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Review Article

Psychopathy: How Humans Got It; Can Humans Get Rid of It?

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Abstract

It is unclear if psychopathy is caused or influenced by social factors, psychological variables, or issues from a defective genetic design. Nevertheless, psychopaths are antisocial and have clear neurocognitive markers indicative of their problems processing distress signals in others.

Psychopathy is ordinarily diagnosed by the Psychopathic Checklist (PCL)—considered a valid and reliable tool by many clinical psychologists and psychiatrists. Although the utilization of the PCL in diagnosis has its doubters, many specialists hold that it is a reliable and legitimate way of diagnosing psychopathy. Neuroimaging and genetic testing can distinguish a specific pattern of the disorder. However, these methods may not specifically identify a psychopath. Skin conductance hyporeactivity readings indicate emotional deficits and impulsivity, indicating a propensity for antisocial behavior and negative interpersonal relationships in psychopaths.

Psychopathy symptoms fall into six domains: 1) detachment, 2) lack of commitment, and lack of empathy or concern for others; 3) lack of perseverance, unreliability, recklessness, restlessness, disruptiveness, and aggressiveness; 4) suspiciousness, inflexibility, intolerance, lack of planning, and lack of concentration; 5) antagonism, arrogance, deceitfulness, manipulativeness, insincerity, glibness or garrulousness, lack of anxiety, lack of remorse, lack of emotional depth, and lack of emotional stability; and 6) self-centeredness, self-aggrandizement, self-justification, a sense of entitlement, haboring a feeling of uniqueness, and invulnerability and invincibility.

Psychopathy afflicts about 1% of the broad population and 10–30% among incarcerated criminal offenders—dependent on the individual's demographic components (e.g. gender, age, culture, or ethnicity).

Currently, there is no pharmacologic remedy for psychopathy. Furthermore, the behaviors of psychopaths have not been corrected by any traditional or nontraditional forms of therapy, such as group therapy, client-centered therapy, psychodrama, psychosurgery, electroshock therapy, or drug therapy. Insufficient and chiefly anecdotal literature exists concerning the application of tranquilizers, mood stabilizers, and serotonergic agents controlling impulsive and aggressive traits in antisocial samples. However, there has been limited investigation of the pharmacological treatment of psychopathy expressly. Thus, the treatment of psychopathy is likely to be similar to other mental disorders, such as schizophrenia, which has an underlying genetic influence and neurodevelopmental bases. Antidepressants, MDMA, and oxytocin analogs have been prescribed to treat the various symptoms of psychopathy. For now, neuroscientists and psychiatrists are the fundamental investigators in the prevention and treatment of psychopathy.

Three significant comorbidity patterns are observed in psychopathy: 1) a high rate of comorbidity with substance use disorders; 2) high association with other personality disorders; and 3) low rates of comorbidity are recognized between psychopathy and certain other personality disorders. Comorbidity is lowest with avoidant (anxious-avoidant), dependent, and obsessive-compulsive personality disorders. Pernicious effects of psychopathy include destructive behaviors, such as aggressive antisocial conduct.

A personality disorder, psychopathy, is delineated by antisocial behavior, impulsivity, shallow emotional responses, and lack of empathy. It is opined that primary psychopathy results from an idiopathic intrinsic deficit (e.g. genetically influenced); secondary psychopathy results from indirect factors (e.g. trauma exposure). The behavioral consequences of each type (primary and secondary) appear similar, but with subtle variances.

Keywords: *Antisocial Behavior; Drug Abuse; Immorality; Manipulation; Neurocognitive; Personality Disorder*

Abbreviations

CAPP: Comprehensive Assessment of Psychopathic Personality; DA: Dopamine; IPDE: International Personality Disorder Examination; MAO-A: Monoamine Oxidase A; NE: Norepinephrine; PCL: Psychopathy Checklist; PCL-R: Revised PCL

Introduction

Psychopathy is considered a personality disorder characterized by antisocial behavior, impulsivity, shallow emotional responses, and lack of empathy [1,2]. Psychopaths cannot love or develop meaningful relationships, fail to learn from experiences, and are alarmingly violent [3]. The term psychopath, sick mind or suffering soul, was coined in the mid-to-late-1800s derived from the Greek *psyche* and *pathos*. The father of modern psychiatry, Philippe Pinel (1745–1826), defined psychopathy as *Mania sans délir,* meaning insanity without delirium, and observed that this insanity did not occur with confusion of mind and intellect.

This term was used to describe individuals with no intellectual problems but demonstrating profound abnormal behaviors, such as cruelty, antisocial acts, substance abuse, irresponsibility, immorality, utter remorselessness, and a complete lack of restraint. The term "moral insanity" was first proposed by James Prichard (1786–1848) to describe all mental illnesses except schizophrenia and mental retardation. Later, J.L.A. Koch (1841–1908), a German psychiatrist, coined the term *psychopathische* or psychopath in response to the controversy surrounding the term "moral insanity" and insisted that a comprehensive evaluation of an individual's life history and behavior is essential to diagnose psychopathy. By the 1920s, the term psychopath was used to include individuals deemed weak-willed, depressed, excessively shy, or insecure.

Hervey Cleckley (1903–1984), known as the Father of Psychopathy, changed the face of psychopathy research. In 1941, he described sixteen criteria for psychopathy, which were later referred to as the Cleckley criteria. This criteria describe the characteristics of a sociopath (psychopathic personality): superficial charm and good intelligence; absence of delusions or other thought disorders; absence of nervousness or psychoneurotic manifestations; unreliability; mendacity and dishonesty; lack of remorse or shame; inadequately motivated asocial behavior; poor decisions and lack of learning from experience; pathological self-centeredness and inability to love; lacking ability to establish emotions; lack of insight; lack of accountability in general interpersonal relations; mismatched behavior while drunk and sometimes without a drink; suicide attempts; impersonal and unsatisfactory sex life; and a lack of life planning.

Cleckley further stated that this disorder is a different kind of abnormality from all those now recognized as seriously impairing competency. According to Cleckley, psychopaths are "the forgotten men" of psychiatry. By the late 1960s, the Diagnostic and Statistical Manual of Mental disorders (DSM) replaced "psychopathic personality" with "antisocial personality disorder" and removed the hallmark traits of callousness and lack of empathy from the description. Robert Hare, one of the world's foremost experts on psychopathy, established and managed a psychopathy research laboratory for thirty years.

Hare was known as "Beagle Bob" by his inner circle for his tenacious ability to follow a scent (research indication). Moreover, Hare developed a gold standard diagnostic tool for psychopathy assessment, known as the Hare Psychopathy Checklist (PCL), first published in 1980 and revised as the PCL-R in 1991, which included almost all of Cleckley's criteria [4].

Discussion

Manifestations of psychopathy (the sociopath)

In examining the etiological factors contributing to psychopathy, Karpman (1941) suggested that *primary psychopathy* resulted from an idiopathic intrinsic deficit now considered as a genetic influence, while *secondary psychopathy* results from indirect factors (e.g. trau-

ma exposure). The behavioral consequences of each appear similar, but with subtle differences. While lower anxiety, general poverty of emotional expression, and crime are characteristics of primary psychopaths, secondary psychopaths are more anxious, show more emotional volatility, and commit more impulsive, reactionary crimes [5].

Symptoms of psychopathy include six domains:

1. The *attachment domain* reflects affiliation in interpersonal relationships, including symptoms such as detachment, lack of commitment, and lack of empathy or concern for others.

2. The *behavioral domain* mirrors the organization of goal-oriented activities and includes symptoms such as lack of perseverance, unreliability, recklessness, restlessness, disruptiveness, and aggressiveness.

3. The *cognitive domain* reflects the disorganization of mental activities, includes symptoms such as suspiciousness, inflexibility, intolerance, lack of playfulness, and lack of concentration.

4. The *dominance domain* deals with status in interpersonal relationships, and includes symptoms such as antagonism, arrogance, deceitfulness, manipulativeness, insincerity, and glibness or garrulousness.

5. The *emotional domain* reflects the experience and expression of affect and includes symptoms such as lack of anxiety, lack of remorse, lack of emotional depth, and lack of emotional stability.

6. The *self-domain* reflects the organization of self-concept and self-other relations and includes symptoms such as self-centeredness, self-aggrandizement, self-justification, and a sense of entitlement, uniqueness, and invulnerability [6].

Prevalence of psychopathy

Psychopathy affects about 1% of the general population and 10–30% among incarcerated criminal offenders [7]. The expression and prevalence of psychopathy depend on the individual's demographic characteristics (e.g. gender, age, culture, or ethnicity), with males more likely to demonstrate all symptoms more than females. Epidemiological data suggests a male:female sex ratio of 3:1 for lifetime prevalence [8]. Adults (aged 18 years and older) have shown higher prevalence rates for developing psychopathy than the younger population [9]. Although psychopathy is found in diverse cultures, there is evidence of cross-cultural differences in prevalence [10]. It has been reported that psychopaths die younger (5X more) than the general population, with a significant positive correlation between PCL-R scores and mortality [11].

The root causes of psychopathy

Social

It is unclear if psychopathy occurs due to social factors, psychological variables, or a defective genetic makeup. The "attachment theory" may be one factor that influences the expression of psychopathy. The tendency of committing violent crimes in most psychopaths has been correlated with early childhood neglect, sexual, mental, physical abuse, or environments where violence was the norm [12]. Early childhood experiences of growing up in a violent home with parents who are disfunctional. Early childhood expereinces of violence were identified as one of the root causes for developing psychopathy in the future [13]. However, heterogeneity was observed in some individuals who later became serial killers with an evident predilection toward psychopathy, while others did not—although the reason is unclear.

Psychopaths are antisocial and have clear neurocognitive markers indicative of the problems that these individuals have in processing distress signals in others. The interpersonal or affective dimension of psychopathy, even in children with psychopathic and antisocial

tendencies, includes shallow effects, cunning, and lack of guilt and empathy [14]. Behaviorally, these individuals are often impulsive and display poor emotional control from an early age.

Neurophysiological

Universally, the biological origin or cause of psychopathy is not fully defined. However, the basic patterns of brain dysfunction are seen in individuals with psychopathic tendencies [15]. In psychopaths, the gray matter of the paralimbic cortex of the brain is significantly reduced, and their brains differ slightly but distinctly from those of normal individuals from birth. Neuroanatomical correlations with psychopathy suggest linking abnormal brain circuits, brain pathophysiology, and genetic disturbances [16].

Prenatal, perinatal, and postnatal development in the psychopathic individual, along with nature (genes) and nurture (environment), have been studied. These studies suggested that structural damage and functional abnormalities in the orbitofrontal cortex and related circuitry (such as the amygdala, basal ganglia, and cortico-subcortical areas) are related to violent psychopathology in youth [16].

The psychopath presents with symptoms similar to patients with orbitofrontal–ventromedial lesions, particularly when the damage is localized in the dorsolateral area [17]. The psychopath and patients with orbitofrontal–ventromedial lesions typically present with similar symptoms, such as impulsivity, antisocial behavior, absence of guilt and shame, behavioral inhibition, and sexual promiscuity [17].

The prefrontal cortex also plays a critical role in working memory, abstract reasoning, attentional control, integration across space and time, anticipation, and planning. While the amygdala stimulates intuitive behaviors (such as hunger, sex, aggression, and other strong emotions), the orbital cortex inhibits those behaviors. Dopamine (DA) levels are adversely affected by this interplay in the brain and other neurotransmitters. Loss of impulse control and uncontrolled desire are standard features of a criminal psychopath. This behavior inhibition may be attributed to neurotransmitter imbalance. Testosterone and androgens are important hormones, while serotonin and DA, and norepinephrine (NE) are the primary neurotransmitters studied in criminology. Psychopathic individuals chiefly studied also had lower NE and 5-hydroxytryptamine (5-HT) levels.

Genetic

The genetic or hereditary reasons for psychopathy have been studied by many researchers who estimated up to 50% heritability. It was reported that the inheritance of genetic makeup might lead to changes in physiological responses due to altered functioning of the brain. In addition, environmental factors or influences shape their childhood behavior.

Viding., *et al*. (2005) reported strong evidence of heredity and no evidence of shared environmental influences in their study [14]. Similarly, Auty., *et al*. (2015) found strong evidence of the transmission of psychopathy from fathers to their children, although this observed tendency was mediated by environmental factors [18].

Therefore, it is essential to understand the specific genetic factors responsible for the transmission and expression of psychopathy. Available evidence shows that a low-expression variant of the monoamine oxidase A (MAO-A) gene—which is linked to the X chromosome and encodes an enzyme that degrades DA, norepinephrine, and serotonin—is responsible for transmission [19,20]. Also, with only a single X chromosome, males are more likely to be influenced by a low-expression variant [21].

Studies are unified in demonstrating a statistically-significant correlation between the short allele of the MAO-A gene and psychopathic or antisocial traits. Considering the reduced serotonin levels in persons with psychopathic behavior, multiple studies have uncovered an association between the short allele 5-HTT with aggression, impulsivity, and antisocial behavior characteristically expressed

by psychopaths [22]. Although the role of DA in the pleasure-reward system is well known, it is also related to violence, aggression, and antisocial behavior [23]. Ponce., *et al*. (2008) found a DRD2 gene polymorphisms that correlated with higher scores on the International Personality Disorder Examination (IPDE) [24].

Overall, it is well established that changes in biological pathways may impact gene expression due to altered individual polymorphisms on behavior arising from experiences and environmental influences [25]. Although these epigenetic activities do not directly relate to psychopathic trait development, they provide scientific reasoning for its etiology [26].

Moreover, several previous studies found abnormal glucose metabolism, dysregulation of opioidergic neurotransmission, and immune-related gene sets associated with violent offending and psychopathy [7]. A recent clinical study in psychopathic individuals also reported a robust upregulation in the expression of RPL10P9 and ZNF132, downregulation of CDH5 and OPRD1 in neurons, and upregulation of RPL10P9 and MT-RNR2 in astrocytes [7]. While the findings regarding genetic factors in psychopathy vary, their interpretation is further complicated by gene-environment interaction in antisocial personality traits [20].

These observations and suppositions indicated that the development of psychopathy is attributable to environmental, social, and genetic factors. However, some other factors—such as prenatal risk factors, broken family, poor parenting, unhealthy parent-child attachment, and childhood abuse—aggravate the condition.

Psychopathy in animals (as a basis for comparison)?

Psychopathy is not all that uncommon in specific animals. In human societies, psychopathy is looked down upon because it often results in murderous rampages or terrible outbursts of aggression. However, it is not noted as such in the animal kingdom because that is just "how it is": *kill or be killed* for sustenance and survival. However, Latzman., *et al.* (2017) studied the personality traits of psychopathy and whether or not they occur in chimpanzees. In a relatively new study published in *Frontiers of Neuroscience*, the researchers worked with 164 chimpanzees and asked their handlers to give them personality ratings on the “CHMP-Tri scales,” which scored their level of psychopathic traits, and such traits did exist [27].

Comorbidities of psychopathies

Three significant comorbidity patterns are observed in psychopathy:

1. A high rate of comorbidity with substance use disorders. This comorbidity may reflect a common etiological mechanism, or maybe sometimes substance use disorders are a consequence or complication of psychopathy.

2. A high rate of comorbidity with other personality disorders. Comorbidity is highest with borderline (emotionally unstable), narcissistic and histrionic personality disorders. To a certain extent, this could be due to the lack of specificity in the diagnostic criteria for personality disorders.

3. A low rate of comorbidity is observed between psychopathy and certain other personality disorders. Comorbidity is lowest with avoidant (anxious-avoidant), dependent, and obsessive-compulsive personality disorders [8].

Detrimental effects of psychopathy

Evidence of the association of psychopathy with destructive behaviors, such as aggressive antisocial behavior has been extensive, thus contributing to ideologies like *Psychopathy as the Unified Theory of Crime* [28]. In psychopathy, the risk for family and friend victimization linearly increases (or perhaps exponentially) with symptoms of the disorder [28]. Violence due to psychopathy is a societal burden on the

public health and criminal justice systems, thus warranting significant attention.

Diagnosis of psychopathy

Psychopathy is commonly diagnosed using the PCL. The PCL is considered valid and reliable by many clinical psychologists and psychiatrists. The PCL is based on interpersonal and affective personality traits, socially abnormal personalities, and clinical signs and symptoms. This diagnosis is made based on a rating on a three-point scale (0, 1, 2). These ratings are, in turn, usually made based on the responses to the questions in a semistructured interview, case-history data, and specific scoring criteria.

Estimating the degree of psychopathy is determined by rating twenty items and a score ranging from 0 to 40. A lower score indicates a pro-typical psychopath, and the cut-off for typical psychopathy is a score of 30 [2]. Even though several new procedures have been devised for making a diagnosis, the PCL is the only one accepted as legitimate and tested. Despite this, psychopathy is still a diagnosis not accredited enough to be acknowledged as a personality disorder by either the American Psychological Association's DSM-IV or the World Health Organization's ICD-10 (SBU 2005).

However, some experts believe that the PCL is outdated and that alternative instruments and classifications are needed [6]. Nevertheless, there are still overwhelming numbers of psychologists and others in psychology and psychiatry that consider the the PCL adequate for the diagnosis of psychopathy.

Since suspected psychopaths who are undergoing an assessment can often be untruthful and deceptive, a precise diagnosis can be problematic. Considering this individual variability, the assessment of psychopathic traits is usually made based upon the subject's file, combined with a semistructured clinical interview, and an assessment according to the checklist [29]. The reliability of a diagnosis is conditional and depends on combining different sources.

With this difficulty in mind, some experts in risk assessment do not consider psychopathy as a scientifically accurate diagnosis. Among the number of factors involved in its accurate diagnosis, trained and educated examiners who can proficiently utilize the PCL are essential. Ineffective guidance and misuse of the instrument can lead to suspected and perhaps misleading psychopathic ratings [30]. However, many international experts in psychology and psychiatry believe that the PCL instrument, combined with the proper training, is a reliable and valid way of diagnosing psychopathy.

Neuroimaging and genetic testing assist in identifying a specific pattern of a contributing disorder but may not indicate a specific diagnosis of psychopathy [31,32]. Compared to non-psychopathic individuals, psychopaths show autonomic hyporeactivity in response to aversive stimuli [33]. A countdown task is a paradigm used to evaluate physiological responses (hyperactivity) to the anticipation and receipt of noxious stimuli via measuring skin conductance responses when anticipating aversive stimuli [34]. Skin conductance hyporeactivity indicates emotional deficits and impulsivity, associated with a propensity for antisocial behavior and negative interpersonal relationships in psychopaths [35].

Medical management of psychopathy

Currently, a cure for psychopathy is not available since no pill can induce empathy, no vaccine can prevent violence, and in addition, talk or verbal therapy cannot change an uncaring mind. It is based on long-term observation and consideration that the behaviors of psychopaths could not be improved by any traditional or non-traditional forms of therapy, such as group therapy, client-centered therapy, psychodrama, psychosurgery, electroshock therapy, or drug therapy [3]. However, psychopathy has traditionally been viewed with pessimism, given the paucity of evidence that any mode of therapy is consistently effective. Although the observation spawns the opinion in clinicians, academics, and laypeople, that psychopathy is untreatable, it can be somewhat controlled symptomatically.

Most of the research literature on treatment focuses on antisocial behavior in general. There is minimal and largely anecdotal literature regarding the effects of major tranquilizers, mood stabilizers, and serotonergic agents in controlling impulsive and aggressive traits in antisocial samples. Moreover, there has been little investigation into the pharmacological treatment of psychopathy per se.

Several reviews have highlightd this lack of efficacy of traditional therapeutic community programs in moderating personality characteristics of psychopathy. Nevertheless, there is evidence that insight-oriented programs may enhance a psychopath's ability to manipulate and deceive, thus increasing risk.

The prospects for treatment progress in psychopathy are likely to be similar to other mental disorders, such as schizophrenia, which has underlying genetic and neurodevelopmental bases. Further, fundamental research should clarify the etiology of the core deficits seen in psychopathy, as this information will aid in the development of more effective interventions. Antidepressants, MDMA, and oxytocin analogs have been applied in treating the various symptoms of psychopathy.

MDMA increases emotional expression and feelings of sociability and empathy, and oxytocin may increase attachment, trust, empathy and help in improving symptoms of psychopathy [36]. As noted, psychopathic individuals have a fundamental deficit when attending contextual cues, giving rise to undesirable responses. Central to this is cognitive deficit which should be grounded in understanding the mechanisms of behavior to improve functioning [37].

This novel treatment approach aims to improve cognitive skills in psycholpathic individuals. It has demonstrated a constructive influence in enhancing sustained attention and modifying behaviors in individuals with cognitive abnormalities, such as attention deficit hyperactivity disorder [38]. Thus, there appears to be positive potential in tailoring cognitive remediation techniques to target specific cognitive-affective mechanisms underpinning this disorder.

Technological advances in individualized treatment have emerged that may have some utility in resolving psychopathy-related cognitive-affective dysfunction. Adopting a technological approach to treatment, a computerized experimental training program has been developed, in which significant improvement when attending to contextual cues are reported [39]. Advances in treatment technology should also be pursued to address the psychopathy-related attention to context deficit and improved functioning among those who would generally be resistant to psychological intervention. However, critical obstacles to a positive outcome for psychological interventions will include core personality traits (e.g. deceit, manipulation, and an absence of remorse), and more general lack of motivation, noncompliance, and a lack of engagement in a therapeutic alliance [40].

For those with established antisocial behavior, programs will need to focus on risk reduction via enhanced supervision and structured interventions designed to shape behaviors into desired directions. Targeting the disorder from multiple angles may have the most significant potential for addressing complex psychopathic traits, whether or not they are acquired or congential—as traditional treatment approaches seem ineffective on their own.

It is well known that to successfully correct human behavior, the therapist has to establish emotional bonding with the individual. In return, from the individual, the therapist should get adequate participation, tolerance, articulateness, communication, and adequate time for treatment [41]. However, in some cases, psychosocial interventions fail and produce no or minor effects since psychopaths do not fulfill these criteria; their lack of motivation, self-regard, and adverse behavior to change, contribute to failure.

To date, the treatment approach towards psychopathy reported a low to moderate success rate for adults and more promising rates for youths [42]. However, directions for future research with the mental models' approach are essential for therapeutic success and management.

The roles of neuroscientists and psychiatrists are essential in the identification and management of traits in psychopaths, along with the strong support by family, relatives, and the immediate social group of the patients. As there is no pill to treat psychopathy, management is based on positive reinforcement rather than punishment aimed at helping to attain insights and reduce impulsivity or poor decisions that contribute to a relapse to crime or antisocial behavior.

Conclusion

A personality disorder, psychopathy, is characterized by antisocial behavior, impulsivity, shallow emotional responses, and lack of empathy. It is opined that primary psychopathy results from an idiopathic intrinsic deficit (e.g. genetically influenced); secondary psychopathy results from indirect factors (e.g. trauma exposure). The behavioral consequences of each type (primary and secondary) appear similar, but with subtle differences.

Psychopathy symptoms fall into six domains: 1) detachment, 2) lack of commitment, and lack of empathy or concern for others; 3) lack of perseverance, unreliability, recklessness, restlessness, disruptiveness, and aggressiveness; 4) suspiciousness, inflexibility, intolerance, lack of planning, and lack of concentration; 5) antagonism, arrogance, deceitfulness, manipulativeness, insincerity, glibness or garrulousness, lack of anxiety, lack of remorse, lack of emotional depth, and lack of emotional stability; and 6) self-centeredness, self-aggrandizement, self-justification, a sense of entitlement, uniqueness, and invulnerability.

Psychopathy affects about 1% of the general population and 10–30% among incarcerated criminal offenders—dependent on the individual's demographic characteristics (e.g. gender, age, culture, or ethnicity).

It is unclear if psychopathy is chiefly influenced by social factors, or psychological variables, or defective genetic makeup. Nevertheless, psychopaths are antisocial and have clear neurocognitive markers indicative of their problems processing distress signals in others.

Three significant comorbidity patterns are observed in psychopathy: 1) a high rate of comorbidity with substance use disorders; 2) a high association with other personality disorders; and 3) low rates of comorbidity are observed between psychopathy and certain other personality disorders. Comorbidity is lowest with avoidance (anxious-avoidant), dependent, and obsessive-compulsive personality disorders. The detrimental effects of psychopathy include destructive behaviors, such as aggressive antisocial behavior.

Psychopathy is commonly diagnosed by utilizing the Psychopathic Checklist (PCL)—considered to be a valid and reliable by many clinical psychologists and psychiatrists. Although the use of the PCL in diagnosis has its critics, many experts regard it as a reliable and valid way of diagnosing psychopathy. Neuroimaging and genetic testing can help identify a specific pattern of and prediliction to the disorder. However, they may not identify a psychopath specifically. The results of skin conductance hyporeactivity tests can help identify emotional deficits and impulsivity, suggesting a propensity for antisocial behavior and negative interpersonal relationships in psychopaths.

Currently, there is no pharmacologic cure for psychopathy. Furthermore, the behaviors of psychopaths have not been substantially improved by any traditional or nontraditional forms of therapy, such as group therapy, client-centered therapy, psychodrama, psychosurgery, electroshock therapy, or drug therapy. Limited and largely anecdotal literature exists for the therapeutic effects of major tranquilizers, mood stabilizers, and serotonergic agents in controlling impulsive and aggressive traits in antisocial samples. However, there has been minimal investigation of the pharmacological treatment of psychopathy specifically. Thus, the treatment of psychopathy is likely to remain—for the time being—similar to those of other mental disorders, such as schizophrenia, which has underlying genetic influences and neurodevelopmental bases. Antidepressants, MDMA, and oxytocin analogs have been tried to treat the various symptoms of psychopathy. For now, neuroscientists and psychiatrists are the fundamental investigators in the identification, treatment, and prevention of psychopathy.

Conflict of Interest Statement

The authors declare that this paper was written in the absence of any commercial or financial relationship that could be construed as a potential conflict of interest.

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