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Physical Activity in Prisons and the Basic Dimensions of Personality of Men Serving Prison Sentences

Abstract: This article concerns physical activity (PA) in penitentiary institutions, understood as non-rest energetic effort performed by prisoners in their free time. The aim of this study was to determine the personality correlates of PA men serving prison sentences. Questionnaire methods were applied in the studies. One group consisted of men incarcerated in penitentiary institutions ($N = 121$), who were physically active, and the comparison group were physically inactive prisoners ($N = 128$) aged from 22 to 55 years old. The study results showed that prisoners regularly participating in programs in the field of physical culture and sports are characterized by higher emotional stability ($p < 0.05$) and a higher level of extraversion ($p < 0.05$). However, they do not differ in the level of psychotism ($p = 0.80$). This paper is a fragment of larger studies on the psychological correlates of physical activity in penitentiary institutions.

Key words: physical activity, prison, personality.

Introduction

Long-term stays in penitentiary institutions, through their depriving, stigmatizing and destructive effect, already repeatedly described in Polish and world literature on the subject (see e.g.: Goffman 1975; Stanik 1976, 1977; Merton 1982; Waligóra 1984; Ciosek 1996, 2001, 2003; Krane, Miles 2000; Chojnacka, Karczewski 2003; Wysocka 2008; Przybyliński 2010), often have a negative,

even criminogenically deepening effect. The negative consequences of prison isolation have also been well documented in empirical studies conducted around the world (see e.g.: Bukstel, Kilman 1980; Jose-Kampfner 1990; Haney 1997). Mostly researchers agree that prison isolation does not always lead to personality pejorative effects, and the effect of incarceration depends on complex interactions of factors involved in influencing an imprisoned person. One of the possibilities of changing the depriving and frustrating conditions of serving punishment may be the development of penitentiary initiatives in the form of programmes connected with physical activity (PA). Due to its personality-creating advantages, PA seems to be a potential opportunity to transfer the obtained results on social functioning in the free world.

Physical activity in penitentiary institutions

The versatility of PA consists in the fact that unlike many other methods of penitentiary interactions, it is completely accepted by prisoners, regardless of the degree of their demoralization and even subcultural membership. Although these people are often characterized by a lack of work habits, reluctance to learn and no need to take advantage of culture, they are often willing to undertake PA (Poklek 2009). Today, the penitentiary interactions based on PA has been incorporated into the social rehabilitation process of people imprisoned after 1989. The possibility (and even necessity) to conduct classes in the scope of physical culture in prisons is indicated by the “Guideline minimum rules for managing prisoners” (2003, p. 15), in which it is written: *Young prisoners, and others who are of appropriate age and physical condition, shall be provided the opportunity to perform sport and recreational exercises at a time allotted for physical exercise. For this purpose, adequate space, equipment and supplies must be ensured.* Meanwhile, the Regulation of the Minister of Justice dated 14 August 2003 on ways of conducting penitentiary interactions in prisons and detention centres, describing the rules of penitentiary work, does not indicate physical culture as a means of penitentiary interaction (Journal of Laws No. 151 of 2003 item 1469). However, the Executive penal code (Journal of Laws No. 90 of 1997, item 557 as amended) indicates the possibility of penitentiary interactions through participation of prisoners in the activities of physical culture and sports, treating physical education and sport education as a form of free time and stimulating social activity of prisoners (art. 135 § 1) and stating: *In a closed-type prison, prisoners, referred to in art. 88a § 2, serve the sentence in the following conditions: prisoners may learn, work, directly participate in religious services, religious meetings and religious education, as well as take advantage of cultural and educational classes, in the field of physical culture and sport, only in the block where they are incarcerated* (art. 88b sec. 3) and: *cultural-educational and sport classes, as*

well as teaching is organized within the penitentiary institution (art. 90 sec. 3); In a semi-open prison: prisoners may participate in group cultural-education or sport classes organized by the administration outside the prison (art. 91 sec. 4); In an open prison: prisoners may participate in group cultural-education or sport classes organized by the administration, outside the prison (art. 92 sec. 4 and 5).

The recreational-sport facilities owned by penitentiary institutions do not seem satisfactory; however, it should be noted that in most institutions there are common rooms for sport activities, and most of them have separate sports fields. Those institutions that do not have such courts use exercise yards for this purpose.

In terms of preferences that dominate among prisoners, the most popular are sports like: football, basketball and martial arts (mainly boxing) (Poklek 2009). Among other disciplines in the field of physical activity, in some prisons, inmates also have the opportunity to participate in Nordic walking classes and canoeing (in the Prison in Czarne this activity is connected with ecological activity – forest cleaning, cleaning river banks), and running (running clubs are being formed). Activities at the gym are also greatly popular, although their definite disadvantage should also consider the lack of qualified trainers (or trainers at all), who would implement strength sports among prisoners as a form of development (physical and mental), and not a strategy of “reinforcing oneself” in strength for purposes that are not always indicative of their social rehabilitation character. Participation of a prisoner in sport activities requires both administrative and medical consent. Consent generally covers the possibility of the prisoner to participate in sport activities no more than twice a week for 2 hours (or additionally on public holidays). The broadest description of programmes covering sport activities in Polish prisons to date is contained in the paper edited by Monika Marczałk (2009).

Physical activity has found its place in the methods of creative social rehabilitation promoted by Marek Konopczyński (2006). The main message of this method is to create new identity parameters that will allow socially maladjusted persons to fulfil social roles other than those thus far. The acquisition of sport competences and physical activity is, in this case, not only to satisfy stimulation needs, prevent aggression and arouse the spirit of sportsmanship, but become a form of creative activity and possibility to socially present one's strengths in a culturally accepted form, which is to contribute to changing society's perception of prisoners. An important part of social rehabilitation carried out in this way is simultaneous intellectual activation and triggering creative processes. Among the most important advantages of education through sport Konopczyński (2006) lists: the growth of body dynamics, aesthetic experience, intellectual experience, positive emotional experience (derived from interaction and competition), increased sense of security, development of consciousness of causative power in life, increased life manageability, clear objectives of action. Changing the identity of a charge associated with practicing sport is also connected with an increase in self-esteem and belief in self-efficacy, as well as perceiving oneself as

an ambitious human being. This positive attitude towards oneself increases the likelihood of a positive attitude towards other people (Motow 2006). Additionally, positive reinforcement, which social rehabilitation brings through sport, contribute to: the growth of self-esteem, change of one's attribution, increase in abilities to solve problems in a socially acceptable manner, achieving physical fitness, as well as learning pro-health measures. Widely understood physical activity also contributes to improving the physical health of the body by enhancing the body's morphofunctional indicators, increasing mobility and efficiency of body systems (respiratory, circulatory, immune, muscular) (Gilewicz 1989; Drabik 1996). Adequate nutrition ensuring optimal amounts of nutrients and resignation from any stimulants are also important in this regard.

Personality and physical activity – a review of empirical studies

According to factor theories, personality is based on the dynamic organization of a certain number of characteristics that determine the behaviour of a human being, the number of which, depending on the accepted theory, generally varies between three and five. An analysis of the basic personality structures adopted in this paper treats personality in terms of three characteristics defined by Hans Jorgen Eysenck Jorgen: extraversion-introversion, neuroticism and psychoticism (see: e.g. Stanik 2013). According to Eysenck, personality is a relatively permanent organization of *character, temperament, intellect and physical properties that determine the specific ways of adapting to the environment* (source: Brzozowski, Drwal 1995, p. 9). In Eysenck's theory, personality and temperament are treated as synonymous terms, although in its core Eysenck's theory of personality belongs to those theories that have the status of the theory of temperament. The definition of personality in paper was adopted in this precise manner.

The three basic personality factors include the already mentioned: neuroticism (N), extraversion-introversion (E-I) and psychoticism (P). The structure of the listed elements of personality is hierarchical – they include factors of the first order, and later correlated habits and behavioural acts (Strelau, Doliński 2011). Eysenck made the assumption on the autonomic reactivity of the nervous system and speed and stability of reactions the substantial basis for creating theories (Hall et al. 2006). The first of them is connected with neuroticism, the second – with extraversion. In environmental conditions that are unfavourable for adaptation, high reactivity can be linked with the development of neuroticism (lack of emotional stability), and the difficulty of creating conditional reactions can be associated with the development of extraversion. In people with high levels of neuroticism and high extraversion, psychopathic disorders may develop (characteristic of the greater part of the imprisoned population than for general society). Therefore,

we can talk about two types of extraversion (source: Pospiszył 1992, p. 205): *extraversion of good adaptation* ("clinging to people", "social extraversion") and *extraversion of bad adaptation* (impulsivity and lack of self-control). In the case of *extraversion of bad adaptation*, we are dealing with impulsive people, manifesting uncontrolled aggression, not manifesting fear, guilt, unable to the internal insight. The severity of neuroticism, extraversion and psychoticism, has a relatively high stability throughout the life of the individual (source: Brzozowski, Drwal 1995).

In previous studies of the personality of people involved in sport, several directions were distinguished (Turosz, Storko 2002): a) covering the type of personality of athletes; b) determining the dependencies between athletic performance and personality traits; c) seeking personality traits, which are an element of competitive selection; d) determining the effect of physical activity on the formation of personality traits. In the discussion conducted in this paper, an important direction of studies, from the point of view of the assumptions, are those listed as the first and the last. In reviewing the existing studies on the personality of people involved in sport, however, it is difficult to find a clear conclusion on this issue. Most of the studies conducted in Poland and around the world used the Big Five traits to measure the personality of athletes: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to experience, and rarely the traits of the Big Three described above.

In many studies, psychoticism, extraversion and neuroticism play a certain role in physical activity. These dimensions prove correlates of physical activity measured not only in groups of athletes, but also people being moderately active on a daily basis. Eysenck, Nias and Cox's study (1982) has shown that people who practice sport significantly differ from those who do not practice any sport in terms of the severity of all three dimensions of personality. Athletes are characterized by higher levels of extraversion and psychoticism and a lower level of neuroticism than in the population of those who do not practice sports. These features also differentiated athletes who achieved high results, from those of inferior sport achievements in an analogous manner to that described above: high extroversion and psychoticism and lower neuroticism. At the same time, it turned out that the relationship between neuroticism and sport success is curved: the best results are achieved by persons with a medium level of severity of this feature. The severity of the individual dimensions of personality is also important for the choice of a specific sport. The cited studies found that introverts much more often choose individual sports, while extraverts prefer team games.

An overview of empirical studies conducted by Kajtna et al. (2004) enables to conclude that people who practice sports regularly show on average a higher than average level of conscientiousness and emotional stability. In the light of these studies, athletes also proved to have greater openness to experience and extraversion than people who do not perform any sport. However, no difference was found between athletes and non-athletes in terms of the trait of agreeableness.

Some studies (Turosz, Storko 2002) even suggest that players of some sports, e.g. football, have a higher level of aggressiveness. It is worth noting that in many disciplines, the behaviour of athletes is aimed at causing harm or suffering to others. Therefore, anti-social behaviour in sport seems quite common.

Some studies also indicate not only the relationship of basic personality traits and professional/results-oriented performance of sport, but also the tendency to exercise regularly. American researchers (Bogg, Roberts 2004) showed significant correlations between the amount of expended energy devoted to physical exercise during the week and personality traits such as: extraversion, conscientiousness and neuroticism, while this correlation proved to be positive in the case of extraversion and conscientiousness, and negative in the case of neuroticism. In terms of the characteristics of the Big Five, the strongest correlate of sport activity, almost in all studies, proved to be conscientiousness (Rhodes, Smith 2006; Gallagher et al. 2012), whereas in the area of the Big Three each of its dimensions (Eysenck et al. 1982).

Like in the case of physical activity and its many manifestations, also in the case of persons committing various forms of crime, one personality profile cannot be determined for the whole group of criminals. In penitentiary institutions around the world reside people with as versatile personalities as their forms are in the world of free people. However, one cannot ignore the fact that the personality of offenders most commonly takes on pathological dimensions. Until now, psychologists have proposed numerous, well-formulated theories linking personality with crime and other forms of antisocial behaviours (see e.g.: Eysenck 1977; Cloninger 1987; Zuckerman 1989). Many of these theories, however, are based on the personality models that have already been criticized in the past as inadequate (Krueger et al. 1994). Over the past 40 years, however, scientists have been able to demonstrate cross-situational and stable in time compatibility of human psychological characteristics, which were also used in criminology studies. The most common methods used by criminologists to measure personality characteristics of offenders has been for many years the Eysenck Personality Questionnaire (EPQ). Of particular importance for distinguishing people prone to committing crimes and non-criminals is the psychotism (P) scale contained in the questionnaire. This scale was standardized on a group of incarcerated offenders, however, this also raises considerable doubts among many researchers (Krueger et al. 1994). The main reservations made in terms of the possibility to diagnose criminality on the basis of personality traits, is precisely the fact that measuring these characteristics is done in penitentiary institutions, while confinement itself (and often it happens so) contributes to aberrations of personality.

In terms of trying to determine a personality profile of offenders, a number of studies have examined the relationship between psychotism, extraversion and neuroticism, and impulsiveness (Herrero, Colom 2008). The results obtained confirm the moderate correlation of impulsiveness with psychotism

and to a lesser extent of extraversion with neuroticism. The special relationship of criminality with psychoticism stems from the fact of positive correlations of this dimension with pathological personality traits (Stanik 2013): hostility, aggressiveness, impulsiveness, emotional coldness and callousness. Therefore, psychoticism remains in a positive connection with demoralization and asociality. Studies also show that psychoticism and neuroticism negatively correlate with the level of socialization. In the population of people manifesting a tendency for crime (and willing to take high risks), many studies have proved the presence of higher than average levels of extraversion and psychoticism. These studies indicate the existence of a higher severity of these traits, not only among people prone to aggressive behaviour, but also prone to any other social risk; therefore, they include populations of offenders, regardless of the nature of the crime committed. Much of the available data on the correlation between personality and antisocial behaviour indicates that the dimension of emotional lability has a strong positive correlation with criminality (Verona et al. 2001). According to Eysenck's studies, both dimensions of personality (neuroticism and extraversion) form a kind of contamination of traits, which leads to a new quality and related to a specific nature of crimes. The general findings indicate that (Stanik 2013) the highest indicator of extraversion and neuroticism are characterized by people committing acts of hooliganism and rape, and the lowest – people committing only theft.

Considering the importance of the basic personality dimensions and mutual combinations of all three characteristics in the development of criminal behaviour, it should be emphasized that in contemporary studies in the field of psychology and criminology, research is abandoning the search for isolated personality factors as the only predictors of criminal behaviour, and looks for complex risk factors (Stanik 2007).

Research method and procedures

The study was conducted in 16 penitentiary institutions in Poland, with the help of prison officers employed there. The studies were conducted under the activities of Polskie Towarzystwo Penitencjarne (Polish Penitentiary Association). Originally, the study procedure was preceded by the deliberate selection of a study sample. Officers were asked to nominate prisoners participating regularly (at least annual) in sport activities, and then to deliberately select a similar group in terms of variables such as: age, length of sentence, education, health and professional activity.

Finally, 249 convicted men aged from 22 to 55 years were included in the study. Among the respondents, 128 people manifested in penitentiary institutions regular physical activity (confirmed by participation in sport and recreational activities) for at least one year, and a further 121 people were not interested

in any form of activities in the field of physical culture and sport offered by the penitentiary institutions. The two groups of prisoners did not differ from each other in a statistically significant way in terms of variables such as: time left until the end of the sentence, length of stay in the penitentiary institution (medium- and long-term punishments), education, criminal record (first-time offender/ penitentiary recidivist), age, serving a sentence in the system of programme interaction or the ordinary system. These variables were extracted as control variables because of their relation to the resulting variables.

Most of the respondents were men with primary/secondary and vocational education (over 45% in each of these groups), less than 8% comprised prisoners with secondary education. A small majority of men (56.2%), until the moment of the study, resided in the prison less than 2 years, and the majority (57.8%) had less than 3 years remaining on their sentence. Every fifth prisoner participating in the study (20.5%) was serving a sentence for the first time, the remainder were penitentiary recidivists. This data will serve as a basis for determining the initial relationships between formal characteristics and physical activity of prisoners.

In order to determine the initial differences between the respondents in the scope of physical activity, a single-factor analysis of variance ANOVA was performed (Tab. 1).

Table 1. Sum of expended energy (expressed in metaminutes) depending on the age of prisoners, the time left until the end of the sentence, length of sentence and criminal history

	Age (N = 249)		Time left until the end of the sentence (N = 249)		Current length of sentence served (N = 249)		Criminal history (N = 249)	
	< 30 N = 123	> 30 N = 126	< 1 year N = 140	> 1 year N = 109	< 2 years N = 144	> 2 years N = 101	P N = 51	R N = 198
M META-MINUTES	2565.98	2675.95	2323.86	3004.09	2334.13	3004.44	2382.51	2683.22
SD	2094.72	1816.98	1818.40	2065.54	1971.32	1909.08	2021.91	1939.01
F	0.20		7.61		3.82		0.96	
p	n.i.		$p < 0.01$		$p < 0.05$		n.i.	

Source: own research.

The results of the analysis showed that

- a) there were no significant, mean differences in the level of physical activity, depending on the criminal history of the respondents ($p = 0.329$); however, it can be noted also in this case that among those convicted for the first time an intense level of physical activity dominates, while penitentiary recidivists

- prefer moderate activity; they also, more often than first-time convicts, exercise in their cells;
- b) nonetheless, the level of physical activity is differentiated depending on the time prisoners spent in prison serving their current sentence ($p < 0.01$); a lower overall level of activity is shown by people who thus far spent less than 2 years in prison; these prisoners also more frequently declare irregular, though more intense exercise, than regular daily moderate exercise and walking. Therefore, it appears that the initial phase of imprisonment is not conducive to taking up regular physical activity, and irregular forms of intense exercise is a form of releasing tension; the likely cause of more regular physical activity in the rest of the sentence served, is slow adaptation to the prison environment and an attempt to mitigate the effects of isolation;
- c) statistically significant differences in the level of physical activity between the groups were also found between groups of prisoners, who had less than 2 years or more than 2 years left until the end of their sentence ($p < 0.05$); in these terms, higher overall expended energy, and higher intensity of exercise were exhibited by prisoners, who had more than 2 years' imprisonment left until the end of their sentence.

In addition, table 2 shows descriptive statistics on the overall percentage of prisoners manifesting low, moderate and high levels of physical activity while in prison.

Before beginning analysis, it is worth noting that the average level of expended energy among prisoners is generally lower than in the case of men not residing in an isolated environment (see e.g.: Wang et al. 2011).

Table 2. Mean levels of energy expenditure in groups of prisoners manifesting low, moderate and high intensity exercise

Level of physical activity	N	%	METAMINUTES			
			M	SD	Min.	Max.
Low	113	45.4	1210.43	654.11	396.00	3406.00
Moderate	88	35.3	3507.55	1668.30	876.00	6600.00
Intense	48	19.3	4658.00	1548.70	1596.00	6600.00
TOTAL:	249	100	2621.63	955.91	396.00	6600.00

Source: own research.

The analysis of frequency showed that the manifestation of intense exercise while in prison is declared by 19.3% of all respondents. Among the convicted men declaring the performance of intensive exercise, strength sports dominate – 74% of all respondents, in determining their effort as intense, manifests it in the form of exercising at the gym and lifting weights. Among the remaining people

exercising intensively, 16% practice running and 10% practice combat sports (boxing). All prisoners exhibiting intense physical activity achieved an average weekly level $M = 4658$ metaminutes (MET) ($SD = 1548.7$). The maximum MET score in this group of respondents was the level of 6600 metaminutes a week. This general level comprises not only the time devoted to intense physical activity, but also the time used for other (moderate) exercise and for walking. Prisoners declaring intense exercise perform it from 2 to 5 days a week, from one to two hours each time. Most (56% of all respondents declaring intense exercise) perform it 3 times a week.

Practicing moderate physical activity is declared by more than 35% of respondents. The mean MET level in this group amounts to $M = 3507.55$ ($SD = 1668.30$), and the minimum score is 876 MET. The maximum score does not differ significantly from the score achieved in the group of convicts manifesting a high level of physical activity. Prisoners cultivating moderate physical activity most often declare doing exercise 5 times a week (36% of respondents). In terms of the types of physical activity among moderate exercise are: general development exercise done in the cell (push-ups, sit-ups, stretching) – 76% of persons declaring moderate activity, table tennis (24%), team games (volleyball, basketball, football) – 21%, kayaking (3.2%), Nordic walking (3.2%) – the percentages do not add up to a hundred, because a significant part of the prisoners declared participation in more than one type of moderate physical activity.

Among all respondents, over 45% do not take up any deliberate physical activity, and the form of energy expenditure among them is mainly walking and walking around the cell. A significant part of the respondents belonging to the group of low PA level practices only sporadic forms of non-rest energetic effort. The mean MET level in this group amounted to $M = 1210.43$ metaminutes ($SD = 654.11$), but the lowest MET value in this group amounted to 396, which corresponds to only two hours of walking per week. Among the respondents manifesting low forms of activity there were also those, who strolled and walked around the cell every day of the week for a few hours a day, and their overall energy expenditure amounted to 3406 MET. None of the people in this group, however, took up any physical exercise in addition to walking, nor did they participate in any activities in the field of physical culture and sports.

It is also worth noting the level of the declared lack of any activity among the respondent prisoners. 50% of the people participating in the studies declare that they spend sitting or lying down without any activity from 3 to 5 hours a day (in addition to night rest). As many as 22.90% of respondents spend their time sitting or lying down for 10 and more than 10 hours per day – (including 3.6% of people for even up to 16 hours). Only 12.5 of the respondents declare that they spend 2 or more than 2 hours on idly lying down/sitting during the day.

Problem and hypothesis

The review of the studies presented above quite clearly shows that offenders are characterized, on average, by higher levels of psychoticism and neuroticism. However, the relationships between criminality and extraversion are ambiguous, though many studies have shown a positive correlation here. The ambiguity of studies on correlation with extraversion also occurs in relation to people practicing sports, but in this case the relationships are generally shown as positive. Among athletes, like in offenders, a higher level of psychoticism was found. However, in contrast to the case of offenders, athletes are characterized by lower levels of neuroticism.

The similarity of certain features, confirmed by the studies cited above, and the strong differences in the scope of other personalities from the basic dimensions, between athletes and criminals became an impulse to formulate questions about the basic personality dimensions of men who both commit crimes, and regularly participate in sport activities. It has become interesting cognitively whether the similar personality trait between athletes and criminals – psychoticism, will reach an even higher level in prisoner-athletes, and whether the dimension of neuroticism positively correlating with criminality will be marked by a lower level in prisoners practicing sport. Finally, the ambiguously defined relation in previous studies between extraversion and sport and criminality seems interesting.

P1: What are the average differences in the basic personality dimensions of men serving prison sentences depending on them manifesting or not manifesting sport activity?

H.1: Men who participate in sports during imprisonment will differ in terms of the basic personality dimensions from physically inactive inmates.

H.1.a: Due to the negative correlation of sport with neuroticism, it is assumed that prisoners practicing sports will be marked on average by lower levels of neuroticism from physically inactive prisoners.

H.1.b: Due to the ambiguous, but recognized relationships between extraversion and sport and criminality, it is assumed that prisoners practicing sports will be marked on average by higher levels of extraversion from physically inactive prisoners.

H1.c: Given the documented by Eysenck relationships of psychoticism both with sports and criminality, it is assumed that the level of this trait will be greater in criminal-athletes, therefore, prisoners practicing sports will be distinguished by a higher level of psychoticism from physically inactive prisoners.

Research tools

EPQ-R – S.B.G. Eysenck, H.J. Eysenck, P. Barret, in Polish adaptation by P. Brzozowski and R.Ł. Drwal. The studies applied the EPQ-R – S.B.G. Eysenck, H.J.

Eysenck, P. Barret, in Polish adaptation by P. Brzozowski and R.Ł. Drwal: *Eysenck Personality Questionnaire – Revised* (EPQ-R). Reliability indicators for the Polish version of the questionnaire amount to approx. 0.80 for the scales of neuroticism (N) and extraversion (E), and 0.60–0.70 for the psychoticism scale. Therefore, the questionnaire should not be used for individual diagnosis. However, it does fulfil its purpose well in the diagnosis of personalities in the case of scientific research (Brzozowski, Woodman 1995).

International Physical Activity Questionnaire – IPAQ. For the purpose of studies in the environment of penitentiary institutions, a modified International Physical Activity Questionnaire (IPAQ) was used – short version (as in: Mata et al. 2012). This questionnaire is a popular tool for studying physical activity with the possibility of comparing results on an international scale. The level of physical activity measured by the questionnaire is evaluated on the basis of weekly energy consumption – MET (*Metabolic Equivalent of Work*) (Biernat et al. 2007). Each type of activity included in the questionnaire has an assigned MET value, then multiplied by its average duration (including the days of the week and the average number of minutes per day). Hence, any particular type of physical activity was converted to appropriate units: minutes of mild physical activity multiplied by 3.3, minutes of moderate physical activity by 4.0, and minutes of intense physical activity times 8.0 – by calculating the so-called metaminutes (e.g. for 10 minutes of moderate physical activity – 4 times 10).

Results

Interpretation based on Eysencks' and Berret's questionnaire helped to identify the primary personality dimensions of the respondents: neuroticism (N), extraversion -introversion (E-I) and psychoticism (P), taking into account the results of the scale of lies (K). Analysis showed a low level of results obtained by the respondents on a scale of lies (2 sten), regardless of their level of physical activity. This result means that on average the entire surveyed population demonstrates a low need for social approval or no tendency to show themselves in a favourable light, and the results of the remaining scales can be considered reliable. Interpretation of the results was performed by taking into account the sten scale, where the results 1–4 indicate a low severity of the trait, the results 5–6 – average, and the results 7–9 should be considered as high (see: Brzozowski, Drwal 1995, p. 73).

The first element of the analysis was the dimension of neuroticism (see: Tab. 3). In terms of the results of this dimension there was not homogeneity of variance, resulting from the fact that in the group of physically active prisoners, the average score of 5th sten dominated ($Do = 5$) obtained by 40.6% of prisoners practicing sport, and in the group of physically inactive people a high score dominated – 7 sten ($Do = 7$), which was obtained by 32.2%. No assumed

equality of variance was taken into account in the statistical analysis presented below.

Table 3. Level of neuroticism (in sten) in imprisoned men, physically active and inactive

	Physically active prisoners (N = 128)		Physically inactive prisoners (N = 121)		Result of t Student	Level of significance
Neuroticism	M	SD	M	SD		
	5.77	1.31	6.23	1.81	-2.32	p < 0.05

Source: own research.

Both physically active and physically inactive prisoners obtained on average mean results in the scale of neuroticism (5–6 sten), which should be interpreted as manifesting moderate emotional balance in behaviour. The results of the neuroticism dimension expressed in sten proved to be, among the prisoners participating in activities in the field of physical culture and sport, significantly lower than in the case of prisoners who did not perform conscious physical activity $t(217.463) = -2.32$; $p < 0.05$. This result indicates, among others, that men who practice sport in prison are characterized by higher resistance to stress than in the case of physically inactive people. They obtained a mean score of 5.77 sten ($SD = 1.31$), while the mean of the physically inactive group was $M = 6.23$ $SD = 1.81$, which exceeds the mean result and comes close to high scores.

Another of the analyzed dimensions of the Big Three was the extraversion-introversion dimension. The mean of standardized results obtained in the E-I scale in both surveyed groups has been presented in Table 4.

Table 4. Level of extraversion (in sten) in imprisoned men, physically active and inactive

	Physically active prisoners (N = 128)		Physically inactive prisoners (N = 121)		Result of t Student	Level of significance
Extraversion	M	SD	M	SD		
	6.44	1.35	6.03	1.52	2.22	p < 0.05

Source: own research.

The first noteworthy empirical fact in the field of the extraversion dimension is placing the overall mean results in the scope of average and high results. Both questioned groups of prisoners obtained mean scores slightly above average results ($M = 6.44$, $SD = 1.35$ – physically active; $M = 6.03$, $SD = 1.52$ – physically inactive). Physically active men, however, obtained a significantly higher result than those who do not participate in physical culture activities and do not practice any sport, $t(247) = 2.22$, $p < 0.05$, which indicates the possibility of

them manifesting their greater tendency for impulsiveness, and at the same time a need for constant movement, change and passion for work. The significance of this fact in conjunction with average and high neuroticism will be discussed in the discussion section.

The last analyzed dimension among those assumed as the three basic, following Eysenck, was the level of psychoticism. The results of this scale are illustrated in Table 5.

In order to test the hypotheses on the differences in the level of psychoticism between physically active and inactive prisoners, the T-Student test was used. Results of the analysis, however, showed no significant differences between groups in this regard $t(247) = -1.76; p = 0.80$.

Table 5. Level of psychoticism (in sten) in imprisoned men, physically active and inactive

	Physically active prisoners (N = 128)		Physically inactive prisoners (N = 121)		Result of T-Student test	Level of significance
	M	SD	M	SD		
Psychoticism	6.12	2.06	6.59	2.07	-1.76	$p = 0.80$

Source: own research.

Both groups obtained a mean score in the scale of psychoticism, oscillating in the upper limits of the average score and the lower limits of the high score (respectively: $M = 6.12, SD = 2.06$; $M = 6.59, SD = 2.07$). Homogeneity of variance was maintained between the groups (Levene's test = 0.02, $p = 0.88$). The median of results in both groups was found at the beginning of the high score range ($Me = 7$). It is also worth noting that in both groups there was also an extremely high score of psychoticism – 9 sten. The frequency of the occurrence of such a high result oscillated around 12% of all prisoners – regardless of the surveyed group. As a result of the analyses, the tendency for asocial and antisocial behaviours in the population of imprisoned people should be confirmed, determined by personality. However, the results cannot admit rejecting the null hypothesis for the dimension of psychoticism. No significant differences were obtained between the men who committed crimes and are simultaneously active or inactive in sports.

Next to the factor analysis in the scope of determining the conditions of physical activity of men serving prison sentences, a multiple regression analysis was also applied. The analysis was conducted in order to determine the predictability of the metaminutes level of physical activity on the basis of the primary personality dimensions (Tab. 6).

An analysis of multiple linear regression was carried out using hierarchical methods. Extraversion itself proved to correlate with PA of prisoners at the level $r = 0.21$, whereas neuroticism and extraversion together correlates with the level

of physical activity of prisoners at the level $r = 0.26$. This correlation increased further with the introduction of the variable *psychoticism*; however, this change was statistically insignificant ($p = 0.08$). The two predictors together (extraversion and neuroticism) explain 60% of the PA variance, whereas extraversion alone explains only 51%. This change is statistically significant, $F (1,246) = 2.34$, $p < 0.01$. With two predictors, the standard estimation error also decreases slightly from 910 of PA metaminutes to 905.

Table 6. Analysis of multiple regression between the primary personality traits and physical activity

Response variable	Explanatory variables	R	R2	Corrected R2	beta	Standard estimation error	F changes	Significance of F changes
Physical activity	extraversion	0.21	0.51	0.47	0.21	910	13.16	$p < 0.001$
	neuroticism	0.24	0.60	0.52	-0.11	905	2.34	$p < 0.05$
	psychoticism	0.26	0.68	0.56	0.09	899	2.17	$p = 0.08$

Source: own research.

Both predictors enable to significantly predict the level of physical activity, and the strength of their impact is similar. Both predictors correlate prisoners with PA poorly, but significantly. Extraversion turned out to correlate positively, while neuroticism negatively, which means that with higher levels of extraversion and lower levels of neuroticism there is simultaneously a chance for prisoners to manifest greater PA. However, this effect is burdened by an error of 905 metaminutes up and down.

The intensity of the exercise done in prison, however, does not affect the level of psychoticism in prisoners. Although, with the introduction of this variable, the level of correlations of primary personality traits with the PA of prisoners additionally increased, this relationship proved to be insignificant.

Discussion and conclusions

To sum up the results presented above, it needs to be noted that high results in the scale of neuroticism, extraversion and psychoticism, at the simultaneous low results in the scale of lying, indicate the tendency of the respondents to criminality, regardless of whether they practice physical activity or not. Therefore, it can be concluded that involvement in PA is not related to a lesser or greater tendency for asocial and antisocial behaviours. At the same time, however, between the groups of physical active and inactive prisoners, interesting personality differences were found.

With regard to hypothesis 1a, it can be concluded that men serving the sentence of imprisonment and exercising regularly are marked by significantly higher emotional stability from physically inactive prisoners. Prisoners participating in activities in the field of physical culture and sport are distinguished by a slightly lower tendency for anxiety, irritability and dissatisfaction, as well as lower incoherence of emotional reactions. This result is confirmed by previous studies carried out both around the world and in Poland on the correlation of neuroticism with practicing sport (see: Eysenck et al. 1982; Kajtna 2004; Bogg, Roberts 2004; Marks et al. 2012). It turns out that even in conditions of prison isolation, in the population of offenders, there is a greater emotional stability among those who play sports than among physically inactive people. It should be noted, however, that all surveyed prisoners obtained on average in the scale of neuroticism scores oscillating on the border of average and high results, which is consistent with the results of previous studies on relationships between criminality and neuroticism (see: Verona et al. 2001; Herrero, Colom 2008).

Neuroticism is related with other dimensions of personality; its relationships with the extraversion dimension particularly are strongly marked. On the one hand, the connection of neuroticism with high and medium extraversion may lead to asocial behaviour; on the other hand, in a diametrically different case, the connection of neuroticism with introversion may cause dysthymic behaviours leading to anxiety and depression. The study results presented above showed an above-average level of extraversion among all surveyed prisoners. This fact is confirmed by the reports of those researchers, who have so far proved positive correlations between criminality and extraversion (Eysenck 1977), although some of the research conducted around the world does not support this relationship (Herrero, Colom 2008).

With regard to hypothesis 1b, a significantly higher level of extraversion can be found among prisoners manifesting planned and regular physical activity in penitentiary institutions, from those imprisoned criminals who are physically inactive during their sentence. This indicates relationships of extraversion of people prone to criminality with their simultaneous tendency to practice sports. High extraversion is associated with a tendency to seek experiences, to be in constant motion. The need for change and challenges is a relatively permanent personality factor of respondents involved in sport activities, which is probably due to the higher energy levels among extraverts and higher need for action among them. Because high energy levels necessitates its referral to the outside world, physically active men in prison turned out to be characterized by higher scores in the extraversion dimension from those who were physically inactive. Extraverts are marked by a tendency to seek stimuli and behaviour characterized by a lack of inhibitions. This tendency, leading to asocial behaviour, at the same time proved to be conducive to looking for another type of activity. This confirms

previous studies on positive relationships between extraversion and physical activity (Eysenck et al. 1982; Kajtna et al. 2004; Bogg, Roberts 2004).

At this point, it is worth returning to the distinction between the extraversion of good and bad adaptation (Pospiszyl 1992). Of course, the extraversion of people who commit crimes is associated with antisocial behaviour. Perhaps, however, extraversion of athletes is extraversion of good adaptation and promotes the development of socially acceptable behaviour. This suspicion may indicate a direction of further research on personality traits (especially extraversion) of criminals performing sport. However, it cannot be denied that some athletes also exhibits antisocial and aggressive behaviour (Turosz, Storko 2002) – perhaps sport activity of some criminals serving imprisonment is in isolation conditions a form of replacing aggression.

In view of the demonstrated connections of extraversion, both with criminality and practicing sport in the conditions of penitentiary isolation, it is worth indicating the directions for further research, checking the strength of the main effects: sport and criminality, as well as explaining the role of sport in the behaviours of criminals, who do not have sufficient opportunities in penitentiary institutions to manifest antisocial behaviour. Perhaps sport is a viable alternative for extraverts involved in delinquent and aggressive behaviour (although one cannot rule out that this would be an aggressive sport).

Interpretation of the presented studies also enables to refer to the level of psychoticism of criminals who are physically active and inactive. It was found that, on average, all surveyed prisoners are marked by a higher than average level of psychoticism, and among many of them, psychoticism was in the range of high results. According to previous studies (Eysenck 1977; Herrero, Colom 2008) it was shown that people prone to antisocial behaviour achieve high scores on the scale of psychoticism. At the same time it was failed to confirm hypothesis 1c, assuming that the level of psychoticism will be higher in offenders practicing sport, which does not confirm previous studies on positive relationships between sport and psychoticism (Eysenck et al. 1982). However, the lack of correlations may be apparent here; therefore, it should be remembered that the results obtained are above-average results regardless of whether physical activity is manifested or not. Psychoticism may be a reflection of a tendency to resist social norms and non-conformism. In the case of its pathological forms, we are dealing with criminality, which was confirmed by the studies.

A limitation of the studies presented above is their correlation character. Due to the accepted theoretical bases for the studies concerning personality traits identified by Eysenck, it was found that the examined features of temperament are predictors rather than the result of participation in sport activities in penitentiary institutions. The constructively critical evaluation of presented studies, presented before the publication of this article, conducted by Reviewers, indicates that “it can be concluded from the presented study results that sport activity of people

serving the sentence of imprisonment develops personality traits that serve not only their social rehabilitation, but rather perpetuates criminal predisposition". For clarity of the presented results, it seems significant to emphasize that the discussed personality traits are relatively permanent, and their change, also in the course of social rehabilitation seems not only difficult, but due to their largely biologically determined nature, may be impossible. It must be remembered that contemporary knowledge on temperament, no longer makes the division of a difficult or easy character, but focuses on the environmental conditions that are favourable for the proper development of behaviour of persons with a particular set of characteristics. Athletes (not only in prisons) are often characterized by nonconformity and low sensitivity to social norms (Eysenck et al. 1982), which in conditions of freedom is confirmed by e.g. the fallen legend of Lance Armstrong, the suspicion of Rafael Nadal's doping, as well as aggression in sport: verbal insults, physical aggression: Pepe (Real Madryt), de Jongs (Manchester City). It seems that the problem of antisocial behaviour does not lie in the personality traits themselves, but in the environmental conditions of their manifestation. Therefore, the importance of the studies presented above for the practice of social rehabilitation in prisons is not based on the belief that sport activities offered to prisoners have the power to change their basic personality traits, but to include these traits when offering penitentiary programmes based on physical culture and sport. Even with an unfavourable system of basic personality traits, from the point of view of socialization, the resulting behavioural tendencies, through properly selected sport activities, can begin to be revealed in sport achievements, rather than in criminal activities (for which we also have evidence, e.g. in the case of many prominent boxers). In conclusion, it is worth emphasizing that the cited studies presented only relationships of physical activity in prisons with the three basic characteristics of temperament, identified as predictors of physical activity. Of course, personality includes a broader dimension of traits, more susceptible to change, and a large part of them (e.g. self-esteem, source of locus of control, a sense of self-agency, depression, a sense of the meaning of life) may largely be the result, not a cause for undertaking physical activity, which can be used as an important moderator of social rehabilitation through sport in prisons. These areas of personality go beyond the scope of this article and will be part of the author's other publications.

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