The Causes and Treatment of Antisocial Personality Disorder in Juvenile Offenders

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A critical literature review submitted in partial completion of PSY 451 Senior Research Thesis.
The DSM-5 defines individuals with antisocial personality disorder as those who engage in repetitive irresponsible, delinquent and criminal behavior. It is a highly controversial diagnosis. Clinicians and researchers argue that it is too heterogeneous, over inclusive and demonstrates a considerable overlap with other disorders. Of the general population, two – three percent have the antisocial personality disorder diagnosis, with three percent of them being men and one percent being female. However, this diagnosis is much higher in those who are incarcerated. Of those who are incarcerated, 47% of men and 21% of females are diagnosed with antisocial personality disorder.

Repeated behaviors include, performing acts that are grounds for arrest, lying, fighting or assaulting, disregard for safety of oneself and others, failure to sustain consistent work behavior and the mistreatment of other individuals. There are genetic and environmental components to antisocial personality disorder, which will be discussed later. Genetics contribute to half of the variance to antisocial behavior, while the environment also plays a big role. Abnormalities in the brain of patients with antisocial personality disorder have also been examined with damage in the amygdala and prefrontal cortex playing a role in the development of antisocial personality disorder (Glenn, Johnson & Raine, 2013).

Deformities in the amygdala may be responsible for antisocial personality disorder. Lesions and inactivation studies have established that the amygdala is essential for the perception of fear. It is also essential for the expression of fearful behavior and acquisitions of fear in response to stimuli that had been paired with aversive outcomes (Morrison & Salzman, 2010). Although it is generally understood that the amygdala is associated with fear and negative emotions, new research shows that the amygdala is
associated with the processing of positive emotions and stimulus reward learning (Baxter & Murray, 2002).

The prefrontal cortex is also associated with antisocial personality disorder. When developed, the prefrontal cortex receives information from all other cortical regions and functions in order to plan and direct motor, cognitive, affective and social behavior across time. The prefrontal cortex develops longer than other sections of the brain. Development might differ when a person is exposed to different environmental stimuli (stress, drugs, hormones, social situations) (Kolb, Mychasiuk, Muhammad, Li, Frost & Gibb, 2012).

This literature review will examine the causes and treatments of antisocial personality disorder in juvenile delinquents. The first section will discuss the psychosocial and behavioral causes of antisocial personality disorder. The second section will examine how the amygdala and its subregional networks and subnuclei as well as the presence of gray matter are associated with antisocial behavior in juvenile delinquents and will examine the structures in the prefrontal cortex and how they differ in juvenile offenders from non-offenders, the presence of gray matter in the prefrontal cortex. The last section will examine the use of medication and behavioral rehabilitation to treat children with antisocial personality disorder.

**Psychosocial, Behavioral and Environmental Contributions**

Antisocial personality disorder has many possible causes. In this section two types of causes will be discussed; the psychosocial/behavioral causes and the environmental causes. Psychosocial and behavioral causes of antisocial personality disorder include the correlation of serotonergic functioning and attention-deficit hyperactivity disorder (ADHD), as well as interpersonal callousness. The causes that have been examined the
most are the environmental causes of antisocial personality disorder. Environmental causes of antisocial personality disorder include, abuse and neglect in childhood, parental history of alcoholism, mental illness and delinquent behavior.

This section will examine the psychosocial and behavioral causes of antisocial personality disorder in regards to how serotonergic levels are correlated with ADHD which leads to antisocial personality disorder and how interpersonal callousness can lead to chronic conduct problems, including antisocial personality disorder. The first psychosocial/behavioral cause is how ADHD can lead to antisocial personality disorder. Serotonergic function disturbances are usually associated with impulsive, aggressive behavior in adults. However, disturbances in serotonergic function in children produce different behaviors. Research shows that there is a relationship between childhood disturbance in serotonergic function and the development of antisocial personality disorder. Results showed that children who developed ADHD had a lower serotonergic responsivity that predicts the development of antisocial personality disorder (Flory, Newcorn, Miller, Harry & Halperin, 2007). The other psychosocial/behavioral cause of antisocial personality disorder is interpersonal callousness (IP). Interpersonal callousness includes, being deceitful, manipulative, grandiose, superficially charming, lacking empathy and guilt, and not accepting responsibility for transgression (Pardini & Loeber, 2008). A longitudinal study showed the association between interpersonal callousness and the development of chronic conduct problems (CP), such as antisocial personality disorder. Boys who had high initial levels of IP and CP were at a high risk for developing antisocial personality disorder (Hawes, Byrd, Waller, Lynam & Pardini, 2016). In
conclusion, children who have lower serotonergic responsivity and ADHD or interpersonal callousness are at a high risk of developing antisocial personality disorder.

Environmental causes of antisocial personality disorder have shown that twins who have shared environmental factors or influences are at a higher risk of both developing antisocial personality disorder (Lyons, True, Eisen, Goldberg, Meyer, Faraone, Eaves, Lindon & Tsuang, 1995). In this section four different environmental causes of antisocial personality disorder will be examined. These causes are childhood abuse and neglect, parental alcoholism, parental mental health and parental delinquency. Childhood abuse and neglect are common environmental causes of disorders like antisocial personality disorder (Bierer, Yehuda, Schmeidler & Mitropoulou, 2003). Childhood abuse and neglect greatly increase a person’s risk for being diagnosed with antisocial personality disorder (Luntz & Widom, 1994). Researchers have looked at the correlation of childhood abuse and neglect and the later development of personality disorders. Antisocial personality disorder has shown significant associations with sexual and physical abuse in childhood (Bierer, Yehuda, Schmeidler, Mitropoulou, 2003). There is also a familial component to the development of antisocial personality disorder; this component involves the family environment (Carey, 1996). Family environments include, parental alcoholism, mental health and delinquency. Parental alcoholism studies looked at the way parents who have alcoholism and antisocial personality disorder contributes to the risk of their child developing a psychiatric diagnosis, such as antisocial personality disorder. The children of parents who have only alcoholism, are at a higher risk of developing ADHD, conduct disorder, antisocial personality disorder and overanxious disorder. However, children whose parents have both alcoholism and antisocial
personality disorder are more likely to develop Oppositional Defiant Disorder (ODD). A dysfunctional parenting style was associated with the child development of antisocial personality disorder (Kuperman, Schlosser & Lidral, 1999). Parental mental illness is also an environmental cause of antisocial personality disorder. Parents who had a history of mental illness and/or suicide attempts had children who were at a greater risk of being violent offenders, an act usually associated with antisocial personality disorder (Mok, Pedersen, Springate, Astrup, Kapur, Antonsen, Morsm & Webb, 2016). The last environmental cause is parental, especially the mothers’, delinquency. A study that examined those with antisocial personality disorder and who were aggressive, looked at the subjects’ mothers and their juvenile behavior. Results showed that those who had mothers who were juvenile offenders were more likely to develop social adversity, such as antisocial personality disorder. They were also more likely to use substances during pregnancy and to offend in adulthood. The early onset of aggression was also associated with subjects who had mothers that were juvenile offenders (Tzoumakis, Lussier & Corrado, 2012). A child’s environment plays an important role in determining their fate. Research shows that the environment of a child can lead to disorders, such as antisocial personality disorder.

Knowing the causes of disorders, such as antisocial personality disorder, is important for reducing the risk of a child developing the disorder. Many of the causes presented above are causes that are preventable. Antisocial personality disorder puts children at a risk of becoming juvenile offenders. By identifying the causes or risk factors of antisocial personality disorder, one can help reduce the risk of developing the disorder and the risk of a child becoming a juvenile offender (Holmes, Slaughter & Kashani,
2001). The psychosocial, behavioral and environmental factors of a child are all factors that can cause the development of antisocial personality disorder.

**Brain Structure Association**

Much research has been done regarding the associations between antisocial personality disorder in juvenile delinquents and their brain development. Two major areas of the brain have been associated with antisocial personality disorder. Those two areas are the prefrontal cortex and the amygdala. This section will examine the structures in the prefrontal cortex and how they differ in juvenile offenders from non-offenders, the presence of gray matter in the prefrontal cortex. It will also examine how the amygdala and its subregional networks and subnuclei as well as the presence of gray matter are associated with antisocial behavior in juvenile delinquents.

Psychopathy combines callous-unemotional traits with behavior that is antisocial and inflexible (Contreras-Rodrigues, Pujol, Batalla, Harrison, Soriano-Mas, Deus, López-Solá, Maciá, Hernández-Ribas, Pifarré, Menchón & Cardoner, 2014). The brains of juvenile offenders, who show antisocial behavior, as well as psychopathy, have been studied and compared to the brains of those who do not commit crimes and show no antisocial behavior. A normal prefrontal cortex is an important area for reducing the risk of antisocial behavior and juvenile delinquency. This section will examine the differences in prefrontal cortexes, damage to the prefrontal cortex and the presence of gray matter in the prefrontal cortex. Studies examining the prefrontal development in juvenile offenders as compared to non-juvenile offenders has shown that even though there is no difference between intelligence in the two groups, incarcerated delinquents are more impulsive, have lower conceptual levels and flexibility and poorer critical thinking. It is believed
that the prefrontal cortices and their limbic inputs are responsible for antisocial behavior and antisocial personality disorder (Chretien & Persinger, 2000). Previous research done with patients who have damage to the ventromedial prefrontal cortex show that they have abnormal judgment responses to a moral dilemma. Researchers took those results and decided to test if patients who have ventromedial prefrontal cortex damage would have abnormal judgments of harmful intentions. Their results showed that those with ventromedial prefrontal cortex damage judged actions that attempted harm, such as murder, are permissible (Young, Bechara, Tranel, Damasio, Hauser & Damasio, 2010). These abnormal judgments can also be associated with antisocial personality disorder. The amount of gray matter volume also plays a role in the presentation of psychopathy in criminals. Criminals showed less gray matter volume in the prefrontal cortex. An increase in gray matter volume in the basal ganglia and supplementary motor area was correlated with antisocial behavior. Higher amounts of gray matter volume in the limbic areas were also correlated with antisocial behavior as well as a risk of violent recidivism (Leutgeb, Leitner Wabnegger, Klug, Scharmüller, Zussner & Schienle, 2015). Reductions in functional connectivity as well as gray matter in the prefrontal cortex are both contributors to antisocial behavior (Contreras-Rodrigues et al., 2014).

Psychopathy is a psychiatric phenomenon that is characterized by a pathological constellation of affective (callous, unemotional), interpersonal (manipulative, egocentric), and behavioral (impulsive, irresponsible) personality traits (Aghajani, Colins, Klapwijk, Veer, Andershed, Popma, van der Wee & Vereiren, 2016). Those with psychopathy show antisocial behaviors. The area of the brain that is most frequently associated with psychopathy and antisocial behaviors is the amygdala. This section will examine the
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amygdala as a whole, the subregional networks, subnuclei and gray matter volume in the
amygdala and how they are correlated to antisocial behavior in juvenile offenders.

Juvenile psychopathy and antisocial behavior, especially callous-unemotional traits, are
similar to the factors that are associated with adult psychopathy. Children with callous-
unemotional traits show lower levels of prosocial reasoning, lower emotional
responsivity and decreased harm avoidance. Brain imaging suggests that children with
these traits have a reduced response of the amygdala and a weaker functional
connectivity between the amygdala and ventromedial prefrontal cortex (Herpers,
Scheepers, Bons, Buitelaar & Rommelse, 2013). Adolescents who scored low on a
certain youth callous and unemotional trait assessment showed a positive correlation
between right amygdala responses and severity of violation ratings. However, when
children viewed pictures that were unpleasant and without moral transgression, the scores
of a youth psychopathy checklist assessment were negatively correlated with
hemodynamic responses in the left amygdala (Harenoki, Haenski & Kiehl, 2014). Many
studies that associated antisocial behavior and psychopathy with the amygdala are just
looking at the amygdala as a whole. However, there are subregional networks that
contribute differently to psychopathy. A study looked at the connectivity of basolateral
and centromedial amygdala networks in relation to the affective, interpersonal and
behavioral traits of psychopathy in juvenile with a history of serious delinquency. Results
showed that different connections in the amygdala are associated with different
psychopathy traits. For example, interpersonal traits of psychopathy are related to the
increase of connectivity of the basolateral and centromedial amygdala networks.
Whereas, affective psychopathic traits are related to the decrease of centromedial
amygdala network connectivity (Aghanjani et al., 2016). Since the amygdala is not a unitary structure, researchers examined how amygdala subnuclei respond to violence. Segmentation identified the basolateral complex and the central subnucleus. Both are used as seeds in a functional connectivity analysis to identify the differences in neuronal coupling that is specific to observed violence (Yoder, Porges & Decety, 2014). Research found that the full amygdala showed connectivity to the right middle occipital gyrus only, however the subnuclei seeds revealed different connectivity patterns. The basolateral complex showed enhanced connectivity with the anterior cingulate and prefrontal regions, while the central subnucleus showed increase connectivity with the brainstem (Yoder, Porges & Decety, 2014). Just like in the prefrontal cortex, gray matter in the amygdala is associated with two temperament dimensions (fearlessness and disinhibition), which are both present in juvenile offenders. MRI scans showed that the greater the fearlessness dimension in a juvenile offender, the less gray matter is present in their amygdala. This fearlessness temperament, as it is associated with gray matter volume, shows evidence for the association between antisocial behavior in juvenile offenders and their amygdala (Walters & Kiehl, 2015). Since atypical amygdala function and connectivity is associated with psychopathy, it is important to show how it is related to the antisocial behavior in juvenile offenders (Yoder, Porges & Decety, 2014).

In conclusion, brain development, differences and atypical functioning is important to study for any disorder. By studying the prefrontal cortex and amygdala in juvenile offenders with antisocial behavior, we are able to determine where the problems develop. By understanding the structural abnormalities of the prefrontal cortex and the
presence of gray matter in the amygdala in juveniles with antisocial behavior, we are able to treat the problems.

**Treatments**

It was generally believed that there was no treatment for antisocial personality disorder; however there has been a significant shift from the view that antisocial personality disorder is untreatable (Meloy & Yakely, 2010). Antisocial personality disorder generally dissipates by adulthood (Ahmadi-Kadhani & Hechtman, 2014). However, when antisocial personality disorder is presented in children, it must be treated in order to lower the risk of the child becoming a juvenile offender. Treatment for children with antisocial personality disorder can consist of the administration of medication as well as a variety of psychosocial interventions which include parent-child therapy, parent training, positive behavioral support and collaborative problem solving (Ahmadi-Kadhani & Hechtman, 2014). This section will examine the use of medication and behavioral rehabilitation to treat children with antisocial personality disorder.

Medication is an effective way to treat many disorders. One study looked at how the drug clozapine affects children with antisocial personality disorder. Even though clozapine is usually used to reduce aggression in schizophrenics and those with borderline personality disorder, nothing had been published with how it affects those with antisocial personality disorder. Researchers found that antisocial personality disorder patients who were taking clozapine showed significant signs of improvement. Their impulsive behavior and anger was more controlled. Violent incidents committed by subjects were also reduced. There was an overall reduction in the severity of antisocial personality disorder when subjects were taking clozapine (Brown, Larkin, Sengupta,
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Romero-Ureclay, Ross, Gupta, Vinestock & Das, 2014). This study is the first to show the effects of clozapine on patients with antisocial personality disorder. Research like this leads to new ways to treat those who are diagnosed with antisocial personality disorder. The appropriate prescription of medication can be beneficial in helping prevent children, with antisocial personality disorder, from becoming juvenile offenders (Meloy & Yakely, 2010).

Another form of treatment for children with antisocial personality disorder is behavioral rehabilitation. This does not have to involve the use of medication for treatment. Treatments that have the strongest empirical support among psychotherapies include parent management training, problem-solving skills training and multisystematic therapy (Kazdin, 2000). These treatments have been studied and research shows that they have many strengths. However, long-term treatment is needed because the characteristics of antisocial personality disorder (impulsivity, deceitfulness, co-morbidity with substance use) are stable and often resistant to change (Gudonis & Giancola, 2008). Since substance abuse is associated with juvenile offenders with antisocial personality disorder, it is suggested that those individuals receive some form of substance abuse treatment. This helps reduce the prevalence of antisocial behavior (Hatchett, 2015).

Although there is more research on psychotherapy treatment for juveniles with antisocial personality disorder, there is also research that suggests certain medications can help reduce antisocial behaviors. Like other disorders, a combination of psychotherapy and medication is preferred (Meloy & Yakely, 2010). It is important to treat antisocial behaviors in children because, although antisocial behaviors often go away with age, failure to treat antisocial personality disorder can result in individuals who are untreated
It is also important to treat children with antisocial personality disorder because it ensures that there will be a less likely chance of that child becoming a juvenile offender.

**Conclusions**

This literature review examined the causes and treatments of antisocial personality disorder in juvenile offenders. The previous sections discussed the psychosocial, behavioral and environmental causes of antisocial personality disorder, the prefrontal cortex and the amygdala’s role in antisocial personality disorder and the use of medication and behavioral rehabilitation to treat juvenile offenders with antisocial personality disorder. It was shown that serotonergic functioning and ADHD as well as interpersonal callousness play a role in the psychosocial and behavioral causes of antisocial personality disorder, while abuse and neglect in childhood, parental history of alcoholism, mental illness and delinquent behavior are aspects of the environmental effects. Differences in the prefrontal cortex of juvenile offenders and non-delinquent juveniles as well as a presence of gray matter in the PFC are two of the brain abnormalities of juveniles with antisocial personality disorder that were discussed. The amygdala and its subregional networks and subnuclei as well as the presence of gray matter are also factors of antisocial personality disorder brain abnormalities. A combination of specific medications and behavioral rehabilitation prove to be the most effective in treating juvenile offenders with antisocial personality disorder.

The environment appears to play the largest effect on the development of antisocial personality disorder in juveniles. It is the development of antisocial personality disorder that plays a large role in the reason why children commit crimes. Children are
very susceptible to things when they are growing up, and if they are raised in an environment that promotes or doesn’t discipline delinquent behavior, they will think it is okay to act that way. Setting a positive example for children is the best way to prevent delinquent behavior and the onset of issues like antisocial personality disorder.

It is important for places like juvenile detention centers, children’s homes and even schools need to have better treatment plans for children who display delinquent behavior with antisocial personality disorder as well as other disorders. It might be the case of some juvenile detention centers that the mental healthcare the juveniles were receiving is not always effective. It is hard for a couple of therapists to give their full attention to every single juvenile at the detention center because the number of juveniles severely outnumbers the amount of therapists available. It might also be the case that therapists do not always their job at all at a detention center. Therapists will refuse to meet with any juveniles, and if they did they would not try to do anything about the juvenile’s behavior issues. Although there are a number of good therapists, there are also therapists in juvenile detention centers that are not helpful in the rehabilitation of a juvenile offender’s behavior. The population these therapists are counseling are a difficult group to counsel because they might not always be willing to change or think that they can change. This is an issue because, if the juvenile does not receive effective behavioral rehabilitation, they will revert to their delinquent behavior when they are released back into society. Medication is also an issue when offenders are not in a detention center. The juveniles receive medication while they are in a detention center and their behavior is modified. While they are incarcerated their behavior is regulated because they are able to receive the proper medication. However, once they are released, they are only given
medication for a certain amount of time. Many of the juvenile offenders do not have the resources to continue to receive medication or behavioral rehabilitation once they are released from a detention center. Their disorders like, antisocial personality disorder, cannot be managed and which can result in more delinquent behaviors, since the brain structures in those with antisocial personality disorder will always be different from those without the disorder. Antisocial juveniles can take medication and go to therapy to relieve the symptoms of their disorder, but if they do not continue with their treatment, they will revert back to previous antisocial behaviors because their brain structures have not changed.

It is very important for juvenile offenders with antisocial personality disorder to receive treatment (behavioral and medication) after they are released from a juvenile detention center. If the proper treatment is not received in the detention center, they will have a harder time reintegrating back into society. If they do not continue treatment outside of a detention center, they will be more likely to repeat their delinquent behavior since their disorder is not under control.
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