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Original Article

Correlation between athletes' aggressiveness and parameters of self-efficacy in high-stress competitive situations

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Abstract:
The aim of this study is to investigate the correlation between athletes' aggressiveness and various parameters of self-efficacy during tense competitive situations. The sample consisted of athletes spanning different levels of sporting experience, from juniors to professionals, excluding amateurs and veterans. Participants were involved in International, European, World, and Olympic sports competitions. Their age was between 15 and 32 years. Sample characteristics: n = 120; M = 23.45; SD = ±5.12; Me = 23.50. Methods: Valid and reliable psychodiagnostic instruments were used to perform a comprehensive cross-sectional analysis. The parameters of self-efficacy examined included self-efficacy in subject activity, self-efficacy in interpersonal communication, motivation for achieving success, and motivation for avoiding failure. Results. Using Pearson's correlation coefficient (r_{xy}), ten statistically significant bivariate correlations of aggressiveness characteristics with the parameters of self-efficacy were established ($p \leq .050$; $p \leq .010$). It was explained that the obtained regularities constitute a poly-determined construct of the complex nature of aggressiveness in the context of sporting activities. It was highlighted that it does not allow stating that self-efficacy is determined by athletes' aggressiveness. It was found that "direct physical aggressiveness" is the most dependent aggressiveness characteristic – four correlations. It was established that "level of impulsiveness" in sports competitions is the least controlled state and, consequently, the most dangerous one. It was found that groups with low levels of aggressiveness had a statistically significant advantage in all five pairs. **Discussion and conclusions.** The dual nature of aggressiveness in sports was revealed and constructive or destructive characteristics of the impact on sporting activities were explained. The knowledge of the specificity of athletes' aggressiveness was deepened. It was generalized that an athlete's aggressiveness is a highly complex psycho-emotional resource, that requires the formedness of a high level of self-regulation and the ability to manage one's psycho-emotional state, achieving optimal sports readiness. We recommend that the obtained empirical results should be implemented in educational-training process, tactical and psychological training for athletes.
Keywords: aggression, self-regulation, self-actualization, self-efficacy, mental health, problematic competitive situation, mental resource.

Introduction

Dynamic changes in society have a crucial impact on physical and mental states of individuals. They significantly affect each individual's well-being and health and are the factors of changes in their behavior. Changed conditions of sporting activities make important corrections to the behavior of all subjects of sporting activities (Popovych et al., 2023c). Dynamic changes cause stressfulness, anxiety and nervousness of athletes that can affect their mental states (Bashtovenko & Onishchuk, 2023; Popovych et al., 2022d), pre-competition expectations (Popovych et al., 2020) and partly lead to demonstration of their aggressive behavior and sometimes hostile aggressive actions (Petrovska et al., 2021). To study the impact of athletes' aggressiveness on the parameters of self-efficacy is important for understanding its constructive and destructive functions which are accompanied by excessive psycho-emotional loads and contribute to or prevent achievement of sports results. Permanent excessive psycho-emotional loads exhaust athletes and can cause a deficiency of psycho-emotional resources in a long-lasting competition period. Rehabilitative components of sporting activities may fail to cope with it, consequently, it will cause high percentage of traumatism, for instance, of team players, difficulties in selecting athletes for a game. In individual sports, it may end up in an athlete's pulling out of important career competitions. Sporting activities belong to the most popular social human activities in the world, therefore, self-efficacy is very important for athletes, fans and also for their coaches, sponsors and the entire sports industry. One

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fatal performance in professional boxing, tennis and other kinds of sport can harm or ruin an athlete's career. Therefore, aggressiveness not only occurs in sporting activities, but it can be an important factor, having a positive or negative impact on sports achievements. The outlined problems increase topicality of the research on statistically significant correlations and differences of aggressiveness with the parameters of self-efficacy. We expect that our study will deepen the understanding of determination of sporting activities by personal characteristics of athletes' aggressiveness.

We should note that aggression is a psychological phenomenon which should be regarded as a trinity – as a state, process and characteristic. Analysis of scientific publications on psychology allows stating that the concepts "aggression" and "aggressive behavior" are considered to be an aggressive reaction, and the concept "aggressiveness" is an individual's characteristic (Mazokha, 2011). Since our research focuses on the impact of aggressiveness, our full attention is paid to the dimensions and types of this dominant characteristic of athletes. I. Mazokha (2011) states that aggressiveness is expressed in readiness for aggressive actions for achieving one's aim and is characterized by aggressive perception, interpretation and reaction to a competitor's behavior. At the same time, the author assigns adaptation characteristics to aggressiveness and regards it as a central function of an individual. Aggressiveness combines the ability to resist society, i. e. it affects an individual's resilience function. In particular, there are studies finding that emotional stability is an important dimension in the typology of resilience (Popovych, 2022f). Obviously, emotional stability and aggressiveness constitute a dual pair of characteristics which make a whole. We should acknowledge that aggressiveness is a complex and a poly-determined formation of psycho-physiological nature of an athlete. Researchers V. Tsynarsky and I. Korobeynikova (2021) focus their attention on a psycho-physiological state of aggressiveness in athletes with a high qualification. The scientists found that an increase in aggressiveness in the group of wrestlers with a high qualification triggers physiological mechanisms which affect imbalance of the processes of excitation and inhibition the central nervous system. Increased excitation in combination with high aggressiveness testifies to a disrupted balance in the nervous system that causes a reduction in stability and accuracy of sensory movements. And, vice versa, low aggressiveness relates to inhibition of neural processes and indicates subjective comfort of wrestlers with a high qualification. Researchers found that taking into consideration manifestations of aggressiveness allows optimizing an athlete's psycho-physiological state and making timely corrections to training process (Tsynarsky & Korobeynikova, 2021). Another research examined manifestations of aggression and hostility in highly-qualified athletes (Petrovska et al., 2021). It was found that there is a tendency towards higher parameters of physical, indirect and verbal aggression in non-elite athletes in comparison with elite athletes. Researchers emphasize that the advantage of elite athletes is such arguments as specificity of sporting activities, psychological training and social support from coaches. We should acknowledge that aggressiveness is paid much attention in studies on dominant mental states of sporting activities: educational-training (Kurova et al., 2023; Popovych et al., 2023d), competitive (Popovych et al., 2019) and rehabilitative (Popovych et al., 2021b; 2022c) and on other common types of human professional activity: educational (Popovych et al., 2022b), pedagogical (Popovych et al., 2023a; Melnychuk et al., 2023) and manufacturing (Mamenko et al., 2022; Solovey et al., 2020). We are interested in a transportation-logistic dimension of human activity related to not less extreme and excessive psycho-emotional and physical loads, than trials in professional sport wherein psychological preparation of a subject of activity or an attempt to automatize this activity are also important (Zinchenko et al., 2020; 2023a; 2023b). This preparation provides an individual's psycho-emotional resource in certain circumstances of activity and can be regarded as a competitive advantage over rivals in sports, as shown in the research on mental resource complexes (Popovych et al., 2022g). Other studies empirically found and theoretically substantiated that support from a coach is an important factor which regulates a junior athlete's self-efficacy (Halian et al., 2023a; 2023b). We assume that a lack of such support is accompanied by manifestations of a junior athlete's aggressiveness and can have unpredictable sports consequences.

Studies identifying the impact of competition and post-competition activities on children's aggressiveness (Sedaghati et al., 2019) attract attention. The researchers proved that these types of activity do not have a statistically significant impact on children's aggressiveness. A significant difference in aggressive attitude towards a game in representatives of different genders identified by P. Mitic et al. (2020) is of scientific interest. Another empirical study established a direct statistically significant correlation of aggressiveness with a competition result in kumite contests and an indirect correlation of aggressiveness with anxiety about sports results in male karate competitions (Purba & Situmeang, 2018). The authors generalized that the development of aggressiveness should be accompanied by control of one's own behavior.

Retrospective analysis of a number of modern studies shows that aggressiveness is directly related to all directions of sporting activities (Gharibvand et al., 2022; Oproiu, 2013). As shown in some of the analyzed publications, physical activeness affects athletes' psychological well-being (Popovych et al., 2021a; 2022d; 2023f). Psychological safety of educational-training space has an effect on sports results (Blynova et al., 2022b; Kalenchuk et al., 2023). Psychological safety is a complex integrative formation wherein the impacts of negative psychogenic factors, including tiredness, are neutralized (Kozmenko et al., 2023; Popovych et al., 2023d). They determine the work of defense mechanisms and coping strategies (Karpenko & Klympush, 2023; Khraban & Silko, 2022; Koval et al., 2024; Kuzikova et al., 2023; Plokhikh, 2023; Shcherbak et al., 2023). At first sight, the

correlation of aggressiveness with results of sporting activities is obvious. At the same time, we understand that it is hypothetical and it is necessary either to confirm or disprove its validity.

The impact of aggressiveness on the parameters of self-efficacy is considered to be constructive and destructive nature of aggressive interventions in sporting activities which can contribute to or prevent achievement of self-efficacy.

Hypothesis. We assume that the parameters of aggressiveness, self-efficacy, motivation for achieving success and avoiding failure in winners will have statistically significant correlations; the researched groups with high and low levels of aggressiveness will have statistically significant differences.

Aim. To establish a correlation between aggressiveness and the parameters of self-efficacy in tense situations of competitive activity.

Methods

Methodology. Methodological foundations of the research include basic principles which substantiate psychological (Mazokha, 2011), physiological (Tsynarsky & Korobeynikova, 2021) and biological nature (Bashtovenko & Onishchuk, 2023) of the phenomenon of aggressiveness in sports, basic ideas of the concept of emotion regulation of an individual's activity (Chebykin, 2023; Plokhikh et al., 2024). We regard aggressiveness as an athlete's characteristic determined by unfavorable social experience and inborn dispositions. Aggressiveness is a characteristic causing aggressive state. Aggressive state is characterized by affective outbursts of anger and impulsive manifestations of behavior in sports.

Aggressive behavior in sports is sometimes called unsportsmanlike behavior. Aggressive sports state is a mental state having the following constituents: cognitive – maintains a subject's orientation in an aggressive situation; emotional – is reflected in a subject's attitude to other subjects of an aggressive act; volitional – assists an aggressively disposed subject in achieving the aim (Kraynikov, 2004). We analyzed modern empirical studies which allowed qualitative comprehension of such components of sporting activities as educational-training, competitive and rehabilitative. Modern tendencies in educational-training activities are examined in the following aspects: academic (Halian, 2023; 2024; Hoian et al., 2024; Shevchenko et al., 2024), psychological (Hrys et al., 2024; Tavrovetska et al., 2023) and innovative (Kobets et al., 2021a; 2021b). Modern tendencies of competitive and rehabilitative activities were identified through psycho-physiological (Cretu et al., 2021; Ferraz et al., 2011; Marques et al., 2011; Strykalenko et al., 2019), age (Blynova et al., 2022a; Okhrimenko et al., 2023), tactical-technical (Popovych et al., 2023e) and temporal aspects (Popovych et al., 2022a; 2023b; Smolinska et al., 2024; Zavatska et al., 2023).

Organization of Research. Throughout 2023, we collected empirical data on athletes of team sports: football, handball and volleyball, and individual sports: track and filed, weight-lifting, tennis, boxing and freestyle wrestling. Empirical cross-section was carried out immediately before the athletes' performance containing extreme, tense and controversial competitive situations. Such competitions were often called "derbies". Standard forms of valid questionnaires were used. Such organization of the research contributed to ensuring ecological validity, since the emotional background before the competition was close to that in a competition. We used a summative research strategy with the elements of comparison of the researched groups' measurements. The research was approved by the coaches and team administrations. The respondents were informed in advance and voluntarily agreed to participate. The ethical committees of the universities approved the proposed subject and algorithm of conducting research. The empirical research was carried out within the framework of the grant project and was coordinated with the National Office Erasmus+ Ukraine.

Participants. The sample consisted of athletes with different experiences in sporting activities – from juniors to professional athletes. Amateurs and veterans did not participate in the research. The respondents were participants of International, European, World and Olympic sports competitions. The age range was from 15 to 32 years. The sample characteristics: n=120; M=23.45; SD=±5.12; Me=23.50. In order to avoid research limitations by gender differentiation and kinds of sport, an equal number of questionnaire forms were selected, i.e. male athletes (n=60; 50.00%) and female athletes (n=60; 50.00%). There were (n=60; 50.00%) representatives of individual sports and (n=60; 50.00%) representative of team sports.

Procedures and instruments. The key method is the questionnaire "Aggressive behavior" (AB) (Ilyin & Kovalev, 2004). This psycho-diagnostic instrument was tested in sports studies (Popovych et al., 2022e). The method has forty statements. Stapel scale was used. Aggressiveness characteristics were identified by four basic and one integrated scale. The basic scales are as follows: "Direct verbal aggressiveness" (DVA); "Indirect verbal aggressiveness" (IVA); "Direct physical aggressiveness" (DPhA) and "Indirect physical aggressiveness" (IPhA). The integrated scale allowed measuring "Level of impulsiveness" (LI). The level of impulsiveness reflects proneness to direct verbal aggression, direct and indirect physical aggression. Internal consistency by the research method is satisfactory and equals (α=.743) by Cronbach's α.

Since the research focused on the empirical results of the self-efficacy, it was important to find the parameters of self-efficacy which were independent variables. The method "Motivation for Achieving Success and Avoiding Failures" (MASAF) (Elers, 2002) allowed measuring motivation for achieving success (MAS) and motivation for avoiding failure (MAF). The second dimension is regarded as the parameter of self-efficacy since tactics of avoiding failure in sports often ensures an appropriate result.

The method "MASAF" (Elers, 2002) was tested in a number of sports studies and was considered valid (Prokhorenko et al., 2023). The questionnaire numbers fifty-two statement. Internal consistency is satisfactory and equaled (α=.723) by Cronbach's α. Since in the questionnaire "Aggressive behavior" (Ilyin & Kovalev, 2004) there are scales of direct and indirect verbal aggression, it was important to establish correlations with the parameters of self-efficacy in interpersonal communication (SIC) and subject activity (SSA), determined by the method "The Self-Efficacy Scale" (SES) (Sherer et al., 1982). This method is valid and reliable, it was also tested in sports studies (Halian et al., 2023a; Halian et al., 2023b). Stapel scale was used.

The value of Cronbach's α was registered at a medium level α=.804.

Statistical Analysis. "MS Excel" was used for preliminary empirical data processing. The descriptive frequency characteristics and the bivariate correlation by Karl Pearson (r_{xy}) were established and comparison was performed by means of the Mann-Whitney U-test using the application "IBM SPSS Statistics" version 29.0.0.0 (241). The figure was created by the service "MS Word. Other standard coefficients for establishing statistical significance, namely, Cronbach's α and Student's t-test were also used. The levels p≤.050 and p≤.010 were considered statistically significant.

Results

The study presents empirical data by a summative research strategy using the procedure of comparing the key dimensions of the researched groups. The summative strategy allowed identifying a causal relationship between dependent and independent variables. Since the dependent variable – aggressiveness – is a complex psychological phenomenon which has a number of dimensions, we consider the dependent variable to be multidimensional. Its complexity allows stating fundamentality, since its parameters are simultaneously arguments, and the variable is capable of being a function. We ensured the key requirement for empirical studies – replication. The empirical data are given through the main descriptive characteristics by all the scales: the mean (M), the mean squared deviation (SD) and the median (Me) (Tabl. 1).

Table 1. The main descriptive characteristics by the researched scales (n = 120)

Scale	Mean (M)	Mean squared deviation (SD)	Median (Me)
"Aggressive Behavior" (Ilyin & Kovalev, 2004)			
DVA	4.23	±1.17	4.00
IVA	4.47	±1.36	4.50
DPhA	2.11	±.70	2.00
IPhA	2.27	±.73	2.50
LI	3.36	±1.09	3.50
"Motivation for Achieving Success and Avoiding Failures" (Elers, 2002)			
MAS	24.08	±3.77	24.00
MAF	15.12	±2.81	15.00
"The Self-Efficacy Scale" (Sherer et al., 1982)			
SSA	37.04	±6.51	37.00
CSIC	4.91	±.92	5.00

Note: DVA – direct verbal aggressiveness; IVA – indirect verbal aggressiveness; DPhA – direct physical aggressiveness; IPhA – indirect physical aggressiveness; LI – the level of impulsiveness; MAS – motivation for achieving success; MAF – motivation for avoiding failure; SSA – self-efficacy in subject activity; SIC – self-efficacy in interpersonal communication.

There are no statistically significant differences between the descriptive characteristics by the scales of aggressiveness identified by Student's t-test and the recommended empirical norms suggested by the authors of the method "Aggressive Behavior" E. Ilyin and P. Kovalev (2004).

Comparison with the descriptive characteristics by the categories of handball referees represented in the research by I. Popovych et al. (2022e) showed an advantage of the sample of athletes over the samples of referees with the European category and referees with the National category by all the parameters of aggressiveness within t = 2.1 – 2.7; p≤.05. We do not exclude that comparison of elite athletes in this dimension would show a different result. No statistically significant differences were found in comparison of the descriptive characteristics by the scales of the methods "Motivation for Achieving Success and Avoiding Failures" (Elers, 2002) and "The Self-Efficacy Scale" (Sherer et al., 1982) and sports samples examined in the studies (Halian et al., 2023a; Prokhorenko et al., 2023).

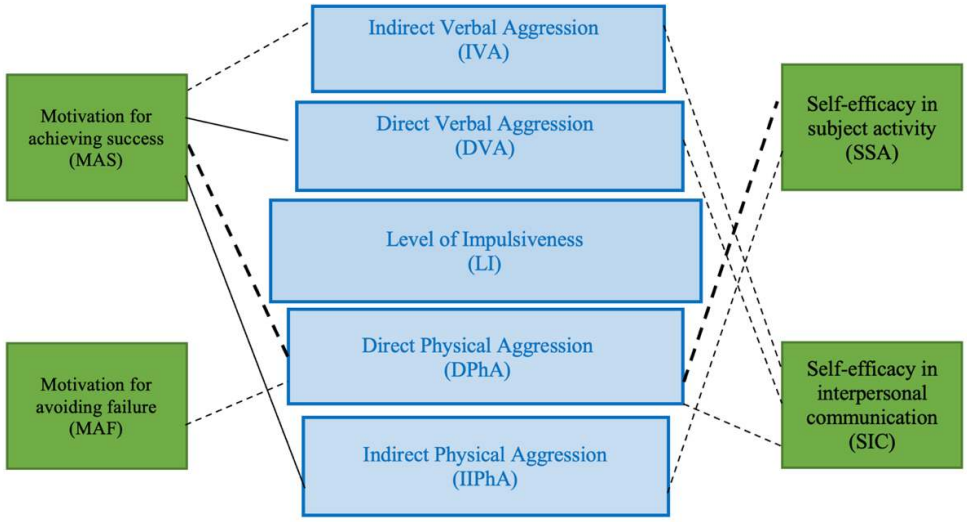
In order to establish regular correlations, we used the Pearson's bivariate correlation (r_{xy}). Tabl. 2 gives the results of correlations of the researched parameters and presents them as a correlation matrix.

Table 2. Correlation matrix of the Pearson bivariate correlation (r_{xy}) of the researched parameters in (n=120)

Parameters of aggressiveness	Pearson's coefficient	Parameters of self-efficacy			
		MAS	MAF	SSA	AIC
DVA	r_{xy}	.183*	.035	-.083	-.145*
	p	.045	.608	.439	.048
IVA	r_{xy}	-.197*	.043	-.021	-.201*
	p	.042	.587	.739	.043
DPhA	r_{xy}	-.284**	-.142*	-.282**	-.148*
	p	.000	.049	.000	.048
IPhA	r_{xy}	.215*	-.033	.210*	-.099
	p	.039	.618	.041	.361
LI	r_{xy}	.122	-.121	.125	.065
	p	.059	.061	.057	.523

Note: DVA – direct verbal aggressiveness; IVA – indirect verbal aggressiveness; DPhA – direct physical aggressiveness; IPhA – indirect physical aggressiveness; LI – the level of impulsivenesse; MAS – motivation for achieving success; MAF – motivation for avoiding failure; SSA – self-efficacy in subject activity; SIC – self-efficacy in interpersonal communication; r_{xy} –Karl Pearson correlation coefficient; p – level of significance; * – p < .050; ** – p < .010.

To perform qualitative analysis and substantiate correlation regularities, we created a correlation pleiad. Fig. I presents a correlation pleiad with lines indicating the significance of bivariate correlations established by Pearson's correlation coefficient (r_{xy}).



Note: – – – negative correlations with p ≤ .010; - - - - - - negative correlations with p ≤ .050;——— positive correlations with p ≤ .050.

Figure I. Correlation pleiad of the parameters of anxiety and the dimensions of self-efficacy (n=120)

We registered ten statistically significant bivariate correlations of the dependent variables with the parameters of self-efficacy (p ≤ .050; p ≤ .010). "Direct physical aggressiveness" is the most dependent variable with four correlations. In other words, direct physical aggression has an inverse statistically significant correlation with a self-efficacy since all the correlation regularities are negative. The parameter "level of impulsiveness" is the least dependent variable with no significant correlation. At the same time, we have to state that impulsiveness in sports competitions is the least controlled state and, therefore, the most dangerous one. It is obvious that combination of physical aggressiveness with direct verbal aggressiveness constitutes such a psycho-emotional formation which requires a high level of self-control and dispositional self-regulation, a developed ability to uplift oneself to an optimal state of competitive activity. Motivation for achieving success is the most important variable having the largest number of statistically significant correlations – four; self-efficacy in interpersonal communication has three correlations; self-efficacy in subject activity has two correlations and motivation for avoiding failure has one correlation. Correlation of DPhA with MAS is the strongest one (r_{xy} = -.284; p=.000). In other words, increasing levels of direct physical aggressiveness have an inverse correlation with motivation for achieving success. Motivation for achieving success is an important component of a self-regulation complex of an athlete's personality (Prokhorenko et al., 2023), therefore, it has a negative regularity. We can state that only two correlations are direct and eight correlations are inverse.

The total experimental effect of our research consisted in the following manipulations which were realized with the dependent variables. According to the logic of our research, we compared all the possible pairs of the researched groups which resulted from the division of the dimensions of the dependent variable. The median of direct verbal aggression equaled (Me = 4.00). Group 1 included low levels of direct verbal aggressiveness by Me > 4.00. Group 2 included high levels of direct verbal aggressiveness which are equal to or more than Me ≤ 4.00. Statistically significant differences in all the pairs of comparison were found by the Mann-Whitney U-test. Tabl. 3 gives the first researched pair.

Table 3. Comparison of direct verbal aggressiveness in Group 1 and Group 2

Mann-Whitney	Parameters of self-efficacy			
	MAS	**MAF**	**СПД**	**CMC**
U	*185.500*	439.500	559.000	629.500
p	.000	.087	.071	.125

Note: U – Mann-Whitney U-test; p – the level of significance; MAS – motivation for achieving success; MAF – motivation for avoiding failure; SSA – self-efficacy in subject activity; CMC – self-efficacy in interpersonal communication; level of significance given in *italics type* – p ≤ .050; p ≤ .010.

It was found that Group 1 with a low level of direct verbal aggressiveness (Me > 4.00) has a significant advantage by the parameter "MAS" (U=185.500; p=.000). No significant advantages were registered in Group 2.

The median of indirect verbal aggressiveness was at the level Me = 4.50. Group 3 included low levels of indirect verbal aggressiveness by Me > 4.50. Group 4 included high levels of indirect verbal aggressiveness which are equal to or more than Me ≤ 4.50. Tabl. 4 contains the second researched pair.

Table 4. Comparison of indirect verbal aggressiveness in Group 3 and Group 4

Mann-Whitney	Parameters of self-efficacy			
	MAS	**MAF**	**SSA**	**SIC**
U	*144.000*	545.500	336.500	*147.000*
p	.000	.111	.058	.000

Note: U – the Mann-Whitney U-test; p – the level of significance; MAS – motivation for achieving success; MAF – motivation for avoiding failure; SSA – self-efficacy in subject activity; SIC – self-efficacy in interpersonal communication; the level of significance given in *italics type* – p ≤ .050; p ≤ .010.

There was a significant advantage of Group 3 by two parameters at the level p≤.010: MAS (U=144.000; p=.000) and SIC (U=147.000; p=.000). There was no advantage of Group 4 by any of the parameters.

The median of direct physical aggressiveness was at the level Me = 2.00. Group 5 included low levels of direct physical aggressiveness by Me > 2.00. Group 6 included high levels of direct physical aggressiveness which are equal to or more than Me ≤ 2.00. Tabl. 5 gives the third researched pair.

Table 5. Comparison of direct physical aggressiveness in Group 5 and Group 6

Mann-Whitney	Parameters of self-efficacy			
	MAS	**MAF**	**SSA**	**SIC**
U	*104.000*	606.500	*128.000*	*135.000*
p	.000	.121	.000	.000

Note: U – the Mann-Whitney U-test; p – the level of significance; MAS – motivation for achieving success; MAF – motivation for avoiding failure; SSA – self-efficacy in subject activity; SIC – self-efficacy in interpersonal communication; level of significance given in *italics type* – p ≤ .050; p ≤ .010.

We registered a significant advantage of Group 5 by three parameters at the level p≤.010: MAS (U=104.000; p=.000); SSA (U=128.000; p=.000) and MAS (U=135.000; p=.000). No advantage of Group 6 was registered.

The median of indirect physical aggressiveness was at the level Me = 2.50. Group 7 included low levels of indirect physical aggressiveness by Me > 2.50. Group 8 included high levels of indirect physical aggressiveness which are equal to or more than Me ≤ 2.50. Tabl. 6 gives the fourth researched pair.

Table 6. Comparison of indirect physical aggressiveness in Group 7 and Group 8

Mann-Whitney	Parameters of self-efficacy			
	MAS	**MAF**	**SSA**	**SIC**
U	*124.000*	449.500	*131.000*	434.000
p	.000	.091	.000	.062

Note: U – the Mann-Whitney U-test; p – the level of significance; MAS – motivation for achieving success; MAF – motivation for avoiding failure; SSA – self-efficacy in subject activity; SIC – self-efficacy in interpersonal communication; level of significance given in *italics type* – p ≤ .050; p ≤ .010.

We established a significant advantage of Group 7 by two compared dimensions (p≤.010): MAS (U=124.000; p=.000) and SSA (U=131.000; p=.000). Group 8 had no advantage in any pair.

The median of the level of impulsiveness equaled Me = 3.50. Group 9 included low levels of Me > 3.50. Group 10 included high levels of impulsiveness which are equal to or more than Me ≤ 3.50. Tabl. 7 gives the fifth researched pair.

Table 7. Comparison of the level of impulsiveness in Group 9 and Group 10

Mann-Whitney	Parameters of self-efficacy			
	MAS	**MAF**	**SSA**	**SIC**
U	*164.000*	*157.500*	*157.000*	*134.000*
p	.000	.000	.000	.000

Note: U – the Mann-Whitney U-test; p – the level of significance; MAS – motivation for achieving success; MAF – motivation for avoiding failure; SSA – self-efficacy in subject activity; SIC – self-efficacy in interpersonal communication; level of significance given in *italics type* – p ≤ .050; p ≤ .010.

Group 9 has a statistically significant advantage over Group 10 by all the researched pairs of comparison: (p≤.010): MAS (U=164.000; p=.000); MAF (U=157.500; p=.000); SSA (U=157.000; p=.000) and SIC (U=134.000; p=.000). Consequently, there is no advantage of Group 10 by any of the parameters.

Discussion

The problem of aggression and aggressiveness has been topical in professional and amateur sports. There are relevant studies which empirically established and substantiated that aggression and hostility are not a guarantee of high sports achievements. Higher results of athletes with low sport qualifications testify to it. Some kinds of sport such as wrestling, boxing and karate are based on contact opposition and can affect the development of a high level of aggressiveness and proneness to conflict (Petrovska et al., 2021). At the same time, even with high parameters of aggressiveness development, it should be positioned as necessary and constructive aggressiveness. Since self-efficacy in competitions will maintain an athlete's ability to manage their optimal competitive state (Alekseev, 2006), a high amplitude of aggressiveness and the ability to manage it, the capacity to instantly get into an optimal state can create a competitive advantage over rivals. The respondents' advantage (see Tabl. 1) by the descriptive characteristics of the parameters of aggressiveness over referees with the European category and referees with the National category (Popovych et al., 2022e) largely confirms the results obtained by T. Petrovska et al. (2021). Such data demonstrate not only development of the respondents' aggressiveness, but also attract our attention to the formedness of other personal characteristics which will allow controlling destructive aggressive energy and directing it into a constructive course.

Establishment of bivariate correlations given in a correlation matrix (see Tabl. 2) and reflected in a correlation pleiad (see Fig. I) allowed stating regularities only between aggressiveness and the parameters of self-efficacy. It also allowed confirming the first hypothesis that the parameters of aggressiveness, self-efficacy, motivation for achieving success and avoiding failure of athletes-winners will have statistically significant correlations. However, the results of correlation by Pearson (r_{xy}) do not allow stating determination of self-efficacy by athletes' aggressiveness. Only the distribution of the researched groups by the median (Me) according to aggressiveness characteristics (see Tabl. 3–7) allowed performing comparison of two groups with a low degree and a high degree of intensity of each aggressiveness type and identifying differences. The applied algorithm allowed finding statistically significant differences and validly stating the impact of athletes' aggressiveness on the parameters of self-efficacy. In other words, a statistically significant difference in comparison of low-level and high-level measurements allowed stating an advantage or a lack of it. We expectedly obtained twelve statistically significant differences (see Tabl. 3–7). In all the pairs, groups with low levels of aggressiveness had a significant advantage: Group 1, Group 3, Group 5, Group 7, Group 9. We can generalize that athletes' aggressiveness affects the parameters of self-efficacy, such as: self-efficacy in subject activity; self-efficacy in interpersonal communication; motivation for achieving success; motivation for avoiding failure. Only low levels of the formedness of aggressiveness, unlike high levels, have a statistically significant advantage and impact. We can state that the second hypothesis is confirmed, i. e. the researched groups with high and low levels of aggressiveness have statistically significant differences. If we take into consideration exclusively the results of correlation (see Tabl. 2 and Fig. I), two registered regularities of motivation for achieving success have a positive statistically significant correlation with DVA (r_{xy} = .183; p=.045) and IPhA (r_{xy} = .215; p=.039). But these correlations only testify to a regular relationship and are not determination, therefore we cannot state the impact on the basis of the results of correlation. We should also note that, if the sample had included exclusively athletes engaged in martial arts, for instance, as shown in the research by V. Tsynarsky and I. Korobeynikova (2021), where the development of aggressiveness is determined by the kind of sport, we assume that our results could be somewhat different. It is an assumption requiring statistical confirmation and substantiation. Researchers O. Gryn and A. Gryn (2021) determined athletes' aggressiveness in different modelled situations (the situation of calmness, the situation of frustration and the situation of intense training) and found that the situation of frustration is accompanied by the highest indicators of aggressiveness. Athletes explained this result as their desire to "put out their strength". The

researchers empirically found and substantiated that an increase in the level of athletes' qualifications leads to a rise in their flexibility and ability to manage constructive aggression, that does not contradict our results obtained in comparison of the researched groups. Researchers A. Osiptsov et al. (2020) highlight not only the importance of the formedness of constructive aggressiveness, but also the ability to manage it, that is also consistent with our empirical results.

We can summarize that an athlete's aggressiveness is a highly complicated psycho-emotional resource that requires a high level of self-regulation and the ability to manage a psycho-emotional state of optimal sport readiness. The obtained empirical results possess scientific novelty and can be implemented in educational-training process, considered by coaching staffs in tactical and psychological training for athletes.

Conclusions

It was substantiated that the impact of aggressiveness on the parameters of self-efficacy is constructive and destructive character of aggressive interventions in sporting activities which can ensure or prevent achievement of self-efficacy. Pearson's correlation coefficient (r_{xy}) allowed establishing ten statistically significant bivariate correlations between aggressiveness characteristics and the parameters of self-efficacy ($p \leq .050$; $p \leq .010$). It was explained that the obtained results are regularities and do not allow stating determination of self-efficacy by athletes' aggressiveness. It was found that "direct physical aggressiveness" is the most dependent characteristic of aggressiveness with four correlations. In other words, direct physical aggressiveness has an inverse statistically significant correlation with self-efficacy since all the correlation regularities are negative. It was found that the parameter "level of impulsiveness" is the least dependent variable with no significant correlation. We can state that impulsiveness in sports competitions is the least controlled state and, consequently, the most dangerous one. The impact of athletes' aggressiveness on the parameters of self-efficacy was found by means of distribution of the researched groups according to aggressiveness characteristics, using the median (Me). It was established that, in all the pairs, groups with low levels of aggressiveness had a statistically significant advantage: Group 1, Group 3, Group 5, Group 7, Group 9. It was found that the groups with low levels of aggressiveness have a significant advantage and, consequently, affect the parameters of self-efficacy, such as self-efficacy, motivation for achieving success and avoiding failure. It was summarized that an athlete's aggressiveness is a highly complicated psycho-emotional resource that requires formedness of a high level of self-regulation and the ability to manage a psycho-emotional state, achieving optimal sport readiness. It was recommended that the obtained empirical results should be implemented in educational-training process, tactical and psychological training for athletes.

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