

## Regression models of coaches' coping behaviors under adverse conditions of sports activities

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### Abstract:

The **aim** of this study was to examine regression models of coaches' coping behaviors under adverse conditions of sports activities. **Methods:** The study involved randomly selected coaches ( $n = 100$ ) who were engaged in sports activities and pursuing a degree. Valid psychodiagnostic instruments and standardized statistical coefficients were used for data analysis. **Results:** A petal diagram illustrating the coping profiles of coaches with varying levels of mental strain was created. It showed that "Confrontive coping," "Distancing," "Self-controlling," "Seeking social support," "Escape-avoidance," and "Planful problem-solving" differed significantly among the groups with different levels of mental strain ( $g_1, g_2, g_3; p < .050$ ). No significant differences were found for "Accepting responsibility" and "Positive reappraisal" ( $p \geq .050$ ). Coaches with a low level of mental strain tend to employ the coping strategies "Planful problem-solving" and "Accepting responsibility". The shares of these predictors in the model are 34.7% ( $R^2 = .346$ ) and 32.7% ( $R^2 = .327$ ), respectively. The share of "Positive reappraisal" in the regression model for coaches with a medium level of mental strain is 79.9% ( $R^2 = .799$ ), and that of "Seeking social support" is 36.7% ( $R^2 = .366$ ). The share of "Distancing" in the model is relatively small – 3.31% ( $R^2 = .033$ ). Coaches with a high level of mental strain tend to employ the coping strategy "Accepting responsibility". The share of this predictor in the model is 49.5% ( $R^2 = .495$ ). **Discussion and conclusions.** Multiple regression analysis was utilised to identify coping strategies most closely associated with the level of mental strain. The impact of coping strategies on mental strain varies considerably depending on its level. Problem-focused strategies are effective for coaches with a low level of mental strain. However, accepting too much responsibility can cause additional strain. The coping strategy "Planful problem-solving" is associated with lower mental strain, and "Accepting responsibility" raises it. Emotion-focused strategies (reappraisal and distancing) are less effective for coaches with medium mental strain, whereas social support is a leading defence resource. In high-pressure situations, personal responsibility can be transformed into excessive internal pressure, self-criticism, and self-dissatisfaction, which intensifies stress. The lack of protective factors in the model indicates depleted resources or ineffective coping strategies. Coaches with low and medium levels of mental strain employ adaptive strategies, maintaining an optimal level of resource mobilisation. Respondents with a high level of mental strain commonly employ maladaptive strategies, which is a reason for special work aimed at developing stress resistance and flexible coping mechanisms in coaches.

**Key words:** self-regulation, self-realisation, self-actualisation, defence mechanisms, stress, mental stability, mental strain.

### Introduction

In modern sports, the coach's role extends beyond technical training for athletes. They become leading figures affecting the mental states of teams and individual athletes. However, coaches often experience a high level of mental strain related to responsibility, uncertain outcomes, and the need to make decisions quickly under stressful conditions. In these circumstances, the effective use of coping strategies becomes an important factor, enabling the individual to maintain internal balance and professional performance. This problem is highly relevant in Ukraine, where people experience significant emotional turmoil caused by war. This issue also concerns sports, determining emotional instability, lower stress resistance, higher anxiety, and, as a result, poor sports outcomes. Training processes are often accompanied by the fear of bombings of cities and villages,

causing stress, nervousness, psychological instability, and, in consequence, unstable sports achievements. Therefore, coaches should spend more time solving athletes' psychological problems during the training process than developing their sports skills. This poses problems for coaches who are limited by the deadlines in preparing athletes for competitions. They get nervous and aggressive, which sometimes results in tense relationships with athletes and managers.

Many studies address the problem of coaches' activities and their psychological preparation. The research by S. Hanton et al. (2005) analyses the impact of competitive and organisational stressors on elite athletes and coaches. The studies by R. Thelwell et al. (2008; 2010) examine stressors related to sports performance and management that affect coaches working with elite athletes and analyse their coping strategies. Environments, personality factors, leadership (namely, coaching styles), and the team's atmosphere are the sources of management stress considered by D. Fletcher and S. Hanton (2003). R. Vealey (2007) analyses the concept of athletes' psychological preparation, particularly the development of mental skills that enable the individual to effectively cope with stress, maintain motivation, concentration, and confidence, and regulate emotional states during the training process and competitions. R. Jones and M. Wallace (2005) study the issue of coaches' dealing with uncertainty and ambiguity.

Studies examining coaches' responses to stress have shaped a certain understanding of the relationship between stress and coaches' health, and this research area typically focuses on burnout (Olusoga et al., 2010). In particular, the study argues that burnout, "the syndrome of emotional exhaustion, depersonalisation, and lower personal achievements" (Maslach & Jackson, 1986), is a probable response to chronic stress or an imbalance between requirements and coping strategies (Smith, 1986). Coaches' responses to stress, the consequences of stress, and coping strategies employed by them are the research subject of P. Olusoga et al. (2010).

The analysis of previous studies indicates that coaches' responses to stressors can vary, hence they require more attention from scientists. Consequently, research into the specificity of coping strategies of coaches with different levels of mental strain will contribute to a more profound understanding of psychological readiness for professional activities and the development of effective programs for psychological support.

*Hypothesis.* The proposed regression models of coaches' coping behaviours under adverse conditions of sports activities will demonstrate significant differences depending on mental strain.

*The research aims* to study the regression models of coaches' coping behaviours under adverse conditions of sports activities.

## Methods

*Methodology.* Our research is grounded in the scientific ideas of professionals in sports psychology who studied athletes' professional skills and levels of anxiety (Fletcher & Hanton, 2001), gender differences in mental manifestations in sports activities (Tolin & Foa, 2006), and social and psychological factors contributing to anxiety disorders (Fletcher & Hanton, 2001; Kerr & Dacyshyn, 2000; Fry & Newton, 2003; Beck et al., 2000; Gould & Udry, 1994). Special attention was paid to psychophysiological patterns of the sample (Cretu et al., 2021; Kozin et al., 2022; 2023), the specificity of emotional regulation of mental states (Nolen-Hoeksema, 2012; Plokhikh et al., 2025; Popovych et al., 2026), and strategies for dealing with the negative psychological consequences of stressful situations (Fletcher & Sarkar, 2012; Kessler et al., 2004). We also considered publications on the specificity of organising the educational process (Nosov et al., 2020; Popovych et al., 2024), the patterns of academic and professional preparation, recent studies with innovative designs, and those based on advanced technologies (Zinchenko et al., 2020).

*Participants.* The research involved randomly selected coaches ( $n = 100$ ), aged 20 to 42 ( $M = 29.12$ ;  $SE = .12$ ;  $SD = 4.43$ ), who engaged in sports activities and pursued a degree. The gender ratio was as follows: male coaches ( $n = 62$ ; 62.00%) and female coaches ( $n = 38$ ; 38.00%).

*Procedures and Instruments.* The methodology "The Psychological Stress Measure" (PSM-25) (Lemyre & Tessier, 1988) was used to measure the levels of mental strain. The tool is designed to measure the phenomenological structure of stress and is based on the idea that stress is heterogeneous and has various aspects, particularly emotional, cognitive, and physiological. The level of mental strain is a diagnosed construct of the methodology. The interpretation of our results implied that the higher the empirical indicator, the higher the level of psychological stress (mental strain) (Lemyre & Tessier, 1988). To diagnose the strategies for overcoming difficulties in various areas of mental activity (coping strategies), we used the methodology "Ways of Coping Questionnaire" (WCQ) (Lazarus & Folkman, 1984), developed on the basis of the first methodology by Folkman & Lazarus (1980) – the questionnaire "Ways of Coping Checklist – WCC". The methodology is based on the ability to overcome life difficulties. Social behaviour aimed at overcoming difficulties enables the individual to deal with a difficult life situation (or stress) employing strategies that align with personal characteristics and situations through the awareness of their actions.

*Statistical Analysis.* The research was conducted employing a confirmatory strategy to predict relationships between independent and dependent variables. A statistical analysis of the results was performed using descriptive statistics and multiple regression analysis. Analysis of variance was performed considering  $p \leq .050$ . Effect size was measured using Eta-squared ( $\eta^2$ ). The statistical program IBM SPSS, version 27, was employed.

## Results

The empirical stage of our research aimed to test the hypothesis that coaches experience different levels of mental strain depending on the coping strategies they use.

Tabl. 1 presents descriptive statistics on the research results regarding the levels of coaches' mental strain. The indicators of a normal distribution, according to the Shapiro–Wilk Test (Sh–W) and the Kolmogorov–Smirnov Test (K–Sb), suggest a non-normal distribution across all variables; therefore, non-parametric methods for processing empirical data were used in further calculations.

**Table 1.** Descriptive statistics of the indicators of the diagnosed variables (n = 100)

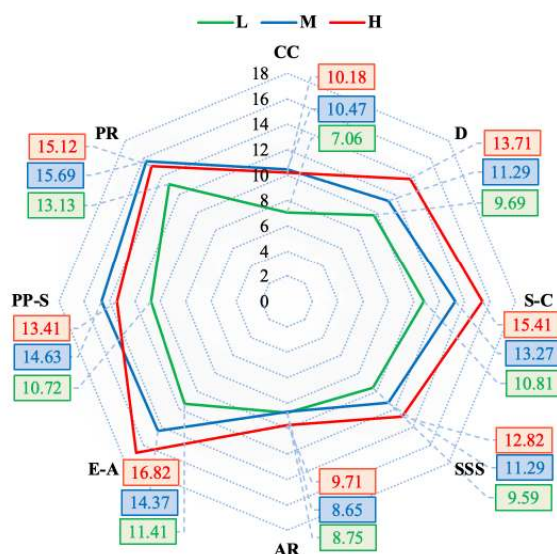
| Variables                                         | M       | SEM  | SD     | Me     | Normal distribution |       |          |          |
|---------------------------------------------------|---------|------|--------|--------|---------------------|-------|----------|----------|
|                                                   |         |      |        |        | A                   | E     | K-Sb (p) | Sh–W (p) |
| PSM-25                                            |         |      |        |        |                     |       |          |          |
| Integral scale of the psychological stress PSM-25 | 102.232 | .770 | 27.703 | 108.00 | .044                | -.815 | .005     | .000     |
| ways of coping                                    |         |      |        |        |                     |       |          |          |
| Confrontive coping                                | 9.33    | .325 | 3.254  | 10.00  | -.156               | .478  | .000     | .000     |
| Distancing                                        | 11.19   | .378 | 3.776  | 12.00  | -.658               | .478  | .000     | .000     |
| Self-controlling                                  | 12.85   | .271 | 2.713  | 14.00  | -.455               | .478  | .000     | .000     |
| Seeking social support                            | 11.01   | .312 | 3.119  | 11.00  | -.297               | .478  | .005     | .004     |
| Accepting responsibility                          | 8.86    | .183 | 1.831  | 9.00   | -.584               | .478  | .000     | .000     |
| Escape-avoidance                                  | 13.84   | .346 | 3.463  | 15.00  | -.433               | .478  | .000     | .000     |
| Planful problem-solving                           | 13.17   | .291 | 2.913  | 14.00  | -1.520              | .478  | .000     | .000     |
| Positive reappraisal                              | 14.77   | .475 | 4.746  | 15.00  | -.450               | .478  | .031     | .000     |

Note: M – the mean; SD – the standard deviation; SEM – the standard error of the mean; A – asymmetry; E – excess; K-S – the Kolmogorov–Smirnov Test; Sh-W – Shapiro–Wilk's Test; \* – a lower bound of significance for the Kolmogorov–Smirnov test. A lower bound of significance for Shapiro–Wilk's test is  $p > 0,05$ ; b – Lilliefors significance correction.

Source: Own research.

Coaches were divided into three groups according to the level of their mental strain based on the analysis of the calculated mean values using the methodology “PSM-25” (Lemyre & Tessier, 1988). Fig. 1 presents the coping profile of coaches with different levels of mental strain given as a petal diagram.

**Coping profile of coaches with different levels of mental strain**



Note: — contour of low mental strain; — contour of medium mental strain; — contour of high mental strain; CC – confrontive coping; D – distancing; S-C – self-controlling; SSS – seeking social support; AR – accepting responsibility; E-A – escape-avoidance; PP-S – planful problem-solving; PR – positive reappraisal.

Source: Own research.

**Fig. 1.** The coping profile of coaches with different levels of mental strain

We assumed that the studied characteristics are significantly different in coaches with different levels of mental strain. The non-parametric Kruskal–Wallis H-test was used because the data distribution was non-normal across all variables. It was found that the values of variables such as “Confrontive coping”, “Distancing”, “Self-controlling”, “Seeking social support”, “Escape-Avoidance”, and “Planful problem-solving” are significantly

different among groups g1, g2, g3 ( $p < .050$ ). Significant differences for the variables “Accepting responsibility” and “Positive reappraisal” were recorded at  $p \geq .050$  (Tabl. 2).

**Table 2.** Descriptive statistics of the studied groups with different levels of mental strain ( $n = 100$ : Group 1 = 32; Group 2 = 51; Group 3 = 17)

| Variables                | Level of PSMa | N  | M       | SEM   | SD     | H      | p    | $\eta^2$ |
|--------------------------|---------------|----|---------|-------|--------|--------|------|----------|
| “PSM-25”                 | low (g 1)     | 32 | 269.41  | 1.81  | 10.283 | 82.218 | .001 | .917     |
|                          | medium (g 2)  | 51 | 108.041 | 0.827 | 7.728  |        |      |          |
|                          | high (g 3)    | 17 | 146.59  | 5.00  | 2.063  |        |      |          |
| Confrontive coping       | low (g 1)     | 32 | 27.06   | .594  | 3.360  | 16.949 | .001 | .232     |
|                          | medium (g 2)  | 51 | 10.47   | .406  | 2.901  |        |      |          |
|                          | high (g 3)    | 17 | 10.18   | .356  | 1.468  |        |      |          |
| Distancing               | low (g 1)     | 32 | 29.69   | .439  | 2.481  | 21.493 | .001 | .128     |
|                          | medium (g 2)  | 51 | 11.29   | .634  | 4.527  |        |      |          |
|                          | high (g 3)    | 17 | 13.71   | .239  | .985   |        |      |          |
| Self-controlling         | low (g 1)     | 32 | 210.81  | .454  | 2.571  | 35.66  | .001 | .348     |
|                          | medium (g 2)  | 51 | 113.27  | .313  | 2.237  |        |      |          |
|                          | high (g 3)    | 17 | 15.41   | .272  | 1.121  |        |      |          |
| Seeking social support   | low (g 1)     | 32 | 29.59   | .654  | 3.697  | 12.128 | .002 | .129     |
|                          | medium (g 2)  | 51 | 11.29   | .391  | 2.795  |        |      |          |
|                          | high (g 3)    | 17 | 12.82   | .300  | 1.237  |        |      |          |
| Accepting responsibility | low (g 1)     | 32 | 28.75   | .348  | 1.967  | 3.626  | .163 | .045     |
|                          | medium (g 2)  | 51 | 18.65   | .271  | 1.937  |        |      |          |
|                          | high (g 3)    | 17 | 9.71    | .187  | .772   |        |      |          |
| Escape-avoidance         | low (g 1)     | 32 | 211.41  | .388  | 2.198  | 31.836 | .000 | .299     |
|                          | medium (g 2)  | 51 | 114.37  | .510  | 3.644  |        |      |          |
|                          | high (g 3)    | 17 | 16.82   | .261  | 1.074  |        |      |          |
| Planful problem-solving  | low (g 1)     | 32 | 210.72  | .629  | 3.558  | 36.145 | .001 | .359     |
|                          | medium (g 2)  | 51 | 114.63  | .231  | 1.649  |        |      |          |
|                          | high (g 3)    | 17 | 13.41   | .193  | .795   |        |      |          |
| Positive reappraisal     | low (g 1)     | 32 | 213.13  | 1.275 | 7.210  | 3.56   | .169 | .059     |
|                          | medium (g 2)  | 51 | 115.69  | .427  | 3.050  |        |      |          |
|                          | high (g 3)    | 17 | 15.12   | .283  | 1.166  |        |      |          |

Note: a – the grouping variable – mental strain; H – the Kruskal-Wallis Test;  $\eta^2$  – Eta-squared, assessed based on the fixed-effects model; N – the number of respondents; M – the mean; SEM – the standard error of the mean; SD – the standard deviation. Source: Own research.

To predict a probable causal relationship between coaches’ mental strain (a dependent variable) and coping strategies (independent variables), multiple regression analysis was used (Tabl. 3–5). The scales of the methodology “Ways of Coping Questionnaire” (Lazarus & Folkman, 1984) were regarded as predictors of regression models: “Confrontive coping”, “Distancing”, “Self-controlling”, “Seeking social support”, “Accepting responsibility”, “Escape-avoidance”, “Planful problem-solving”, and “Positive reappraisal”.

**Table 3.** Generalised data for regression analysis models

| Data for Regression analysis models                                    |                |                           |      |                       |      |        |                  |
|------------------------------------------------------------------------|----------------|---------------------------|------|-----------------------|------|--------|------------------|
| Model R                                                                | R <sup>2</sup> | Correction R <sup>2</sup> | SE   | Statistics of changes |      |        |                  |
|                                                                        |                |                           |      | R <sup>2</sup>        | F    | df (1) | df (2) p (for F) |
| Regression models for respondents with a low level of mental strain    |                |                           |      |                       |      |        |                  |
| 1                                                                      | .771a          | .594                      | .581 | 6.658                 | .594 | 43     | 30 .000          |
| 2                                                                      | .960b          | .921                      | .916 | 2.983                 | .327 | 120    | 485 1 29 .000    |
| Regression models for respondents with a medium level of mental strain |                |                           |      |                       |      |        |                  |
| 1                                                                      | .677c          | .458                      | .447 | 5.746                 | .458 | 41     | 445 1 49 .000    |
| 2                                                                      | .901d          | .812                      | .804 | 3.421                 | .354 | 90     | 215 1 48 .000    |
| 3                                                                      | .919f          | .845                      | .835 | 3.137                 | .033 | 10     | 072 1 47 .003    |
| Regression models for respondents with a high level of mental strain   |                |                           |      |                       |      |        |                  |
| 1                                                                      | .704g          | .496                      | .462 | 1.513                 | .496 | 14     | 755 1 15 .002    |

Note: regression models for respondents with a low level of mental strain: 1, 2 – models of multiple regression (Model: 1 (a) – planful problem-solving; Model: 2 (b) – predictors: planful problem-solving, accepting responsibility); regression models for respondents with a medium level of mental strain: 1, 2, 3 – models of multiple regression (Model: 1(c) – positive reappraisal; Model: 2(d) – positive reappraisal, seeking social support; Model: 3 (f) – positive reappraisal, seeking social support, distancing); A regression model for respondents with a high level of mental strain: 1 – model of multiple regression (Model: 1(g) – accepting responsibility); R – correlation coefficient of the predictor with the model; R<sup>2</sup> – coefficient of determination; SE – standard error; F – Fisher’s test; p – statistical significance; df (1, 2) – degrees of freedom. Dependent variable: “PSM-25” – psychological stress measure.

Source: Own research.

The results presented in Tabl. 3 indicate that all models have high and statistically significant correlation values. When variables are added to the model, the  $R^2$  value increases, confirming the model's better fit. F-statistics in the regression model for respondents with a medium level of mental strain decrease in Model 3, which can testify to a narrower specification; however, it remains statistically significant. Respondents with a high level of mental strain are presented by one regression model. The differences between the models are statistically significant (Tabl. 4).

**Table 4.** Indicators of differences in the empirical distribution of models

| ANOVAa                                                                        |                |    |             |         |       |
|-------------------------------------------------------------------------------|----------------|----|-------------|---------|-------|
| Model                                                                         | Sum of squares | Df | Mean square | F       | P     |
| <b>Regression models for respondents with a low level of mental strain</b>    |                |    |             |         |       |
| 1. Regression                                                                 | 1947.867       | 1  | 1947.867    | 43.942  | .000  |
| 2. Regression                                                                 | 3019.729       | 2  | 1509.864    | 169.720 | .000  |
| <b>Regression models for respondents with a medium level of mental strain</b> |                |    |             |         |       |
| 1. Regression                                                                 | 1368.250       | 1  | 1368.250    | 41.445  | .000c |
| 2. Regression                                                                 | 2424.128       | 2  | 1212.064    | 103.560 | .000d |
| 3. Regression                                                                 | 2523.275       | 3  | 841.092     | 85.446  | .000e |
| <b>Regression models for respondents with a high level of mental strain</b>   |                |    |             |         |       |
| 1. Regression                                                                 | 33.778         | 1  | 33.778      | 14.755  | .002c |

Note: a – dependent variable: “PSM-25” – psychological stress measure; 1, 2, 3 – models of multiple regression (see note in Tabl. 4); df (1, 2) – degrees of freedom; F – Fisher's test; p – statistical significance.

Source: Own research.

Regression analysis identified the share of predictors in determining coaches' mental strain. The second model with two predictors, planful problem-solving and accepting responsibility, is the most comprehensive model for respondents with a low level of mental strain. The third model with three predictors, positive reappraisal, seeking social support, and distancing, is the most comprehensive model for respondents with a medium level of mental strain. The model with the predictor “accepting responsibility” is valid for respondents with a high level of mental strain (Tabl. 5). All models are statistically significant at a level of  $p < .010$  and account for a relatively large share of predictors in determining variability in the dependent variable.

**Table 5.** Beta coefficients of predictors in the regression analysis model

| Coefficients                                                                  |                             |                    |                         |         |           |       |                                            |
|-------------------------------------------------------------------------------|-----------------------------|--------------------|-------------------------|---------|-----------|-------|--------------------------------------------|
| Model                                                                         | Not standardised<br>$\beta$ | Standardised<br>SE | Standardised<br>$\beta$ | T       | p         | VIF   | Correlations<br>Zero-orderPartialComponent |
| <b>Regression models for respondents with a low level of mental strain</b>    |                             |                    |                         |         |           |       |                                            |
| 1(Constant)                                                                   | 93.286                      | 3.790              |                         | 24.615  | .000      |       |                                            |
| Planful problem-solving                                                       | -2.228                      | .336               | -.771                   | -6.629  | .0001.000 | -.771 | -.771                                      |
| 2(Constant)                                                                   | 61.203                      | 3.380              |                         | 18.107  | .000      |       |                                            |
| Planful problem-solving                                                       | -1.767                      | .156               | -.612                   | -11.308 | .0001.078 | -.771 | -.903                                      |
| Accepting responsibility                                                      | 3.103                       | .283               | .594                    | 10.977  | .0001.078 | .758  | .898                                       |
| <b>Regression models for respondents with a medium level of mental strain</b> |                             |                    |                         |         |           |       |                                            |
| 1(Constant)                                                                   | 81.131                      | 4.256              |                         | 19.061  | .000      |       |                                            |
| Positive reappraisal                                                          | 1.715                       | .266               | .677                    | 6.438   | .0001.000 | .677  | .677                                       |
| 2(Constant)                                                                   | 81.316                      | 2.534              |                         | 32.084  | .000      |       |                                            |
| Positive reappraisal                                                          | 3.598                       | .254               | 1.420                   | 14.172  | .0002.561 | .677  | .898                                       |
| Seeking social support                                                        | -2.631                      | .277               | -.952                   | -9.498  | .0002.561 | .157  | -.808                                      |
| 3(Constant)                                                                   | 77.859                      | 2.567              |                         | 30.333  | .000      |       |                                            |
| Positive reappraisal                                                          | 3.630                       | .233               | 1.432                   | 15.576  | .0002.566 | .677  | .915                                       |
| Seeking social support                                                        | -2.681                      | .255               | -.970                   | -10.534 | .0002.571 | .157  | -.838                                      |
| Distancing                                                                    | .312                        | .098               | .183                    | 3.174   | .0031.004 | .151  | .420                                       |
| <b>Regression models for respondents with a high level of mental strain</b>   |                             |                    |                         |         |           |       |                                            |
| 1(Constant)                                                                   | 128.315                     | 4.771              |                         | 26.893  | .000      |       |                                            |
| Accepting responsibility                                                      | 1.883                       | .490               | .704                    | 3.841   | .0021.000 | .704  | .704                                       |

Note: a – dependent variable: “PSM-25” – psychological stress measure; constant – intercept; 1, 2, 3 – multiple regression models (see note in Tabl. 3);  $\beta$  – beta coefficient; SE – standard error; p – statistical significance; t – Student's test; VIF – collinearity index.

Source: Own research.

## Discussion

For effective coaching, it is important to possess technical knowledge and be able to adapt psychologically to complex and unstable environments. Solving problems in this area involves employing various coping strategies. Our research aims to test the assumption that coaches employ different coping strategies when overcoming difficulties, depending on the level of mental strain. Study show that female coaches commonly exhibit higher

levels of psychological stress, emotional exhaustion, and depersonalisation than male coaches. At the same time, male coaches are more inclined to reflect and less prone to devalue their accomplishments. Emotional exhaustion is a key predictor of coaches' emotional strain, as corroborated by the results of regression analysis. Task orientation and depersonalisation are predictors that negatively affect the variability of the dependent variable.

Let us look at the results obtained using the methodology "WCQ" (Lazarus & Folkman, 1984) (see Fig. 1). The value of "confrontive coping" reveals its adaptive variant ( $M = 9.33 \pm .325$ ,  $SD = 3.254$ ), indicating coaches' ability to achieve mutual understanding with subordinates. The value of "Distancing" ( $M = 11.9 \pm .378$ ;  $SD = 3.776$ ) corresponds to a medium level of mental strain, testifying to the frequent use of the coping strategy of emotional detachment. This strategy may have a temporary adaptive effect; however, using it regularly indicates unstable adaptive potential and proneness to maladaptive coping in the conditions of chronic or intense stress. The result of "Self-controlling" ( $M = 12.85 \pm .274$ ,  $SD = 2.713$ ) indicates the frequent use of the coping strategy of emotional self-regulation. This can attest to significant internal tension when self-control is practised not as a stable personality trait but as a defence response that requires continuous energy resources. If this level of strain persists for an extended period, adaptive potential may be depleted. "Seeking social support" ( $M = 11.01 \pm .312$ ,  $SD = 3.119$ ) indicates a slight tendency to employ interpersonal coping strategies. This strategy can be adaptive under conditions of effective communication. However, using it frequently may testify to low internal autonomy in managing stress and the risk of maladaptation without external support. The value of "Accepting responsibility" ( $M = 8.86 \pm .083$ ,  $SD = 1.831$ ) indicates a moderate inclination toward self-analysis, accepting responsibility for one's actions, and relative emotional stability, which can contribute to overcoming stressful situations effectively. This strategy can be adaptive if it is not accompanied by self-destruction or continuous self-criticism. The coping strategy "Escape-avoidance" ( $M = 13.84 \pm .346$ ,  $SD = 3.463$ ) means evading a problematic situation, psychological "detachment" (distraction, daydreaming, and a loss of interest). Coaches often avoid problem-solving or emotionally "switch off" themselves in stressful situations. This strategy is considered maladaptive if it dominates others. It does not contribute to solving problems but only postpones them, increasing internal tension. This is a potential risk for respondents' professional resilience and psychological well-being. "Planful problem-solving" is one of the most constructive and effective coping strategies that contributes to reducing anxiety and emotional tension. The obtained empirical result ( $M = 13.17 \pm 0.291$ ,  $SD = 2.913$ ) indicates coaches' relatively strong adaptive potentials. They regard a difficult situation as a challenge and tend to exhibit thoughtful behavior rather than impulsive or passive responses. This level reflects the ability to behave intentionally, analyse situations, and make decisions, which is a positive characteristic of coaches' psychological readiness for professional activity. The coping strategy "Positive reappraisal" ( $M = 14.77 \pm .475$ ,  $SD = 4.746$ ) involves searching for a positive meaning in stressful events, transforming a crisis into an opportunity for growth, and focusing on internal development. This is a mature and adaptive strategy. This coping strategy is the main one for maintaining psychological well-being under conditions of professional stress and is extremely important in coaches' activities.

The qualitative analysis reveals that the problems facing sports coaches are commonly related to organisational aspects and partially concern sports-related aspects. This aligns with the results obtained by other researchers studying athletes' and coaches' activities. In particular, S. Hanton (2005) notes that elite athletes underscore organisational sports problems more frequently than the problems associated with competition results (Hanton et al., 2005). R. Thelwell et al. (2008) include environments among organisational stressors. Personal factors, leadership (particularly coaching styles), and a team atmosphere are sources of organisational stress, according to the study by D. Fletcher and S. Hanton (2003).

The comparative analysis of the coping strategies of coaches with different levels of mental strain, according to the Kruskal-Wallis H-test, reveals significant differences between the groups ( $g_1$ ,  $g_2$ ,  $g_3$ ) with  $p = .001$  and a very large effect size ( $\eta^2 = .917$ ) (see Tabl. 2). This confirms a relevant division of the sample based on the level of mental strain. Significant differences were identified ( $p = .001$ ;  $\eta^2 = .232$ ) in the strategy "Confrontive coping". The value of mental strain increases from a low to a medium level, but slightly decreases in  $g_3$ . Thus, moderate strain contributes to an active response, whereas excessive strain may reduce the effectiveness of confrontive behaviour.

Statistically significant differences were recorded ( $p = .001$ ;  $\eta^2 = .128$ ) in the coping strategy "Distancing". It was shown that an increase in distancing results in higher mental strain. It means that coaches with high mental strain commonly avoid emotional involvement in the problem. Very strong differences ( $p = .001$ ;  $\eta^2 = .348$ ) were found between coaches with a low level of mental strain on the scale "Self-controlling". Notably, a high value was observed in the three groups. This indicates attempts to regulate emotional reactions in response to increasing mental strain. Significant differences ( $p = .002$ ) with a small effect size ( $\eta^2 = .129$ ) were diagnosed in the coping strategy "Seeking social support". Coaches with high mental strain often seek support that indicates their dependence on external resources with increasing emotional tension. Statistically significant differences ( $p < .001$ ;  $\eta^2 = .299$ ) were recorded in the coping strategy "Escape-avoidance". The highest values were observed in respondents with high mental strain. Thus, coaches with high mental strain tend to employ a maladaptive strategy to avoid problems.

Another coping strategy showing differences with the largest effect size ( $\eta^2 = .359$ ) is “Planful problem-solving” ( $p = .001$ ). Coaches with a medium level of mental strain commonly plan their actions to solve problems. Respondents with a high level of mental strain showed lower values, which indicates a reduced ability to think strategically under the influence of a high stress level.

No statistically significant differences were found in the coping strategies “Accepting responsibility” ( $p = .163$ ;  $\eta^2 = .045$ ) and “Positive reappraisal” ( $p = .169$ ,  $\eta^2 = .059$ ). Thus, they are relatively stable regardless of mental states. Thus, the most adaptive strategies (planning and self-controlling) are commonly employed by coaches with a medium level of mental strain. This testifies to an optimal level of resource mobilisation. Coaches with a high level of mental strain tend to employ maladaptive strategies: avoidance, distancing, and high self-control. This suggests the need to develop stress resistance and flexible coping strategies within the system for training coaches. To identify coping strategies closely related to a certain level of mental strain, multiple regression analysis was utilised. It was found that coaches with a low level of mental strain tend to employ the coping strategies “Planful problem-solving”  $\beta = -.612$ ,  $p = .000$  and “Accepting responsibility”  $\beta = .594$ ,  $p = .000$ . The share of the predictor “Planful problem-solving” in the model is 34.7% ( $R^2 = .346$ ), and that of “Accepting responsibility” is 32.7% ( $R^2 = .327$ ).

The shares of predictors in the model were calculated as the coefficient of determination for semi-partial (Component) correlation (see Tabl. 5). Thus, “Planful problem-solving” reduces mental strain in coaches with a low level of mental strain. At the same time, though accepting responsibility is an indicator of personal maturity, it is associated with a higher level of mental strain due to high internal control or proneness to self-accusation.

Three regression models were calculated for coaches with a medium level of mental strain. The third model, which includes the predictors “Positive reappraisal” ( $\beta = +1.432$ ,  $p = .000$ ), “Seeking social support” ( $\beta = -0.97$ ,  $p = .000$ ), and “Distancing” ( $\beta = +.183$ ,  $p = .003$ ), is the most comprehensive. It is seen that “Positive reappraisal” and “Distancing” increase mental strain, whereas “Seeking social support” reduces it. The share of the predictor “Positive reappraisal” in the model is 79.9% ( $R^2 = .799$ ), and that of “Seeking social support” is 36.7% ( $R^2 = .366$ ) (see Tabl. 5). These two factors have a common variance. The share of the predictor “Distancing” in the model is relatively small – 3.31% ( $R^2 = .033$ ), though it is statistically significant. Thus, the coping strategy “Seeking social support” associated with a lower level of mental strain is the most important one for coaches with a medium level of mental strain. Though “Positive reappraisal” and “Distancing” are often considered adaptive, in our case, they are associated with higher mental strain, which can testify to their ineffectiveness in situations with a medium level of mental strain.

Coaches with a high level of mental strain tend to employ the coping strategy “Accepting responsibility”  $\beta = .704$ ,  $p = .002$ . The share of this predictor in the model is 49.5% ( $R^2 = .495$ ) (see Tabl. 5). It means that the more responsible the individual, the higher mental strain they have. This can be related to excessive self-demandingness, overload, guilt, etc. Thus, the maladaptive coping strategy “Accepting responsibility” is a significant predictor of higher strain for coaches with a high level of mental strain.

Our research suggests the need to work with coaches to stabilise their mental states, develop strategies to cope with stress (Thelwell et al., 2010), uncertainty, and ambiguity (Jones & Wallace, 2005), while minimising harm to their health. Moreover, coaches must possess skills in psychological support for athletes with whom they work. R. Vealey (2007) highlights the coach’s role in mental training. The study by P. Olusoga et al. (2010) reveals that coaches must reflect on their responses to stress and the impact of their reactions on athletes (Olusoga et al., 2010). Sports psychologists must help coaches identify and develop the psychological skills and strategies necessary to meet the requirements for world-class coaching.

## Conclusions

The research demonstrates a successful attempt to model coaches’ coping behaviours under adverse conditions of sports activities. Regression analysis was utilised to determine the models of significant coping strategies depending on coaches’ mental strain. It was shown that the impact of coping strategies on mental strain varies considerably depending on the level of this strain. Problem-focused strategies are effective for coaches with a low level of mental strain. However, accepting excessive responsibility may cause additional strain. The coping strategy “Planful problem-solving” is associated with lower mental strain, and “Accepting responsibility” increases it. Emotion-focused strategies (reappraisal and distancing) appear to be less effective for coaches with a medium level of mental strain, whereas social support is a main defence resource. In extremely stressful circumstances, personal responsibility can be transformed into excessive internal tension, self-accusation, and self-dissatisfaction, which can increase stress. A lack of protective factors in the model indicates resource depletion or ineffectiveness of conventional coping strategies. It was shown that coaches with low and medium levels of mental strain commonly employ adaptive strategies. This testifies to an optimal level of resource mobilisation. Coaches with a high level of mental strain tend to employ maladaptive strategies.

## References

- Bakker, A.B. & Demerouti, E. (2007). The Job Demands-Resources model: state of the art. *Journal of Managerial Psychology*, 22(3), 309–328. <https://doi.org/10.1108/02683940710733115>

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- Barnett, N. R., & Wright, P. (1994). Psychological considerations for women in sports. *Clinics Sports Medicine*, 13(2), 297–313. Retrieved from <https://pubmed.ncbi.nlm.nih.gov/8013034/>
- Bass, B. M. (1977). Bass Orientation Inventory (RNVT, Ori). [Database record]. APA PsycTests. <https://doi.org/10.1037/t06491-000>
- Beck, J. G., Shipherd, J. C., & Ohtake, P. (2000). Do panic symptom profiles influence response to a hypoxic challenge in patients with panic disorder? A preliminary report. *Psychosomatic Medicine*, 62(5), 678–83. <https://doi.org/10.1097/00006842-200009000-00012>.
- Chang, K. H., Lu, F.J., Chyi, T., Hsu, Y. W., Chan, S. W., & Wang, E. T. W. (2017). Examining the stress-burnout relationship: The mediating role of negative thoughts. *Peer J Life & Environment*, 5, e4181. <https://doi.org/10.7717/peerj.4181>
- Chang, W. H., Wu, C. H., Kuo, C. C., & Chen, L. H. (2018). The role of athletic identity in the development of athlete burnout: The moderating role of psychological flexibility. *Psychology of Sport and Exercise*, 39, 45–51. <https://doi.org/10.1016/j.psychsport.2018.07.014>
- Cohen, S., Murphy, M. L. M., & Prather, A. A. (2019). Ten surprising facts about stressful life events and disease risk. *Annual Review of Psychology*, 70, 577–597. <https://doi.org/10.1146/annurev-psych-010418-102857>.
- Cordes, C., & Dougherty, T. (1993). A Review and an Integration of Research on Job Burnout. *Academy of Management Review*, 18(4), 621–656. <https://doi.org/10.5465/AMR.1993.9402210153>.
- Cretu, M., Borysenko, I., Ushmarova, V., Grynyova, V., & Masych, V. (2021). Features of vascular regulation of students – future specialists in physical education and sports of different sports specializations with different body lengths. *Health, Sport, Rehabilitation*, 7(2), 29–44. <https://doi.org/10.34142/HSR.2020.07.02.03>
- Crum, A. J., Akinola, M., Martin, A., & Fath, S. (2017). The role of stress mindset in shaping cognitive, emotional, and physiological responses to challenging and threatening stress. *Anxiety, Stress, & Coping*, 30(4), 379–395. <https://doi.org/10.1080/10615806.2016.1275585>
- Eagly, A. H., & Wood, W. (2012). Social role theory. In P.A.M. van Lange, A.W. Kruglanski, & E.T. Higgins (Eds.). *Handbook of theories of social psychology* (pp. 458–476). Sage Publications Ltd. <https://doi.org/10.4135/9781446249222.n49>
- Fletcher, D., & Hanton, S. (2001). The relationship between psychological skills usage and competitive anxiety responses. *Psychology of Sport and Exercise*, 2(2), 89–101. [https://doi.org/10.1016/S1469-0292\(00\)00014-5](https://doi.org/10.1016/S1469-0292(00)00014-5)
- Fletcher, D., & Hanton, S. (2003). Sources of organizational stress in elite sports performers. *The Sport Psychologist*, 17(2), 175–195.
- Fletcher, D., & Sarkar, M. (2012). A grounded theory of psychological resilience in Olympic champions. *Psychology of Sport and Exercise*, 13(5), 669–678. <https://doi.org/10.1016/j.psychsport.2012.04.007>
- Folkman, S., & Lazarus, R. S. (1980). An analysis of coping in a middle-aged community sample. *Journal of Health and Social Behavior*, 21(3), 219–239. <https://doi.org/10.2307/2136617>
- Fry, M. D., & Newton, M. (2003). Application of Achievement Goal Theory in an Urban Youth Tennis Setting. *Journal of Applied Sport Psychology*, 15(1), 50–66. <https://doi.org/10.1080/10413200305399>
- Gaudreau, P., Morinville, A., Gareau, A., Verner-Filion, J., Green-Demers, I., Franche, V. (2016). Autonomy support from parents and coaches: Synergistic or compensatory effects on sport-related outcomes of adolescent-athletes? *Psychology of Sport and Exercise*, 25, 89–99. <https://doi.org/10.1016/j.psychsport.2016.04.006>.
- Giacobbi, P. R. Jr., Lynn, T. K., Wetherington, J. M., Jenkins, J., Bodendorf, M., & Langley, B. (2004). Stress and coping during the transition to university for first-year female athletes. *The Sport Psychologist*, 18(1), 1–20. <https://doi.org/10.1123/tsp.18.1.1>
- Glandorf, H. L., Madigan, D. J., Kavanagh, O., & Mallinson-Howard, S. H. (2023). Mental and physical health outcomes of burnout in athletes: a systematic review and meta-analysis. *International Review of Sport and Exercise Psychology*, 1–45. <https://doi.org/10.1080/1750984X.2023.2225187>
- Gould, D., & Udry, E. (1994). Psychological skills for enhancing performance: arousal regulation strategies. *Medicine and science in sports and exercise*, 26(4), 478–485.
- Gustafsson, H., Kenttä, G., & Hassmén, P. (2011). Athlete burnout: An integrated model and future research directions. *International Review of Sport and Exercise Psychology*, 4, 3–24. <https://doi.org/10.1080/1750984X.2010.541927>
- Haneishi, K., Fry, A. C., Moore, C. A., Schilling, B. K., Li, Yu., & Fry, M. D. (2007). Cortisol and stress responses during a game and practice in female collegiate soccer players. *Journal of Strength and Conditioning Research*, 21(2), 583–588. <https://doi.org/10.1519/R-20496.1>
- Hanton, S., Fletcher, D., & Coughlan, G. (2005). Stress in elite sport performers: A comparative study of competitive and organizational stressors. *Journal of Sports Sciences*, 23(10), 1129–1141. <https://doi.org/10.1080/02640410500131480>

- Hartley, C., & Coffee, P. (2019). Perceived and received dimensional support: Main and stress-buffering effects on dimensions of burnout. *Frontiers in Psychology*, 10, 1724. <https://doi.org/10.3389/fpsyg.2019.01724>
- Jones, R. L., & Wallace, M. (2005). Another bad day at the training ground: Coping with ambiguity in the coaching context. *Sport, Education and Society*, 10(1), 119–134. <https://doi.org/10.1080/1357332052000308792>
- Kerr, G., & Dacyshyn, A. (2000). The retirement experiences of elite, female gymnasts. *Journal of Applied Sport Psychology*, 12(2), 115–133. <https://doi.org/10.1080/10413200008404218>
- Kessler, R. C., & Üstün, T. B. (2004). The World Mental Health (WMH) survey initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *International Journal of Methods in Psychiatric Research*, 13(2), 93–121. <https://doi.org/10.1002/mpr.168>
- Kozin, O., Cretu, M., Boychuk, Y., Kozina, Z., Korobeinik, V., & Sirenko, P. (2022). Comparative characteristics of the functional state of future art teachers and other pedagogical specialties students. *Health, Sport, Rehabilitation*, 8(4), 20–31. <https://doi.org/10.34142/HSR.2022.08.04.02>
- Kozin, O., Kozina, Z., Cretu, M., Boychuk, Y., Pavlović, R., Garmash, I., & Berezhna, Y. (2023). Vegetative regulation of vascular tone and features of the nervous system of pedagogical universities students. Is there a relationship with professional specialization?. *Health, Sport, Rehabilitation*, 9(1), 29–44. <https://doi.org/10.34142/HSR.2023.09.01.03>
- Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal and coping. New York: Springer Pub. Co.
- Leiter, M. P., & Maslach, C. (2005). Banishing burnout: Six strategies for improving your relationship with work. Jossey-Bass/Wiley.
- Lemyre, L., & Tessier, R. (1988). Mesure de Stress Psychologique (MSP): Se sentir stressé-e [Measurement of psychological stress: To feel stressed]. Canadian Journal of Behavioural Science / Revue canadienne des sciences du comportement, 20(3), 302–321. <https://doi.org/10.1037/h0079945>
- Lin, C. H., Lu, F. J. H., Chen, T. W., & Hsu, Y. (2021). Relationship between athlete stress and burnout: a systematic review and meta-analysis. *International Journal of Sport and Exercise Psychology*, 20(5), 1295–1315. <https://doi.org/10.1080/1612197X.2021.1987503>
- Lupien, S. J., Maheu, F., Tu, M., Fiocco, A., & Schramek, T. E. (2007). The effects of stress and stress hormones on human cognition: Implications for the field of brain and cognition. *Brain and cognition*, 65(3), 209–237. <https://doi.org/10.1016/j.bandc.2007.02.007>
- Maslach, C. (1978). The client role in staff burnout. *Journal of Social Issues*, 34(4), 111–124.
- Maslach, C. (1998). A multidimensional theory of burnout. In C.L. Cooper (Ed.). *Theories of Organizational Stress* (pp. 68–85). Oxford: Oxford University Press. <https://doi.org/10.1093/oso/9780198522799.003.0004>
- Maslach, C., & Jackson, S. E. (1986). MBI: Maslach Burnout Inventory; Manual Research Edition. Palo Alto, CA: Consulting Psychologists Press.
- Maslach, C., & Jackson, S. E. (1981). The Measurement of Experienced Burnout. *Journal of Occupational Behaviour*, 2, 99–113. <https://doi.org/10.1002/job.4030020205>
- Moen, F., Hrozanova, M., Stiles, T. C., & Stenseng, F. (2019). Burnout and perceived performance among junior athletes – associations with affective and cognitive components of stress. *Sports*, 7(7), 171. <https://doi.org/10.3390/sports7070171>
- Nolen-Hoeksema, S. (2012). Emotion regulation and psychopathology: the role of gender. *Annual Review of Clinical Psychology*, 8, 161–187. <https://doi.org/10.1146/annurev-clinpsy-032511-143109>
- Nosov, P., Zinchenko, S., Popovych, I., Safonov, M., Palamarchuk, I., & Blakh, V. (2020). Decision support during the vessel control at the time of negative manifestation of human factor. *CEUR Workshop Proceedings*, 2608, 12–26. <https://ceur-ws.org/Vol-2608/paper2.pdf>
- Olusoga, P., Butt, J., Maynard, I., & Hays, K. (2010). Stress and Coping: A Study of World Class Coaches. *Journal of Applied Sport Psychology*, 22(3), 274–293. <https://doi.org/10.1080/10413201003760968>
- Plokhikh, V., Popovych, I., Shevchenko, N., Losiyevska, O., Kolly-Shamne, A., & Akimov, R. (2025). Time Perspective of Forced Migrants within the National Boundaries and Abroad. *Journal of Education Culture and Society*, 16(1), 125–142. <https://doi.org/10.15503/jecs2025.2.125.142>
- Popovych, I., Karpenko, Y., Matusiak, H., Dobrovolska, N., Scolota, E., Kalenchuk, V., & Hoian, I. (2026). Emotional intelligence in shaping junior athletes' productive coping strategies. *Health, Sport, Rehabilitation*. <https://doi.org/10.58962/HSR.2026.1331>
- Popovych, I., Yaremchuk, N., Yakovleva, S., Kariyev, A., Sadykova, A., & Kulbida, S. (2024). Research on the Types of Future Teachers' Self-Realization Under Conditions of a Digital Educational Environment. *Journal of Education Culture and Society*, 15(1), 435–451. <https://doi.org/10.15503/jecs2024.1.435.451>
- Purvanova, R. K., & Muros, J. (2010). Gender differences in burnout: A meta-analysis. *Journal of Vocational Behavior*, 77, 168–185. <https://doi.org/10.1016/j.jvb.2010.04.006>
- Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. *Journal of Organizational Behavior*, 25(3), 293–315. <https://doi.org/10.1002/job.248>

- Schaufeli, W. B., & Taris, T. W. (2014). A critical review of the job demands-resources model: Implications for improving work and health. In G.F. Bauer & O. Hämmig (Eds.). *Bridging occupational, organizational and public health: A transdisciplinary approach* (pp.43–68). Springer Science + Business Media. [https://doi.org/10.1007/978-94-007-5640-3\\_4](https://doi.org/10.1007/978-94-007-5640-3_4)
- Smith, R. (1986). Toward a cognitive-affective model of athletic burnout. *Journal of Sport Psychology*, 8, 36–50.
- Swami, V., Weis, L., Barron, D., & Furnham, A. (2018). Positive body image is positively associated with hedonic (emotional) and eudaimonic (psychological and social) well-being in British adults. *The Journal of Social Psychology*, 158(5), 541–552. <https://doi.org/10.1080/00224545.2017.1392278>
- Thelwell, R. C., Weston, N. J. V., & Greenlees, I. A. (2010). Coping with stressors in elite sport: A coach perspective. *European Journal of Sport Science*, 10(4), 243–253. <https://doi.org/10.1080/17461390903353390>
- Thelwell, R. C., Weston, N. J. V., Greenlees, I. A., & Hutchings, N. V. (2008). Stressors in elite sport: A coach perspective. *Journal of Sports Sciences*, 26(9), 905–918. <https://doi.org/10.1080/02640410801885933>
- Tolin, D. F., & Foa, E. B. (2006). Sex differences in trauma and posttraumatic stress disorder: a quantitative review of 25 years of research. *Psychological bulletin*, 132(6), 959–992. <https://doi.org/10.1037/0033-2909.132.6.959>
- Tuck, D., & Patlamazoglou, L. (2019). The relationship between traumatic stress, emotional intelligence, and posttraumatic growth. *Journal of Loss and Trauma*, 24(8), 721–735. <https://doi.org/10.1080/15325024.2019.1621543>
- Vealey, R. S. (2007). Mental skills training in sport. In G. Tenenbaum & R. C. Eklund (Eds.). *Handbook of sport psychology* (3<sup>rd</sup> ed., pp. 287–309). New Jersey: John Wiley & Sons, Inc.
- Weiss, M. R., & Chaumeton, N. (1992). Motivational orientations in sport. In T. S. Horn (Ed.) *Advances in sport psychology* (pp. 61–99). Human Kinetics.
- Zebrowitz, L. A., & Montepare, J. M. (2008). Social psychological face perception: why appearance matters. *Social and Personality Psychology Compass*, 2(3), 1497–1517. <https://doi.org/10.1111/j.1751-9004.2008.00109.x>
- Zinchenko, S., Tovstokoryi, O., Nosov, P., Popovych, I., Kobets, V., & Abramov, G. (2020). Mathematical Support of the Vessel Information and Risk Control Systems. *CEUR Workshop Proceedings*, 2805, 335–354. <https://ceur-ws.org/Vol-2805/paper25.pdf>