

КРИМІНАЛЬНЕ ПРАВО ТА КРИМІНОЛОГІЯ. КРИМІНАЛЬНО-ВИКОНАВЧЕ ПРАВО

DOI: 10.34015/2523-4552.2020.4.01
УДК 343.9

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GENETIC AND ENVIRONMENTAL CONDITIONS OF AGGRESSIVE CRIMINAL BEHAVIOR. METHODOLOGICAL AND ETHICAL CONCLUSIONS FROM PILOTAGE

Our research project is framed as biosocial analyzes of the etiology of criminal behavior. This research can be characterized as a conceptually and methodologically innovative attempt to connect the research areas that so far have not been considered together in one project. The research project is based on three components: sociological, psychological, and biological. The main aims of the article are to initiate and facilitate debate concerning the interaction between factors belonging to a variety of different areas and provide an interdisciplinary approach to the study of criminal behavior etiology. A discussion over proveniences of criminal behavior is needed both to enrich consciousness and knowledge about conditions lying under criminal behavior and to reshape practical solutions in the field of social rehabilitation. The article also concerns our methodological and ethical reflections coming from our pilotage project involvement.

Keywords: *criminal behavior etiology; biosocial criminology; GxE; aggressive crime.*

Представлений авторами дослідницький проект оформлен в виде биосоціального аналізу етіології преступного поведіння. Это исследова-

ние можно охарактеризовать как концептуально и методологически инновационную попытку связать воедино те области исследований, которые до сих пор не рассматривались в одном проекте. Исследовательский проект базируется на трех компонентах: социологическом, психологическом и биологическом. Основные цели статьи – инициировать и стимулировать дискуссию о взаимодействии факторов, относящихся к различным областям, а также обеспечить междисциплинарный подход к изучению этиологии преступного поведения. Дискуссия о доказательствах преступного поведения необходима как для обогащения представлений и знаний об условиях, лежащих в основе преступного поведения, так и для переосмысления практических решений в области социальной реабилитации и постановки новых целей и задач. Статья также касается наших методологических и этических размышлений, исходящих из участия в пилотном проекте.

Ключевые слова: *этиология преступного поведения; биосоциальная криминология; агрессивная преступность.*

1. Introduction

Many scientific disciplines deal with the issue of etiology of offending. Reflection on this subject has been present in medicine, psychology, and sociology for nearly 150 years. Crime is an extremely complex social phenomenon, requiring the involvement of many perspectives and the use of scientific achievements of many disciplines (Baker, Tuvblad, Raine 2010; Taylor 2016). Criminology, from a historical point of view, owes its development primarily to medical sciences, however nowadays more significantly refers to the achievements of social sciences. The proof of this is the special popularity of such criminological perspectives as the social control theory, differential association theory, the concept of social learning, and criminal career (Letkemann 1973; Akers 1985; 1998; Matsueuda 1988; Gottfredson and Hirschi 1990). It should be noted, however, that the interdisciplinary approach, although it concerns criminology *in abstracto*, is relatively rarely used in the framework of individual studies on the etiology of offending (see Comunale et al. 2020). As

part of criminology, we usually deal with disjoint analyzes from a psychological, sociological, or biological perspective. Approaches seeking a compromise between different disciplines in this field are rather exceptions to this rule (Batawia 1931; 1949; Jefferson 2010).

Our paper aims to draw the Reader's attention to the current biosocial criminology research (abbreviated as *GxE*). This approach is one of the most dynamically developing in modern criminology. We present the *GxE* perspective, as well as the methodological problems and ethical dilemmas accompanying its research application, basing on the example of our research, undertaken as part of the research project *Genetic and environmental determinants of aggressive crime*. This is the first research in the field of biosocial criminology undertaken in Poland.

2. Sources of the biosocial research trend in criminology

The beginnings of scientific reflection on the causes of criminal behavior and thus the foundations of criminology as a scientific discipline date back to the second half of the 19th

century. Biological orientation representatives were pioneers in this field. Over the years of research and analyses, theories attributing tendencies to criminal behavior to individuals with specific physiognomy gained popularity (Lombroso 1896/2006; 1911; Lombroso Ferrero 1911), followed by theories of the endocrine system diseases (Berman 1932), faulty chromosome structure (see e.g. Heitzman 2001: 46-47; Cheema and Virk 2012: 940), and theories of intergenerational transmission of "criminogenic" genetic material (Cloninger et al. 1982; Bohman et al. 1982; Mednick, Gabrielli, Hutchings 1984; Cloninger and Gottesman 1987; Blackburn 1993; Joseph 2001). Some of these analyzes have provided important evidence of the biological basis of crime. Below we discuss some of the most important findings.

Physiognomy - anthropometrical studies

The Italian psychiatrist and anthropologist Cesare Lombroso, author of the concept of a "born criminal" from the 1870s, is widely recognized as the "father of modern criminology". In his research, Lombroso measured bodies (primarily - heads) of 832 prisoners and compared them with the results of his anthropometric tests of 390 soldiers. Based on the collected research material, he stated that criminals were characterized by certain specific physical features, which in his opinion were to prove their particularly close biological relationship with the primal man. Those so-called atavistic features included e.g. unnatural size ears, sloping forehead, receding chin, curved, upturned or flattened nose, strongly developed jaws and cheekbones, unnaturally long arms, etc.

(Lombroso 1896/2006). The presence of at least five such traits - as Lombroso argued - would mean that the person was "born to become a criminal" and as such was predestined to conflict with criminal law. According to Lombroso's estimates, born criminals would constitute about 40% of the prison population (he initially claimed it to be up to 60%) (see Ciosek 2001: 70).

Despite his deterministic perspective, Lombroso saw the possibility of non-biological (exogenous) factors interfering in the process of becoming an offender. In his later work titled *Crime: Causes and countermeasures*, which complements the concept of "born killer", he described a wide set of criminogenic factors related to the physical environment, e.g. climate, the proximity of mountains, etc., and social features, such as economic situation, level of education or religion. However, he upheld his previous position, viewing hereditary biological factors as decisive in criminogenesis (see Lombroso 1911).

The concept of a "born criminal" has gained immense popularity and found many supporters in the world of science, especially in Italy (see: Lombroso 2006: *Author's Preface*). Lombroso's perspective was, however, a largely mechanistic and fatalistic approach, which reduced the role of free will and self-determination of the individual. For this reason, it was met with severe criticism internationally, both by representatives of medical sciences (e.g. Goring 1913) and social sciences (e.g. Tarde 1890/1924). He was criticized for assigning too much importance to factors beyond the control of the individual. The very assumption of the relationship between criminal behavior and appearance was also put into question. Although the

physiognomical (anthropometric) perspective was discredited at the beginning of the 20th century, it received wide coverage in the scientific community. It gave an impulse to further scientific research aiming to answer the basic criminological question: "Why do some people become criminals?". An expression of this are research explorations in the field of medicine which were undertaken in subsequent years.

Endocrine research

The common denominator of research on the biological basis of criminal behavior is the assumption of a correlation between human biophysical features and his tendency (or lack thereof) to criminal behavior. An important direction in this context was endocrine research in the 1930s. As a result, it was found that disorders of the central and peripheral internal secretion system (endocrine glands: thyroid, pancreas, pituitary, pineal gland) correlate with malfunctions of the central and peripheral nervous system and may lead to criminal behavior (see Berman 1932). The main representatives of this perspective Max G. Schlapp and Edward Smith (1928) cited statistical data according to which every third offender suffers endocrine disorders. The authors eventually identified such disorders as having a decisive role in criminogenesis, thus assuming, with accordance to Lombroso, the perspective of biological determinism.

According to today's knowledge, the relationship between endocrine gland malfunction and crime is indirect, at most. Rather, criminal behavior may be a side effect of life difficulties experienced in connection with cardiovascular diseases. However, there

is currently no evidence that they predispose people to commit crimes.

Research on the structure of chromosomes

A specific preface for genetic research in the area of criminology was the research on the structure of chromosomes conducted in the late 1960s. According to this perspective, the propensity for criminal behavior was to be related to the inheritance of an additional Y chromosome by some men. Research verifying this thesis confirmed the presence of the XYY type chromosome structure or, in very rare cases, the XYYY system among men who committed particularly aggressive offenses, while an average man has the XY system (Heitzman 2001: 46-47; Ciosek 2001: 71; Nowak and Wysocka 2001: 116-7; Sakowicz 2009: 203).

The criminological society, however, questioned the methodology of this research. Critical voices concerned in particular the selection of the sample (very few cases examined) and therefore the lack of credibility of the found statistical dependencies (Cheema and Virk 2012: 940). It has also been noted that the occurrence of the double or triple Y chromosome is incidental, which means that in practice it is irrelevant in deciding its relationship with crime. Further studies on the relationship between the structure of chromosomes and criminal behavior did not resolve these issues, and eventually, this direction of research was abandoned.

The beginnings of genetic research

The issue of biological inheritance of factors critical to one's tendency towards criminal behavior was already raised by Lombroso (see 1911: 151-174). However, it was not until later decades that (along with advances in

knowledge about DNA structure) scientific research was undertaken to reveal whether such a relationship exists. Particularly important achievements within genetic research are attributed to the Scandinavian research projects undertaken in the 1970s and 1980s. Their attention focused on two specific research groups:

a) offenders with twin siblings - the object of interest was the possible repetition of offending among pairs of twins (mono- and diatomic), which the researchers viewed as premises for the biological inheritance of criminal tendencies;

b) offenders who were raised by foster families – research focused on possible criminal history repetition among their parents - biological or/and adoptive, which would provide data on the crime being the result of either genetic or environmental (social) factors (Blackburn 1993: 138-140).

Christiansen, who was one of the first researchers to consider the possibility of differences in the inheritance of criminal behavior propensity due to the biological sex of twin siblings, stood out among the first type of research. His team's research was based on criminal records in Denmark which included a total of 3586 convicted men and women having twin siblings. Analyzes showed that both male and female pairs of identical twins (i.e. with identical DNA structure) had significantly higher conviction rates than pairs of dizygotic twins (with 50% genetic compatibility, as in the case of ordinary siblings). In the case of male couples, repeatability ("pairwise concordance") rate of 35.8 was recorded if they were identical twins and only 12.8 if dizygotic. Among women, the difference was even more

visible as the index was respectively: 21.4 and 4.3 (1977, cited in: Joseph 2001). Christiansen himself was cautious about the results of his study. He stated that there is no clear evidence that genetic factors play a key role in the process of reproducing crime through subsequent generations (ibid.). Dalggaard and Kringlen (1976), authors of analogous studies conducted in Norway, have noticed, however, that the similarity of experiences related to criminal records among identical twins may result not only from their genetic similarity but also from growing up in the same socialization environment. In the same context, it can also be seen that peer groups, which are usually overlooked in biological analyzes, play an important role in shaping individual attitudes and behaviors, including criminal ones (see Rowe and Osgood 1984).

Among the research of the second group, one of the most broadly cited is the analysis conducted in the second half of the 1970s by the Swedish team of scientists led by Claude R. Cloninger (Cloninger et al. 1982; Cloninger and Gottesman 1987). Originally, the research was focused on the genetic determinants of alcoholism and their impact on criminal behavior. The analysis covered 862 people who were adopted as children. Particular attention of researchers was drawn to a significant group of the examined in which there was intergenerational (observed both among them and their parents) recurrence of offending, while neither generation was addicted to alcohol (Bohman et al. 1982). It was therefore concluded that there is a likelihood that criminality occurring irrespectively of alcohol-related problems may be conditioned by

genetics. It was also noted that in this specific group the examined individuals committed crimes of the same type as their parents – particularly, crimes against property (Cloninger and Gottesman 1987). Therefore, analyzes confirmed that adopted children are more likely to conflict with the law if their biological parents had a history of offending (Cloninger et al. 1982).

On the other hand, it has also been shown that the likelihood of criminal behavior increases when adopted children were raised by foster parents with a criminal past. For the aim of the analysis Cloninger's research team distinguished four sub-groups of respondents – due to the presence or absence of genetic factors (criminality of biological parents) and environmental factors (criminality of adoptive parents). It was found that: 2.9% of the respondents had a conflict with the law – if neither group of factors was present; 6.7% – if only environmental factors, 12.1% – only genetic factors were present (ibidem). Particularly noteworthy is the fact that when both groups of factors co-occurred, the likelihood of offending by adopted children increased up to 40%, meaning that 4 out of 10 children from this group became offenders themselves. This suggests that there are important interactions between genes and the environment (Raine 2002: 47). This trend was confirmed in similar Danish studies conducted in the same period (Mednick et al. 1984).

Biosocial perspective (GxE)

Genetic research in criminology has provided important evidence for the existence of a biological basis of crime. From the perspective of social sciences, however, it seems most important to draw attention to the role

that the environment plays in shaping the criminogenic potential of the individual. The biosocial perspective gained wide attention after the Caspi's (et al. 2002) work appeared in *Science* in 2002. The focus on a gene-environment interaction drew the attention of criminologists. The findings provided indisputable evidence that genetic risk combined with adverse social conditions is more likely to result in antisocial behavior than when existing separately (Guy and Chomczyński 2018). The results of genetic research suggest the existence of mechanisms of inheritance of certain predispositions to criminal behavior. Genetic risk factors, however, become particularly important as they tend to interact with criminogenic environmental (i.e. social) factors (Baker et al. 2010: 21), such as family background with a low socio-economic background (e.g. Robinson and Beaver 2009), low level of social control in socialization environments (e.g. Sampson and Laub 1993), socialization content (e.g. McCord 1991), living in disorganized neighborhoods and communities (e.g. Sampson and Raudenbush 1999; Sampson 2006), or participating in deviant peer groups (e.g. Mercer et al. 2017). The etiology of criminal behavior is, therefore, a result of both groups of risk factors. This finding is the basis for biosocial analyses of crime - *Genetic and Environmental studies* ("GxE").

The results of numerous studies (e.g. Reiss and Leve 2007; Brody et al. 2009; Robinson and Beaver 2009; Beaver et al. 2013; Ratchford 2013; Daw et al. 2013; Tessler et al. 2013; Wu and Barnes 2013; Knafo and Jaffee 2013; Schwartz et al. 2015) suggest that factors subject to genetic inheritance, i.e.

specific genetic polymorphisms, play an important role in the etiology of crime. Genetic polymorphisms such as monoamine oxidase (MAO-A), 5-HTTLPR serotonin transporter, COMT enzyme, dopamine transporter DAT1 and dopamine receptors DRD2 and DRD4 have been identified as so-called *risk alleles*, i.e. polymorphisms that increase the risk of criminal behavior. In recent years, they have been repeatedly used to measure the so-called *cumulative genetic risk* of anti-social, risky, aggressive, and criminal behavior in studies conducted by prominent criminologists (e.g. Belsky and Beaver 2011; Beaver et al. 2012; 2013).

In Poland, research in the *GxE* perspective has not been conducted so far. Analyzes of the etiology of crime usually focus on one area (depending on the scientific discipline in which they are undertaken). They tend to deal separately with psychological, socio-cultural, or formal-legal aspects of offenders' functioning. The biological component and the interactions that may occur between genetic and environmental risk factors are usually neglected. However, it is increasingly recognized in Western criminology that collecting biosocial criminological data and the development of empirical and theoretical evidence-based knowledge is essential for further development of this discipline. Therefore, we have concluded that undertaking *GxE* research is an important project.

This article aims to encourage a discussion on the interactions between different groups of factors and the methodology of research conducted in this perspective. At the same time, we would like to indicate that undertaking this type of analysis may constitute an opportunity to increase the knowledge

about the etiology of criminal behaviors. Such research is, in our opinion, not only of cognitive value but also of application potential. We believe that the implementation of research will contribute to the development of more effective tools and activities supporting offenders' rehabilitation and their social reintegration, i.e. corresponding to individual predispositions (in accordance to Risk-Need-Responsivity model [see Ward et al. 2007]).

3. The research concept

The research project implemented by our team is within the biosocial analyses of the etiology of criminal behavior. The presented research direction is innovative, both conceptually and methodologically, as it attempts to combine perspectives and research areas that so far have been treated separately.

Our study aims to determine the regularity of occurrence of specific genetic polymorphisms in perpetrators' of aggression-based crimes DNA and to determine the interactions between genetic, psychological, and environmental (social) factors. Such an analysis is aimed to increase our understanding of the causes of criminal behavior and at identifying individual variables affecting the effectiveness of crime- and recidivism-prevention programs.

The research involves a group of 125 men – convicted, as a result of a final court sentence, of absolute imprisonment for committing crimes against life or health, under articles 148-159 of the Polish Penal Code:

- art. 148 – homicide
- art. 156 – causing serious damage to health
- art. 157 – causing medium and slight damage to health

- art. 158 – participation in a fight or beating

- art. 159 – using dangerous objects in a fight or beating

The project comprises three research components: biological, sociological, and psychological. Below we provide a brief description of these modules.

Biological module

The biological research component includes an analysis of saliva (DNA) samples. It aims to determine the genotypes and genetic polymorphisms of the studied men. We use kits for individual DNA sampling (Oragene-OGR-600). This kit is used to collect a small sample of saliva. Saliva collection is done by collecting saliva in a plastic tube (which is part of the kit) until it reaches the level indicated by the line (2ml). Participation in the study is completely voluntary, and the procedure lasts no more than 10 minutes. The collected saliva samples will be genotyped and then examined for the presence of six genetic polymorphisms: MAO-A, COMT, 5HTTLPR, DAT1, DRD2, and DRD4.

Sociological module

The sociological component of the project includes an analysis of the functioning of the studied men in their formal and informal social milieus at the stages of their childhood, youth, and adulthood. Sociological research is undertaken in a qualitative paradigm, using the biographical method. The data is collected employing semi-standardized biographical interviews according to the preparation instructions, thus leaving the researched men free to express themselves while increasing the possibility for the context of discovery (*serendipity*) (Strauss and Corbin 1990; Silverman 2011). Within

the framework of these interviews, we are looking for information on the resumes of convicted men, with particular emphasis on the course of the criminal career and its conditions.

The biographical method has a long tradition in sociological analyses of crime. The origins of its application, both in sociology itself and in the study and analysis of crime, date back to the early 1920s and are related to the achievements of the Chicago School. Nowadays, it is increasingly used in analyses of criminality, which is particularly visible in the dynamically developing perspective of *narrative criminology* (see: Presser and Sandberg 2015). However, the narrative approach has not been used in biosocial criminological research so far.

The empirical material collected in the course of the biographical interviews will be subjected to open and selective coding and qualitative analysis in a specialized program such as ATLAS TI version 8.4.4 (Strauss and Corbin 1990; Konopásek 2008). Categories determined inductively will allow us to establish relationships concerning the presence of criminogenic environmental factors in the studied biographies. The results of qualitative studies will then be compared with the results of genotyping and psychological tests to determine whether and what interactions occur between these groups of factors.

Psychological module

The assessment of prisoners in the context of their psychological functioning is complex, difficult, and requires special consideration. After consultation with experts-practitioners in the field of psychological care in detention facilities and court experts, we decided to use the shortest possible number of diagnostic tools (minimum

examination time and several items). The charges of the institutions we examine will probably show little motivation to participate in the project. Such a state of affairs may be caused by isolation and all types of disorders. There is also a probability that the tests will be completed in a random or biased way, leading to an attempt to make an appropriate impression on the researcher (polling effect). By using short, innovative tools, there is a chance to minimize the consequences of these problems.

The first of the used tests is MEOS (Managing Emotions of Others) by Austin and O'Donnell. It is a relatively new tool consisting of 58 items measuring the ability to cope with other people's emotions. We chose this tool because of its brevity and the assumed interactive nature of the creation of emotions. This tool correlates well with both measures of emotional intelligence and dark triad (machiavellianism, narcissism, psychopathy). It is a unique tool because of the rich classification of possible reactions to the emotions of others – as many as 6 dimensions, which concern both behaviors improving and worsening the mood of the environment with pro- and anti-social motivation (Austin and O'Donnell 2013).

The second proposed tool is one of the best-known personality measurement tests – NEO-FFI. There are 5 factors in this personality classification: openness to experience, conscientiousness, extraversion-introversion, agreeableness, and neuroticism. However, these are not in fact personality traits, but rather factors under which certain characteristics and personality traits can be applied. Personality researchers Paul Costa and

Robert McCrae confirmed the validity of this model and dubbed it "The Big Five".

The third tool is the INTE Emotional Intelligence Questionnaire. As the author of the Polish version writes about it, "this tool is based on the first version of Salovey and Mayer's concept (1990) and, according to the model proposed in it, is to measure three components of emotional intelligence: the ability to perceive, evaluate and express emotions, the ability to use emotions as factors supporting thinking and acting, and the ability to regulate emotions at home and in other people" (Matczak 2013).

4. The ethical and methodological issues

The ethical dilemmas

Some of the ethical questions raised by this research concern biocriminology and are widely discussed (Walby, Carrier 2010; Carrier, Walby 2014; Guy, Chomczyński 2018). When we discussed our thesis and the research conceptual frame on the criminological conferences, we used to face several questions that were put to thematic order:

a) The problem of interviewee anonymity

Both academics and practitioners raised the problem of our subjects' anonymity that is allegedly not protected enough. Critical voices were concerned with the ways of how biographical and biological data will be secured and separated to prevent someone from obtaining it. While answering this criticism, we referred to our research application approved by a bioethical commission, where we employed a data double-coding procedure and its spatial separation. To provide maximum anonymity protection we also introduced the procedures of

data access. For that reason, research team members (including a head researcher) do not have granted access to entire data but only the one compatible with their field of expertise (i.e. psychologist has access only to psychological data). To protect our subjects' anonymity, we also limited the length of interviews quotation to reduce the risk of recognition (Saunders et al. 2015).

b) Not sufficient control over research results

Some critics expressed an opinion that not sufficient level of control over research results may lead to taking it over for non-scientific goals. Especially lawyers were concerned about the use of the database by insurance institutions to differ healthcare contributions as the consequence of genetic disease. Defending our project, we were convinced that all data and research results legally belong only to the University's department responsible for genetic analyzes and us – the research team members. Moreover, due to a bioethical commission's decision, research is a pilotage only and serves to show some basic associations and space for further research.

c) Following Cesare Lombroso heritage

Some of our opponents raised an argument of "neo-Lombrosionism" as the conceptual framework of our research concentrated on biological determinism influencing deviant behavior tendencies (especially criminal ones). These arguments that are based on Cesare Lombroso's (2006) theory are both inaccurate and biased, because they do not meet our research conception, that besides biological module, includes also sociological and psychological ones. The sociological module concerns directly

upbringing process, family, friends, and school circles' influence on further biographical courses. The psychological module lets us investigate the problem of the identity and emotions management role in a criminal career. All three elements of the research (biological, sociological, and psychological) are equally important in answering research questions and none of them is superior to the rest.

d) Stigmatizing people possessing „crime gen”

Our opponents express fear of "stigmatizing" our subjects because of possessing "crime gen". We should take into consideration that on the one hand a single "crime gen" does not exist, but on the other hand, the risk of committing a violent crime is higher among people who have some particular variants of gens (Caspi et al. 2002; Baker et al. 2010; Tiihonen et al. 2014). The current researches show the biological factor contribution among violent crime offenders while lacking this factor in the control group. Based on the literature, we believe that knowledge about the role of biological factors that may influence committing violent crimes, does not lead to stigmatization but can weaken it. The superior reason for making research on this topic is to give an impulse for shaping individual social rehabilitation programs that respect natural differences between offenders. We are convinced that knowledge about individual offenders' predispositions contributes to design a proper environment that facilitates social reintegration by reducing perpetrators' exposition to factors causing aggression.

In this context, it is also worth noting the current discussion in Anglo-Saxon countries on the possibility of using the results of genetic testing in

court proceedings (see Welsh and Farrington 2012). Critics of such an approach are particularly concerned about questioning the notion of free will, the possibility of a potential waiver or leniency of punishment and release from responsibility (criminal or even moral) – if the court were to consider an aggressive crime as a result of a genetic “defect” (Heitzman 2001: 47). Conversely, the recognition of the results of genetic testing in court proceedings may also result in heavier treatment by the judiciary due to the potential risk of repeating offending, especially in countries implementing repressive models of criminal policy (cf. *ibidem*). A potential stigmatizing effect may also be an attempt to monitor the development of children, adolescents, and genetically charged adults (Denno 1995, cited in: Heitzman 2001: 47).

The methodological dilemmas

The project is based on first-hand data, so several problems are concerned with gaining empirical material. As far as the psychological module requires the use of three preconceptualized and highly standardized tools, the sociological part assumes to create a tool to aggregate our subjects’ biographical facts. We considered two approaches that are based both on less standardized and more standardized tools. The first one assumes open-ended questions that might allow subjects to reveal details more spontaneously which grants the researcher with the ability to gather much more detail about their experiences (Denzin 1990; Blaikie 2010; Curtis 2010; Silverman 2011). Along with a higher degree of “freedom” and greater chances for serendipity (Strauss and Corbin 1990) that this tool withbrings, we faced also the problem of interviewees’ low communication skills.

The open-ended tool requires our subjects’ reflexivity, openness, and motivation to give a good biographical narration that we could not count on. Instead of this, many interviewees were not keen to share their life stories with us, including physical context, prison culture of distrust, or unwillingness to share private spheres with outsiders (Fleetwood 2015). Facing the problem of poor-quality narrations, we decided to transform open-ended questions into a more standardized necessary tool. We employed a questionnaire to gather comparable material rich in biographical facts (Gruszczyński 2003).

The next challenge was a research order framed in prison settings (Patenaude 2004; Crewe 2018). To ensure anonymity and privacy as we declared in the research application, we had to negotiate with prison staff to obtain access to two separated rooms where we could perform psychological and sociological interviewing at the same time. As a consequence, the procedure of research preparation was more complicated and additionally strained staff members.

5. Ending notes

As indicated by Jamie M. Gajos (et al. 2016), biosocial research is nowadays an increasingly important element in the construction of evidence-based prevention programs in Anglo-Saxon countries, whose popularity has been steadily growing over the last decade. The role of this research is being considered at both macro- and micro-social levels, with these perspectives intertwining. It is indicated that the main function of criminology as a scientific discipline is to develop effective tools to prevent crime, including by reducing the scale of recidivism.

Recidivism rates in Poland are alarmingly high. Data from the Polish Central Board of Penitentiary Service indicate that the number of repeat offenders who have been imprisoned in for the past decade has annually been at a level of over 34.000. In 2019, out of a total of 66.000 convicts who have been imprisoned, 37.000 were imprisoned for at least the second time, constituting 56.6% of the prison population (*Roczna informacja statystyczna za rok 2019*: 7). In the years 2001-2019, their share among the total number of the convicted individuals increased by over 11pp. These data indicate that the rehabilitation centers are mainly addressed to persons already known to the judiciary who, return to crime despite previous criminal sanctions, rehabilitation activities, and other preventive interventions.

Western researchers indicate that biosocial analyses provide particularly valuable data in this respect. It is suggested that genetic polymorphisms may be responsible for so-called individual *responsivity* (see Ward et al. 2007) to preventive interventions (rehabilitation projects, social reintegration programs, therapies, etc.) in which the individual participates while in prison and after leaving this institution. In this light, the aim of the undertaken analyses is:

- Firstly, to develop tools allowing to improve the process of diagnosing the individual needs and predispositions of prisoners.
- Secondly, to indicate possible areas of improvement of preventive interventions taking into account the responsiveness of their recipients.
- Thirdly, to introduce the perspective of reactivity into the

scientific and practical discourse in Eastern Europe.

The combination of genetic and social perspectives can also contribute to a better understanding of the causes of risky and criminogenic behavior, primary and secondary crime (recidivism), and help to identify individual variables that affect the effectiveness of prevention programs to a greater or lesser extent.

Accomplishments to date

The project received a positive opinion from the Bioethics Committee at the Regional Medical Office in Lodz. The approval was also obtained from the Director of the District Inspectorate of the Prison Service in Lodz for conducting research with the participation of convicted persons in the units in the Lodz district. Both approvals let us initiate the project and begin the data collection process. So far, we were able to cover 17 subjects out of 125 planned. The first cases gave us the opportunity to make minor corrections in the interview scenario to adjust the tool more to subjects' characteristics.

Further challenges

The project aims to provide a basis for further analysis of the relationship between genetic and environmental criminogenic factors. The results obtained will allow us to determine the basic regularities which will allow us to establish further directions of research.

Summary

It has been a long way since first criminologists started to pay attention to determinants of criminal behavior, maneuvering between biological, sociological, demographical factors. Looking at the past, we might argue that most theoretical approaches prioritized only one factor that was located at the center of analysis and further

explanation of crime etiology. The criminological breakthrough came along with the Caspi's (2002) findings that created a space for a discussion over gene-environment interaction. Since that time the *GxE* approach has gained as many protagonists as opponents.

The case of our research project is founded on an interdisciplinary background. Trying to reduce biases typical for particular sciences we employed biological, psychological, and sociological modules seeking answers for the questions of biological and environmental determinants of criminal

behavior. We hope to deliver reliable data enabling further study on a larger scale.

Our project gave us hitherto only methodological reflection over the research process as well as particular activities that constituted the whole protocol of gaining and anonymizing data, establishing contacts with subjects, creating the proper atmosphere of mutual trust, etc. The most challenging part will be data interpretation and standardization to make it comparable for further analysis.

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Генетичні та зовнішні детермінанти агресивної злочинної поведінки. Методологічні та етичні висновки за результатами проекту

Наш дослідницький проект оформлений як біосоціальний аналіз етіології злочинної поведінки. Це дослідження можна охарактеризувати як концептуально та методологічно інноваційну спробу поєднати підходи до досліджень, які до цього часу не проводились у комплексі. Дослідницький проект базується на трьох компонентах: соціологічному, психологічному та біологічному. Основними цілями статті є ініціювання дискусії щодо взаємодії між факторами злочинної поведінки, що належать до різних областей, та забезпечення міждисциплінарного підходу до вивчення етіології злочинної поведінки. Дискусія щодо доказовості злочинної поведінки необхідна як для збагачення уявлень і знань про умови, що передують злочинній поведінці, так і для переосмислення практичних рішень у галузі соціальної реабілітації. Стаття також стосується наших методологічних та етичних роздумів, пов'язаних із проведенням нашого пілотного проекту.

Ключові слова: етіологія злочинної поведінки; біосоціальна кримінологія; агресивний злочинність.