

## Gender differentiation of self-regulating mental states of athletes with disabilities: comparative analysis

LESIA PROKHORENKO<sup>1</sup>, IHOR POPOVYCH<sup>2</sup>, HANNA SOKOLOVA<sup>3</sup>, YULIIA CHUMAIEVA<sup>4</sup>,  
YURII KOSENKO<sup>5</sup>, TETIANA RAZUMOVSKA<sup>6</sup>, VIACHESLAV ZASENKO<sup>7</sup>

<sup>1,2,7</sup>Mykola Yarmachenko Institute of Special Pedagogy and Psychology, NAPS of Ukraine, UKRAINE

<sup>2</sup>Kherson State University, Kherson, UKRAINE

<sup>3</sup>South Ukrainian National Pedagogical University named after K. D. Ushynsky, Odesa, UKRAINE

<sup>4</sup>Odesa National Maritime University, Odesa, UKRAINE

<sup>5</sup>Anton Makarenko Sumy State Pedagogical University, Sumy, UKRAINE

<sup>6</sup>Volodymyr Vynnychenko Central Ukrainian State University, Kropyvnytskyi, UKRAINE

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### Abstract:

**The purpose** is to develop a strategy for empirical research on self-regulating mental states of athletes with disabilities; to identify differences in the structure of self-regulating mental states in the male (Group 1) and female (Group 2) samples. **Research methods:** psychological content parameters of self-regulation were determined using reliable and valid psycho-diagnostic instruments tested in empirical research on sport psychology. Ranking by a module value of the research parameter ( $R_g$ ) was applied; factor analysis with the method ANOVA with Varimax rotation was used; correlation between the parameters was determined by means of Spearman's coefficient ( $r_s$ ); significant differences were identified with Student's t-test. **Results.** The study substantiates a strategy for empirical research on self-regulating mental states of athletes with disabilities. The ranking of the parameters under study by the level of significance of correlations with self-esteem was performed. Significant differences ( $p > .05$ ) were found by two content parameters of self-regulation: process ( $t = 1.2006$ ) and result ( $t = 1.1045$ ). Two graphical factor structures of self-regulating mental states of athletes with disabilities by gender differentiation were created. It was established that the most loaded factors in the male sample (Group 1) are F1 "Value-meaningful" ( $D_{G1} = 22.67\%$ ) and F2 "Result-motivated" ( $D_{G2} = 16.23\%$ ). It was found that the most loaded factors in the female sample (Group 2) are F1 "Procedural-value" ( $D_{G1} = 23.88\%$ ) and F2 "Pragmatically-oriented" ( $D_{G2} = 14.34\%$ ). The study substantiates that dominants for athletes with disabilities in Group 1 are meaning-of-life in sporting activities and stable motivation for success. The research emphasizes that a procedural component of sporting activities dominates in female athletes. The smallest number of correlations was registered in Group 1:  $F4_{G1}$  – "Self-worth" and Group 2:  $F5_{G2}$  – "Reflexive", they are the most independent and dangerous ones. Female athletes with the above dominating mental state are too much focused on their "Ego", that reduces concentration on training and competition activities. Female athletes with the self-regulating state "Reflexive" spend too much time analyzing their shortcomings, they are too much focused on correction of their mistakes and on an excessively high level of self-criticism that does not contribute to achievement of maximum sport results. **Conclusions.** The obtained empirical results should be operationalized into tactical preparation for training staff and male and female athletes with disabilities. Differentiation of self-regulating mental states can be a considerable tactical advantage in sporting activities of people with disabilities. **Key words:** psycho-emotional state, self-esteem, level of aspirations, motivation for success, Paralympic sports, athletes with disabilities.

### Introduction

According to the World Health Organization (WHO), there are about 10.0% of people in the world with different types of disabilities. One of the key issues of the present is full-fledged integration of people with disabilities into society. Along with damaged body functions and structures, there are serious problems with full-fledged functioning of a person with disability as a member of society (World Health Statistics, 2021). Scientists substantiate that physical culture and sports for people with disabilities become one of the most important directions which can provide appropriate conditions for socialization and normalization of mental states. Successful physical and mental adaptation to new conditions of life is realized through engagement in physical culture and sport (Bpiskin, 2007).

Involvement of people with disabilities in sports has a deep humanistic meaning in the dimensions of each individual and society on the whole. Encouraging people with disabilities to go in for sports reflects humanistic tendencies of society, contributes to creation of inclusive space, attention and tolerant attitude towards people with physical disabilities. It can be proved by sports tournaments, organized at local, regional, national and

international levels. Paralympic Games and Deaflympics take the second place among sports competitions ranked by popularity after the Olympic Games. Athletes with disabilities dream of participating in them. O. Shamykh (2020) conducted fundamental research on psychological regularities of self-realization of an individual in Paralympic sports. The researcher established that the determinants of self-realization of athletes are: aspiration for personal development; positive self-esteem; self-acceptance with all strengths and weaknesses; availability of well-formed life goals and meaning of life; openness in social contacts and interaction with people around (Shamykh, 2020). The phenomenon of self-realization is closely related to readiness for self-regulating activity (Popovych et al., 2022g). It was found out that self-esteem, aspirations and the difference between these parameters by the key values of an athlete's meaning of life are main vectors of their self-regulating readiness for sports competitions. Parameters and correlations of self-esteem and aspirations are determinative in individual psycho-emotional training at the stage of specialized basic training. Obviously, positive and adequate self-esteem is essential among psychological content parameters in the above phenomena. It was established that self-esteem as a component of self-regulation of an individual is characterized by high operational and assimilative capacities (Boryshevsky, 2012).

Changes in self-esteem occur slowly and require permanent psycho-therapy and autosuggestion. The impact of self-esteem on sport results is important and stable for a long period of time. The research on self-actualizing mental states of young female handball players finds out that parameters of self-consciousness of athletes are the main ones which determine dominating mental states of self-actualization (Popovych et al., 2022d). The determined parameters of self-consciousness form the basis of such dominating mental states as search of self-actualization, self-motivation and self-education. V. Shuba (2017) examined the specificity of sporting activities of Paralympic athletes in the process of self-education and found out that optimal time for training per day is 45 minutes. The scientist emphasized that it is important to consider individual-typological characteristics of athletes with disabilities in the course of self-education and training process and develop competencies for gaining knowledge and acquiring skills under extreme conditions in these athletes. The study presents the structure of athletes' self-education as a combination of three components: motivational-personal, cognitive and activity-based (Shuba, 2017). The comparative research on Olympic swimmers and Paralympic swimmers pays attention to the importance of mental training and the correlation between emotions and results (Saint-Martin et al., 2020). Another study examines individual-typological characteristics female Paralympic champions in basketball and identifies the advantageous parameters of those who entered a team and those who remained applicants. One more study focuses on personal constructs and mental states of mood (Martin et al., 2011). M. Boryshevsky (2012) highlights a key role of social-psychological expectations along with self-esteem and aspirations in the context of self-regulating activity of an individual. Expectations are a mechanism that allows guiding conscious activity of an individual towards realization of their internal reserves and adjusting them to the external conditions in order to achieve significant results successfully. Self-regulation of behavior is available in each element of an individual's expectations (Boryshevsky, 2012).

Another study examines that the level, content and modality of an athlete's expectations affect a victory result (Popovych et al., 2021e). An individual's expectations are the initial element of social contacts and interactions depending on self-esteem and aspirations and permanently affect and correct the latter (Popovych et al., 2021b; 2022f; Popovych, 2009; 2019). It was established that the most important motivations for activity for athletes with disabilities are the motivation for achievements and self-development; the motivation for self-realization in society. The dominating motivation is the motivation aimed at personal development and aspiration for being a successful athlete. Athletes with inborn or acquired disabilities or those who became Paralympic athletes after traumas have a different structure of the dominating motivations for sporting activities than traditional athletes. Sport is the meaning of life and psychological relaxation for such individuals (Dubchak & Krivonosenko, 2020). It was established that athletes with disabilities have higher indexes of psychological adaptation, motivation for success and active social life, unlike people with disabilities who do not go in for sports (Bpiskin, 2007). Some researchers maintain that sport becomes such an activity for athletes with disabilities in which an object and a subject merge that allows identifying a powerful resource of self-control and multifaceted self-realization (Kokun & Shamykh, 2016; Shamykh, 2019). The tendency to combine an excessively high level of motivation for achieving an aim in athletes with disabilities and a high level of readiness for risk (Bpiskin, 2007; Matveev, 2010) is not characteristic of traditional athletes (Popovych et al., 2022a). There is a study examining the development of mental toughness of Paralympic athletes and establishing that the respondents gained a functional advantage from the influence of extremely difficult situations in a favorable environment.

That helped them develop stable mental characteristics and form behavior, individual cognitive strategies for coping with stress (Powell & Myers, 2017). The above-mentioned powerful resource of self-control is an absolutely unique combination of individual-typological characteristics, mental processes and states of an individual. There are studies on mental states reflecting subjects of activity in different areas – from differentiation between educational-training (Popovych et al., 2022c), competition (Popovych et al., 2021f), regenerating and rehabilitating (Balk & Englert, 2020; Lazareva et al., 2017; Popovych et al., 2021d) sporting activities to such areas of human life as educational-professional (Popovych & Blynova, 2019a; 2019b) and

recreational (Popovych et al., 2019b). The complex of content parameters and their levels allowed identifying unique factor structures of mental states of the research participants. Theoretic analysis and the above arguments evidence topicality and scientific demand for research on self-regulating mental states of athletes with disabilities.

Self-regulating mental states of athletes with disabilities are considered to be such dominating mental states of educational-training, competition and rehabilitating activities of individuals which support self-development, assist in handling difficult situations and motivate for self-realization in society.

**Hypothesis.** 1) creation of the structure of self-regulating mental states will contribute to effective tactical preparation of training staff and athletes with disabilities for competitions; 2) gender differentiation of self-regulating mental states will have significant differences in the research parameters; 3) significant differences in the structure and the level of factor loadings will be identified.

**Purpose.** To suggest a strategy for empirical research on self-regulating mental states of athletes with disabilities; to present gender differentiation of the structure of self-regulating mental states and identify the differences.

### **Material and methods**

*Methodology.* Methodological foundations of sporting activities of athletes with disabilities were outlined in the studies by Yu. Bpiskin (2007) and L. Matveev (2010). The concept of Paralympic sport is considered in the study as a powerful stimulus for self-realization of an individual with disabilities, mobilization of a body's resources, disabled people's awareness of their prospects concerning possibilities to recover from diseases and their full-fledged integration in society (Shamych, 2020; Shuba, 2017). The research considers the determinants of an individual's self-regulation as a main factor of their subjectiveness (Boryshevsky, 2012) and the level of development of social expectations of athletes with disabilities as self-regulating readiness for probable scenarios of events (Popovych, 2005; 2014; 2017).

The study presents a verifying strategy for empirical research using systemic and complex scientific approaches. While developing the strategy we considered the experience of empirical psychological research in the following areas: 1) regularities of educational-professional and self-educational activity of an individual (Hudimova, 2021; Hudimova et al., 2021; Kobets et al., 2021a; 2021b); 2) psychophysiological and age regularities of the research participants (Cretu et al., 2021; Galan et al., 2018; Kokun, 2004; Kozina et al., 2019; Paliichuk et al., 2018; Popovych et al., 2021g); 3) safety of educational-training space (Blynova et al., 2022; Mamenko et al., 2022; Popovych et al., 2020a); 4) adaptational and psycho-emotional resources (Blynova et al., 2019; Khraban & Silko, 2022; Plokhikh, 2021; Popovych et al., 2022e; Vavryniv & Yaremko, 2022); 5) gender differentiation of a value aspect (Hulias, 2020; Hulias & Hoiian, 2022; Hulias & Karpenko, 2022); 6) studies on a human factor in extreme situations, excessive loads, automated systems and advanced technologies (Nosov et al., 2020; 2021a; 2021b; Zinchenko et al., 2021; 2022a; 2022b). The outlined areas are one of the arguments about integration of systemic and complex approaches of the research.

*Participants.* The research involved athletes with disabilities who had: hearing disorders; damages of locomotor apparatus; vision problems. Respondents were selected randomly, but we considered activeness and regularity in sporting activities, an age aspect was not the main one. The athletes were from 12 to 35 years old ( $M=21.45$ ;  $SD=5.12$ ). The research participants were representatives of Kyiv municipal center of physical culture and sport for people with disabilities "Invasport" (Kyiv, Ukraine); Kherson regional center of physical culture and sport for people with disabilities "Invasport" (Kherson, Ukraine). The total number was  $n=122$ , the male athletes –  $n=62$  (50.82%) and the female athletes –  $n=60$  (49.18%). The respondents represented individual and team sports: swimming, track and field, tennis, fencing, draughts, football, volleyball, freestyle wrestling and archery. Among the research participants there were champions, silver and bronze medalists of Paralympic Games and Deaflympics, participants and winners of regional, national and international tournaments.

*Organization of research.* We selected psycho-diagnostic instruments, chose the research base and realized the pilot stage of a verifying strategy of the research in August–November, 2021. Participant observation with registering basic self-regulation manifestations and probable destructions of behavior was also used. Eleven sessions of participant observation were held during trainings and tournaments. Participation of athletes in the experiment was voluntary and confidential. All the participants, their trainers and, when necessary, parents or people accompanying the athletes were informed of the survey. There was a consent of the Ethical Committees of the administration of the Center of physical culture and sport for people with disabilities "Invasport".

*Procedures and instruments.* The suggested methodology, fundamental concepts and retrospective analysis facilitated identification of the key guidelines of the strategy for empirical research on self-regulating mental states of athletes with disabilities. That determined the selection of parameters and appropriate psycho-diagnostic instruments. The basic parameters of self-regulation were measured with the method "Diagnosis of self-esteem" ("DSE") (Prikhozhan, 2007). Two scales were used: self-esteem (SE) and the level of aspirations (LA). The coefficient  $\alpha$ -Cronbach equaled  $\alpha_{DSE} = .902$ . The coefficient  $\alpha$ -Cronbach was determined by all the scales of the method. The parameters of life-meaningful orientations were determined with the test "Life-meaningful orientations" ("LMO") (Leontyev, 2006). The test allowed determining the respondents' life meaningful

orientations in the dimensions of the past, the present and the future. The given scales are the key ones in the operational aspect of an activity component of self-education of athletes with disabilities (Shuba, 2017). Six scales were applied: life goals (LG), process (P), result (R), locus of control – life (LCL), locus of control – self (LCS), general awareness of life (GAL). The coefficient  $\alpha$ -Cronbach was determined by all the scales of the method, it equaled  $\alpha$ LMO = .823. The questionnaire “The level of social expectations” (“LSE”) (Popovych, 2017) was used to determine the level of expected results (LER). The coefficient  $\alpha$ -Cronbach made  $\alpha$ LSE = .808. It was determined by all the scales of the method. The parameters of motivation for achieving success (MA) and avoiding failure (MF) were determined with the psycho-diagnostic instrument “Motivation for achieving success and avoiding failure” (“MASAF”) (Elers, 2002). This instrument is a combination of two methods which allows determining the research parameters appropriately and comparing the data on the research participants. The coefficient  $\alpha$ -Cronbach equaled  $\alpha$ MASAF = .830. Since one test combines two parameters directed differently, the coefficient of homogeneity was not determined. The generalized scale of hardiness (HR) of the method “Hardiness survey” (“HS”) (Maddi, 1994) was used. The coefficient  $\alpha$ -Cronbach equaled  $\alpha$ HS = .856. It was determined by all the scales of the method.

*Statistical analysis.* All the statistical operations of the empirical research were performed by means of “SPSS” v. 24.0. Ranking by a module value of the research parameter (Rg) was used. Factor analysis was performed with the method ANOVA with Varimax rotation; correlation of the parameters was determined by means of Spearman’s correlation coefficient (rs), significant differences were identified by means of Student’s t-test. The significant levels of differences were  $p \leq .05$  and  $p \leq .01$ .

## Results

The purpose of the empirical research was to perform comparative analysis of self-regulating mental states in the male (Group 1) and the female (Group 2) samples. The comparison was performed by all the measured parameters, by the ranks (Rg) and by the factor loadings of the structure of self-regulating mental states. Tabl. 1 contains the research parameters presented through the basic descriptive frequency characteristics in Group 1 and Group 2. Significant differences were identified by means of Student’s t-test.

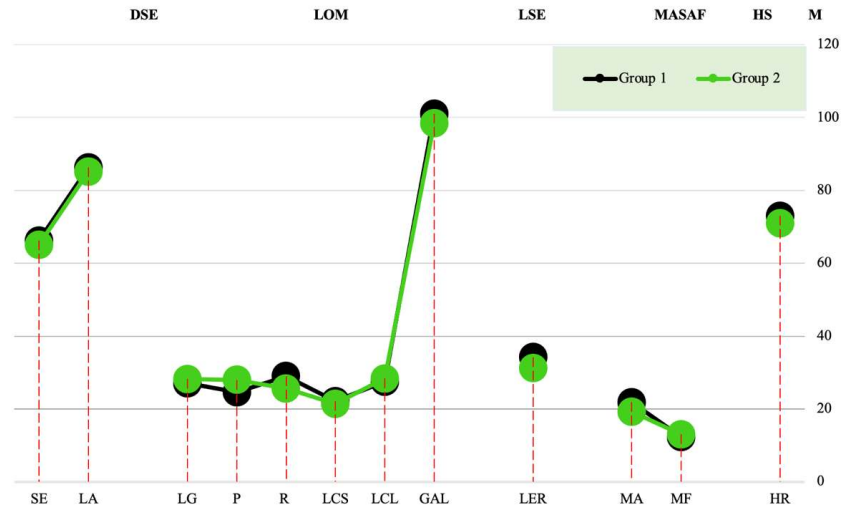
**Table 1.** Significant differences by Student’s t-test of the research parameters in Group 1 and Group 2.

Scale	Group 1		Group 2		Student’s t-test	Level of significance
	M <sub>1</sub>	SD <sub>1</sub>	M <sub>2</sub>	SD <sub>2</sub>		
<b>“Diagnosis of self-esteem” (Prikozhan, 2007)</b>						
SE	66.24	±14.56	65.12	±13.93	.4372	–
LA	86.30	±16.42	85.23	±16.33	.2634	–
<b>“Life-meaningful orientations” (Leontyev, 2006)</b>						
LG	27.04	±6.21	28.23	±6.34	-.3336	–
P	24.56	±4.12	28.02	±4.94	-1.2006	$p < .05$
R	29.03	±6.13	25.67	±4.94	1.1045	$p < .05$
LCS	22.11	±4.39	21.45	±4.09	.3554	–
LCL	27.55	±4.67	28.34	±5.04	-.4006	–
GAL	101.12	±14.52	98.45	±13.95	.2135	–
<b>“The level of social expectations” (Popovych, 2017)</b>						
LER	34.23	±8.51	31.22	±7.13	.7396	–
<b>“Motivation for achieving success and avoiding failure” (Elers, 2002)</b>						
MA	21.89	±3.43	19.23	±3.23	.4690	–
MF	12.39	±1.71	13.03	±1.98	-.2558	–
<b>“Hardiness survey” (Maddi, 1994)</b>						
HR	73.09	±17.11	71.04	±16.33	.3498	–

Note: Group 1 – the male sample of athletes with disabilities; Group 2 – the female sample of athletes with disabilities; M<sub>1</sub> – arithmetic mean of Group 1; SD<sub>1</sub> – square deviation of Group 1; M<sub>2</sub> – arithmetic mean of Group 2; SD<sub>2</sub> – square deviation of Group 2; SE – self-esteem; LA – level of aspirations; LG – life goals; P – Process; R – result; LCS – locus of control-self; LCL – locus of control-life; GAL – general awareness of life; LER – the level of expected results; MA – motivation for achieving success; MF – motivation for avoiding failure; HR – hardiness.

In the descriptive frequency characteristics by all the parameters of psycho-diagnostic methods there is a tendency for a prevailing number of higher values of the parameters in the male sample (eight parameters), unlike the female sample (four parameters). This tendency is also available in the studies examining traditional athletes (Popovych et al., 2022d; 2022g). The content parameters determined by “LMO” have different tendencies suggested by the author of the test “Life-meaningful orientations” (Leontyev, 2006). The differences are not significant, there are also no significant differences in the descriptive frequency characteristics obtained in the empirical research on Paralympic athletes (Shamykh, 2020).

The diagram visualizes comparison of psychological content parameters of athletes with disabilities in Group 1 and Group 2 (Fig. I).



Note: DSE – “Diagnosis of self-esteem” (Prikozhan, 2007); LOM – “Life-meaningful orientations” (Leontyev, 2006); LSE – “The level of social expectations” (Popovych, 2017); MASAF – “Motivation for achieving success and avoiding failure” (Elers, 2002); HS – “Hardiness survey” (Maddi, 1994); M – arithmetic mean; Group 1 – the male sample of athletes with disabilities; Group 2 – the female sample of athletes with disabilities; SE – self-esteem; LA – level of aspirations; LG – life goals; P – Process; R – result; LCS – locus of control-self; LCL – locus of control-life; GAL – general awareness of life; LER – the level of expected results; MA – motivation for achieving success; MF – motivation for avoiding failure; HR – hardiness.

**Figure I.** Diagram of comparison of the parameters of self-regulation of athletes with disabilities Group 1 and Group 2

Significant statistical differences were determined in the athletes with disabilities Group 1 and Group 2 by two parameters: process ( $t=-1.2006$ ;  $p>.05$ ) and result ( $t=1.1045$ ;  $p>.05$ ). value-meaningful orientation – result ( $M=29.03$ ;  $SD=\pm 6.13$ ) prevails in the male sample (Group 1), value-meaningful orientation – process ( $M=28.02$ ;  $SD=\pm 4.94$ ) prevails in the female sample (Group 2). This difference is a feature of gender differentiation and this result is expected and regular. It should be mentioned that this difference affected the ranking of the parameters and content features of self-regulating mental states.

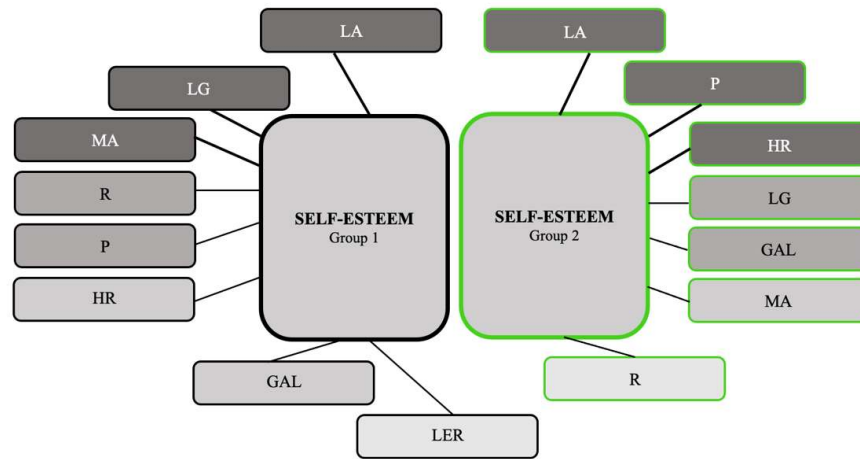
Correlations of the research parameters and the main measurement of self-regulation of the participants– self-esteem (SE) – were determined. Self-esteem of athletes with disabilities is considered to be a powerful component of self-consciousness, self-realization and self-regulation which has a high assimilative ability and has a considerable impact on achievements in sporting activities. Correlations were differentiated by Group 1 and Group 2, and the ranking was performed in each group of the research participants. Tabl. 2 presents the ranking by the male (Group 1) and the female (Group 2) samples by Spearman’s correlation coefficient ( $r_s$ ).

**Table 2.** Ranking in Group 1 and Group 2 by Spearman’s correlation coefficient ( $r_s$ )

Scale	Self-esteem (SE)			
	Group 1 (n=62)		Group 2 (n=60)	
	$r_s$	Rg	$r_s$	Rg
LA	.283**	1	.245**	1
LG	.232**	2	.119*	4
P	.138*	5	.242**	2
R	.146*	4	.098*	7
LCS	.033	-	.056	-
LCL	-.051	-	-.044	-
GAL	.128*	7	.114*	5
LER	.117*	8	.077	-
MA	.191**	3	.102*	6
MF	.068	-	.068	-
HR	.137*	6	.176**	3

Note: Group 1 – the male sample of athletes with disabilities; Group 2 – the female sample of athletes with disabilities;  $r_s$  – Spearman’s correlation; Rg – ranking by a module value of the research parameter; \* –  $p<.05$ ; \*\* –  $p<.01$ ; LA – level of aspirations; LG – life goals; P – Process; R – result; LCS – locus of control-self; LCL – locus of control-life; GAL – general awareness of life; LER – the level of expected results; MA – motivation for achieving success; MF – motivation for avoiding failure; HR – hardiness.

Fig. II visualizes significant correlations of the research parameters with self-esteem arranging the parameters vertically downward by a module value of correlations.



Note: ——— positive correlations with  $p \leq 0.05$ ; - - - - positive correlations with  $p \leq 0.01$ ; Group 1 – the male sample of athletes with disabilities; Group 2 – the female sample of athletes with disabilities; LA – level of aspirations; LG – life goals; MA – motivation for achieving success; R – result; P – process; HR – hardiness; GAL – general awareness of life; LER – the level of expected results.

**Figure II.** Ranking of the research parameters in Group 1 and Group 2

It was established that the rankings of the parameters of the male (Group 1) and female (Group 2) samples differ considerably in the ranks, the values of correlations and the number of significant correlations. In Group 1 there were eight significant statistical correlations, in Group 2 there were seven significant statistical correlations. There were three significant correlations at the level  $p > .01$  in Group 1: LA ( $r_s = .283$ ); LG ( $r_s = .232$ ); MA ( $r_s = .191$ ) and in Group 2: LA ( $r_s = .245$ ); P ( $r_s = .242$ ); HR ( $r_s = .176$ ). Respectively, there were five correlations at the level  $p > .05$  in Group 1: R ( $r_s = .146$ ); P ( $r_s = .138$ ); HR ( $r_s = .137$ ), GAL ( $r_s = .128$ ); LER ( $r_s = .117$ ) and there were four correlations in Group 2: LG ( $r_s = .119$ ); GAL ( $r_s = .114$ ); MA ( $r_s = .102$ ) and R ( $r_s = .098$ ).

It was established that the parameters with the strongest correlations ( $p > .01$ ) have considerable differences by the second ( $2Rg_{G1} = LG$  ( $r_s = .232$ );  $2Rg_{G2} = P$  ( $r_s = .242$ )) and the third ranks ( $3Rg_{G1} = MA$  ( $r_s = .191$ );  $3Rg_{G2} = HR$  ( $r_s = .176$ )) in the ranking. The parameters are identical by the first rank ( $1Rg_{G1} = LA$  ( $r_s = .232$ );  $1Rg_{G2} = LA$  ( $r_s = .242$ )). There are differences in all the parameters of the groups under study by the 4<sup>th</sup>–8<sup>th</sup> ranks at the level  $p > .05$ . It means that the parameters by the 4<sup>th</sup>–8<sup>th</sup> ranks do not coincide. The above combinations of the ranks in Group 1 and Group 2 can be explained in the following way: the continuum “level of aspirations – life goals – motivation for achieving success” oriented towards “the future” dominates in the male sample Group 1. The above parameters reflect the resultative vector. Such a combination is an evidence of a powerful internalizing mental resource in the representatives of this group. The prevailing continuum in Group 2 – “level of aspirations – process – hardiness”, which is a combination of the time orientations “the future” and “the present” with domination of a procedural vector is different. Such a combination is also a powerful resource in which aspirations are supported with the value “here and now” along with endurance and hardiness of the representatives of this group. Availability of a significant correlation at the level  $p > .05$  with the level of expected results (LER) ( $r_s = .117$ ) which is not available in Group 2 shows that Group 1 is oriented towards results. The selected psycho-diagnostic instruments are considered to be relevant and sensitive to the measurements of the research subject, and the suggested methodology for the empirical research on self-regulating mental states of athletes with disabilities is thought to be appropriate. According to the algorithm of comparative methodology of the research we should come to determination of dominating factor loadings. ANOVA was used to identify dominating self-regulating mental states of athletes with disabilities. Two factor structures were created. The structure of Group 1 reflects six factor loadings of the male sample. The structure of Group 2 reflects five factor loadings of the female sample. Tabl. 3 contains the values of the parameters given as comparison of the dominating factor loadings of the male (Group 1) and the female (Group 2) samples.

**Table 3.** Comparison of the dominating factor loadings in Group 1 (n=62) and Group 2 (n=60)

Group 1				Group 2				
Factors (F)	Value (V)	Dispersion (d)	Sum dispersion ( $\Sigma d$ )	Factors (F)	Value (V)	Dispersion (d)	Sum dispersion ( $\Sigma d$ )	
F1 <sub>G1</sub>	6.963	22.67	22.67	F1 <sub>G2</sub>	7.723	23.88	23.88	
F2 <sub>G1</sub>	4.795	16.23	38.90	F2 <sub>G2</sub>	4.343	14.34	38.22	
F3 <sub>G1</sub>	3.239	11.32	50.22	F3 <sub>G2</sub>	3.165	10.05	48.25	
F4 <sub>G1</sub>	2.530	7.04	57.26	F4 <sub>G2</sub>	2.678	6.23	54.48	
F5 <sub>G1</sub>	1.896	3.45	60.71	F5 <sub>G2</sub>	1.905	2.89	57.37	
F6 <sub>G1</sub>	1.176	1.89	62.60					

Note: Group 1 – the male sample of athletes with disabilities; Group 2 – the female sample of athletes with disabilities; F1<sub>G1</sub> – “Value-meaningful”; F2<sub>G1</sub> – “Result-motivated”; F3<sub>G1</sub> – “Procedural-value”; F4<sub>G1</sub> – “Self-worth”; F5<sub>G1</sub> – “Hardiness”; F6<sub>G1</sub> – “Expected readiness”; F1<sub>G2</sub> – “Procedural-value”; F2<sub>G2</sub> – “Pragmatically-oriented”; F3<sub>G2</sub> – “Hardiness”; F4<sub>G2</sub> – “Value-meaningful”; F5<sub>G2</sub> – “Reflexive”.

It was established that F1 “Value-meaningful” (D<sub>G1</sub>=22.67%) and F2 “Result-motivated” (D<sub>G2</sub>=16.23%) are the most loaded factors in the male sample (Group 1). It was found out that F1 “Procedural-value” (D<sub>G1</sub>=23.88%) and F2 “Pragmatically-oriented” (D<sub>G2</sub>=14.34%) are the most loaded factors in the female sample (Group 2). These results can be substantiated by the fact that finding the meaning of life in sporting activities and stable motivation for achieving success are dominating in the factor structure of self-regulating mental states in the male sample. The male athletes who were able to surpass their previous sporting achievements, when there was no external competition, gained a victory more often. A procedural component of sporting activities is dominating in the factor structure of the female athletes. It was established that they improve their sport skills through responsible attitude towards training activities, through exercising appropriately. The athletes achieve perfection through training that allows them reaching a higher level and motivates them for systemic sport results. The largest number of correlations (determined by the correlation matrix of the application “SPSS” v. 24.0) were registered in Group 1: F2 “Result-motivated” and Group 2: F1 “Procedural-value”. All the correlations of these factors are significant. They are the most related and dependent. In other words, they are characterized by systemic nature of impact. The smallest number of correlations was registered in Group 1: F4<sub>G1</sub> – “Self-worth” and Group 2: F5<sub>G2</sub> – “Reflexive”. The self-regulating state “Self-worth” may dominate in the male athletes with disabilities, then they are too focused on their personality, on their “Ego”. Excessive focus on their personality may distract them from training and competition processes and reduce their concentration. The self-regulating state “Reflexive” may dominate in the female athletes with disabilities. Being in this state, they spend too much time analyzing their shortcomings, they are too much focused on correction of their mistakes, demonstrate an excessively high level of self-criticism. It prevents from achieving maximum sport results. Since these mental states have the smallest number of correlations F4<sub>G1</sub> (three) and F5<sub>G2</sub> (two), they are the most independent and, consequently, dangerous ones. F6<sub>G1</sub> “Expected readiness” in the male sample is of scientific interest. It can be explained by the fact that domination of the continuum “level of aspirations – life goals – motivation for achievements”, oriented towards “the future”, contributes to the formation of a mental state with approbation ability. An athlete’s expectations are a constituent of the future. They are a vector oriented towards predicting a sport result. It should be mentioned that the following self-regulating mental states are identical by the name in both samples: “Value-meaningful”, “Procedural-value” and “Hardiness”. The factor structures have the following differences: in the number of factors, respectively in Group 1 (six) and Group 2 (five); in the location of the identical factors, respectively, in Group 1 (F1, F3, F5) and Group 2 (F4, F1, F3); in the values of loadings, for instance, in Group 1 – F1 “Value-meaningful” (V=6.963; d=22.67%), and in Group 2 – F4 “Value-meaningful” (V=2.678; d=6.23%). The above three facts did not allow performing comparison of the measured values (V; d) by reliability coefficients.

## Discussions

Retrospective analysis of scientific studies on psychology of sport, psychotherapy and physical rehabilitation allows stating that the problem of sporting activities of people with disabilities is still topical and of scientific and social significance. Unfortunately, social cataclysms, pandemics, war conflicts, catastrophes and traumas cause an increase in the number of people with disabilities. Sport is the meaning of life and psychological relaxation for most of them (Dubchak & Krivonosenko, 2020). Athletes with disabilities highlight that sport makes them more confident, teaches them to overcome barriers, handle challenges and cope with losses. They say that one should not surrender but permanently improve oneself. These athletes emphasize that sporting activities make them more available to the world. Most of them highlight that they have become much stronger not only physically, but also psychologically and socially owing to sport. They stop being ashamed of their traumas, psycho-physiological inborn and acquired disabilities. There is a lack of scientific studies examining self-regulating mental states, but there are publications related to this scientific issue.

It is necessary to return to the discussion on self-regulating mental states finding the smallest number of significant correlations, respectively, in Group 1: F4<sub>G1</sub> – “Self-worth” (three) and Group 2: F5<sub>G2</sub> – “Reflexive” F5<sub>G2</sub> (two) (see Tabl. 3). These mental states are the most independent and, consequently, dangerous ones. It should be mentioned that V. Plokhikh (2022) identified limitations of psychological protection mechanisms for the formation of an individual’s time orientations. It is important that athletes with disabilities with the dominating self-regulating mental state “Self-worth” and “Reflexive”, through psychological protection mechanisms which are prevailing in them are not able to affect appropriately the formation of their time perspective. Excessive concentration on “Ego” reduces openness and social contacts, that does not contribute permanent achievements in sports. Their sport results, if there are any, are local.

The self-regulating mental state F6<sub>G1</sub> “Expected readiness” (see Tabl. 3) is available only in the male sample. According to the empirical studies on social expectations of an individual (Popovych, 2017), expected readiness



is a powerful resource for creation of a model of the expected future. This model is an outline of a future victory result (Popovych et al., 2021e). It accounts for domination of the continuum “level of aspirations – life goals – motivation for achievements” – the content parameters, outlining the future, in the male sample.

Other scientific studies concern a gender aspect and examine the features of self-realization of Paralympic athletes (Shamykh, 2020). They compare emotional states of male and female Paralympic athletes and establish that availability of disabilities is more essential for male than for female athletes, therefore differences in self-realization are more significant. The studies highlight that most respondents do not consider their previous sport achievements to be final, and they are enthusiastic about setting new objectives and achieving them. It is necessary to add that no significant differences were found in the general structure of organization of urgent sensori-motor action of males and females. The researchers state that there are differences but they are not significant (Plokhikh & Yanovska, 2022). The research on emotional regulation establishes that Paralympic athletes have higher indexes than traditional athletes (Yavorovskaya et al., 2021). It also identifies signs of sexual dimorphism, with domination of high aggressiveness and low psychological adaptability in male athletes with disabilities, unlike female athletes, whose adaptability is higher (Lukovska et al., 2017). All the above scientific facts established empirically prove that there are prevailing differences on the plane of self-regulation of the research participants. Therefore, the factor structures presented in our research have a considerable number of significant differences.

The first hypothesis is confirmed since creation of the structures of self-regulating mental states contribute to efficient tactical preparation of training staff and male and female athletes with disabilities for sports competitions. The second hypothesis is confirmed since there are significant differences by two parameters – process ( $t=-1.2006$ ;  $p>.05$ ) and result ( $t=1.1045$ ;  $p>.05$ ). The third hypothesis cannot be considered as confirmed since the given differences are significant by the number of factors, the location of identical factors and the values of factor loadings, but it was not confirmed by means of comparative coefficients.

### Conclusions

1. Self-regulating mental states of athletes with disabilities are such dominating mental states of educational-training, competition and rehabilitation activities of individuals that provide self-development, help overcome difficult situations in life and motivate people with disabilities for self-realization in society.

2. It was established that there are significant differences ( $p>.05$ ) by two psychological parameters of self-regulation in the male Group 1 and the female Group 2 samples: process ( $t=-1.2006$ ) and result ( $t=1.1045$ ).

3. Two factor structures of self-regulating mental states were created. It was found out that F1 “Value-meaningful” ( $D_{G1}=22.67\%$ ) and F2 “Result-motivated” ( $D_{G2}=16.23\%$ ) are the most loaded factors in the male sample (Group 1). It was established that F1 “Procedural-value” ( $D_{G1}=23.88\%$ ) and F2 “Pragmatically-oriented” ( $D_{G2}=14.34\%$ ) are the most loaded factors in the female sample (Group 2). The largest number of significant correlations was registered in Group 1: F2 “Result-motivated”, and in Group 2: F1 “Procedural-value”, therefore they are the most related and the most dependent.

4. The smallest number of correlations was registered in Group 1:  $F4_{G1}$  – “Self-worth” and Group 2:  $F5_{G2}$  – “Reflexive” – they are the most independent and dangerous ones. Male athletes with this dominating mental state are too focused on their personality, on their “Ego”, that reduces concentration on training and competition processes. Female athletes with the self-regulating state “Reflexive” spend too much time analyzing their shortcomings, they are too much focused on correction of their mistakes, on an excessively high level of self-criticism that does not contribute to achievement of maximum sport results.

5. The obtained empirical results should be operationalized into tactical preparation of training staff and male and female athletes with disabilities. Differentiation of self-regulating mental states can be an essential tactical advantage in sporting activities of people with disabilities.

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