

THE RELATION BETWEEN DISRUPTIVE FACTORS AND SUCCES IN SAILING

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Abstract: *There are many factors that affect the success of sailors. Psychological factors are some of the unavoidable ones that are connected to the sports performance. One of the key factors is anxiety which is changing according to the experience and the situation the sportsmen find themselves in. The goal of this paper was to determine the effect of disruptive factors on the success in sailing conducted on 29 students of Kinesiology faculty in Zagreb. In the research wave height, visibility, wind strength and anxiety level were measured and analysed. Anxiety was analysed through multidimensional approach to anxiety as a temporary state of the examinee, and the anxiety as a personality trait. Every examinee has filled out the Endler EMAS-T questionnaire which evaluates the anxiety as a personality trait, while everyday they were filling out EMAS-S questionnaire prior to every regatta, so that current anxiety could be compared to the regatta results. Statistically significant correlation between anxiety and success in sailing was proved in 2 out of 8 regattas, so it can hardly be said that the hypothesis was proved. Statistical significance was proved in lessening of the somatic anxiety level of sailors in correlation with the number of days and the exposure to the stressor. It can be concluded that the level of anxiety is changing the more days passes and the more the sailor is exposed to the stressor and that some indications of the correlation of anxiety and the success in regatta sailing exist.*

Keywords: *anxiety, education, regatta, students, water sports.*

INTRODUCTION

Sport sailing is very hard to observe from the scientific aspect. Sailing is a complex activity demanding a plethora of competencies, which in turn necessitates conducting of multidisciplinary research in order to envelope the great number of factors affecting the success (Sjøgaard, 2015). Reason for that is a multitude of external influences producing new and different conditions continually, conditions to which sailors need to continually adapt. To achieve top sports performance, beginner sailors, the same as more advanced ones, have to fulfill not only motor and functional demands, but also psychological ones, which will enable the sailor unhindered participation in the activity, especially in the conditions of competition. Besides different external influences, internal ones, such as the level of cognitive or autonomous anxiety, motor and functional abilities, experience, fatigue, hunger or dehydration, arousal of the nervous system, also affect the success in sailing (Ilić et al., 2022). Arousal of the nervous system represents neutral psychological phenomenon which can be connected to the negative (anxiety) and positive (thrill) affects but is not synonymous to the either of them (Cox, 1998). Any activity, depending on its structure and complexity, demands specific level of arousal to achieve the ideal result. Any sports skill has its theoretical optimal level of arousal. This optimal arousal level varies as a function of complexity of the task and the skill level of the athlete, i.e., highly skilled athletes and athletes performing simple task need moderately elevated level of arousal for maximum performance. Less skilled athletes and those performing complex task require a relatively low level of arousal (Cox, 1998). In former research the optimal level of arousal in sailing has not been researched, but, as in other sports, the inverted U theory is applied – performance is at lowest level if arousal is extremely high or extremely low, it is at highest level if arousal is moderate, or optimum. There are a few theories explaining the effect of inverted U theory. Manzanares et al. (2017) confirmed an inverted-U theory in sailing, linking performance to attentional focus. Studying the Optimist class, they found that successful sailors maintain focus on key start factors, while less successful sailors shift attention to irrelevant cues. Almost every athlete is under the influence of competition anxiety which, depending on the intensity and type of activity he or she performs, can help or be a disruptive factor in reaching his/her potential and success. This shows that anxiety significantly affects athlete sports performance, which introduces the need for anxiety with the

aim of reaching better results (Dinter et al., 2021). Based on his research, Kos (2018) points out that optimal level of stress and exposure to stressors is preferable, with aim of professional and private growth in different aspects of life, which can be closely related to the sports activities too. In competitive sailing the main stressor is regatta, comprising the fear of failure, fear of social evaluation or other factors. Psychologists are researching anxiety through two spheres. Anxiety can be seen as a personality trait, and as such is defined as predisposition to perceive certain environmental situations as threatening and to respond to these situations with increased anxiety level. On the other hand, anxiety can be seen as a state, defined as immediate emotional state characterized by apprehension, fear, tension, and increase in physiological arousal (Spielberger, 1971). Anxiety can be divided into cognitive and somatic. Cognitive state anxiety refers to the mental component caused by fear of failure, fear of negative social evaluation, and other factors (Cox, 1998) that are certainly affecting the actions of sailors and their ability to reach quality prompt and right decisions during regattas. Somatic state is a physical component pertaining to the physiological body reactions (Cox, 1998). To observe precompetitive anxiety and influence of that disruptive factor on success in sailing as precisely as possible, and in order to compare it to the results, anxiety should be observed both as a personality trait and through the multidimensional model of state anxiety. Having in mind that success in sailing is mainly connected to the different motor abilities, negative influence of anxiety on the physical demands of regatta can greatly affect the final placement. The aim of this research is to determine if the level of cognitive and autonomous anxiety and anxiety as a personality trait is a predictor of the success in regatta sailing together with the influence of different external factors such as wave height, wind strength and visibility.

METHODS

The sample consisted of 29 fourth and fifth year kinesiology students specializing in sailing at the University of Zagreb. To obtain more quality observance and assessment of the results, top sailors were excluded from the research. Disruptive factors variables in sailing observed in the research were: wind strength (WS), wave height (WH), visibility (V), level of anxiety as personality trait (ANXtrait), level of cognitive anxiety state (anxCOG) and level of autonomous/somatic anxiety state (anxAUTON). Also, summative ranking for individual athletes in several regattas were observed, in which higher value represents inferior result. Weather conditions (wind strength, visibility, wave height) were recorded using online sources and adjusted when necessary based on regatta field observations. The last two measuring instruments in the research are Endler's questionnaires for anxiety out of which EMAS-T and EMAS-S questionnaires were used in the research. EMAS-T assesses the level of anxiety as a personality trait in an examinee. EMAS-S is used to measure the current anxiety state. The questionnaire is constructed of 20 parts, out of which 10 parts assesses cognitive anxiety, while the rest of 10 parts assesses autonomous- emotional component of anxiety as a state. In both questionnaires assessment of dimensions is done through the Likert 5-point scale. Also, average values for trait anxiety (ANXtrait), and state anxiety in two dimensions (anxCOG, anxAUTON) were calculated. Further data analysis was performed in SPSS (Statistical Package for Social Sciences) program. In the research two protocols were implemented. The first involved completing the EMAS-T questionnaire to assess trait anxiety, which students filled out online on the second day of classes to reduce the influence of first impressions. The second protocol spanned 4 days. Before sailing, students completed the online EMAS-S questionnaire to assess state anxiety, and the number of students per sailboat was recorded. After 2-3 hours of training, one or more regattas were held, and final rankings of the helmsman were recorded.

RESULTS

During the research, variables visibility (V) and wave height (WH) (Table 1) showed very similar values, and therefore were excluded from the further analysis due to the small variations. Wind strength, according to the Beaufort scale, 4 to 6 knots represent level 2 and is defined as a breeze. Most of the research was conducted in that wind strength range, or ± 0.5 knots, which does not make a significant difference for beginner sailing on Laser Stratos sailboats. Average level of trait anxiety (Table 2) is relatively low in the sample, and its values are more on low or medium level.

Table 1. Descriptive values of weather conditions.

Variables	Day 1	Day 2	Day 3	Day 4
Visibility (km)	10-20	12-16	10-16	10-12
Wave height (m)	0.3	0.5	0.4	0.3
Wind strength (kts)	6.5	3.8	4.0	4.5

Table 2. Trait Anxiety in Different Groups of Examinees

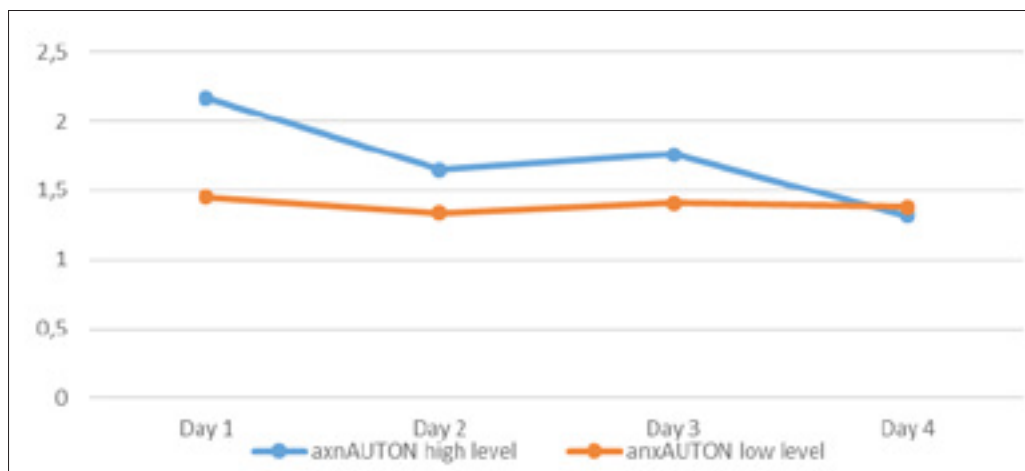
Examinee group	Average level of trait anxiety
Men	2.66/5
Women	3.00/5
The entire sample	2.73/5 – St.dev 0.58

Autonomous state anxiety is significantly varying in the function of ordinal number of days, and that condition is even more significant in examinees assessed with higher levels of trait anxiety. Cognitive state anxiety varies depending on the function of ordinal number of days, but that variations are not systematic, and post-hoc tests have showed that days cannot be differentiated among themselves with any level of certainty. Also, it can be observed that assessed level of trait anxiety statistically significantly and in a better way predicts the level of cognitive state anxiety of the examinee, while gives only marginal predictions on the level of autonomous state anxiety (Table 3).

Table 3. Results of Covariance Analysis Taking the Ordinal Number of Days as a Source of Variability Inside the Group, Trait Anxiety as a Source of Variability Between the Groups and Cognitive and Autonomous Anxiety as Dependent Variables

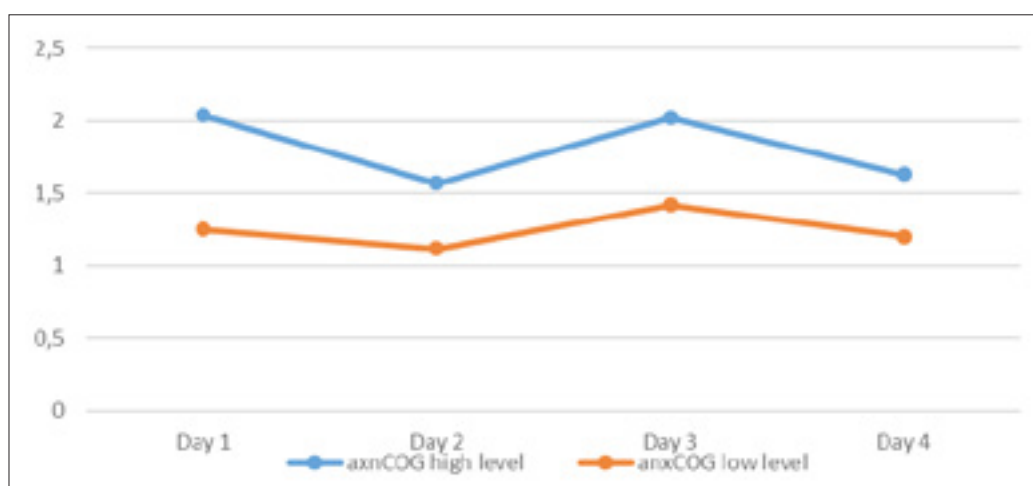
Source of variance	measure	df	F	p
Ordinal number of days	Cognitive anxiety	3 / 66	8.79	<.001
	Autonomous anxiety	3 / 66	5.90	<.001
Trait anxiety	Cognitive anxiety	1 / 22	9.27	<.01
	Autonomous anxiety	1 / 22	3.81	.06
Ordinal number of day x trait anxiety	Cognitive anxiety	3 / 66	1.24	.30
	Autonomous anxiety	3 / 66	9.93	<.01

In graph 1, a statistically significant decrease in autonomous anxiety (anxAUTON) can be observed as a function of the ordinal day number and the level of trait anxiety. The decrease of value is more significant in examinees that were assessed with higher level of trait anxiety.



Graph 1. Assessed mean value for variable anxAUTON

In graph 2 assessed mean value for the level of cognitive state anxiety (anxCOG) is varying with the function of ordinal number of day depending on the disruptive factors for that day. Also, it can be noted that in the examinees with higher level of trait anxiety, higher level of cognitive state anxiety is assessed. In the regattas during the first and second day of measuring, there was no statistical significance in any of the disruptive factors.



Graph 2. Assessed mean value for variable anxCOG

In Table 4 values of statistical significance for individual disruptive factor on the third day are represented for the success in the third day regattas. Marginal effects were shown for influence of state anxiety (variables anxCOG and anxAUTON) which shows that the examinees with the higher level of anxiety, especially cognitive component of it, had lower result in regattas of the third day. Trait anxiety in this case was not significant.

Table 4. Relation of the Level of State Anxiety on the Third Day to the Success in Sailing on the Third Day With the Dependant Variable Suma.rank_03

Source of variance	df	F	p
ANXtrait	1 / 22	0.80	.38
Cognitive state anxiety on the third day	1 / 26	4.72	.04
Autonomous state anxiety on the third day	1 / 26	3.08	.09

Table 5 shows that, as in first two days, on the fourth day there is no statistical significance in relation of some of disruptive factors to the success in sailing either. During the data analysis, an interesting regularity was noticed ($r=0.44$, $p<0.03$) in which the final ranking of the third day predicted the level of cognitive, but not autonomous state anxiety of examinees the following day.

Table 5. Relation of the Level of State Anxiety on the Fourth Day to the Success in Sailing on the Fourth Day With the Dependant Variable Suma.rank_04

Source of variance	df	F	Sig.
ANXtrait	1 / 22	0.03	.87
Cognitive state anxiety on the fourth day	1 / 26	0.08	.78
Autonomous state anxiety on the fourth day	1 / 26	0.03	.87

DISCUSSION

Competitive sports have a potential for developing a certain level of stress, and also anxiety, so the importance of intervention is stressed in such sports, with the aim of decreasing negative emotional states and increasing of success (Hanton et. al 2015; Weinberg, 2015). Different conditions to which sailors have to constantly adapt are directly influencing the results in regatta sailing (Oreb, Prlenda and Kolega, 2013). Some of these conditions, such as wind strength, wave height and visibility, were directly observed in this research too, but due to their low values and variations couldn't affect the success, and therefore were excluded from the research. Results have confirmed that the level of cognitive and somatic anxiety can affect the success in regatta sailing with statistical significance, but this hypothesis was confirmed in only 2 out of 8 regattas. It can hardly be concluded on the basis of such a small number of results in questionnaires connected to the success in regatta sailing, that there is a valid confirmation of that constataction. There is a number of external factors which could influence forming of the results. Considering that all the results of questionnaires had to be connected to the results of regatta sailing, the research could not be conducted anonymously, but the data was available only to the mentor and the examiner. Due to the inanonymity of the questionnaire it can be questioned to what extent it influenced the thruthfulness of answers, or did examinees adapt their answers to their everyday social role. Also, data concerning the level of anxiety show very low values, attypical for athletes, especially if they are viewed in the context of experience that examinees had in sailing, so the validity of those results can also be questionable. Through this research it was confirmed with statistical significance ($p < 0.05$) the decrease of state anxiety through constant exposure to the stressor, which was proved especially in somatic anxiety of the examinees. In training with beginners greater progress can be expected in the later days of training, when the athletes will be accustomed to the new and unknown environment. For cognitive state anxiety statistical significance was also determined, but it changed over the days unsystematixcally, which can be assigned to the other disruptive factors, such as fitness, fatigue or hunger that were present during the regattas at the end of the training day. One of the factors affecting the level of measured cognitive, but not autonomous anxiety on the fourth day, was the overall ranking of the examinees in the regattas on the third day. The examinees with the better result at the end of the third day, had lower level of cognitive anxiety on the fourth day, and the examinees with lower result on the third day had higher level of cognitive anxiety the following day. It showed a potential disruptive factor that should be taken into consideration in the further researches. Regattas were allways, due to the teaching of other elementary knowledge, conducted at the end of teaching process, and therefore the period between questionnaires and first regattas was 2 to 3 and a half hours, which can result in different data concerning anxiety. The time period between filling out the questionnaire and conducting the activity greatly affects the result, especially in somatic anxiety (Cox, 1998). Also, the decrease of somatic anxiety after the beginning of the competition is pointed out, in this case after the first regatta. In the occurence of anxiety in sailing Maynard (2006) points out possibilities of conducting unimodal or multimodal interventions, depending on the type of anxiety. If there is a perception of one of the anxiety types (cognitive or somatic), in most cases unimodal intervention is applied, but if both types of anxiety occur, multimodal intervention is conducted, under condition that there is enough time to apply quality intervention. Among unimodal interventions most significant are applied relaxation (Ost, Jerremalm and Johanson, 1988) and positive mind control (Suin, 1987), while among multimodal interventions stress management training stands out (Smith, 1980). Further research is necessary to define factors affecting the cognitive state anxiety of examinee, the dimension of anxiety which showed in a part of this research to be able to predict sometimes ($p < 0.041$) the final result of the regatta. Considering that sailing consists of wide spectre of classess that therefore use different vesels, different demands are occuring in relation to different positions. Consequently, future research should be focused on specific positions on sailboats. It especially refers to big class regattas, in which great number of different possitions exists, and certain positions demand fast and strong crew to perform certain elements (Neville, Pain & Folland, 2009). Such positions would expectedly demand slightly higher level of arousal, while, on the other hand, position of helmsman or tactitian for right and prompt decision making would demand slightly lower level of arousal so the focus can be turned to the greater number of environment factors. Some authors are pointing out that the number of days spent on the water and number of perfomances on regattas positively affect the success in sailing (Tan & sur., 2006; Caraballo, González-Montesinos & Alías, 2019). Considering that in the research students of 4th and 5th year were included, it can be assumed that their level of skill is not the same, but due to the structure of teaching process it was not possible to group the sample according to the experience and skill which would ensure more reliable results. Most of the fifth year students participated in more practical classess,

which brings them advantage over fourth year students. Some of the examinees perfected their skills by working in sailing clubs, putting them in advantageous position compared to other colleagues.

CONCLUSION

Research of the disruptive factors in the complex sport as sailing, requires great effort and applying of different aspects. Therefore the fact that similar or connected research could not be found is not surprising. Besides numerous, unpredictable external disruptive factors, internal disruptive factors of the sportsmen are very difficult to measure in the environment and the proces the examinees are in. On the other side, laboratory conditions are difficult or even impossible to simulate due to the very high number of affecting factors. Surely, one solution is to conduct numerous similary researches excluding most of the disruptive factors and focusing on few selected ones, contributing thus to the reliability of results. Based on these results, a connection between anxiety and performance in sailing can be observed in only 25% of the conducted regattas; however, this does not allow for theoretical conclusions regarding the relationship. However, the reduction in anxiety levels through continuous exposure to the stressor was confirmed with statistical significance. Therefore, when working with beginners, greater progress can be expected in the later stages of training, as athletes adapt to the new environment.

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Primljen: 10. mart 2025. / Received: March 10, 2025
Prihvaćen: 10. april 2025. / Accepted: April 10, 2025

