

# **Criminological and Philosophical Explanations for the Formation of Homicidal Ideation and the Role of Serotonin (5-HT) in Controlling Aggressive Behavior**

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**ABSTRACT:** From a criminological point of view, the passage to the act represents the concrete materialization of the volitional act of crime, but also the manifestation of the homicidal ideation (hidden in the darkness of the unconscious) as an active shadow of the darkness of criminal preparation (before thinking), which opens its death drive, in the intangible world of the symbolic and penetrates the reality of criminal causality. From a philosophical point of view, it must be explained how the unconditionality of the crime becomes an essential condition for the commission of the criminal act. This article also analyzes the effect of serotonin (5-HT) in the neural control of the manifestation of aggressive behavior. Impulsive aggression, depression, personality disorders, drug abuse, are associated with a dysfunction in the serotonin system (5-HT). The neurobiology of violence examines the serotonergic system and proposes in some cases therapeutic action. The role of the amygdala in the process of emotional, affective and motivational representations is essential. Imaging studies that reported significant correlations between amygdala activity and emotional memory are also analyzed.

**KEYWORDS:** homicidal ideation, serotonin (5-HT), amygdala, aggressive behavior

## **Introduction**

In a recent study published in the *Journal of Forensic Sciences*, homicide is considered the most serious and costly crime (Carbone, Holzer, Vaughn, DeLisi 2020). From a criminological point of view, the potential psycho-behavioral precursor of criminal behavior is homicidal ideation (Carbone, Holzer, Vaughn, DeLisi 2020). According to the latest official data, there are an estimated 17,284 homicides a year in the United States, and the average cost of homicide is \$ 17.25 million (Carbone, Holzer, Vaughn, DeLisi 2020). There are also situations when the costs of victims, the costs of criminal justice, the lost productivity of criminals who do not work and do not pay taxes, the public costs suffered by the community through the damage created can reach certain violent criminals with a long criminal career and \$ 150 million, individually (DeLisi et al. 2010). Tax homicide taxes in the United States annually amount to \$298.15 billion (Carbone, Holzer, Vaughn, DeLisi 2020).

A recent study found that 1 in 20 young British people met the criteria for two or more mental disorders; behavioral problems in childhood correlate phenotypically, suggesting a general dimension of psychopathology, which has been called the p factor (Allegrini et al. 2020). The p factor is hereditary (50% - 60%) and manifests itself consistently at different ages. Studies indicate a genetic overlap between the general risk of psychiatric disorders in adulthood and the p factor in childhood, even from the age of 7 (Allegrini et al. 2020). Crime increases in early adolescence, around the age of 14, reaching a peak between 20 and 25 years (when the maximum is reached) and then begins to decrease (Rocque, Posick, Hoyle, 2015, in a study on the age-crime curve).

## **Homicidal ideation**

Homicidal ideation is defined by the presence of thoughts about committing a lethal violent act against specific (identifiable) or nonspecific (having a general character) targets, regardless of whether the homicide was committed (completed with the death of the victim), attempted (attempt) or just prepared (preparatory acts) (Carbone, Holzer, Vaughn, DeLisi 2020). Etienne De Greeff in Introduction to Criminology presented the criminogenic process (the stages by which the criminal

act is carried out) and stated that man is never fully described by the finality of the very serious act he committed, but only a part of his personality can be translated the accomplishment of the absolute material act (De Greeff 1946). The inner attitude that directs these absolute acts is not in full agreement with their outer manifestation. Attitude describes the psyche from which it emanates (De Greeff 1946). In the first stage of the criminogenic process, the homicidal ideation is indefinite, improbable. Raoul Allier calls this stage “ineffective assent” (in *La Psychologie de la conversion chez peuples noncivilises*, 1925, Payot, Paris). This stage does not imply external action or behavior of the subject, but only tacit acceptance of the presence of the homicidal idea, which is born in the perpetrator's being and begins to form the germs that precede the passage to the act. Stephen Costello, analyzing Lacan's psychoanalysis as a dialectical operation, presents the notion of unconscious speech, that inner voice that speaks to us and that undermines the conscious thinking of the subject (Costello 2017). The homicidal ideation appears from the limit of the criminal preconscious and pushes the perpetrator towards the encounter of the Real, which is revealed only as a traumatic presence. In order to resist the Real, the neurotic subject sometimes constructs his fantasies, because the reality belongs to death, desire and sexual pleasures. The real repeats the shock of birth, the trauma of the perpetrator who becomes aware of his unjustified presence in the world (Costello 2017). Lacan believes that the perpetrator must be ethically responsible for both his intentional conscious acts and unconscious and seemingly accidental failed acts (Costello 2017). By consciously assuming the unconscious death drive, suicide is considered by Lacan the only completely successful act, because suicide expresses both the conscious intention of the Self and the unconscious intention of the Self (Costello 2017). Acting-out for Lacan is a symptom, it is the beginning of the transfer and it results from the failure to remember the past. Emphasis is addressed to the Other, the subject offers himself to the analyst and expresses his message through action, his behavior betrays unconscious desires (Costello 2017). To get rid of guilt (self-punitive paranoia, a term introduced by Lacan) and unbearable anxiety, the perpetrator resorts to the act, ie gives up the imaginary world, symbolism and fantasies, and accepts breaking ties with the social world, the criminal act expresses the will to power of the subject who identifies with the object of the criminal act. The passage to the act is a transgression of the symbolic order in Real (Costello 2017). Homicidal ideation occurs very often in patients with antisocial personality disorder, schizophrenia, psychotic disorders with a delusional content based on persecution and has been associated with criminal career. The conjugal aggressors, the rapists, the serial killers confess that the homicidal ideation is present and precedes the transition to the act of committing the criminal act. Patients with schizophrenia were 12 times more likely to experience homicidal ideation, and those with antisocial personality disorder 25 times more likely than people with psychotic disorder. (Coal, Holzer, Vaughn, DeLisi 2020). Young people who have problems with self-control, who suffer from emotional disorders and lack of emotional regulation, with lower socioeconomic status and without financial security experience homicidal thoughts, and are prone to antisocial behavior (Carbone, Holzer, Vaughn, DeLisi 2020). When suicidal thoughts or homicidal ideation appear, psychosocial and medical intervention is recommended. The risk increases greatly when there have been patients in the family with aggressive or suicidal behavior. Experiences of criminal thinking exist only insofar as the criminal self is aware of them and agrees to expose them, to take them out of its private world.

### **Philosophical aspects regarding the psychic constituents of thought**

From a philosophical point of view, the internal process by which the homicidal ideation appears in consciousness and deforms the personality structure of the perpetrator must be explained, becoming an essential cause of the criminal act. In “Letters on the Tractatus” Ludwig Wittgenstein explains to Russell the difference between fact and state of affairs. Thought is a fact, and thought (Gedanke) must have constituents that correspond to the words in the language (Wittgenstein 2012).

“Is thought (Gedanke) made up of words? Not! But from psychic constituents that have the same kind of relationship with the reality that words have. I do not know what these constituents are” (Wittgenstein 2012, *Letters on the Tractatus*, p. 100).

Wittgenstein argues that the relationship between the constituents of thought and those of the represented fact is a matter of psychology. Mircea Flonta in the introduction to *Tractatus Logico-Philosophicus* considers that for Wittgenstein the will, as a bearer of ethics will not change the facts of the world, these boundaries change according to the way we understand to manifest in the world, according to the way we live our lives; good and evil exist only in relation to the subject, with the will as a noumenal existence. Studies on free will, personality and cognitive improvement must be analyzed by neuroethics (Canli 2015). In the *Critique of Practical Reason*, Kant (1999, 223) considers that everything of nature acts according to laws, and the will is the causality of a living being. “Only a rational being has the faculty to act according to the representations of the laws, according to the principles, that is, only she has a will.” In the *Critique of Pure Reason*, Kant (1994, 351) argues that the unconditional is never encountered in experience, but only in the Idea, it is transcendental. “If the conditional is given, then the whole sum of conditions is also given, therefore the absolute unconditional, which alone makes the conditioned possible.” The passage to the act is based on the totality of the conditions that allowed the appearance of the homicidal ideation in the being of the perpetrator. Presenting the structure of the psychic apparatus in his book on psychoanalysis, Sigmund Freud (2014, 173) considers that psychic life is conditioned by its physical organ and place of action, the brain (nervous system), but also by the acts of our consciousness, “which exist directly and cannot be brought closer by no description. Everything between them is unknown to us, a direct relationship between the two end points of our knowledge is not given to us.” Individual conduct involves directing actions in a certain way by making a decision; the attempt to establish the unique and appropriate purpose of the action is based on the intention to achieve this goal, followed by the elaboration of the mental plan for carrying out the action (Tănăsescu 2018). In the deliberation, certain processes are carried out to investigate the conditions for carrying out the criminal activity, evaluating its effects in objective reality. Following the analysis of the meanings, motives and purpose pursued, the mental plan for the concrete realization of the criminal activity is finalized by making the decision to commit the crime (Tănăsescu 2012).

### **Intergenerational transmission of violence**

An unhappy childhood in which the victim is physically and mentally abused can transform an individual's personality, sometimes with the risk of antisocial behavior during adolescence, or later in adulthood. Elizabeth Tomsich (2016) in her study on the cycle of violence argues that we can find in certain situations causal links between physical abuse in childhood and violence in adolescence or adulthood. Child abuse in childhood has a high risk of committing violence later in life; for these children there is a 38% higher risk of being arrested for a violent crime, compared to control cases, which had no history of childhood abuse. The theory of the cycle of violence is not deterministic; it proposes that childhood abuse increases the risk of violence later in life of the subjects analyzed, compared to those who are not victimized; this theory is known as the hypothesis of intergenerational transmission of violence (Tomsich 2016). Since 1973, the symptoms of Stockholm Syndrome have been recognized in other abusive situations, such as victims of domestic violence or child abuse, with aspects of intergenerational transmission of violent behavior and serious implications for the development of criminal behavior, potential therapy and social issues regarding the reintegration of victims (Hegheş and Şchiopu 2019).

### **5-HTTLPR genotype and SLC6A4 methylation**

The brain is a network of billions of neurons bathed in chemicals called neurotransmitters, which allow neurons to transmit information to each other (Barrett 2017). The receptive field of a neuron

depends on the information it receives, ie it depends on its neural context at that time (Barrett 2017). The brain can be considered an anatomical structure of neurons, which can create an amazing number of spatiotemporal patterns (Barrett 2017). The basic task of the brain (allostasis) is to provide the resources of the physiological systems in the person's body, necessary for the process of growth, survival and reproduction; the brain classifies its sensations to make sense of them and constructs emotional events through connections that originate in cortical regions (Barrett 2017).

DNA methylation plays an important role in maintaining genetic stability and is essential for mammalian development; DNA methylation is a promising biomarker for many applications (Tost 2010). DNA methylation patterns are likely to change in response to environmental stimuli, such as toxins, diet, stress, the epigenome being the most vulnerable during early development in utero (Tost 2010). DNA methylation models can predict and monitor the response to cancer treatment; Aberrant changes in DNA methylation have been detected in several diseases, especially in cancer, where hypomethylation at the genome coincides with gene-specific hypermethylation (Tost 2010).

Elif Duman and Turhan Canli publish in 2015 a study on the influence of life stress, 5-HTTLPR genotype and SLC6A4 methylation on gene expression and stress response in healthy Caucasian men. The authors try to find the relationship between stressful life experiences in childhood, adolescence, adulthood, 5-HTTLPR genotype and SLC6A4 methylation. This study suggests that individual differences in the SLC6A4 gene in DNA methylation could underlie the mechanism by which stressful life events could regulate gene expression (Duman and Canli 2015). Both early (childhood, adolescence) and recent stress modify DNA methylation depending on the 5-HTTLPR genotype; these changes are also reflected in gene expression and cortisol response, affecting individuals' stress response differently (Duman and Canli 2015). SLC6A4 is a serotonin transporter gene, important for researchers in deciphering its interaction with stressful life events; serotonin (5-hydroxytryptamine, 5-HT) is a very important neurotransmitter that regulates the stress response of the hypothalamic-pituitary-adrenal axis (HPA); the serotonin transporter is responsible for the reuptake of excess serotonin into the synaptic cleft (Duman and Canli 2015). The main function of the serotonin transporter is to remove serotonin from the synapse, returning it to the presynaptic neuron, where the transmitter can be downgraded or relaunched later (Karg, Burmeister, Shedden 2011). Serotonergic neurotransmission influences human behavior regarding sexual activity, motor and sensory activity, the process of knowledge, affective-emotional behavior, food consumption and social communication; individuals who carry at least one copy of the short version of 5-HTTLPR have a higher activity of the anterior cingulate cortex (which has an important role related to cognitive function, empathy, decision-making, emotion); the short version of 5-HTTLPR is associated with neuroticism, which is a risk factor for depression; gene-environment interactions make individuals vulnerable to depression (Canli and Lesch 2007). Maternal separation in the first months of life results in poor social adjustment, interaction problems - in monkeys *Macaca mulatta*; these deficiencies are related to the function of the serotonergic system (Canli and Lesch 2007). Niklas Nordquist and Lars Oreland hypothesize that the dual role of serotonin as a neurotransmitter and neurotrophic factor has a significant impact on the behavior and risk of neuropsychiatric disorders through the altered development of the limbic neurocircuit involved in emotional processing and development of serotonergic neurons during development. The study data can be explained if the association between serotonin and conditions of behavioral and psychiatric disorders were mainly a consequence of events that occur during fetal and neonatal brain development (Nordquist, Oreland, 2010). The neurotransmitters serotonin and dopamine play an important role in the basic neurobiology of different behaviors; dopamine influences the behavior compared to the usual response, and serotonin compensates for this phenomenon and directs balance towards a more flexible, subject-oriented response (Sanchez et al. 2015). The function of serotonin in the central nervous system modulates the balance between the usual goal-oriented behavior control systems and stimulus response (Sanchez et al. 2015). Serotonin deficiency has been associated with a higher propensity for violent outbreaks and has been supported by studies in patients with antisocial personality disorder, impulsive aggression, and type II alcoholism (Quadros, Takahashi, Miczek 2010). The effects of gene-environment interaction have been investigated among low-income

children, vulnerable to antisocial development, abused and without receiving special treatment (Cicchetti, Rogosch, Thibodeau 2012). The 5-HTTLPR interaction and the time of development of abuse indicated more severe antisocial outcomes for children with early onset and recurrent abuse based on genotype (Cicchetti, Rogosch, Thibodeau 2012). One method of directly lowering the central level of 5-HT and observing the causal effect of serotonin is acute depletion of tryptophan (an amino acid that is used in protein biosynthesis); a small amount of tryptophan, the precursor of the amino acids serotonin, leads to decreased brain levels of serotonin (Kramer, Riba, Richter, Munte 2011). Carriers of the short-variant 5-HTTLPR compared to non-carriers showed significantly greater amygdala activation during an emotion-related pregnancy in response to emotional stimuli. Tonsil activation reflects subjective emotional experience and improves memory in relation to the emotional intensity of the experience (Canli et al. 2000). The amygdala is sensitive to the emotional intensity of a stimulus; amygdala activation reflects a certain flexibility, which rapidly changes the emotional response in a given situation (Canli et al. 2000). Direct (offensive) aggression is related to serotonergic neuronal activity, while impulse-aggression violence is related to 5-HT activity (Berend 2004). There is some evidence that receptor antagonists (eg, risperidone) inhibit aggressive behavior in patients with various mental disorders, including depression or schizophrenia (Berend 2004). Ulrike Kramer and colleagues are conducting a study examining the role of serotonin in reactive aggression through acute tryptophan depletion. Acute tryptophan depletion (called ATD in the study) attempts to stimulate aggression through provocation. Behavioral data showed a decreasing effect of ATD aggression in participants with low aggressive behavior, while no ATD effect was detected in participants with high aggressive behavior (Kramer, Riba, Richter, Munte 2011).

## Conclusions

Carriers of the short version 5-HTTLPR are twice as likely to suffer from mental disorders and depression after stressful events - death of loved ones, failure in romantic relationships, serious illness, job loss, childhood abuse; they have a predisposition to ruminations associated with increased vulnerability to stress; the cellular substrate through which the link between genes and the environment is created could shape social behavior; individuals respond differently to stress depending on the 5-HTTLPR genotype; this reflects mechanisms that affect structural connectivity and functionality within the neural circuit; gene-environment interactions make individuals vulnerable to depression (Canli and Lesch 2007).

The meaning of a sensory event does not trigger the action, but results from it; emotions are constructions of the world, not reactions to it (Barrett 2017). The Self that appears in the unconscious phantom as a subordinate or ideal personality (Jung 2011) is dependent on its own interoception. The inner life of the individual, with its existential data, influences the social behavior. The social event of the world triggers the sensory event of the being. The reaction to the stress of life, to the social or antisocial acts of one's peers is always a personal reaction. We can only guess how the personality, influenced by suicidal thoughts and homicidal ideation, will respond to aggression and stimuli in society.

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