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Review Article

Pedophilia: Definition, classifications, criminological and neurobiological profiles, and clinical treatments. A complete review

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Abstract

This work focuses on the topic of pedophilia by reconstructing with a critical review all the main etiological theories proposed in the literature, focusing in particular on the clinical, psychological and neurobiological elements, to conclude that the multifactorial solution is the best possible proposal to account for clinical, psychological, and socio-environmental causes.

Introduction, definition, classification and diagnostics aspects

Pedophilia is a form of paraphilia recognized and classified in the DSM-V (Diagnostic and Statistical Manual of Mental Disorders, V ed.) and other psychodiagnostic manuals [1]. It is a paraphilic disorder which meets certain criteria [2,3].

a) recurring sexual fantasies, impulses, or behaviors involving one or more prepubertal children (usually ≤ 13 years) that have been present for ≥ 6 months;

b) the person is driven by the impulses, has difficulty resisting the impulses, or is altered by the impulses and fantasies;

c) the person is ≥ 16 years old and at least ≥ 5 years older than the child-targeted by the fantasies or behavior.

However, there are exceptions to this strictly clinical rule and they concern environmental factors and circumstances. This diagnosis is excluded if the two subjects are both minors (provided they have reached puberty or are peers with absence or reduced presence of drives sexually attributable to libidinal energy [4]) or the sexual bond is secondary to a bond of affection between the two subjects who are fully aware of the intrapersonal and interpersonal implications of their behavior, and provided that they are sexually mature, even if the culture of origin admits as functional the relationship between older and younger subjects beyond the limits indicated by western cultures [2].

Epistemological data underline a greater prevalence of pedophilia among the male sex over the female sex, but the data appear to be underestimated, especially about *female pedophilia* where they generally prefer young male children, who tend to be younger than male pedophiles' victims. Female pedophiles often have been victims of abuse and mistreatment in childhoods and tend to have other disorders, such as depression, substance abuse, and frequent personality disorders. They also have difficulties in intimate relationships with peers, have low self-esteem, poor anger management skills, are afraid of being abandoned, and show emotional difficulties such as limited empathy, and act together with men (in these cases, in general, more than one child is involved) [2,5].

According to the interactions of the adult subject with his peers or with mature adults, the pedophile disorder can be considered [2]:

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a) exclusive when the patient is attracted only to children;

b) non-exclusive, if the pedophile experiences attraction and sexual drive for subjects over the age considered to be pathological;

c) differentiated, when the adult is attracted exclusively to one sex (male or female);

d) undifferentiated when the adult is attracted indiscriminately to both sexes (male and female);

e) preferential when the adult is attracted to both sexes but has a higher prevalence to one;

f) incestuous when the adult experiences attraction and drive exclusively or mainly for a minor linked by a family relationship (children, brothers, sisters, grandchildren, or cousins).

For the diagnosis of this mental disorder, it is not necessary to wait for the sexual interest to materialize in the sexual act with the minor [2].

Registry age plays a fundamental role in identifying this morbid condition. The central parameter for the diagnosis of pedophilic disorder is sexual attraction for subjects aged 13 or under. Therefore, the victims are not yet developed from a maturational and sexual point of view, even if from a legal point of view, this age limit is slightly higher than an age of consent (for example, in the UK the age of consent to perform sexual acts is 16 years, while in Italy it is 14 years). For the pedophilic form, it is necessary to distinguish *pederasty* (*ephebophilia* towards males, *nymphophilia* towards females), i.e. sexual attraction towards subjects of adolescent age, between 14 and 17 years old. Socially more tolerated and less serious, this attraction focuses on subjects who have completed or are completing the phase of sexual development and maturity [2].

Another important distinction lies in the difference between a *pedophile* and a *child molester*, as too often, especially in the common sense and in journalistic jargon, outside the psychiatric sphere, these two terms are confused or scrambled. The pedophile is the one who presents a marked and significant pathological deviation of the libido towards children but who does not carry out violent acts (i.e. objective behavior). However, there are hypotheses in which the pedophile is also an active molester (and in this case, it is not uncommon to find a comorbidity with antisocial, borderline, or histrionic personality disorders), but other hypotheses exist where the molester is not necessarily a pedophile [6].

The places of interest where the victim can be identified and chosen is always linked to family or public activities such as schools or youth meeting centers. In recent years, the Internet has become another place (albeit non-physical) where potential victims may be found, thanks to social networks and online messaging. In criminological and judicial practice [5], some specific characteristics of *online pedophiles* have been identified which seem, at least in part, to differentiate them from other *classic pedophiles*. The online pedophiles are usually:

a) Male, Caucasian ethnicity, belonging to different socio-economic backgrounds;

b) Aged between 18 and 25 years, younger than *traditional pedophiles*;

c) They generally have not committed previous sexual crimes.

Generally recognized [7], the five phases of online priming are:

a) Formation of a friendship relationship, where the pedophile behaves in a friendly and kind way (friendship forming stage);

b) Formation of a relationship of trust, where the pedophile puts in place a whole series of techniques to demonstrate good faith and his honesty (relationship forming stage):

c) Assessment of the risk of being discovered, weighted by a series of protective attitudes that encourage the minor (risk assessment stage);

d) Phase of the exclusive relationship, where the pedophile promises personal advantages and favors perhaps of an economic nature (exclusivity stage);

e) Real sexual phase, where there is the first physical contact (sexual stage).

Those who make online baiting attempts

a) Tend to avoid direct relationships, spend the majority of their time in chats looking for social/sexual contacts aimed at immediate sexual gratification;

b) Are empathetic and able to be emotionally in tune with their victims;

c) Are compulsively engaged in sexual activities.

Recent research [8-10], has helped to define two distinct profiles: those who limit themselves to the possession and exchange of child pornography and those who, in addition to holding these materials, try to involve children and adolescents directly in sexual acts. Within this second profile, the presence of two subgroups have been identified:

a) Fantasy-driven: motivated to involve teenagers in virtual sex without requesting a direct meeting;

b) Contact-driven: motivated to engage in sexual relations with teenagers outside the Internet.

Generally, however, there are 2 types of pedophiles: the *sadistic pedophiles* and the *playful pedophiles*. The sadistic pedophile experiences maximum pleasure by brutalizing his victim. This occurs both through psychological violence (humiliation) and through physical violence. The playful pedophile tends to play with children and rarely traumatizes them. The game has the dual purpose of winning the trust of

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the parents and the child and of setting an attitude of silence with the child, proposed as part of the game itself [5].

Psychological profiles

The term *pedophilia* derives from the Greek *pais* = child and *filìa* = love, and means love for children. From a behavioral point of view, this interest can manifest itself in multiple ways, from simply looking at children to adopting strongly sexualized behaviors, which may include: stripping, stroking, or touching the child or masturbating in his presence, or by subjecting the child to oral, anal, or vaginal intercourse by penetrating the child with the penis, fingers, or other objects. A distinctive feature of this pathology is its *ego-syntonic character*. It is conduct that does not cause discomfort to the subject, but gives him pleasure [11]. For this reason, the pedophile is not aware of having an illness, does not present feelings of guilt towards the victims, and frequently presents a series of errors of thought that lead him to justify his actions and to consider the victim as consenting. On the other hand, those who are aware of their condition have a *pedophile tendency*, which has not yet fully evolved into the actual disorder [2].

In dynamic psychology, the *classical psychoanalytic thesis* maintains that the pedophilic act is linked to fixations and regressions towards forms of infantile sexuality. We stress the importance of drive theory, but also of relational aspects in the genesis of pedophile behavior. The explanatory factor hypothesized consists of halted psychosexual development due to early trauma or having lived one's sexuality in a restrictive environment, or pedophilia could be the result of sexual conflicts reached without the contribution of the imagination, probably due to a failure of consciousness caused by a pathology [4]. In any case, the approach of S. Freud [12-31] who considered pedophilia as a perversion, taken up more recently by Kernberg, is based on the castration anxiety that hinders the pervert from achieving adult sexuality and makes him regress to a partial drive (anal, oral, .). The fear of facing an adult woman makes him fall back towards a less powerful and therefore, less anxiety-provoking subject, with whom he can avoid penetration, or if he faces it, it occurs from a position of strength [32]. Freud stated that childhood traumas, in general, are incurable and leave wounds that no longer heal and that provoke in adults with a history of abuse in their childhoods, a multiplicity of phenomena affecting the emotional, relational, social, and behavioral spheres of varying depths [4].

Recent psychoanalytic approaches distinguish between pedophilic behavior, pedophilic fantasy, and pedophilic obsession (which must have sexual activity with a child in order not to suffer from intolerable and anguished anxiety). The bases of this theory are, however, exclusively derived from clinical observations and in any case, explain very little about why pedophilia is chosen by some individuals as a defense mechanism instead of other possible defensive mechanisms [4]. Failure to resolve the oedipal crisis through identification with the father-assailant (for boys) or mother-aggressor (for girls), causes an improper identification with the parent of the opposite sex or an improper choice of the object for libidinal catharsis [12]. To appease their castration anxieties, paraphilics are forced to constantly examine their own or others' genitals. Also, the decisive factor that prevents orgasm through conventional genital intercourse is castration anxiety. Perversions, therefore, perform the function of denying castration [13]. Many people suffering from paraphilias have separated and incompletely identified from their intrapsychic representations of the mother. The result is that they feel that their identities as separate people are constantly being threatened by a merger or incorporation by internal or external objects. Sexual expression may be the only area in which they manage to assert their independence. Another aspect of the relief experienced by paraphilic patients after they have implemented their sexual desires is their feeling of triumph over the mother who controls them from within [12]. Pedophiles especially need to dominate and control their victims, to make up for their feelings of helplessness during the Oedipal crisis. Some theorists believe that the choice of a child as an object of love by pedophiles is narcissistic. According to the classical view [13], pedophilia does represent a narcissistic object choice, since the pedophile sees the child as a mirror image of himself as a child. Narcissism results from the oedipal fixation, where the pedophile identifies with his mother and sees himself in the child. Pedophiles are also considered to be weak and helpless individuals because their choice of children as sexual objects pose less resistance or create less anxiety than adult partners, thereby allowing pedophiles to avoid castration anxiety [14]. In clinical practice, many pedophiles are found to suffer from a narcissistic character pathology, including psychopathic variants of narcissistic personality disorder. Sexual activity with prepubescent children can underpin the pedophile's fragile self-esteem. Similarly, many individuals with this perversion choose professions in which they can interact with children because the idealizing responses of children help them maintain a positive self-image. On the other hand, the pedophile often idealizes these children and sexual activity with them, therefore, involves the unconscious fantasy of merging with an ideal object or restructuring of a young, idealized self. Anxiety about aging and death can be kept at a distance through sexual activity with children. When the activity is associated with a narcissistic personality disorder with severe antisocial traits, as part of an obvious psychopathic character structure, the unconscious determinants of behavior can be closely related to the dynamics of sadism. Pedophiles are frequently themselves victims of child sexual abuse and the child's sexual conquest is the instrument of revenge, a sense of triumph and power can accompany their transformation from a passive trauma into an actively perpetrated victimization [12]. Finally, another author believes that the origins of pedophile tendencies should be sought in the very first mother-child interactions, as the mother's narcissistic needs for self-love could be excessively transmitted to the child due to the mother's need to be idealized by the son. This would have the effect of substantially delaying the child's separation-detection process [15].

Still on the dynamic trend, Jungian psychology has not made great contributions to the study of pedophilia, except for a group of analysts (including Gordon) who argue that to understand pedophilia it is essential to consider its non-

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pathological version. In practice, *normal* pedophilia consists of the adult-child interaction, but at the same time is mediated and altered by the characteristics of childhood. In pedophilia, there could be a tendency to retain an idealized desire for the purity and innocence of childhood [4].

Some psychotherapists [4,67] who treat perpetrators of sexual abuse against children seem to adhere to the theory that pedophilia is caused by the fact that the sexual perpetrators were themselves abused in childhood. Garland and Dougher thus coined the term *abuse abuser theory*, which is strongly criticized for the lack of representative samples due to the heterogeneity of the abusers, the absence of adequate control groups, and insufficient statistical evaluations. However, the theory still appears interesting and has not yet been denied. In essence, the crimes of the adult aggressor can be in part a repetition and a reflection of a sexual assault that he suffered as a child. Pedophilia is then a distorted attempt to give an outlet to early unresolved sexual trauma. This theory was originally based on a double theoretical explanation of a psychodynamic imprint where the adult subject replicates the victimization suffered as a child, according to the same modalities suffered then. As an adult, he obtains the triumph precisely in what he had been a victim of as a child. This perverse act is *eroticized hatred*, an act of revenge by which the past is canceled and transformed into pleasure and victory. The victims of child sexual abuse would, therefore, act sexually and aggressively to reduce the painful affects and sensations experienced several times during the previous trauma, as well as to overcome the sense of helplessness, the negative self-image, the loss of confidence in others, and the fear of impending danger, which constitute the other post-traumatic aspects related to sexual abuse. This author has also divided child molesters into two categories:

a) *Regressed*, those who have developed a sexual and interpersonal orientation appropriate for their age, but who, in certain circumstances, may regress to a sexual orientation aimed at children;

b) *Fixed*, in which primary sexual interest has never developed beyond the level of interest in minors.

Another research group on the origins of pedophilia claims that sexual assailants are very likely to have grown up in deviant families. Such studies show that sex offenders are statistically most likely to belong to dysfunctional families. In a study aimed at researching the degree of parental identification, for example, subjects defined as pedophiles had a low degree of identification towards their parents compared to a control group represented by college students or compared to a group of subjects defined as criminals. These findings support the notion that sex offenders are different from other offenders in their perception of parental identification. Failure to identify can play an important role in the development of a psychosexual disorder [33].

The *psychiatric psychodiagnostic* instead hypothesize the existence of:

a) *Primary pedophilia* which involves, to a certain extent, an integration of the pedophile ego and a consequent stability of its personality;

b) *Secondary pedophilia*, resulting from other serious psychopathologies such as schizophrenia, some organic psychoses, and other conditions in which the personality disintegrates, causing a series of perverse behaviors.

On this line of thought, pedophilia takes on the appearance of a paraphilia composed of two very distinct aspects, aggression, which has as its purpose the imposition of suffering and is aimed at neutralizing threats to the mental and physical survival of the perverted individual, and annihilation, as intimate relationships with others, generally viewed as normal, are viewed as perilous or destructive by perverts, since in such situations they feel completely under the control of the other person. The emotional focus of the pedophile's relationship with others is on himself. An important question that remains open is how can a pedophile commit acts that the whole of society, including criminals, strongly and unequivocally condemns. The explanation that Glasser offers underlines the fact that the company's regulatory standards do not become an integral part of the pedophile's personality due to the strong repulsion he feels for his parents and other authoritarian figures who mistreated him during childhood. In pedophile activities, what is pursued is precisely the protest against them. Nonetheless, there is a struggle between the individual's internal psychological needs and the pressures of society, which results in the characteristic self-deception of the pedophile [34,35].

The *cognitive model* claims that pedophiles seek any means to justify their actions and use, for example, pornography as a source of reassurance. In it, pedophiles see other adults doing the things that they do or would like to do and this creates an aura of normality around the abuse that can loosen their inhibitions, and constitute the first step of an escalation that can result in the most foul acts. In this perspective, the idea that pornography serves as a *relief valve*, useful for diverting sexual energy away from the material fulfillment of abuse, is rejected. Pedophilia is considered by cognitivism to be like an addictive behavior, as is the case with alcohol and drug use, and therefore it cannot be contained and fought by offering material that instead feeds it. Among the characteristics of the cognitive style of pedophiles, there is the minimization of abuse. In fact, in their stories, the abuse is defined as something consensual and in a certain sense desired by the child himself. Pedophiles often defend themselves, citing as an excuse for their behavior, unemployment, or a family bankruptcy. These are nothing more than defensive rationalizations, which act as fragile justifications. Some authors have hypothesized the presence of cognitive distortions but they cannot be considered as a specific etiological factor, as abusers distort perceptions in terms advantageous to themselves and only secondarily report their deviant desire to have sex with the minor. This is the indicative precursor, not a distorted perception. As a result, distorted interpretations of children's behavior can lead to inappropriate beliefs, while it is more difficult for beliefs to produce the perceptions themselves [5].

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Neurological aspects

Progress of the diagnostic techniques available for neuroscientific research has made it possible to identify some structural and/or functional alterations that might occur in the brains of pedophile subjects, with consequent effects on the orientation and sexual behavior of these people. The changes are:

a) A decrease in the volume of gray matter in the frontostriatal circuits, which manifests itself in an inability to inhibit repetitive behaviors [36];

b) A reduction of gray matter in the amygdala and hypothalamus, brain regions critical for sexual development [37];

c) Sexual disinhibition following a deficit of the temporal-frontal lobes and basal ganglia, caused by dementia or tumor, or hypersexuality following subcortical deficits [38].

In a recent study, researchers observed that the non-additive genetic variance (i.e. where both allelic interactions at the same locus and allelic interaction between different loci is present) of a sample of the Finnish population with a sexual interest in children and young people under 16 years of age was 14.6%. This percentage has to take into account the environmental factors mentioned above. Further research on the biological etiology of pedophilia has been based on the assumption that this disorder may result from alterations in neurological development. It has been observed that these subjects can often present neuropsychological deficits, including a low intelligence index, attention deficit, reduced verbal and visual-spatial learning ability, and slower cognitive processing. Therefore, a review of the literature will attempt to provide evidence of the involvement of brain structures in paedophilic behavior. Before the technological advent of imaging studies, the most significant cases on which researchers focused their attention were neurological diseases; it has been observed that pedophilic behavior can be caused by a variety of diseases such as brain tumors, different forms of dementia, Parkinson's disease, Huntington's disease and hippocampal sclerosis such as encephalitis. As far as brain tumors are concerned, it was observed that subjects suffering from neoplasia located in the right frontal lobe (medial paracentral, medial and orbitofrontal) reported having had sexual intercourse with their minor daughter or son, exposure of the penis in front of children and encouragement to touch it, as well as interest in viewing child pornography, sexual harassment of various kinds and exhibitionism. From a neurophenomenological point of view, these behaviors are closely related to the brain alterations produced by the tumor, which affect the executive and control functions of one's behavior. Concerning dementias, in particular frontotemporal (lower temporal region, frontal atrophy in one or both hemispheres and lower functional volume of the amygdala) and vascular (caudate nucleus, pale globe, and posterior cingulate cortex) reported sexual harassment of pre-pubertal subjects, exhibitionism, sexual demands to the wife, uninhibited and aggressive sexual behavior, frequent masturbation and sexualized language. It should be noted in this regard, that the clinical cases just exposed, suffer the inconvenience of being the result of observation of individual patients. By abnormal sexual behavior, these studies have set themselves the objective of investigating those regions of the brain that could, however, provide evidence of the existence of neurological abnormalities related to pedophile behavior. In support of this first review, we will now analyze the various neuroimaging studies conducted in recent years, in which, in addition to identifying the areas of the brain associated with sexual arousal compared between a group of healthy subjects and a group of pedophiles, the correlations between the volume of brain activity of pedophiles and their psychopathological characteristics will be highlighted. The analysis of the results reveals a difficulty in drawing definitive conclusions on the neural correlates of pedophilia. Although neurological case reports frequently point to a pathology of the frontal lobes, temporal lobes, and basal ganglia, such alterations may be associated with a decreased control of behavior that may be more applicable to hypersexual behavior, rather than to a specific preference of a paedophilic type. The push for neurobiological research has however led to three important theoretical developments in an attempt to explain the various aspects of pedophilia. The frontal lobe theory could be useful in explaining those crimes against minors related to behavioral disinhibition and uncontrolled compulsive behavior. In support of this, structural and functional differences have been found in terms of size, as well as in the functioning of the right and left dorsolateral prefrontal cortex and the orbitofrontal cortex, in pedophiles with a history of sex offending with children. The temporal-limbic theory tries to explain pedophilia through structural and functional differences in temporal lobes that can contribute to the development of a paedophilic sexual preference. The "double lobe" theory suggests that both frontal and temporal disorders are responsible for different behaviors in pedophiles, such as decreased impulse control and hypersexuality. They, therefore, provide preliminary evidence on the abnormality of the brain structure underlying inadequate sexual behavior, which could, therefore, be relevant in motivating the pedophile's sexual behavior. Through functional neuroimaging and MRI, a reduction in the volume of the amygdala in the pedophile has been observed in three different studies, so it could be an interesting and promising result. However, future analyses should include a larger sample to replicate the result and thus confirm the real involvement of the amygdala [45-55].

Consistent with this neurobiological approach, previous studies have suggested that abnormalities in plasma phospholipid fatty acids may play a role in aggressive behaviour. Recently, it has been suggested that a dysfunctional serotonergic turnover in the brain may be involved in the etiopathology of pedophilia. Depletion of n-3 Polyunsaturated Fatty Acids (PUFA) may cause serotonergic system alterations that may be related to pedophilia and aggression. An impoverishment of the serum phospholipid n-3 superior unsaturated fatty acids (HUFAs) and, in particular, DHA may participate in the pathophysiology of paedophilia. One hypothesis is that an impoverishment of n-3 HUFA and DHA may cause changes in

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serotonergic turnover, which are related to impulse control and aggressivity-ostility, behaviours that are associated with paedophilia [56,57].

In the course of visual stimulation with images of naked children, increased brain response in areas known to be generally involved in the development of sexual stimuli (in particular, insula and cingulate gyrus) has been observed. The cerebral response of pedophiles in front of naked children is similar to that of adults in front of images of naked adults [39]. Conversely, in the course of visual stimulation with images of naked adults, a reduced activation is observed in areas of the brain that usually activate in non-pedophile subjects, since it would reflect in the brain the lack of sexual interest in adults [40].

Furthermore, the left hemisphere of criminals' brains tend to be smaller than that of normal subjects. Pedophiles, in particular, differ from normal subjects and rapists in the particularity of having the left hemisphere smaller than the right one [2,41].

Also, although there is no definitive evidence on the involvement of hormone profiles about pedophilia, some results indicate an increase in prolactin, cortisol, testosterone, and androsterone. In any case, there is a great deal of caution in presenting these results since the altered hormone levels could also be due to the stressful events suffered by the subjects [42].

Recently, genetic studies have shown that the cause of an adult's diverted attraction towards children could be the result of the defect of a growth factor (progranulin) involved in numerous physiological, but also pathological processes. This defect is the consequence of a progranulin genetic mutation [43].

Treatments and therapies

The most correct clinical treatment appears to be the integrated one between pharmacological profiles (usually antiandrogens, anxiolytics, and serotonin reuptake inhibitors) and cognitive-behavioral, strategic, or group psychotherapy (Bion type), with the use of specific techniques such as hypnosis. Long-term individual or group psychotherapy is usually needed, which can be particularly useful when it is part of an integrated treatment that includes social rehabilitation, the treatment of coexisting mental and physical disorders, and drug treatment. Psychotherapeutic efficacy can be reduced or canceled out based on the patient's awareness (if the beginning of the path depends on his decision or a judicial obligation) and on the comorbidity of other psychopathologies (especially personality disorders and psychotic ones). In general, the objectives of the therapeutic program should be to decrease the sexual impulse addressed to the child through the elimination of positive reinforcements (the cessation of reinforcing stimuli of the operative conditioning), to decrease emotional involvement towards the child, to improve interpersonal relationships with other adults, to decrease hypersexuality, and to stop the learned paraphilic behaviors. Analogous to chemical castration (which is temporary) is the use of gonadotropin-releasing hormone agonists. However, if the disorder is marked by substantial hypersexuality, psychopharmacological treatment should be used, which prefers cyproterone acetate and medroxyprogesterone acetate, which lasts longer than four years. Finally, the use of antidepressants and antipsychotics is preferred if the pedophilic condition is associated with other psychiatric disorders. [2,58-66]

Conclusions

a) The theoretical considerations proposed usually underline the unitary and solitary nature of the etiological cause, whether they are strictly clinical or psychological theses. A possible multifactorial approach, in the writer's opinion, could be able to explain all the elements involved. The components are:The *psychological component*, which would explain the psychological reasons a person would feel an attraction for a child and seek gratification.

b) The *physical component*, of medical origin, which would seek the physiological reasons (whether hormonal, genetic, or neurobiological) that explain the attraction towards children. Dysfunctionality could therefore be a component.

c) The *environmental component*, which would seek the reasons in the traumas suffered or hinge events, such as violence, degraded context, the dysfunctionality of the family, uncontrolled disinhibition, or transgression in childhood and which would affect the evolution of the adult subject.

Studies have shown that pedophiles can share many psychiatric characteristics beyond deviant sexual desire, including high rates of affective disorder disorders, substance use disorders, impulse control disorders, other paraphilias, as well as cluster personality disorders B and A. Among the etiological causes, the childhood history of sexual abuse and the underlying neurobiology of deviant sexual arousal certainly emerge, with a reduction in erotic differentiation [44].

Neuroimaging studies show a heterogeneous picture and do not allow definitive conclusions on the neurobiological mechanisms underlying pedophilic preferences and behavior. However, the three theories outlined above, the altered network transformation related to sexual arousal remain factors to be investigated for future studies. Ultimately, success could be achieved with further investigation on a subject that still carries a considerable burden of social stigma, but which promises to offer an improvement not only for patients but also for society in general.

In the multifactorial model, therefore, a different and articulated number of levels is suggested which, in whole or part, play to favor a better evaluation in the holistic approach of the pathology, according to a progression of scale that passes from the simple *pedophile inclination* to a real *pedophile tendency*, to evolve into the typical *pathological condition*, as described in the DSM-V. Even today it does not seem possible

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to attribute the etiopathogenesis of pedophilia to a single class of events, either intrapsychic or external. It is necessary to take into consideration a multiplicity of factors because there does not seem to be a single typology of pedophiles.

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