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Commentary

MALE VIOLENCE AGAINST WOMEN: INTEGRATION BETWEEN PSYCHOLOGICAL AND NEUROSCIENTIFIC DATA AND THEIR USE IN FORENSIC EVALUATION FOR THE JUDGMENTS

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ABSTRACT

Human growth and development, starting from conception, are characterized by a progressive increase in body and organ dimensions, as well as specific functional maturity, under the influence of genetic as well as environmental and epigenetic determinants. Beyond a possible normal familial trait, increased fetal growth resulting in a large for gestational age newborn, isolated macrosomia or that associated with congenital malformation, can be attributable to both maternal metabolic and genetic pathology. Overgrowth syndromes are a heterogeneous group of diseases characterized by excessive tissue development often concomitant to neurodevelopmental involvement. Recently, an increased risk of fetal overgrowth with Assisted Reproductive Technology has been reported. Thus, in pediatric practice, it is fundamental to monitor any patient who presents with increased growth parameters, variable malformations, neurodevelopmental delay, and distinctive features from birth, aiming to ensure as adequate a medical management as possible, and for some of the disorders, strict tumor monitoring is also necessary.

1. The psychological perspective

The processes underlying violent behavior, its origins, and characteristics, have always been a subject of study in the field of psychology. With regard to the study of violent behavior of men against women in particular, the studies carried out by attachment theorists have offered notable contributions to this issue by expanding the framework of knowledge outlined in classical psychoanalytic theory. [1]

Since it is possible to identify profiles and personalities which are different in those who have perpetrated physical violence compared to psychological violence, attachment theory scholars have highlighted that such behaviors could be connected to a condition involving a disorganization of the attachment system that originates in childhood. When this condition is associated with some anomalies in neurobiological development, it can seriously affect cognitive development.

Current research using a multidimensional framework (bio-psycho-socio-relational) that helps to elaborate the bases for violent behavior against women presents a growing opportunity to address these issues more effectively. An example of this would be the use of neuroscience in forensics.

Attachment theorists have highlighted that abused children, children who have had a relationship with a threatening and/or frightening caregiver (children who have experienced an unstable and careless family environment, characterized by conflicts in the parental couple, severe and inappropriate punishments by parents, situations of severe rejection or neglecting) can show an "unresolved state of mind for abuse," structuring, consequently, an strongly dysfunctional internal working model ("insecure style") of self, others and relationships. This model of insecure attachment does not favor the development of the "reflective function," and according to different authors, this could be an important risk factor for severe mental disorders.

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Furthermore, the poor quality of early attachment experiences would seem to constitute a risk factor, in adulthood, for sexual offending behaviors, violence and maltreatment behaviors [2,3,4,5]

There are two categories of violent acts against women, both linked to dysfunctional attachment relationships. Impulsive attacks are carried out as a consequence of minimal provocation, but in a state of mind characterized by the perpetrator as being uncontrollable and overwhelmingly full of rage; conversely, in the premeditated attacks of "predatory" violence against women, the perpetrator carefully plans the attacks, which lack plausibility.[6, 7, 8] In violent men, the disorganized representation of self is something from which he cannot escape because it is experienced from within the self and it manifests as an overwhelming need to control the partner. This "persecutory" disorganized self-representation is projected onto a woman whose body acts as a vehicle for the violent man's intolerable mental state. The violence of the Self (of the abuser) towards the "body of the other" (victim) can be a way of either "controlling" his own mental states andaffections invested in the condition of the body or of destroying "ideas" projected "inside" the body of the other. Therefore, when the independent mental existence of the Other threatens this process of externalization, these men feel desperate and resort to violence. [6,9, 10]

Psychological maltreatment, on the other hand, would be carried out mainly by those subjects in whom the perverse trait affects the narcissistic disorder (not "malignant"), as described in in DSM 5 and, more broadly, in PDM 2. [11, 12]

Summarizing a large number of studies, although not all of them concordant, it could be said that, in a general and schematic way, many of the subjects who systematically carry out acts of physical and/or psychological violence against their partners can be included in the framework of "overt narcissism" or in the context of "covert narcissism". [4, 13, 14, 11, 15]

2. The neuroscience perspective

The issue of violence against women has also been studied from the neuroscientific perspective.

It is commonly understood that the major goal of neuroscience research is to provide a complete understanding of the structure and function of the central nervous system and the relationship between neural processes and behaviors through a molecular, genetic, and biochemical approach.

In the last decade, progress in the study of neuroscience has provided useful contributions both in scientific and legal fields. Various studies have suggested that violent behavior is associated with structural abnormalities of Male violence against women in several brain areas, which are highlighted by structural and functional brain imaging. [16]

These findings are supported by observation of evident morphological and functional changes in the brains of criminal or traumatic injuries involving the frontal lobes [17, 18] as well as in other brain structures such as the hippocampus, temporal and limbic areas and the amygdala.[19, 20] As reported by Gregory et al., a grey matter reduction in medial and lateral areas of the orbito-frontal cortex is observed in psychopathic subjects as assessed by structural magnetic resonance imaging and volumetric voxel-based morphometry analyses.[21]

It is widely known that the subcortical structures are involved in regulating higher cerebral processes that control cognition, decision-making, the planning of complex behavioral strategies, and neuropsychiatric symptoms**.**

Recent studies suggest that multiple brain regions are implicated in brain impairments, such as the amygdala, insula, and the superior temporal gyrus in both males and females. [22]

Brain-imaging research has documented structural and functional brain abnormalities in association with violence as well as related conditions such as psychopathy, criminality and aggression. [23]

Prefrontal impairments are particularly well-replicated, although the functional neuroanatomy of violence is likely complex, involving impairments to neural networks subserving emotion regulation, moral decision-making and impulse control. [24]

Violent and aggressive individuals may also show enhancement of striatal structure/function and significant volume reductions in the left orbital frontal cortex, right anterior cingulate cortex and the amygdala. [25, 26]

Overall, violence meets the neurodevelopmental criterion of being characterized by abnormalities in brain structure and function, although what remains to be seen is how early in life these brain abnormalities predict violence later in adult life.

Anatomical alteration found in violent individuals could be a result of genetic influence. [27, 28]

Several gene variants have been associated with aggressive and violent behavior.

Increasing evidence suggests that there are other genes that are linked to aggressive behavior and antisocial personality disorder in humans. The majority of these candidate genes related to the development of aggressive behaviours are genes of the dopamine, serotonin, and norepinephrine neurotransmitter systems. [29] Particularly, common alleles of some serotonin pathway genes, including those involved in its degradation (as explained, monoamine oxidase A, MAOA), or its re-uptake into pre-synaptic neurons (SERT), have been shown to confer functional variation.

In summary, at present no certain correlation has been demonstrated between neuroscientific data and the phenomenon of violence against women; probably, violence against women is not a psychiatric pathology but a kind of behaviour that might be related to many pathologic and socio-cultural factors.

3. Multidimensional integration

Genomic Increasing neuroscientific knowledge has led to a debate on the interaction between cognitive neuroscience and neurolaw.

The use of neuroscientific data has recently appeared in European Courts and been met with divergent reactions. In two cases which were settled in Italy in 2009 and 2011 neurogenetics and neuroimaging evidence led to mitigated sentences due to the fact that they putatively demonstrated a tendency towards aggressive behavior (Court of Appeal of Trieste on September 2011) and the presence of a mental disorder (Court of Appeal of Como on 2009). [30]

Both decisions were criticized by several scientists not only due to the general methodological problem of applying statistically mediated group findings to individual cases, but also due to foundational theoretical difficulties regarding the proof of a casual relation between genetic predisposition, violent behavior and psychiatric disorder. [31, 32]

From the legal point of view, the debate generated by neuroscience findings poses some key questions: how can these findings be transferred and applied to the legal system?

Could neuroscience data be considered an "objective and evidence-based" proof of deterministic behaviour?

Is it possible to use these findings as a tool to better evaluate penal liability? and where violence is a form of culture, as in the case of mutilations, how should psychological data be interpreted? [33]

According to some scholars, neuroscience is close to providing the definitive empirical demonstration that every human behavior is only the mechanistic outcome of a brain process; in this perspective, a free and conscious will would exist exclusively as a manifestation of neuronal connections.

According to other researchers, although neuroscience is able to identify the subjects' predisposition to violent and antisocial behaviours in the light of psychological and social factors, we still have no tools or systems to help us ascertain whether this predisposition will actually become concrete. [34]

Undoubtedly, contributions from the neuroscience field are useful to explain the complex interaction between brain, mental states, and behaviour, but neuroscientific evidence in the legal system is not solely used to ascertain the guilt or not of the accused. In order to have a juridical value, this neuroscientific evidence should be related to clinical evidence that is gathered through psychological methods of analysis. In the assessment of criminal responsibility, neuroscientific evidence could be used to support traditional psychological and psychometric methods.

Nowadays, neuroimaging and genetic studies can assist in diagnosis of neurological and psychiatric illnesses, but cannot be considered as proof to ascertain the partial or total reduction of the cognitive and volitive faculties (conditions for diminished or not responsibility as required by Italian penal code) in order to establish the imputability of the offender.

For these reasons, experts recommend a critical approach to the application of neuroscientific data in criminal lawsuits to reduce misinterpretations in the legal field. [35]

It should be emphasized that various critical issues are related to the use of neuroscience evidence in legal processes, [36] considering that Daubert remains the ruling guide on how to approach the admissibility of scientific evidence in a Court.

Functional magnetic resonance imagery (fMRI) is the most used in the forensic field, but the small numbers of tested subjects means that the results cannot be applied to a general population in a legal setting. Judges often make the mistake of interpreting neuroimaging data as objective evidence of mental illness, assuming that the diagnosis of the illness can be made on the basis of brain images.

Instead, neuroimaging techniques and genetic data are methods that can assist in the diagnosis of neurological and psychiatric illnesses, but no study has been able to show a causal relationship between brain structure anomalies, psychological functions and psychiatric illness. [37]

It should be highlighted that neuroimaging techniques are always performed after the individual has committed the offence, so that they are not able to provide information on the mental state of the accused at the crucial moment, when the crime was actually committed.

It is essential to remember that no one can reconstruct *post hoc* what took place in someone's brain/mind at the time of a crime.

In conclusion, it is necessary for future research to include coordinated, interdisciplinary efforts that engage clinicians, jurists, scientists, legal scholars and lawmakers to identify a common and standardized approach in order to integrate neuroscientific evidence into legal practice.

References

1) Freud S. *Instincts and their Vicissitudes. Complete Works, Standard ed., Vol. XIV*. London, Hogarth Press, 1915.
2) Fonagy P. *Attachment Theory and Psychoanalysis*, London, Karnac Books, 2001.
3) Simonelli C, Petruccelli F and Vizzari V. *Le perversioni sessuali*. Milano, Franco Angeli, 2004.
4) Kernberg O. *Aggression in Personality Disorders and Perversions*. New Haven, Yale University Press, 1992.
5) Fonagy P. Male perpetrators of violence against women: An attachment theory perspective. J Appl Psychoanal Stud 1999; 1: 7-27.
6) Farrington DP, Gaffney H and Ttofi MM. Systematic reviews of explanatory risk factors for violence, offending, and delinquency. Aggressive *behave* 2017; 33: 24–36.
7) Dutton DG. Male abusiveness in intimate relationships. Clin Psychol Rev 1995; 15: 567-581.
8) Saunders DG. A typology of men who batter: Three types derived from cluster analysis. Am J Orthopsychiatry 1992; 62: 264-275.
9) Fonagy P and Target M. Towards understanding violence: The use of the body and the role of the father. Int J Psychol Psychoanal 1995; 76: 487–502.
10) TullioV, Zerbo S, Lanzarone A, et al. The violence of men against women: Medico-legal and psychological issues. Med Leg J 2019; 0(0): 1-4.
11) Jung CG. *A Review of the Complex Theory. CG Jung Collected Works, Vol. VIII*, New York, Princeton University Press, 1934.
12) Sánchez-Medina A. Perverse Thought. Int J Psychol Psychoanal 2002; 83: 1345-1359.
13) American Psychiatric Association, *DSM-5. Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*, Washington, American Psychiatric Publishing, 2013.
14) Lingiardi V and McWillims N (eds.). *Psychodynamic Diagnostic Manual, Second Edition*. New York, The Guilford Press, 2017.
15) Kohut H. *The analysis of the self*. New York, International Universities Press, 1971.
16) Yang Y, Glenn AL and Raine A. Brain abnormalities in antisocial individuals: implications for the law. Behav Sci La*w* 2008; 26:65-83.
17) Raine A. Is prefrontal cortex thinning specific for antisocial personality disorder? Arch Gen Psychiatry 2001*;* 58, 402–403.
18) Krajbich I, Adolphs R, Tranel D, et al. Economic games quantify diminished sense of guilt in patients with damage to the prefrontal cortex. J Neurosci 2009*;* 29: 2188-2192.
19) Raine A, Lencz T, Taylor K, et al. Corpus callosum abnormalities in psychopathic antisocial individuals. Arch Gen Psychiatry 2003; 60:1134-1142.
20) Yang, Y, Raine A, Narr K, et al. Localization of deformations within the amygdala in individuals with psychopathy. Arch Gen Psychiatry 2009; 66:986–994.
21) Gregory S, Ffytche D, Simmons A, et al. The antisocial brain: psychopathy matters. Arch Gen Psychiatry 2012; 69: 962-72.
22) Rogers JC and De Brito SA. Cortical and subcortical gray matter volume in youths with conduct problems: A meta-analysis. JAMA Psychiatry, 2016; 73: 64–72.

23) Glenn A, Raine L, Yaralian A, et al. Increased volume of the striatum in psychopathic individuals. Biol Psychiatry 2010; 67: 52–58.
24) Raine A and Yang Y. Neural foundations to moral reasoning and antisocial behavior. Soc, Cogn Affect Neurosci 2006; 1: 203–213.
25) Matthies S, Rusch N, Weber M, et al. Small amygdala-high aggression? The role of the amygdala in modulating aggression in healthy subjects. World J Biol Psychiatry 2012; 13(1): 75–81.
26) Rosell DR and Siever LJ. The neurobiology of aggression and violence. Am J Psychiatry 2008; 165: 429-442.
27) Rhee SH and Waldman ID. Genetic and environmental influences on antisocial behavior: a meta-analysis of twin and adoption studies. Psychol Bull 2002; 128: 490-529.
28) Craig IW and Halton KE. Genetics of human aggressive behavior. Hum Genet. 2009; 126: 101-13.
29) Craig IW. The importance of stress and genetic variation in human aggression. Bioessays 2007; 29: 227-36.
30) Collica MT. Gli sviluppi delle neuroscienze sul giudizio di imputabilità. In Carlizzi G. and Tuzet G (eds). *La prova scientifica nel processo penale*, Torino, Giappichelli Editore, 2018.
31) Schleim S. and Roiser JP. FMRI in translation: the challenges facing real-world applications. Front Hum Neurosci 2009; 3(63): 1-7.
32) Kendler KS. "A gene for": the nature of gene action in psychiatric disorders. Am J Psychiatry, 2005; 162(7), 1243–1252.
33) Vella M, Argo A, Costanzo A, et al. Female genital mutilations: genito-urinary complications and ethical-legal aspects. Urologia 2015; 82 (3): 151-159
34) Double R. How to accept Wegner's illusion of conscious will and still defend moral responsibility. Behav Philos 2004; 32: 479-491.
35) Gkotsi GM, Gasser J. Critique of the use of neuroscience in forensic psychiatric assessments: The issue of criminal responsibility. Evol psychiatr 2016; 81: 25-36.
36) Calvin J, Giordano KJ. Integrating Brain Science and Law: Neuroscientific Evidence and Legal Perspectives on Protecting Individual Liberties. Front Neurosci 2017; 11: 621.
37) Aubert A, Coudret E. Prédictibilité du comportement: neurosciences et neuro-mythes. AJ penal 2012; 2: 80–3.