Antropomotoryka. Journal of Kinesiology and Exercise Sciences
JKES 90 (30): 63-69, 2020

SECTION – VARIA

(1.6) DOI: 10.5604/01.3001.0014.7772

DIAGNOSIS OF GENERAL INTELLIGENCE WITHIN THE ASPECT OF TRAINING YOUNG FOOTBALL PLAYERS AT SPORTS CHAMPIONSHIP SCHOOLS

Joanna Basiaga-Pasternak[1], **Henryk Duda**[2], **Agnieszka Wojtowicz**[1]

[1] Department of Psychology, AWF Kraków
[2] Department of Sports Games and Recreation, AWF Kraków

Keywords: intelligence, football players, psychological diagnosis

Authors' contribution:

A. Study design/planning
B. Data collection/entry
C. Data analysis/statistics
D. Data interpretation
E. Preparation of manuscript
F. Literature analysis/search
G. Funds collection

Abstract:

Introduction. Psychological diagnostics in competitive sport is very useful in the selection process. Therefore, proper diagnostic methods are used to be predictive for both teachers and trainers.

Aim of research. The aim of the study was to establish the best method for diagnosing football players' level of intelligence.

Materials and methods. Raven's Progressive Matrices - APIS-P(R), football tests were used. All of the 177 participants (males) practised football.

Results. In research, it has been shown that intelligence tests examining crystallised intelligence are not useful in the aspect of training, but may be a clue in the teaching process for teachers. The results of liquid intelligence tests (Raven's Progressive Matrices) indicate positive correlations with the level of tactical and technical knowledge, as well as efficiency of the tested footballers.

Conclusions. In the diagnosis of team sports players, it is useful to test liquid intelligence.

Introduction

In the 1973/74 school year, the first sports schools were established in Poland. There were 2 technical secondary schools, 17 general secondary schools, and 25 primary schools [1]. From the very beginning of their existence, when enrolling in schools, the role of psychological factors was emphasized as a significant disposition for the development of a specific sports specialisation [2]. Today, sports championship schools and sports classes established at general and primary schools are still operating. In addition to sports activities, they implement the core curriculum in accordance with the guidelines of the Ministry of National Education in order to reconcile educational requirements with training of youth particularly talented in sports [3]. Furthermore, the selection of schools to this type of school should be based on criteria related to requirements of the training programme [4].

In order to ensure optimal learning and training conditions for children and adolescents studying at sports schools, and to characterise young athletes, numerous studies, also of psychological nature, have been carried out at these specific institutions. Previously conducted analyses among students of sports championship schools in the field of sports psychology concerned, among others, aspects of personality and temperamental traits [5-10], interpersonal relationships and social adaptation [11-13], coping with stress [14, 15], motivational structure [16], behaviour [17].

Based on research carried out over the years, it has been shown that students of sports schools are diverse

in terms of psychological properties. However, it has been noted that there are certain characteristics that accompany competitors reaching the highest level of sports, which are also specific to each sport. In the presented article, the authors focus solely on the education of football players. The role of mental traits in footballers, being significant for game performance, was also observed in the National Model of the Game of the Polish Football Association (PZPN) [18].

Thanks to psychological diagnosis in sport, its results provide significant information allowing to characterise a given athlete and to develop individual styles of preparing him or her for the start. Also, at the stage of recruitment to sports schools, including those football-related, it is worth paying attention to the psychological aspect. Schools of sports championship type are usually not of mass nature - their students are young people selected on the basis of sports predisposition, often, also with regard to mental characteristics.

Research aim and methods

The aim set by the authors is to answer the question "are intelligence tests used during recruitment (apart from typical sports tests) to schools with a sports profile?" The materials presented in the text are the result of many years of experience in the selection of optimal diagnostic tools, cooperating with sports schools Joanna Basiaga-Pasternak and Henryk Duda.

The recruitment process for this type of facility requires the use of methods that are accurate and reliable. Their performance must also be time-limited - recruitment is group-based, with even several hundred candidates taking the tests during 1 day. The selection of diagnostic methods, including psychological ones, must therefore take into account time constraints and a large number of respondents. In football, so-called 'pitch intelligence', associated with quick decision-making and high cognitive performance is of great significance [19]. Therefore, it was decided to use methods for diagnosing intelligence (i.e. various types).

In the presented text, the results obtained by candidates (later students) of the Football Championship School in Kraków are presented, with regard to the examination of intelligence tests within the context of selected educational and sports-related achievements, which were observed when they were already students. This was illustrated by 3 research trials.

Study group and research methods

The research was carried out during recruitment and during the school year (i.e. after qualifying the candidates as students) at the Józef Kałuża and Henryk Reyman School of Sports Championship in Football (SMS) (today: Charter High School of Sports Championships) in Kraków.

In the research carried out over an approx. 10-year period, 3 groups of subjects A, B and C were distinguished. The study was conducted over the course of 5 years, during different school years.

Statistical analyses

The analyses were performed using the STATISTICA 13.3 statistical calculation program. Basic descriptive statistics of the examined quantitative variables were presented, i.e. means, medians and standard deviations. In the case of describing correlations between abilities and school achievements, non-parametric analysis using Spearman's signed rank correlation coefficient was used due to the lack of normal distribution among the analysed variables. To determine the level of ability depending on sports level, the *t*-test was applied. ANOVA with repeated measurements was implemented to analyse the profile of the players' ability depending on the achievement of successes. Pearson's correlation coefficient was used to determine correlations between intelligence and tactical thinking, as well as knowledge about the game. The adopted level of significance was $\alpha = 0.05$.

Group A examination - diagnosis of general intelligence - crystallised

Group A consisted of 98 boys, candidates for the 1st class of the Sports Championship High School in Kraków.

APIS-P (R) - a questionnaire by Matczak, Jaworowska, Ciechanowicz, Stańczak, Zalewska [20], was used to measure *general intelligence* understood as the basis of intellectual activities, responsible for their individual differentiation. In particular, the measurement here is related to crystallised intelligence, that is, mental abilities to "deal with content-specific problems through the use of culturally significant skills and knowledge. It is dependent on experience" [20, p. 8]. The APIS-P (R) method allows to establish the level of capabilities, understood as internal abilities determining the effectiveness of performing specific cognitive tasks. These are the abilities: abstract-logical (the ability to perform operations of logical reasoning on abstract material), verbal (they condition the reasoning of speech and its use), visual-spatial (enabling the effectiveness of the course of operations constituting mental representations of physical transformations or displacements), and social (they condition the understanding of interpersonal relations and planning methods of acting on people) [20 p.10]. All these abilities are essential for the effective functioning of a football player.

The second indicator was *school achievement* (average grade from all subjects, math and Polish),

The third - *sports level* - a group of 18 players with particularly high sports efficacy (Polish champions and runners-up), obtained while being students of the school, was selected.

Group B and C examination - diagnosis of general intelligence - fluid

Group B comprised 34 subjects, candidates for the 1st class of the Sports Championship High School in Kraków. The Raven Matrix Test in the Standard Version [21], and tactical thinking scores (during the school year, after enrolment in the school) were used.

Group C, on the other hand, consisted of 45 individuals, younger juniors, first candidates and then students of the Sports Championship School in Kraków. The Raven Matrix Test in the Standard Version [21] and the assessment of the knowledge level about the game were used; knowledge test about the tactical actions of players; the level of performing motor activities with the ball; the effectiveness of motor activities in simulation games and the effectiveness of group cooperation in simulation games.

As earlier mentioned, the study of general fluid intelligence was carried out in Groups B and C, using the Raven Matrix Test. This tool allows assessment of intellectual abilities in the sense of fluid intelligence, a biologically conditioned ability not related to the experience of an individual. It is also associated with convergent thinking [22]. As shown in the study [23], high results for the Raven Matrix Test are positively correlated with the level of performing tasks based on eye-hand coordination. Therefore, fluid intelligence is an important factor correlated with speed and accuracy of motor reactions. It is also related to the course of motor functions over time. For that reason, it was considered a useful tool in the diagnosis of athletes.

Results

Group A - abstract-logical, verbal, visual-spatial, social skills versus school achievements and sports level.

The results presented in Table 1 indicate that the studied footballers were characterised by social skills to the highest degree ($\overline{x}$ = 17.63), and following, by abstract-logical skills ($\overline{x}$ = 15.53). Verbal skills were the weakest in this group ($\overline{x}$ = 11.81).

Table 1. Descriptive statistics for specific skills

	N	Mean	Median	Minimum	Maximum	Std. dev.
Abstract-logical skills	98	**15.53**	17.00	2.00	22.00	4.62
Verbal skills	98	**11.81**	11.00	3.00	26.00	4.31
Visual-spatial skills	98	**12.48**	13.00	2.00	20.00	3.96
Social skills	98	**17.63**	18.00	10.00	26.00	3.69

Table 2. Non-parametric (Spearman's) correlations between skills and school achievements

Pair of variables	Spearman's signed rank correlation coefficient $p<0.05000$			
	N of weights	Spearman's R	*t*(N-2)	*p*
Polish & Mathematics	98	0.71	9.94	<0.001
Final mean & Mathematics	98	0.81	13.34	<0.001
Final mean & Polish	98	0.85	15.68	<0.001
Abstract-logical skills & Mathematics	98	0.35	3.64	<0.001
Abstract-logical skills & Polish	98	0.25	2.50	0.014
Verbal skills & Mathematics	98	0.21	2.15	0.034
Verbal skills & Polish	98	0.26	2.65	0.009
Verbal-spatial skills & Mathematics	98	0.31	3.19	0.002
Verbal-spatial skills & Polish	98	0.27	2.74	0.007
Social skills & Mathematics	98	0.28	2.88	0.005
Social skills & Polish	98	0.25	2.51	0.014

The correlations between abilities and school achievements of the examined youth were assessed (Tab. 2).

Along with the increase in the level of abilities, the level of assessment for Polish and mathematics in the subjects also increased, however, these correlations were weak. Strong correlations were found between the scores for Polish and mathematics ($r = 0.71$), and also between the final mean and these scores ($r = 0.85$ for the Polish language and $r = 0.81$ for mathematics).

The data presented in Table 3 refer to the relationship between sports level (the group "with achievements", i.e. champions and vice-champions of Poland and "without such high achievements") and individual types of abilities. There were no differences in the level of abilities between those who achieved success in sports and those who did not achieve high sports results. The greatest difference was noted in the level of social skills - a higher level was achieved by students who later failed to achieve high results in football.

The results (Tab. 4) allow to indicate that the ability profile does not differentiate players with or without achievements in competitive sport ($F_{3.288} = 0.16$; $p = 0.920$). Differences in the level of individual abilities were observed in all subjects ($F_{3,.88} = 37.66$; $p < 0.001$).

Group B examination - diagnosis of general, fluid intelligence and tactical thinking.

The conducted analysis showed that along with an increase in the Raven Matrix Test results (which proves the growing level of general, fluid intelligence), the level of tactical knowledge among players also experienced an increase (Tab. 5).

Group C examination – general, fluid intelligence and the level of knowledge about the game; knowledge test regarding the tactical actions of players; the level of performing motor activities with a ball; the effectiveness of motor activities in simulation games and the effectiveness of group cooperation in these games.

Subsequent analyses demonstrate a relationship between the above-mentioned variables. The correlation coefficient at the level of $p < 0.005$ is considered here.

The results presented in Tables 6-10 show positive correlations between general-fluid intelligence and knowledge about motor/technical activities (Tab. 6, $r = 0.53$), knowledge about tactical activities (Tab. 7, $r = 0.546$), the effectiveness of performing the motor activity test with a ball (Tab. 8, $r = 0.540$), the effectiveness of motor activities in simulation games (Tab. 9, $r = 0.334$, low correlation level) and the effectiveness of group cooperation in these games (Tab. 10, $r = 0.507$).

Table 3. Individual skills and sports level – results of *t*-test

	Mean 0	Mean 1	*t*	df	*p*	N 0	N 1	Std. dev. 0	Std. dev. 1
Abstract-logical skills	15.75	14.56	0.99	96	0.325	80	18	4.62	4.66
Verbal skills	11.91	11.33	0.51	96	0.609	80	18	4.49	3.48
Visual-spatial skills	12.66	11.67	0.96	96	0.338	80	18	3.96	3.99
Social skills	17.89	16.50	1.45	96	0.151	80	18	3.64	3.85

Legend: 0 – group without achievements in football; 1 – group with achievements (Polish champions and vice-champions)

Table 4. Results of ANOVA with repeated measurements – skills and footballers with and without achievements in sport

	Degree of freedom	F	*p*	Partial Eta-squared
Constant term	1.0	1241.56	<0.001	0.928
Achievements in football	1.0	1.70	0.195	0.017
Error	96.0			
SKILLS	3.0	37.66	<0.001	0.282
SKILLS*x*Achievements in football	3.0	0.16	0.920	0.002
Error	288.0			

Table 5. General-fluid intelligence and tactical thinking – Pearson's correlation coefficient

	Result of tactical thinking test
General-fluid intelligence	*r*=0.53
	p-0.001

Table 6. Dependency between level of general-fluid intelligence and indices from the test on knowledge about motor actions of players – score in points

Index	Raven's test of general-fluid intelligence	Knowledge on motor actions (technical)
Arithmetic mean	47.33	48.49
Coefficient of variation	13.62	15.75
Standard deviation	6.45	7.64
Correlation	0.534***	

Correlation significance: *** - $p<0.001$

Table 7. Dependency between level of general-fluid intelligence and indices from the test on knowledge about tactical actions of players – score in points

Index	Raven's test of general-fluid intelligence	Knowledge on tactical actions
Arithmetic mean	47.33	55.40
Coefficient of variation	13.62	8.82
Standard deviation	6.45	4.88
Correlation	0.546***	

Correlation significance: *** - $p<0.001$

Table 8. Dependency between level of general-fluid intelligence and efficiency in performing the test on motor actions with a ball among players – score in points

Index	Raven's test of general-fluid intelligence	Test of motor actions (technical) with ball (isolated conditions)
Arithmetic mean	47.33	62,78
Coefficient of variation	13.62	7,97
Standard deviation	6.45	5,00
Correlation	0.540***	

Correlation significance: *** - $p<0.001$

Table 9. Dependency between level of general-fluid intelligence and efficiency of motor actions in simulated games – score in points

Index	Raven's test of general-fluid intelligence	Efficacy in game (technical)
Arithmetic mean	47.33	60.60
Coefficient of variation	13.62	6.61
Standard deviation	6.45	4.01
Correlation	0.334*	

Correlation significance: * - $p<0.05$

Table 10. Dependency between level of general-fluid intelligence and efficiency of group cooperation in simulated games – score in points

Index	Raven's test of general-fluid intelligence	Efficacy in game (tactical)
Arithmetic mean	47.33	61.81
Coefficient of variation	13.62	6.16
Standard deviation	6.45	3.81
Correlation	0.507***	

Correlation significance: *** - $p<0.001$

Conclusions

The results presented in the earlier part of the study show that there is no clear relationship between sports level and individual abilities characterising crystallised intelligence. Only in terms of social abilities, higher scores for this variable were noted among athletes who did not achieve success at the level of Polish champion or runner-up. This is a surprising correlation. Social and communication skills, the ability to understand others and express one's thoughts adequately seem to be useful for a footballer. Field communication and the resulting cooperation is an important element of functioning in every team. Meanwhile, it was the less titled athletes who turned out to be more communicative. However, in this study, it has been shown that to be successful in football, great social abilities are not a prerequisite. Or maybe individualities are successful in today's football and it is the set of individualities, not team spirit, that leads to success? Such a concept would undermine current beliefs about the role of communication between players; although Blaser and Seiler [24] noted changes in communication among football players. The greater the experience of the players and the greater knowledge ("shared knowledge"), the more verbal and non-verbal communication was limited. Therefore, understanding pitch situations, so-called team intelligence [25], plays a greater role here, especially since traditional communication may be impaired by noise accompanying games. Konter also obtained ambiguous research results in the area of non-verbal intelligence in footballers [26]. This issue certainly requires further analysis.

Returning to the relationship between the results of the APIS-P (R) test and the educational achievements of the participants, it can be concluded that the analysed method may be a tool for prognosticating educational progress, but it is not applicable in the case of practicing sports or predicting sports achievements.

Much more useful - from the perspective of training and coaching - are methods measuring the level of general-fluid intelligence (in this study, it was the Raven Matrix Test in Standard Version). In this study, unequivocal correlations between the results of general, fluid intelligence and variables specific to football players have been shown. As it was observed, the higher the level of fluid intelligence in subjects, the more knowledge they have about motor and tactical activities. Interestingly, they are also characterised by greater efficiency of motor activities and better group cooperation. This is in line with the observations noted by Truszczyński et al. [23], who show that the results of the Raven Test correlate with the pace of learning and automation of motor activities. The discussed dependencies also confirm our earlier observations [19, 27-29]. Thus, on the basis of the conducted analyses, it is possible to propose the use of the Raven Matrix Test (or similar methods, allowing to determine the level of fluid intelligence) in the diagnosis of team game players at the stage of recruitment.

Conclusion: In psychological diagnostics regarding football players' level of general intelligence, it seems more justified to include the analysis of fluid intelligence.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Ethics Committee

References:

[1] *Materiały Ministerstwa Oświaty i Wychowania. Założenia programowo – organizacyjne szkół o profilu sportowym*. Sport Wyczynowy.1973; 9(107): 18-26.

[2] Krawacki J: *Propozycje do założeń organizacyjnych szkół o profilu sportowym*. Sport Wyczynowy.1973; 9(107): 26-28

[3] Klusek J: *Kierunki dostosowania kształcenia ogólnego do warunków i potrzeb przygotowania sportowego w niepublicznych szkołach mistrzostwa sportowego*. W: Panfil R, Nosal J, redaktorzy. Edukacja młodzieży uzdolnionej w grach zespołowych poprzez niepubliczne szkoły mistrzostwa sportowego. II Ogólnopolska Konferencja Naukowa – Metodyczna. Sport Contact. Wrocław; 1998.

[4] Kuch S: *Zadania zintegrowanego procesu nauczania, szkolenia i wychowania w szkole sportowej.* W: Bisaga J, Chojnacki K, redaktorzy. Narciarstwo. Program Szkolenia Dzieci i Młodzieży. Warszawa: Centralny Ośrodek Sportu. Resortowe Centrum Metodyczno-Szkoleniowe Kultury Fizycznej i Sportu Warszawa; 1997.

[5] Kościelak R: *Wybrane problemy osobowości a sport.*W: Maroszek K, Dubowik E, Kościelak R, Kulas H, Krawczyński M, redaktorzy. Wybrane zagadnienia z psychologii sportu. Gdańsk: Akademia Wychowania Fizycznego;1995.

[6] Kościelak R, Maroszek K: *Poczucie umiejscowienia kontroli i samoocena a wynik sportowy.* W: Rychta T, redaktor. Osobowość a zachowanie celowe sportowców. Warszawa: Biblioteka Trenera. Centralny Ośrodek Sportu; 1998.

[7] Guszkowska M:*Cechy osobowości uczniów szkół mistrzostwa sportowego*. Kultura Fizyczna. 1997; 3-4: 8-13.

[8] Guszkowska M: *Wyniki w nauce a poziom intelektualny uczniów Szkoły Mistrzostwa Sportowego*. Psychologia Wychowawcza. 1997; 4: 352-359.

[9] Tchórzewski D, Szczygieł A: *Zmiany typu temperamentu pod wpływem działalności sportowej na przykładzie zawodników sportów zimowych.* W: Krasicki S, redaktor. Sporty zimowe. Strategia rozwoju – badania naukowe. Kraków: Akademia Wychowania Fizycznego w Krakowie; 2005 (Studia i Monografie nr 31).
[10] Basiaga–Pasternak J: *Profil osobowości bramkarzy – uczniów Szkoły Mistrzostwa Sportowego Piłki Nożnej.* W: Stuła A, redaktor. Wybrane zagadnienia szkolenia i analizy gry piłkarzy nożnych. Opole: Politechnika Opolska; 2012 (Studia i Monografie z. 311).
[11] Wlazło E:*Z wiązek sprawności umysłowej z sytuacją interpersonalną uczniów klas sportowych.* W: Prozdrowotne wychowanie fizyczne i sport dzieci i młodzieży. II Interdyscyplinarna Krajowa Konferencja. Materiały Naukowe.18-21.X.1995. Warszawa-Spała, Warszawa;1996.
[12] Nowocień J: *System wartości społeczno-wychowawczych klas sportowych*. Kultura Fizyczna.1980; 4: 17-20.
[13] Guszkowska M: *Przystosowanie społeczne młodzieży ze szkół mistrzostwa sportowego*. Wychowanie Fizyczne i Sport. 1996; 3: 49-63.
[14] Guszkowska M: *Poziom stresu, stan zdrowia i samopoczucie psychiczne uczniów w okresie adaptacji do szkoły średniej*. Sztuka leczenia. 2003; 1[IX]: 61–68
[15] Basiaga–Pasternak J: *Psychologiczne uwarunkowania radzenia sobie ze stresem w sporcie*. Kraków: Akademia Wychowania Fizycznego w Krakowie; 2007 (Studia i Monografie nr 38).
[16] Basiaga–Pasternak J, Duda H: *Motywacja a oceny piłkarskie u zawodników Szkoły Mistrzostwa Sportowego w Krakowie*. W: Turowski K, redaktor. Dobrostan i powodzenie. Lublin:Wydawnictwo NeuroCentrum;2009.
[17] Rychta T, Mikołajczyk M, Guszkowska M: *Opinie i postawy młodzieży szkół mistrzostwa sportowego wobec dopingu*. Sport Wyczynowy. 1993; 5-6 (341-342): 77-88.
[18] Dorna M, Paluszek K, Stępiński M, Stolarczyk M, Śliwowski R, Zalewski B: *Narodowy Model Gry PZPN.* Warszawa: PZPN;2016.
[19] Duda H, Basiaga-Pasternak J: *Intellectual of process of teaching tactics game as important aspect of healthy training (on young foot footballers' example).* In: Turowski K, redaktor.W ellness And Success. Lublin: Wydawnictwo NeuroCentrum; 2009.
[20] Matczak A, Jaworowska A, Ciechanowicz A, Stańczak J, Zalewska E:*APIS-P(R) - Bateria Testów APIS-P(R).*Warszawa:Pracownia Testów Psychologicznych PTP;2005.
[21] Jaworowska A., Szustrowa T:*Test Matryc Ravena w Wersji Standard – Formy Klasyczna, Równoległa, Plus*. Warszawa: Pracownia Testów Psychologicznych PTP;2010.
[22] Uszyńska-Jamroc; *Myślenie twórczo-syntetyczne, krytyczno-analityczne i praktyczno-kontekstualne a sukcesy w szkole dzieci ośmioletnich*. Psychologia Rozwojowa. 2005; 10:1(99): 99–107.
[23] Truszczyński O, Różanowski K, Baran P, Lewandowski J: *Wartość predykcyjna inteligencji w badaniach sprawności psychomotorycznej kierujących pojazdami*. Przegląd Psychologiczny. 2012; 55(4): 397-410.
[24] Blaser MA, Seiler R: *Shared Knowledge and Verbal Communication in Football: Changes in Team Cognition Through Collective Training*. Frontiers in Psychology. 2019;10:77
[25] Duarte R. Collective intelligence: *An incursion into the tactical performance of football teams*. Conference: Proceedings of the First International Conference in Science and Football (p. 23-28), At Palermo, Italy, 2011.
[26] Konter E: *Nonverbal intelligence of soccer players according to their level of play, Procedia*. Social and Behavioral Sciences.2010; 2(2): 1114-1120.
[27] Duda H, Basiaga–Pasternak J: *Wpływ procesów myślowych na sprawność specjalną o zróżnicowanej strukturze u młodych piłkarzy nożnych.* W: Stuła A, redaktor. Wybrane zagadnienia treningu sportowego piłkarzy nożnych. Gorzów Wielkopolski: Zamiejscowy Wydział Kultury Fizycznej w Gorzowie Wielkopolskim, Międzynarodowe Towarzystwo Naukowe Gier Sportowych; 2005.
[28] Duda H, Basiaga–Pasternak J: *Wpływ intelektualizacji procesu nauczania na sprawność specjalną młodych piłkarzy nożnych*.Annales UMCS Sectio D Medicina, VOL. LX, SUPPL. XVI, N.1, Lublin:Uniwersytet Marii Curie – Sklodowskiej Akademia Medyczna; 2006.
[29] Duda H, Basiaga–Pasternak J: *Realizacja szkolenia taktycznego w opinii zawodników drużyn piłki nożnej.* W: Żak S, Klocek T, redaktorzy. Nabór i selekcja oraz szkolenie dzieci i młodzieży w zakresie sportowych gier z piłką. Wrocław: Międzynarodowe Towarzystwo Naukowe Gier Sportowych; 2007. (Monografia nr 9).

Author for correspondence

Joanna Basiaga-Pasternak
E-mail: joanna.basiaga@awf.krakow.pl
ORCID:0000-0002-6875-4875
Affiliation: Department of Psychology, AWF Kraków