain goods or the payment of compensation costs in procedures regulated by Government Regulations. Based on Articles 26, 27, and 28, the maximum imprisonment, confinement, and fine for delinquent children is 1/2 of the maximum threat of imprisonment, confinement, and fine as must be imposed on adults. For crimes punishable by life imprisonment or the death penalty, the child is sentenced to a maximum of 10 years.

After the passing and promulgation of the SPPA Law in 2012 which stated the invalidity of the Juvenile Court Law (Article 106) above, there was a change in the term used to refer to children suspected of committing criminal acts, namely "Children in Conflict with the Law" with an age limit of 12 years until before 18 years, the minimum limit which increased compared to the limit in the Juvenile Court Law. For the record, by focusing on Restorative Justice (Article 5), the SPPA Law also regulates Diversion (Article 1 paragraph 7), which is the settlement of children's cases from the criminal justice process transferred outside criminal justice. If the Diversion process does not reach an agreement or the agreement arising from the Diversion process is not implemented, then the process proceeds to the criminal justice stage.

As in the Juvenile Court Law, in SPPA, children who conflict with the law can be subject to action and sentenced to crimes. Based on the SPPA Law, children aged 12 years to before 14 years can only be subject to action (Article 69) and not criminal conviction. In addition, child detention may only be carried out if the child is 14 years old or older, and the child is suspected of having committed a criminal act that carries a threat of 7 years or more (Article 32). Regarding the form of action or crime, the actions given to return to a guardian/parent or person and treatment at a psychiatric hospital or LPKS, the obligation to participate in formal training and/or education by the government or private entities, the revocation of a driver's license, and/or restoration as a result of a criminal act (Article 82).

Meanwhile, the main crimes that can be imposed are in the form of warning crimes, conditional crimes, job training, and forms of coaching in institutions, and prisons (Article 71). Criminal restrictions on liberty and imprisonment for children can only be imposed for a maximum of 1/2 of the maximum prison sentence threatened to adults. In addition, special minimum provisions related to imprisonment do not apply to children, but the imprisonment provisions contained in the Criminal Code remain valid as long as they do not conflict with the SPPA Law (Article 79).

In 2023, Law No. 1 of 2023 concerning the Criminal Code (KUHP) has been stipulated and promulgated and effective from January 2, 2026, repealing Law No. 1 of 1946 concerning Criminal Law Regulations mentioned at the beginning of the discussion of this section. In line with the SPPA Law, Article 40 and Article 41 of the Criminal Code state that if a criminal offender is under 12 years old, he is not subject to criminal liability but is handed over to his guardian or parents or included in guidance, guidance, or education programs at institutions that provide social welfare or government agencies. The age limit for imposing actions on children in the Criminal Code is also in line with the SPPA Law, which is 12 years to under 14 years old. Reviewing the form of diversion, form of action, and criminal form, the Criminal Code mentions forms that are in line with the SPPA Law, by Article 117 of the Criminal Code which states that these things are carried out by the provisions of laws and regulations.

DISCUSSION

Neurolegal Studies in Setting the Minimum Age for Children

Neurolaw can be defined as a field in which neuroscience and science are connected in a multidisciplinary field to be able to regulate human behavior by understanding that behavior through discoveries and achievements in neuroscience and making it part of the study of law [12]. This field of fusion was introduced by J. Sherrod Taylor in a journal

article titled "Neuropsychologists and Neurolawyers." According to Taylor, competent clinical neuropsychologists can provide convincing evidence related to the lack of brain injury. In his journal article, Taylor mentioned how clinical evidence could be used by claimants with brain injuries could be used as direct evidence that could be *cross-examined* in court [13]. Expert testimony and/or accurate data can be one of the basis for judges' considerations in making legal decisions, so that law enforcers' knowledge in Criminal Law and Criminal Procedure Law can be strengthened by other disciplines, such as psychology, criminology, forensic neurology/psychiatry, forensic physics and chemistry, and so on [14].

Clinical evidence from neuroscience can be one aspect of consideration in the field of neurolaw, and clinical evidence is obtained from the application of *neuroimaging* techniques, or brain imaging, The technology used to perform brain imaging includes *Magnetic Resonance Imaging* (MRI), which can scan parts of the body, including the brain, by emitting radio waves received as energy by the nucleus in the body human. In addition, there is also *functional Magnetic Resonance Imaging* (fMRI) technology, specifically for scanning brain function, which applies MRI techniques dynamically so that it can monitor small changes in blood flow in the brain [15]. In fact, with the development of technology today that begins to apply internet networks between devices, automation, and *Artificial Intelligence* (AI), there has been a discourse that AI will support not only evidence but also prediction and risk assessment, such as through signs someone is lying or other biological signs so that criminal acts can be intervened [16].

In several studies cited by Aono et al. in 2019 on neuroscience evidence in court, especially in Western countries such as the United States, *neuroscience evidence* is one of the considerations that influence jury decisions in criminal courts related to criminal convictions. This is mainly due to the jury's perception of the subject's cognitive state, the extent to which the subject can control himself, and other reasons, such as moral responsibility and free will, that the subject has. In the study, several other factors that influence the decision of the jury in criminal trials are mentioned, namely the type of mental condition (eg schizophrenia versus psychopathy), the level of danger that can be caused by the perpetrator in the future, and the type of criminal conviction (death penalty or not). Although not a determining factor, neuroscience evidence, both through expert testimony and brain imaging evidence, strengthens an argument and affects satisfaction and impact on understanding a psychological phenomenon [17].

Meanwhile, in the context of child crime, cognitive development itself is the growth of the mental ability of a child who commits a criminal act to think reasonably about the evil and immoral nature contained by his actions and their effects. In a study of the *landmark decision of the* criminal case *Roper v. Simmons* in the United States, Arian Petoft describes a review of neuroscience perspectives by citing various findings and conclusions in modern neuroscience studies since the 2000s [18]. Several important points in Petoft's study deserve to be elaborated to understand the neurolegal perspective in terms of juvenile criminal considerations.

First of all, from the physio-anatomical aspect of the brain based on brain fMRI sequences from the age of 4 to 21 years, gray matter in a person's brain is still developing until the age of the person reaches 21 years. Most of the processes that occur in the brain are in this area of gray matter, so physiologically it can be said that before reaching 21 years, the brain still has not reached its maturity level. Cognitive functions, including moral reasoning, are still in their early and advanced stages of development [19].

Second, cognitive development occurs step by step, and in comparison, there are the following differences between the adult brain and the children's brain: impulse control, reward-derived motivation, emotional responses, and moral and social perceptions. These differences, in more detail, include reflex responses, planning, monitoring performance, brain processes to reward, basic emotional behavior, reflex emotions, responses to social norms and conventions, moral reasoning, and understanding of others (social reasoning). Given these physio-anatomical aspects and cognitive development, children should be treated differently from adults [20] legally without negating their criminal responsibility.

Still related to cognitive processes, key cognitive aspects namely social, emotional, and motivational aspects in the brain are coordinated from the prefrontal cortex [21]. Associated with the issue of the age limit in the responsibility of criminal acts by children in Indonesia, the age limit according to the provisions of the Criminal Code and the latest SPPA Law is 12 years and before 18 years. By age 12, one of the cognitive functions of attention seems to mature, and the child transitions from concrete thinking to abstract thinking, and the ability to imagine the outcome of something and cause-and-effect relationships begins to develop [22,23]. Meanwhile, cognitive planning function only develops by age 12, so compared to adults, children and adolescents in general are still unskilled [24].

In a study by Mercurio et al. titled "*Adolescent Brain and Legal Responsibility*," there are other important factors to note in children's brain development, including those aged 12 to before 18. First, there is behavior that is still based on rewards and not on the consequences of an action. Second, there is pressure from friends, where there is a possibility of a teenager doing risky actions when with his friends. Third, there is risky decision-making, which is influenced by the rudimentary development of the part of the brain that functions to plan, combined with emotional reactivity that also still occurs at that time [25]. The three factors above can also influence each other, thus increasing the possibility of children being involved in risky activities, including activities that violate the law. Sensitivity to *rewards*, both material and social (e.g., acceptance of the child by friends, praise, etc.) combined with the child's emotional reactivity reflects the impact of the function of the prefrontal cortex that is still developing.

Keep in mind that brain development of children at the age of 12 to 18 years is a process that takes place gradually and slowly throughout these years, and even into young adulthood, so an absolute or concrete age limit for brain maturity cannot be set and applied generally. However, discoveries and knowledge in neuroscience are undeniable facts, especially the influence of brain development on the behavior of children and adolescents that make them have to be treated differently legally, again without negating their responsibility before the law through the enactment of criminal acts or convictions.

Given that the process of brain development occurs slowly and gradually as mentioned above, the application of a neurolegal perspective to a juvenile criminal case or a child's actions requires a special review of each case individually by both a neurologist and a legal expert because the child can be at different points in his development. In addition, as Mercurio et al. explain, *neuroscience* factors are not the only determinants of unlawful actions, as in the case of environmental pressure or *peer pressure*, so in the review of juvenile criminal case law, these factors must still be taken into consideration.

CONCLUSION

Indonesia's Criminal Code and the SPPA Law regulate the minimum limit of criminal liability for children. The age limit for children responsible for their criminal acts has been changed from 16 to 18 years, with the current SPPA Law focusing on Restorative Justice, prioritizing restoration over retaliation. The prefrontal cortex, which regulates emotional, social, and motivational cognitive functions, is not fully developed at 12 years. Legal handling of child criminal cases must consider the child's brain development, supported by evidence and testimony from neurologists and legal experts. This ensures justice for victims without compromising the child's welfare and freedom. To implement child criminal treatment at the 12-year age limit, a competent neurologist/psychiatrist and legal experts must be present to ensure fair and restorative law enforcement. Future reviews are needed to enrich studies in this field and create comprehensive justice for children as the next generation of the Indonesian nation.

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