

КРИМІНАЛЬНЕ ПРАВО. КРИМІНОЛОГІЯ. КРИМІНАЛЬНО-ВИКОНАВЧЕ ПРАВО

УДК 343.97

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THE POTENTIAL OF BIOSOCIAL CRIMINOLOGY

Biosocial criminology is one of the fastest growing lines of research within the field of criminology. Much of the findings suggest that genetic risks are involved in anti-social behavior including criminal behavior with the environment and genes working in a synergistic manner. These findings have tremendous potential for crime prevention. According to researchers in the field, the continued accumulation of biosocial criminological data, and the development of biosocial theories is imperative to the advancement of this perspective. In spite of the promising advances in biosocial research there is considerable opposition to this line of research in the United States.

Keywords: *genetics, biosocial criminology, crime prevention.*

Дана характеристика биосоціальної кримінології, которая является одним из самых быстрорастущих направлений исследований в области кримінології. Большинство результатов таких исследований подтверждают, что генетические риски антисоциального и преступного поведения лица имеют синергетический влияние на него наряду с окружающей его средой. Полученные данные имеют очень большое значение для эффективного предупреждения преступности. Проанализированы труды исследователей, по мнению которых дальнейшее накопление биосоциальных кримінологических данных и развитие биосоциальных теорий являются крайне необходимыми для продвижения этой научной отрасли. Однако, несмотря на многообещающие перспективы в этой сфере, в США существует большая оппозиция относительно проведения биосоциальных исследований.

Ключевые слова: *генетика, биосоциальная кримінология, предупреждение преступности.*

Introduction. While criminology is primarily a discipline related to explaining the origins of criminal behavior, crime prevention through policy is certainly a secondarily goal. In a recent article a prominent criminologist, Michael Vaughn, commented that «most if

not all [crime] prevention is biosocial» [1]. Driven by advances in molecular biology and neuroscience, biosocial approaches are increasingly being used in research designs to better explain the proximate influences of criminal and other forms of antisocial behavior, and

by implication assess their usefulness in crime prevention or criminal justice policy. Therefore, it is imperative that researchers continue to accumulate biosocial data, and formulate robust biosocial theories, to advance criminology so that it is more in line with other fields (e.g., psychology and psychiatry) that endeavor to the causes of anti-social behavior [2]. Doing so would also move criminology away from solely relying on environmental approaches that center on the correlates of crime to a public health model that involves identifying risk factors (genetic and environmental) and employing intervention strategies designed to prevent the onset of anti-social behavior [1]. To do so, however, biosocial researchers must employ more experimental-type research designs to understand the underlying causes of criminal behavior and develop approaches to attenuate the risk factors associated with it [3].

Beyond this, there are philosophical and legal advantages to advancing biosocial criminology when it comes to the etiology of criminal behavior vis-a-vis criminal justice practice. With research advances in the fields of neuroscience and genetics there is an increasing recognition that commonly held assumptions about culpability are out of step with the workings of the brain, for example. This has particularly important implications for one of the foundations of criminal intent (*mens rea*), and therefore impacts the concept of fairness in sentencing. Indeed, recent research has found that the use of neurobiological evidence is increasingly being used to mitigate sentencing in a wide range of felony cases, and between 20 to 30 percent of defendants are successful in winning appeals because of neurobiological evidence [4]. That sci-

ence reveals that we have less control over our actions, and some have much less control than others renders culpability less of a dichotomous concept and more of something of a continuum. Therefore, in order to fairly assess the degree of blameworthiness when it comes to sentencing offenders, research in criminology and criminal law must keep pace with scientific advances to remain viable and legitimate [5; 6].

Contemporary Biosocial Research. Molecular genetics has advanced to the point of surpassing earlier behavioral genetic studies to suggest that gene-environment interactions are in play when it comes to explaining the origin of antisocial phenotypes, or those related to criminal behavior. While a review literature is beyond the scope of this paper, there is one notable example that made biosocial criminology more palatable to conventional criminologists. The study appeared in *Science* in 2002 and drew attention to a gene-environment interaction and criminality. The findings provided indisputable evidence to support the contention that genetic risk when combined with adverse social conditions was more likely to result in antisocial behavior than when they existed separately. Researchers found that a suboptimal functioning gene that produces the enzyme monoamine oxidase A (MAOA) combined with environmental risk (childhood maltreatment in males) was associated with a greater degree of violence along four measures of antisocial behavior. In short a lower functioning allele was associated with an antisocial phenotype in concert with adverse social conditions [7]. One of the reasons that this study was embraced by some of those with biosocial as well as sociological leanings was that the research-

ers made clear the importance of the environment in shaping the genetic risk for violence.

Since the findings by Caspi et al., who argued for a molecular as well as environmental basis to anti-social, bio-social research is beginning to gain acceptance among a small number of criminologists, and it is beginning to influence the research designs [2]. Subsequent research has confirmed this type of gene-environment interaction in children [8]. With the advancement of molecular genetics, it is now cheaper and easier to collect and analyze DNA samples. Recently research has started to incorporate the logic of a genetic environmental interaction into treatment and crime prevention [3]. Additional findings suggest that individual-level characteristics influence how offenders respond to efforts to reduce recidivism. Treatment effectiveness is influenced by age, gender, and even educational level, for example. As this line of research has moved forward, several prominent databases from ongoing longitudinal studies have added DNA to their collection processes (e.g. the National Youth Family Study, and The National Longitudinal Study of Adolescent to Adult Health) and are now regularly used by a small number of criminologists. Biosocial criminologists now acknowledge that people with one genotype may respond better to treatment than those with another genotype. In other words, a genotype may attenuate risk because the individual with a certain genotype responds better to an intervention than someone without genetic risk. This is referred to as the differential-susceptibility hypothesis; which essential means that some people are more sensitive to the environment than others, so that they will be

more affected by negative environmental influences, but more positively affected by positive environmental influences [9]. This means that these highly sensitive individuals are more malleable and subject to environmental influences such as treatment intervention. In one study using an experimental design, researchers found a moderating effect that a treatment intervention had on a serotonin transporter gene on the promoter region of the 5-HTTLPR, found to be associated with the onset of behavioral risk (early initiation of sexual behavior and substance use) among adolescents. Findings indicated that compared to controls, youth exposed to the treatment exhibited a lower rate of initiation of at-risk behavior lending support for the differential susceptibility hypothesis [10]. While relatively rare, these studies point the way forward for the evolution of criminology in the direction of a prevention science where the risk of crime is identified and treatment modalities minimize the onset of risk behaviors.

The Foundations of Opposition to Biosocial Criminology. In spite of the advances made in biosocial research there is considerable opposition to this sort of research in the United States that have their roots in Europe. The biological origins of criminal behavior are traditionally linked to a somewhat obscure physician, Cesare Lombroso, who conducted research on Italian convicts. Based on data obtained by comparing the physical features of prisoners with conscripts, Lombroso argued that the criminal offenders were evolutionary throwbacks to an earlier era; marked by identifiable physical features (physical stigmata) and inborn abnormalities that determine criminal behavior essentially making certain offenders

born criminals. His theory of atavism was initially hailed as a scientific breakthrough when he published his work, *L'Uomo Delinquente* in 1876. A number of studies followed most importantly, Goring's *The English Convict*, that refuted Lombroso's claim that a physical stigmata distinguished criminals from non-criminals. More studies followed, and his theory of atavism was severely criticized, and rejected leaving Lombroso somewhat of a laughing stock by the 20th century [14]. Although he subsequently revised his theory to include social factors, his work remains linked to biological determinism, eugenics, and even Nazism [15]. The upshot is that criminology has since remained ardently attached to environmental explanations of criminal behavior, and criminologists have shunned biological approaches to crime. Because of the indelible Lombrosian stain contemporary biosocial theorizing and research has remained relegated to the fringes of mainstream criminology until relatively recently. Meanwhile, research along these lines has proceeded primarily in the fields of psychiatry, and psychology and has uncovered genetic and environmental risks for antisocial phenotypes or endophenotypes such as self-control shown to influence anti-social and criminal behavior.

Contemporary Opposition to Biosocial Criminology in the United States.

While somewhat surprising, the fear that biosocial theorizing will lead down the slippery slope of eugenics is not uncommon and lays just below the surface among certain segments of the academic population. Because criminology and criminological theory is essentially sociological in nature, a clear majority of (and therefore their approaches to research) can be consid-

ered sociological criminologists, and tend to be deeply opposed to research suggesting biological links to any sort of behavior; especially criminality. For this reason, some biosocial criminologists have concluded that opposition is largely based on ideological grounds; what some have referred to as a «rage against reason». Indeed, opponents have argued that contemporary biosocial theorizing and methodology is merely an extension of Lombroso's basic framework [13]. In fact, it is not uncommon for biosocial criminologists to be labeled as «neo-Lombrosian» in journals [14]. Thus invoking Lombroso is in essence a code in vivo for those opposing biosocial research.

Another more general reason for opposition among mainstream criminologists is the strict adherence to the belief that the environment is the sole influence on criminal behavior. Part of this is because few criminologists have very minimal undergraduate or graduate coursework in biology or genetics and therefore tend to be skeptical or dismiss theorizing or research proposing biological influences on behavior [15]. Genetic research in general has many ethical implications because the information derived related to the subject who is genotyped, but also the family. Moreover, genetic findings are not routinely understood by laypersons, and even some in academia. One common misunderstanding, is a «one gene/one behavior» when it comes to genetic risk for an antisocial phenotype; which is a common erroneous assumption even among academics [16]. When it comes to antisocial behavior such as violence or any other antisocial phenotype of interest to biosocial criminologists, research indicates that genetic influences (certain genetic polymor-

phisms) are involved in anti-social behavior including criminal behavior with the environment and genes working in a synergistic manner [2].

Not surprisingly, the most vociferous critics of biosocial criminology tend to be from sociological criminologists who see biosocial theorizing as an anathema and dangerous because of a fear that research findings will be used to justify racism, sexism, and eventually leading to policies of eugenics. Therefore, based on an ideological premise of what policies biosocial research may lead to, there has been a concerted effort to root out and rid those who engage in it from academia because it violates certain core values held by mainstream criminologists that some have referred to as a tribal moral community. In short, because biosocial theorizing and research violates certain values, it should not be permitted. The effect of this adversity has been felt throughout academia negatively influencing careers, research topics. Some have even called for banning studies estimating the role of genetics in criminal behavior. In effect, this opposition amounts to a repression of scientific research, and impedes the advancement of the field of criminology seemingly on moral grounds even though genetic influence on behavior is widely acknowledged in fields such as psychiatry and psychology [14; 18].

Biosocial research in criminology has also been criticized on epistemological and methodological grounds. Earlier biosocial research relied on twin and adoption studies to demonstrate the degree to which traits or phenotypes are attributable to genetic influences, the shared environment, or the non-shared environment. In general, these studies affirmed that 50 percent of the

variation in an antisocial phenotype or related to antisocial behavior (e.g. self-control) was accounted for by genetic influences (heritability). What is more, a recent meta-analysis in the journal *Nature Genetics* that included 50 years of twin studies and over 14 million twins concluded that nearly half of the variance in the 17,000 traits analyzed was due to heritability [19]. A recent article in the flagship journal in the field, *Criminology*, however, questioned the entire premise of such genetically informed behavioral traits using twin and adoption studies on methodological and conceptual grounds that were «inherent in the method itself» [12]. The authors of this article called for an end to these types of studies arguing that this sort of research overestimated heritability, and minimized shared environmental factors like the family environment. They also argued that such heritability models incorrectly partitioned genetic and environmental influences. While more recent research involves genotyping and thus molecular genetics, this criticism does not directly apply to my research, but is worth mentioning as an illustration of the general opposition to biosocial criminology.

Cultural and Historical Impediments in Europe. In addition to the ideological opposition to biosocial criminology in the United States, specific historical and cultural elements of a country give rise to prejudices, judgments, and suspicions concerning a research team's intentions. This risk to scientific activity is emotionally-laden and therefore must be addressed in a sensitive manner that considers the composition of the board reviewing the research, contemporary events such as the current political climate, and discrete historical events. Therefore, it is crucial for the

lead member of the team advancing the project to be acutely aware and adept in negotiating the process for approval by an IRB or bioethical board.

Historical specificities in Poland for example exacerbate the opposition surrounding any genetic research purporting to correlate genetic risk and criminality. Polish scientists are suspicious about research involving genetics and genotyping because of the association with the Nazi eugenics research; especially when it comes to how the research will be used. Poland was occupied by Germany during the World War II, and its citizens suffered some of the most heinous treatment and immoral medical experiments in modern history. Therefore, Poland is a particularly provocative setting to engage in biosocial research and collect biological specimens because it was the setting of some of the most extreme Nazi atrocities perpetrated by Germans particularly the mass exterminations of ethnic Poles and Jews. According to the statistics of Institute of National Remembrance (IPN) Nazi Germany was responsible for the deaths of 2,77 million ethnic Poles and nearly 3 million Polish Jews [21]. The United States Holocaust Memorial Museum has documented inhumane medical experiments, and the murder of as many as 200,000 mentally and physically disabled adults and children who were euthanatized in Nazi concentration camps located in Germany and Poland [22; 23; 24].

Moreover, some medical experiments were focused on eugenics research that had roots in Weimar Republic before the war, and were linked with categorization of people to be exterminated (e.g., homosexuals, and mentally ill people). Medical experiments were also carried out also on children [22].

There are other examples of pseudo-science being misused to justify unethical and racist experiments such as Japanese doctors carrying out grisly experiments on Chinese prisoners during wartime, [24] or the United States Public Health Service Study at Tuskegee in which African-Americans were left untreated for the disease to determine its progression [25; 26]. There are other less known examples of egregious violations of medical ethics involving eugenics and Native American removal in the United States [27].

Conclusion. One of the more general observations that we intended to emphasize in this paper was that social science research is subject to additional scrutiny when it comes to conducting biosocial research beyond that of medical research. Although biosocial criminology has the potential to contribute to existing evidence-based intervention treatment modalities and early prevention efforts, there are ardent efforts to impede this line of research. In short, social science is prepared to sacrifice research findings that have implications for crime prevention. We strongly acknowledge that there legitimate reasons (e.g., historical antecedents) underlying the opposition to biosocial research, and that there were clear misuses of research in the past. Clearly social science exists within a socio-cultural framework. However, we believe that all hypotheses should be tested using the best data available, and that all areas of human interaction should be studied.

There is a growing body of research showing that a gene-environment interaction is involved in antisocial behavior. More research is needed to address crime prevention. While some inroads have been made

into determining whether genetic risk should be incorporated into treatment and effective rehabilitation programs, such research is limited due to the cost of conducting prevention trials [18]. My current research is intended to contribute to the growing body of knowledge of genetic and environmental risks for criminal behavior with the long term goal of preventing the onset, or continuity criminal behavior through treatment intervention.

Additionally, I attempted to highlight the culturally specific obstacles to conducting research and to provide an example for others wishing to conduct biosocial research outside of the United States. One of the things to emerge from this discussion is that while medical research is evaluated on consistent moral and philosophical bio-ethical standards, social science research is evaluated on within socio-cultural setting in which it occurs. I do not wish to trivialize objections to social science research involving genetics. There is no doubt that genetic differences continue to be used as a basis to make malicious arguments [28]. Our advice is to encourage researchers to take into consideration the cultural setting and historical background of their research setting. Certain methods, approaches, or research models that appear benign in one country can become a flashpoint for opposition or even prevent research in another one. In Poland the memory of genetic experiments

carried about by Nazis even after 70 years is viable enough to affect genetic projects involving human beings today. The fact that criminal offenders are included in our current research in Poland may recall the human experiments with inmates in concentration camps, and concerns about the use of our findings. Researchers need a culturally sensitive team that takes precautions before embarking on a project.

Finally, one way to soften opposition to biosocial research may rest in models that test whether gene-environment interactions exist for pro-social behavioral phenotypes as well of antisocial and criminal behavior. While the focus of research thus far has been aimed at discovering genetic contributions to violence or other risky behaviors, I suggest that these same models can be employed to link genetic and environmental interactions for morally desirable behaviors such as altruism. Such studies exist, but are limited to specific disciplines such as business [29]. One of the challenges of this is that criminal behavior has a codified classification contained in legal statutes. Finding common and agreed-upon parallels or proxies for prosocial behavior may pose particular problems for research. The advantages of overcoming this challenge, however, would far outweigh the effort in paving the way for more acceptance of the role of genetic influences on behavior.

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ПОТЕНЦІАЛ БІОСОЦІАЛЬНОЇ КРИМІНОЛОГІЇ

Проаналізовано етіологію злочинної поведінки й методи запобігання злочинності та зменшення рівня рецидивізму. Розглянуто роль спадковості й оточення за дисперсії фенотипічних рис, антисоціальної та злочинної поведінки. Подано результати досліджень мутацій, що викликають імпульсивну та агресивну поведінку людей, які є важливими для профілактики злочинів або реабілітації. Біосоціальна кримінологія є одним із найбільш швидкозростаючих напрямів досліджень у галузі кримінології. Більшість результатів таких досліджень підтверджує, що генетичні ризики антисоціальної та злочинної поведінки особи мають синергетичний вплив на неї разом з її оточенням. Отримані дані мають дуже велике значення для ефективного попередження злочинності. На думку дослідників, подальше накопичення біосоціальних кримінологічних даних і розвиток біосоціальних теорій є конче необхідними для просування цієї наукової галузі. Однак незважаючи на багатообіцяючі перспективи у цій сфері в США існує чимала опозиція щодо проведення біосоціальних досліджень.

Ключові слова: *генетика, біосоціальна кримінологія, попередження злочинності.*

Надійшла до редакції 25.01.2018