# Advantages and Disadvantages of Criminology Engaging with Psychology and Biology

 Advances in the biological sciences, and in particular neuroscience and evolutionary biology have advanced the understanding of the human brain. Thereby, it has also helped to advance the field of psychology. Criminology has also benefited from these advances since studies have shown a relationship between criminal offending and genetic factors that could explain why some people are more likely to offend during their lifetimes than others are. In psychology, the biological approach to understanding the human psyche posits that we are a total of our physiology and genetics. This approach investigates the behaviors, feelings, and thoughts of the human being from a physical or biological viewpoint, which has led to the development of pharmacological treatments for various mental health problems because of the argument that changing the physiological function of the brain results in changes in thoughts, feelings, and behaviors. Diagnosis of mental health problems and the potential for criminal offending has also received a boost from neuroscience. Using techniques such as neuroscience and electroencephalograms (EEGs) and MRIs (magnetic resonance imaging), neuroscience can indicate the underlying physiological structure of the brain, thereby helping to identify people with a predisposition to criminal offending like psychopaths. However, a psychological and biological approach has various negative impacts when applied to criminologies such as negative eugenics, genetic profiling and various implications of the claims of biology and psychology on the criminal justice system such as sentencing based on genetic and psychological predispositions inherent within a convict. The research investigates the various advantages and disadvantages of Criminology engaging with psychology and biology.

 Biological sciences, and in particular neuroscience can provide insights into the differences between a criminally predisposed brain structure and the brain structure of a person less likely to offend. This is a significant advantage provided to criminology because it allows criminologists to understand the biological and therefore the psychological influences of crime, thereby better preventing and intervening for people with a high predisposition to criminal offending because of their brain structure and functioning. Techniques in neuroscience that provide an understanding of the criminal mind are EEGs, CAT scans, and MRIs. Electroencephalogram imaging studies the patterns of the brain’s functions, which provide insights into an individual’s neurological response to various stimuli. MRIs and CAT scans have proved to be the most useful in understanding the criminal mind (Snead 2007; Rose 2000; Kerr, Binnie and Aoki 2008; Baskin, Edersheim, and Price 2007). Neuroscience provides precise descriptions of the biological determinants of criminal behavior that has significant relevance to criminology.

 According to Wright and Boisvert (2009), the findings from the ‘hard sciences,’ such as biology could provide a benchmark in the theoretical and conceptual frameworks used in criminology. Also, the already empirically validated criminology studies could be improved through incorporation of empirical knowledge from the biological sciences (Wright and Boisvert 2009). Some of the criminology theories that could benefit from the biological sciences mentioned in Wright and Boisvert’s (2009) research include the general strain theory and the theory of low self-control. Biological explanations of self-control provide more insight than purely criminological theories. Biological sciences have found that the loss of executive functions, which are functions that ensure an individual has sufficient self-control, are caused by damage or underdevelopment to the frontal cortex region of the brain (Wright and Boisvert 2009). Using brain imaging technologies such as EEGs and MRIs, criminologists can identify people with deficiencies in this area of the brain and make them the focus for intervention to prevent future criminal offending.

 Studies on the inheritance of criminal tendencies can provide a means for early detection and intervention for at-risk individuals who are most likely to offend in the future. This can allow the criminal justice system to prevent crime before it occurs early enough. More evidence about the usefulness of the biology to criminology comes from genetic studies. According to Raine (2011), genetic abnormalities can manifest as abnormalities in the brain, consequently predisposing the affected individual towards antisocial behavior. There is strong evidence that abnormalities in the prefrontal cortex region of the brain are prevalent among antisocial groups (Raine 2011; Wright and Boisvert 2009). In extreme cases such as psychopathic criminal behavior, Raine (2011) states that patients who have a damaged ventral prefrontal cortex exhibit signs of psychopathic behavior such as bad decision-making reduced emotional and autonomic functioning and disinhibited behavior.

Psychopathic criminals have similar traits. However, it is not possible to use traditional criminology methods to determine who is most likely to be a psychopath because this would involve profiling people based on insufficient social science methodologies and theories. Using insights from biology provides the precision and accuracy required to predict whether someone is most likely to offend in the future. Wright and Boisvert (2009) add that biology can help determine the differences between males and females in criminal offending. While this might seem like gender profiling because as Wright and Boisvert (2009) state, there is a myth that males and females are the same in emotional dynamics, cognitive abilities and orientations and behavioral adaptations, it is an empirically validated fact that such differences exist. Some of the biological differences between the sexes that can improve understanding of gender differences in criminology include neurotransmission, hormone regulation, brain structure and functioning (Wright and Boisvert 2009). The application of biology to criminology can help in building profiles of potential criminal offenders and identify some of the biosocial factors that might predispose them to criminal behavior. Biology provides additional precision to criminology’s theory and methodological process.

 Both biology or ‘hard sciences’ and psychology promote the development of objective and empirical truth in criminology, potentially making it easier to defend the truth claims criminologists make on sociopolitical, public policy and criminal justice issues. This is important because there is evidence in the research literature that conventional criminology does not have the “truth” value required to inform various aspects of social and political life, such as public policy, which demonstrates the need for the incorporation of biology and psychology into criminology. Turner (2012) states that because of the contemporary socio-political circumstances within which criminology operates, there is the danger of ideological fraud to meet sociopolitical ends that are not supported by “truth” as held by criminologists (Turner 2012). This can have negative sociopolitical and public policy consequences, especially regarding the criminal justice system. Currie (2007) makes similar observations about the truth-value in criminology that Turner (2012) makes. She states that even when criminologists have insurmountable evidence “that could make a strong case for or against certain kinds of action or intervention,” chances are this evidence might be ignored in favor of other spurious evidence that does not have a backing in empirical research (pp. 177). The problem of ensuring that criminological perspectives are easily accepted and validated based on serious evidence elaborated on by Turner (2012) and Currie (2007) has promoted the increasing relevance of biology and psychology in criminology discourse.

 Despite the demonstrated need for biology and psychology in criminology, the research literature is pervaded by criticisms of the approach similar to those that sociobiology faced when E.O. Wilson first conceptualized it more than three decades ago. Biology’s application in the social sciences is the most controversial because of historical misappropriation of its findings to justify negative eugenics, which is the profiling and targeting of people with particular genetic backgrounds to reduce their reproductive capacity or eliminate them from the gene pool. Since Darwin’s theory of evolution by natural selection was published, the debate on applying biological principles to criminology and the wider social sciences has lingered, but there is growing an appreciation of biology in criminology, albeit with some important considerations about the potential for similar negative eugenics issues that faced sociobiology. According to Heylen, Pauwels, Beaver, and Ruffinengo (2015), there is an increasing prevalence of the biosocial approaches (e.g., biology and psychology) in some of the sub-disciplines in criminology but the progress is slow and gradual, especially among young criminologists who might have reservations about employing the biosocial approaches in crime analysis. There is minimal training in biosocial approaches, which is an additional explanation the researchers offer for the slow integration of these approaches in criminology (Heylen, Pauwels, Beaver & Ruffinengo 2015). Heylen, Pauwels, Beaver, and Ruffinengo (2015) cite various traditional criticisms that have emerged in the biosocial criminology debate. The most persistent and relevant are the notion that biosocial criminology ignores the social structures that influence criminal behavior, such as socioeconomic background and education, in favor of reductionist, deterministic and behaviorist scientific perspectives. These perspectives, the critics argue, simplify human behavior. Such implications can lead to racial profiling, negative eugenics and other simplistic that have historically proven dangerous to social well-being (Heylen, Pauwels, Beaver, & Ruffinengo 2015). Historical occurrences such as the eugenics movement of the early 20th century because of simplistic ideologies are examples of the disadvantage of applying biological sciences to human behavior.

 Considering the potential for a simplified and deterministic view of human behavior because of the reductionist nature of the ‘hard sciences,’ there is a need to consider the evidence for and against psychological and biological profiling in crime analysis. Knowledge derived from the methods of the ‘hard sciences’ has the problem, and at the same time, the advantage of "increases incrementally and messily and rarely (if ever) get it right the first time” (Walsh and Wright 2015, pp. 62). This means that while the incremental advancement of knowledge allows for a cumulative understanding of natural phenomenon, the fact that science rarely gets it right the first time should be cause for concern when it is applied to weighty human affairs such as the predisposition to commit a crime. This is what happened when evolutionary biology was applied in the science of understanding the influence of genetic differences on human behavior. According to Walsh and Wright (2015), critics of biosocial approaches cite the example of Ptolemy and his appropriation of cosmology to explain physical phenomenon. Some of his scientific arguments were wrong, such as the geocentric view of the universe, which means that science is fallible. During his time, scientific and church authorities were in agreement with some of his ideas that have since been proven wrong by scientists such as Newton and Galileo (Walsh and Wright 2015). Heylen, Pauwels, Beaver, and Ruffinengo (2015) state that the perceived danger aforementioned in the current discussion about science’s fallibility in the face of contradictory evidence is based on a misunderstanding of the application of the biosocial approaches to criminology.

 Heylen, Pauwels, Beaver, and Ruffinengo (2015) state that researchers like Raine (2011) contend that while there are genetic predispositions that could determine future criminal behavior, these predispositions only become a real consideration when there are environmental influences. Therefore, genetics alone cannot be used in criminology to make decisions or suppositions about the analysis of crime. The genes, or biology, have to interact with environmental influences to lead to criminal behavior (Heylen, Pauwels, Beaver, & Ruffinengo 2015). Psychology, being the study of how social structures and environmental influences can influence behavior, thoughts, and feelings, is a social science complement to biology. Both disciplines should be included in their application in the field of criminology to avoid the negative consequences of sociobiology on human beings such as negative eugenics. An example of the need for an eclectic use and integration of social sciences and ‘hard sciences’ is the observed relationship between age and criminal behavior.

 Criminology, in and of itself, cannot provide an adequate elaboration of the observed relationship between age and criminal behavior because it can only investigate patterns in the crime data. Other than that, it might have difficulties concretely explaining why young people commit most crimes than older people. Carrier and Walby (2014) state that if only aetiological criminology (criminology’s explanations of observed cause-effect relationships) is used in explaining such phenomenon, then the scientific validity of criminology will come into question. Other researchers cited before have expressed the danger to criminology’s influence on public policy and the criminal justice system if the discipline loses scientific validity or it does not provide sufficient explanations for the cause-effect relationships observed in its empirical research (Turner 2012; Currie 2007). Carrier and Walby (2014) state that in the cause-effect relationship between age and crime, injecting physiological explanations could provide better insights on this relationship. The researchers argue that physiologically, younger people commit more crimes because of the various physiological abnormalities that occur during the early developmental stages of an individual's life. Various elements of the body are responsible for the crime rates among young people such as testosterone levels, damage to the amygdala, dopamine and serotonin levels in the brain (Carrier and Walby 2014). These biological elements offer concrete explanations that are scientifically acceptable by researchers, thereby making it easier for criminology to carry out its mandate in public policy and the criminal justice system.

 While criminology might provide the scientific and social science basis for what they contend as true, the disadvantage that what they assert might be appropriated for political purposes is very real. Becker (1967) states that officials that assert a particular truth might not be responsible for the actions of those they speak on behalf, but they are still responsible for the truthful assertions. Therefore, although the goal of criminology in adopting biosocial approaches might not be to create negative outcomes like racial and genetic profiling, and negative eugenics, their truth assertions make them responsible for the negative outcomes (Becker 1967). This is the same problem facing sociobiology. Sociobiology makes claims about the relationship between human genetics and behavior without the associated political connotations that would make such an idea justification for discrimination and profiling among those who accept the claims of sociobiology as true. Nonetheless, criminology has to accept this risk to advance the discipline towards a multidisciplinary approach to crime analysis.

 Another disadvantage of biosocial approaches comes from the debate between the biosocial criminologists and critical criminologists counterparts. Critical criminologists argue that the adoption of biosocial approaches could make sociological criminology appear less important. Carrier and Walby (2015) argue that the biosocial model and the models used in criminology are different in their conceptual underpinnings. Social science models, like those used in sociological criminology, have conflicting and plural foundational schemes as opposed to the relatively consistent and singular schemes underlying ‘normal science.' Carrie and Walby (2015) state that biosocial criminologists prefer the models in ‘normal science' than the ones in sociological criminology, creating the danger that the latter will be favored and the former marginalized. This danger can make criminology a less credible mode of crime analysis if there is no eclectic or integrated adoption of models from both sociological criminology and biosocial approaches. The current paper argues that to remove the disadvantages associated with biosocial approaches discussed so far, both models should complement each other in application to crime analysis.

 In practice, the application of biosocial approaches has had mixed results in the criminal justice and legal system, but according to research, these results have mostly been negative or unimpressive. The criminal justice system has used evidence and insights gained in criminology through the adoption of biosocial approaches, with varying degrees of success and criticism from practitioners in the criminal justice system and researchers. Maroney (2009) points out that recent findings in science have influenced legal practice and theory, with significant failures in improving the criminal justice systems. The Supreme Court has appropriated developmental neuroscience's findings of the development of the teen brain and its relationship to criminal behavior to make decisions on punishment in juvenile justice systems. For example, based on the application of developmental neuroscience in the *Roper v. Simmons* case, the U.S. Supreme Court ruled to remove the death penalty for juvenile offenders (Maroney 2009). Maroney (2009) argues that the scientific approach in developmental neuroscience might provide a clear understanding of overall differences in teen development but it does not account for individual differences. In other words, teenagers exposure to similar neurological development might manifest differences in capacity to commit crimes, thereby making developmental neuroscience difficult to implement in practice. In addition, Maroney’s (2009) analysis of various juvenile cases did not show that legal practitioners necessarily apply the findings from neurological development studies in their decision-making processes. They are more likely to use strongly held beliefs and values to inform decision-making than biosocial criminology recommendations. Therefore, biosocial approaches still face issues in practice because this approach to crime analysis is still in development.

 There is some evidence that biosocial approaches have influenced the criminal justice system significantly in specific areas, such as the severity of the sentencing for psychopathic offenders. According to Aspinwall, Brown and Tabery’s (2012) study, when judges were exposed to expert testimony on the biomechanical processes that lead to psychopathy, they were more likely to give lesser sentences and to attribute the psychopath’s criminal behavior to mitigating factors. The researchers used the content analysis methodology and a sample of 181 U.S. state trial judges. They found an increase from 29.7 percent to 47.8 percent in the number of judges who cited mitigating factors in their sentencing (Aspinwall, Brown and Tabery 2012). Just like the removal of the juvenile death penalty cited in Maroney’s (2009) research, Aspinwall, Brown and Tabery’s (2012) research shows that in some spheres of the criminal justice system, biosocial approaches could drastically influence legal theory and practice, for better or for worse. Other researchers provide mixed evidence on the impact of biosocial approaches to legal practice and theory, and overall criminal justice systems (Goodenough and Tucker 2010; Winick 2009; Perlin 2009; Greene and Cahill 2012; Pustilnik 2009). Currently, the research on biosocial approaches in criminology as opposed to or in complementary application with sociological criminology is still in its early stages.

The analysis of the application of biology and psychology (or biosocial approaches) in criminology, its advantages and disadvantages has shown that there are significant advantages but the research on this subject is still young. The major advantage is that such approaches increase the scientific validity of criminology. An associated advantage is that criminologists will be more effective in influencing public policy and the criminal justice system. Findings from biology and psychology could provide additional support for theories and practices in criminology, which would otherwise stand on flimsy ground as far as empirical validity is concerned. On the other hand, biosocial approaches might marginalize sociological criminology, thereby lending less scientific credence to sociological criminology. Furthermore, other than the influence of biology and psychology on such case rulings among juveniles and psychopaths, these approaches are just beginning to have an impact on the legal theory and practice.

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