

## PRELIMINARY RESEARCH OF SUPERSTITIOUS BEHAVIOR IN ORIENTEERING

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### Summary

Superstitious behaviors stem from athletes' need to reduce competitive pressure and uncertainty of outcome, as it gives them the illusion of control over a number of external factors (luck factors) that may affect their competitive result. This study aims to determine the presence of superstitious behavior, its relationship to age, gender, competitive experience and self-confidence of competitors, and adequacy of Bleak and Frederick scale (1998) use to our athletes. From the original Superstitious Rituals Questionnaire developed by Bleak and Frederic (1998), after translation into Serbian, four items were removed, and the question of confidence in one's own orienteering skills was added, and the respondents were allowed to list personal superstitious behaviors not mentioned in the questionnaire. The questionnaire was completed by 78 orienteers (45 men, 33 women), aged 10-70 years and with an average competitive experience of 15.2 years. Based on the obtained research results, it was determined that from 10 to 68% of Serbian orienteers use 15 out of a total of 41 superstitious rituals, that the average number of these rituals per respondent was small ( $M/SD = 5.38 \pm 3.46$ ), that their effectiveness assessed on a scale of 0-5 was low ( $2.88 \pm 1.31$ ), that no one used 6 rituals, and that a significant number of orienteering-specific rituals were listed that were not present in the applied questionnaire. There is a significant positive correlation between the number of uses of superstitious rituals and female gender ( $p=.25$ ), and a negative one with age, competitive experience, and self-confidence in orienteering skills ( $p=-.40; -.38; -.39$ , respectively). The fact that Serbian orienteers practice a relatively small number of superstitious behaviors listed in the applied questionnaire, mentioning at the same time, other superstitious rituals that they usually consider necessary routines of pre-start preparation, indicate the need to construct a new superstitious behavior questionnaire specific to orienteering and our sports culture.

**Key words: RITUALS / AGE / GENDER / COMPETION EXPERIENCE / SELF-CONFIDENCE / ORIENTEERING**

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## INTRODUCTION

Superstitious behavior is characteristic of people of all cultures. It is in man's nature and his desire to control the outcomes of events in his life, to make them more predictable and favorable, even though it is impossible by rational actions. Although his logical reasoning tells him that his superstitious behavior has no fundamental basis in the scientifically proven connection between cause and effect, a man still does not renounce his superstitious beliefs.

Superstitious behaviors originate from the cultural and ethnic milieu of the individual and society. Taking the example of sport, they have, among other things, the function of reducing the pressure and uncertainty of the competitive outcome for the athlete. They give him the illusion of control over numerous external factors (luck factors), which, according to his belief, can influence his competitive result.

Ciborowski (1997) speaks of two kinds of superstition in sport. The first is coincidental superstition, or superstition of Skinner's pigeons' type. The second is causal superstition, implying the existence of causal relation between behavior and the impact on the outcome of events despite the lack of scientific evidence for such a relation. Superstitious behaviors have always existed in sports and took place directly before the very eyes of sports fans, the media, or more indiscreetly in less visible forms. However, the more intense interest of sports psychologists and experts in other social sciences and humanities in their study dates back to the second half of the last century. It happened when the stigma of negativity was removed from them and when the athletes' belief that practicing rituals calmed them down, helping them to enter the competition process calmer, with more confidence, and with a sense of control over the outcome, was respected and accepted, even if it was just an illusion.

Most researchers (Bisht, Sardar & Pandey, 2016; Bleak & Frederik, 1998; Brevers, Nils, Dan, & Noel, 2011; Donti, Katsikas, Stavrou & Psychountaki, 2007; Domotor, Ruiz-Barquin & Szabo, 2016; Ptacek, 2016; Ofori, Biddle & Lavalley, 2012; Schippers & Van Lange, 2006; Todd & Brown, 2003) use a general Womack's definition of superstition as "unusual, repetitive, rigid behaviour that is perceived to have a positive effect by the actor, whereas in reality there is no causal link between the behaviour and the outcome of an event", or her definition of sport-specific superstition as "actions which are repetitive, formal, sequential, and distinct from technical performance and which the athlete believes to be powerful in controlling luck or other external factors" (Womack, 1992, p. 192). Researchers in sports also rely on Moran's definition of superstitious behavior in sports, which reads: "behavior that does not have a clear technical function in skill execution, but it is believed to control luck or other external factors" (Moran, 1996; as cited in Foster, Weigand, & Baines, 2006).

Certain researchers dealing with this phenomenon also use Merriam-Webster Dictionary, defining superstition as "a belief or practice resulting from ignorance, fear of the unknown, trust in magic or chance, or a false conception of causation" (Merriam-Webster.com Dictionary); as well as "irrational beliefs that an object, action, or circumstance that is not logically related to a course of events influences its outcome" (Damisch, Stoberock, & Mussweiler, 2010),

Just as superstitions in everyday life should be distinguished from prejudices (Živanović, Rađenović and Savić, 2012), in sports, it is also important, but also quite essential, to distinguish them from pre-competition routines (Allen, Thornton & Riby, 2020; Basiaga-Pasternak, 2019; Bleak & Frederic, 1998; Ciborowski, 1997; Domotor, Ruiz-Barquin & Szabo, 2016; Donti et al., 2007; Gupta & Dutt, 2019). Although both superstitious rituals (SR) and pre-competition routines (PCR) include formal, sequential, and often repetitive elements, they differ in their function (control of luck or performance), origin (they are developed by athletes themselves - learned with the help of experts), content and rigidity. Domotor et al. (2016) point out that the difference between them, although often unclear, still exists. While athletes try to control highly stressful and uncertain competitive performances and luck with superstitious rituals, PCRs are deliberately learned with the help of sports experts. Their goal is to influence the quality of performance techniques directly. Superstitious

behaviors in sports usually occur by chance. Athletes irrationally believe that they bring them luck, even though they have no direct connection with the technique of performance. PCRs directly influence the technique of performance (Foster & Weigand, 2006). They include cognitive and behavioral techniques for regulating excitement, control of attention and concentration, reduction of anxiety, strengthening of self-confidence, etc. The most important is that the athlete has control over them. Superstitions help the athlete to maintain emotional control, to create the illusion of control over the outcome of his performance, to decrease his level of anxiety, increase his self-confidence. They are effective only as long as he believes in them. They have a rigid timing and fixed order of execution. Thus, the athletes have a feeling of being controlled by rituals instead of having control over them.

Superstitious behaviors of athletes were previously looked upon mostly negatively. They were considered to have a deteriorating role in performance, which contributed to the relatively late (somewhere in the middle of the last century) beginning of scientific research on their nature, prevalence, and role in sports. Nowadays, numerous data are obtained in the studies of athletes with different levels of success regarding factors (personal and situational) related to the tendency for superstitious rituals or indicating the benefits of their use. It is almost impossible to mention all studies dealing with issues of superstition in sport, regardless of the relevancy of their results. However, it seems that the research of Bleak & Frederick (1998) has to be mentioned. In addition to determining the prevalence of superstition in football, gymnastics, and athletics, it also gave rise to the first instrument for its measurement, the Superstitious Ritual Questionnaire (SRQ), launching an "avalanche" of research that has enriched our knowledge of this ubiquitous phenomenon of modern sport.

Two recent studies also deserve attention, as they provide an excellent phenomenological analysis of superstition in sports (del Rosario, 2017) and a comprehensive review of the literature and research dealing with the connection between superstition and performance, the types, reasons, and sports in which it has been researched (Domotor et al., 2016). By far, the most significant number of researches of superstitious rituals were performed on basketball players (Barkoukis, Perkos & Kokkinopoulos, 2011; Brevers, Dan & Noel, 2011; Burke, Czech, Knight, Scott, Joyner, Benton & Roughton, 2006; Buhrmann, Brown & Zaugg, 1982; Buhrmann & Zaugg, 1981; Deol & Sing, 2017; Donti et al., 2007; Foster et al., 2006; Gupta & Dutt, 2019; Gregory & Petrie, 1972; Hodd, 2002; Womack, 1992; Zaugg, 1980 etc.), football players, American football players, baseball players, ice and field hockey players, athletes, tennis players, table tennis players, gymnasts, volleyball players, swimmers, golfers, boxers, ballet dancers, swordsmen, university athletes including athletes of various sports and competition levels.

Researchers have shown that there is a wide range of different forms of superstitious beliefs, from the general ones ("break your leg" and "knock on wood", avoiding the unfortunate number 13, the black cat, wearing the 'rabbit's foot' amulet ...), to personally specific or characteristic for certain sports only. Demystifying superstitions in sports, Neil (1982) tries to classify them according to the origin, referring to Coffin's typology (Coffin, 1971) with 3 categories: beliefs and actions coming from athlete's culture, superstitions related to a long tradition in a sport, and personal superstitions or eccentricities. Neal refers to Gmelch (1972) who classifies superstitions in baseball into three categories: rituals, taboos, and fetishes. Based on the manner of manifestation, i.e., types of activities, Živanović et al. (2012) divide superstitions into verbal (words and phrases that athletes address to themselves), nonverbal (gestures, facial expressions, sounds, body movements), and mixed (rituals that include both verbal and nonverbal activities). Starting from Jahoda's definition of superstition (1969) as "belief that one's destiny is in the hands of unknown external forces controlled by forces over which man has no control," Gregory & Petrie, (1972, p. 2) have separated general and sports superstitions into several subcategories (uniform, clothing, equipment, routine, objects/amulets, food, religion, spectators, hair, hands). Their classification is very similar to the one used by Bleak & Frederick,

(1998) in their Superstitious Ritual Questionnaire: clothing and appearance, fetishes, rituals before the performance, during the performance, team rituals, prayers and superstitions of the coach.

Many researchers were looking for answers to questions about the nature and prevalence of superstition in sports, factors (personal and situational) related to their practice, and the effects of their use on the psychological state of athletes and the quality of their performance. Without detailing the analyzed studies, however, their results can be summarized as follows: (i) rituals are characteristic of all sports and cultures; (ii) athletes use them to prepare for performance, reduce anxiety, boost self-confidence, and improve performance; (iii) they appear in various forms and contents; (iv) they are generally more prevalent among female athletes; (v) they have a placebo effect and give athletes the illusion of control over stressful competitive situations; (vi) athletes manifest less general superstition than non-athletes, but their superstitious rituals are more related to sport; (vii) superstitious rituals differ from the pre-start routines; (viii) the use of SR is influenced by various factors; (ix) elite athletes are more superstitious than non-elite, and those from team sports than athletes from the individual ones; (x) SRs have a positive effect on the quality of performance in sport; (xi) higher levels of sports mastery and competition are associated with greater use of superstitious behavior; (xii) the position in which athletes play, and the type of sport affect the tendency for superstition; (xiii) each sport has its dominant specific superstitions; (xiv) the original athletes' culture influences their superstitious behavior; (xv) most studies have confirmed a positive association between religiosity and superstitious behavior; (xvi) certain characteristics of personality are predictors of superstitious behavior; (xvii) athletes with an external locus of control exhibit more superstitious behavior than athletes with an internal locus of control; (xviii) athletes with more prominent need for control are more likely to use superstitious behavior serving them to gain control in competitions; (xix) there are no consistent results on the prevalence of A-type behavior pattern among athletes of different competing levels, nor on its contribution to superstitious behavior; (xx) there is a positive correlation between the level of competitive anxiety and the number of superstitious behaviors; (xxi) a positive correlation has been established between sports identity and superstitious behavior, and a negative correlation between sports self-confidence and superstitious behavior; (xxii) competing experience is negatively related to superstition; (xxiii) a negative correlation was found between the internal attribution style and the number of superstitious rituals; (xxiv) the connection between optimism and pessimism and superstition in sport is ambiguous and requires further research; (xxv) commitment to rituals in sports is greater when the uncertainty and importance of the game is greater, which is attributed to the mediating effect of psychological tension.

Having in mind that it was not possible to find a study dealing with superstition in orienteering in the available literature, and knowing, based on own experience, that such behaviors exist, our non-experimental observation had several goals: (1) to determine the prevalence of superstitious rituals among orienteering athletes in Serbia; and (2) to investigate the level of confidence regarding the efficacy of superstitious rituals. Moreover, the connection of superstition with sex, age, competitive experience, and level of self-assessment of orienteering competitive abilities (conditional sports self-confidence) were included. A specific goal of this research is the assessment of the adequacy of the original Superstitious Ritual Questionnaire by Bleak & Frederick (1998) to assess the superstition level of orienteers. The doubt in the cognitive capacity of this questionnaire stems from the fact that it is intended for athletes in general and that most contemporary authors use it only as a starting point for constructing questionnaires specific to certain sports. Based on the above, this study represents only the first phase of research that should provide enough facts as a basis for the construction of instruments to assess superstition in orienteering.

Based on the insight of the results of previous research of superstition in sports and the own experiences of the authors in orienteering, the following research assumptions were made:

- The presence of superstitious rituals among orienteers and the belief in the effectiveness of such behavior is similar to its prevalence among other athletes;

- There will be a connection between gender, age, and the competitive experience of orienteering athletes and their practice of superstitious behavior;
- There will be a difference between female orienteers and male orienteers regarding the larger number of rituals and the nature of ritual behavior whose effectiveness is more believed;
- Younger competition categories and orienteering athletes with shorter training and competition experience use rituals more often than older competitors, which mostly have a more significant number of years of competing experience.
- A negative correlation is expected between the level of confidence in orienteering skills (sports self-confidence) and the tendency for superstition.

## METHOD

### Sample of respondents

In the research 78 orienteers of both genders, 45 men (average age 38.7+/-20.6 years), and 33 women (average age 29.2+/-19.5 years), participated voluntarily in the competition categories from M/W12 to M/W70. Average male orienteers' competing experience was 19.1+/-15.8 years, but it was much less for the female orienteers: 9.9+/-9.9 years.

### Preliminary information to participants of observation

Via email of the Orienteering Association of Serbia, all orienteers were seven days earlier informed about the goals of the planned research, informed about the date of its realization, and asked to participate in it voluntarily. They obtained basic information on its importance and goals, the confidentiality of personal data, and the date of its realization. On the Serbian sprint championship (November 2020), the participants have completed the Questionnaire before or after the performance.

### Instrument

In the research, the original Superstitious Rituals Questionnaire (SRQ), developed by Bleak and Frederick (1998) was used, based on the scale used by Buhrmann, Brown, & Zaugg (1982). The Questionnaire contains 45 superstitious rituals divided into 7 categories: clothing/appearance and preparation, fetishes, rituals before the performance, during the performance, team rituals, prayers and coach. After translation into Serbian, the Questionnaire was slightly shortened and modified by deletion of 4 items (*When sub-in take jacket to player; Wear Same clothing under pads; Scoring first (point/s); Slap hand of scorer*) assessed as non-characteristic and incomprehensible to the sample. Participants were asked to indicate whether or not they used each of these rituals and then assess the degree of effectiveness of the rituals they used on a scale from 1 (not effective at all) to 5 (very effective).

Sports self-confidence is measured by the following question: Circle one number on a scale of 1-5 that best describes how confident you are in your orienteering skills? (1 = not at all; 5 = very sure). This measuring procedure with one item is identical to the one used by Ptacek (2016), examining the connection between superstition and self-confidence in sports. We consider it acceptable because sports self-confidence is not the main focus of this research but only one of several different factors that influence the practice of superstitious rituals in athletes.

In the last part of the Questionnaire, the participants were asked to list superstitious behaviors they use in orienteering, which are not contained in the Questionnaire. It reads: *It is crucial that you now list the superstitious behaviors you use in orienteering, which are not listed above. The number of your answers is unlimited (e.g., you drink a half bottle of water, or put left sneaker/sock first and then the right, you eat nothing before the race; drink water three times, cross yourself; 15 minutes before the start go to the toilet, etc.).*

### Statistical processing and data analysis

The results were analyzed by descriptive and comparative statistical procedures (t-test, one-way ANOVA with *Tukey Post Hoc* test). Exploratory factor analysis (FA) was performed to establish the number and nature of factors forming the basis of superstitious behavior in sport and to check whether they match the assumptions of Bleak and Frederick (1998) that superstitious behavior in sports measured by their Questionnaire falls into the seven above-mentioned categories.

## RESULTS AND DISCUSSION

The research results are presented in eight tables, and their analysis covers several areas of knowledge - from the prevalence and evaluation of the effectiveness of superstitious rituals in orienteering to their correlation with demographic, situational, and personal variables, identification and analysis of differences in superstitious behavior of the orienteers of different gender, age categories, competitive experience and levels of self-confidence in orienteering skills, to methodological issues related to the applied Superstitious Rituals Questionnaire.

### I Prevalence and belief in the effectiveness of superstitious rituals

The results given in Tables 1 and 2 show that 92.3% of the orienteers use 1-14 of the 41 rituals listed in the questionnaire, while 7.3% do not use any superstitious ritual. These findings are similar to the data obtained in the study of Brevers et al. (2011) who found that 75.8% of Belgian athletes of both genders used 1-12 rituals, and the study of Ciborowski (1997) where 73.2% of baseball players described themselves as superstitious. Examining the relationship between superstition and self-confidence in sports among athletes from various team and individual sports in American colleges, Ptacek (2016) found that 98% used at least one superstitious ritual, while the average number of rituals used was 13, which indicated their significantly higher tendency to superstitious behavior than it was the case with the orienteers of Serbia. When the average number of rituals practiced by orienteers (M/SD:5.38/3.46) is compared with the findings of the study by Bleak and Frederick (1998), the conclusion is that it is far less than that used by football players (M/SD: 10.75/7.07), gymnasts (M/SD: 15.33/5.55) and athletes (M/SD: 9.78/4.65). Data on the prevalence of superstitious behavior among athletes obtained in different studies are not adequate for comparison because they were obtained on samples of different sizes, from different sports, on different competing levels, with athletes of only one or both genders, from different cultures, or the superstition was measured by different instruments, and expressed as a percentage, the cumulative average score on the scale as a whole (e.g. Bisht et al., 2016), average scores for the scale as a whole or individual categories of superstition (e.g. Ptacek, 2016). For example, Gupta & Dutt (2019) report that 78% of the Indian team sports athletes are superstitious, Burger & Lynn (2005) report that 74.3% of baseball players are superstitious, while Yadav & Agashe (2018) find that 78% of the elite Indian team and individual sports athletes are very superstitious, 16% moderately superstitious, and 6% not at all superstitious. In certain studies (Deol & Singh, 2017; Ofori et al., 2012), there is no data on the number of superstitious behaviors used by athletes of different competing levels, gender, sport type, origin, or psychological characteristics. On the other hand, other studies show the percentage of use of each ritual (Bleak & Frederick, 1998; Basiaga-Pasternak, 2019; Gregory & Petrie, 1972) or category of rituals (Barkoukis, Perkos & Kokkinopoulos, 2011; Ptacek, 2016; Wiseman & Watt, 2004), so it is not easy to give a common conclusion about their prevalence.

The analysis of data in Table 2 shows that among the 15 rituals mentioned by at least 10% of the orienteers, rituals related to clothing, appearance, and preparation dominate (*way of dressing, warming up in isolation and silence, listening to the same music, eating the same meal, tying shoelaces in the same way, non-shaving on the day of the competition*), while the rituals most used by orienteers include rituals during the performance (“cheering, encouraging, 67.9%”), team rituals (“team cheering,

53.8% and team speech, 41.0%”) and rituals before the performance (“*warming up in the same way, 44.9%*”). Attitudes towards fetishes or lucky charms are mixed. The most significant percentage (25.6%) of orienteers reject them, not believing that they can bring them luck during the performance, 12.8% state that they have a lucky piece of clothing, and 10.3% wear a lucky amulet on the day of the competition. Data presented in Tables 3, 4, 5, 6, and 7 show whether and to what extent such beliefs are influenced by gender, age, and competitive experience.

Interestingly, the data on practicing certain rituals does not reflect the average score of their effectiveness, ranging from 1 (not effective at all) to 5 (very effective). The average effectiveness score (Table 1) is relatively low ( $M=2.88$ ,  $SD=1.31$ ), and a conclusion could be drawn that orienteers use them “just in case.” However, they don’t believe in their effectiveness to ensure good performance and controlling luck factors. Although the ritual of *touching and kissing lucky charm* use only 3.8% of athletes, its effectiveness score is the highest ( $M=3.67$ ), i.e., the orienteers usually consider it effective. It is followed by team ritual of *stacking hands*  $M=3.57$ ) used by only 9% of respondents, two praying rituals, also with low percent of usage (6.4% and 7.7%, respectively): *I am afraid I will have no luck if I don’t say a prayer* ( $M=3.40$ ), and *Before every performance, I pray for success* ( $M=3.33$ ). High score of the effectiveness of prayer before every performance, and a high percentage of usage of this ritual, also was confirmed in the study of Bleak & Frederick (1998), because it was used by 84% of football players, 83% of athletes and 67% of gymnasts, estimating it from *often* to *very efficient* ( $M= 4.38$ ; 4.08; 4.00, respectively).

**Table 1.** Number, percentage and average of mentioned rituals with average score of their effectiveness and confidence in orienteering abilities.

Number of mentioned rituals	f	% of respondents that have mentioned that number of rituals	
0	6	7.7%	
1	6	7.7%	
2	4	5.1%	
3	7	9.0%	
4	13	16.7%	
5	5	6.4%	
6	8	10.3%	
7	10	12.8%	
8	8	10.3%	
9	2	2.6%	
10	2	2.6%	
11	2	2.6%	
12	1	1.3%	
13	2	2.6%	
14	2	2.6%	
Total:	78	100%	
Variable	M	SD	Min-max
Number of used ritual	5.38	3.46	0-14
Effectiveness score of the ritual	2.88	1.31	1-5
Sports self-confidence	4.10	0.81	2-5

Our attention is especially deserved by those rituals (Table 2) that no orienteer has ever used (e.g., *putting lucky charms on the sneakers, painting the face, haircut on the day of competition, tattoo before the beginning of competition season, team prayer, and the importance of common prayer to the team*), indirectly showing that prayers, especially collective ones, are not an ingrained model of our culture and religion. Coach’s superstition, writing the numbers on the skin, bathing with ice-cold water on the day of competition, is not typical superstitious behavior in orienteering. Thus, the mentioned rituals are unnecessary for the future questionnaire intended for orienteers.

**Table 2.** Basic descriptive statistics for the sample as a whole for all researched rituals

Rituals	Frequency and percent		Effectiveness ratings	
	f	%	M	SD
1. Cheerleading (D1)	53	67.9	3.17	1.73
2. Team cheer (E2)	42	53.8	3.19	1.64
3. Warm-up using same routine (C6)	35	44.9	2.88	1.62
4. Pep talk important for good performance (E4)	32	41.0	3.16	1.35
5. Dressing well to feel better prepared (A3)	28	35.9	3.04	1.62
6. Check appearance in mirror (A1)	28	35.9	2.21	1.37
7. Need silence/seclusion before game (C4)	27	34.6	3.11	1.58
8. Tape shoes identically before game/meet (A14)	25	32.0	2.68	1.80
9. Discarding lucky charms (B6)	20	25.6	1.90	1.52
10. Music during warm-up (C2)	13	16.7	3.31	1.70
11. Have lucky item of clothing (B1)	10	12.8	3.10	1.29
12. Wear warm-up top or bottom the same way (A4)	10	12.8	2.60	1.78
13. No shaving on game/meet day (A8)	10	12.8	2.10	1.37
14. Eat same pre-game/meet meal on game day (A13)	8	10.3	3.00	1.69
15. Wearing lucky charm on game/meet days (B3)	8	10.3	2.50	1.51
16. Stacking hands (E1)	7	9.0	3.57	1.13
17. Unprepared if no pep talk (E3)	7	9.0	2.71	1.31
18. Pray for success before each game (F1)	6	7.7	3.33	1.97
19. Wearing lucky charm so it can't be seen (B5)	6	7.7	2.67	1.50
20. Afraid luck will run out if no prayer (F2)	5	6.4	3.40	1.34
21. Team mascot helps cause (B2)	5	6.4	2.60	1.82
22. Gum chewing (D2)	5	6.4	2.60	1.67
23. Snacks – energizers before contest (C3)	5	6.4	2.20	1.30
24. Taping body / even if not injured (C1)	4	5.1	3.00	1.15
25. Dressing sloppily – feel better prepared (A5)	4	5.1	2.50	1.91
26. Wearing lucky charm so that it can be seen (B4)	4	5.1	2.00	1.15
27. Kiss/touch lucky charm before game/race (B7)	3	3.8	3.67	2.31
28. No socks under running spikes (A15)	3	3.8	1.00	0.00
29. Coach is superstitious (G1)	2	2.6	2.00	1.41
30. Coach take lucky charm to game (G2)	2	2.6	1.50	0.71
31. Same trainer does taping job (C5)	1	1.3	3.00	-
32. Coach encourages prayer/meditation (G3)	1	1.3	5.00	-
33. Wear socks inside out for luck (A6)	1	1.3	1.00	-
34. Take ice bath morning of game (A9)	1	1.3	1.00	-
35. Carve number in flesh (A12)	1	1.3	1.00	-
36. Good luck markings on shoes (A2)	0	0.0	.00	.00
37. Face painting (e.g. black under eyes) (A10)	0	0.0	.00	.00
38. Haircut on game/meet day (A7)	0	0.0	.00	.00
39. Get tattoo before season (A11)	0	0.0	.00	.00
40. Team has team prayer (F3)	0	0.0	.00	.00
41. Important for team to pray together (F4)	0	0.0	.00	.00

**Note:** Item groups A - Clothing and Appearance; B - Fetish; C -Pre-game/Meet Rituals; Game/Meet Rituals; E – Team's Rituals; F - Prayer; G - Coach

The analysis of the answers given by the respondents to the additional *open question* about the rituals they use, which are not mentioned in the questionnaire, indicates they do not perceive certain behaviors (going to the toilet, hydrating, arranging hair, checking the equipment for the performance, the way of warming up and feeding) as superstitions but as part of the pre-start routine and preparation for the performance. Approx. 14% of orienteers additionally state they are not superstitious, have no rituals, or do not do anything specific. The content of the rituals they have mentioned shows that they fall into the category of pre-start routines (deep breathing, visualization, meditation, ways of warming) or orienteering-specific rituals (cleaning the chip a certain number of times, checking the binding of shoelaces, the equipment to be carried, start times of rival competitors, getting to know the terrain based on previous maps). The results presented in Tables 1 and 2, as well as the results of exploratory factor analysis (Table 8) indicate the need to create a questionnaire for the assessment of superstitious rituals that are specific for orienteering and our sports culture.



## II Connection of demographic, situational, and personal factors with superstitious behaviour

In Table 3 are presented only the statistically significant Pearson's coefficients of correlation between the effectiveness of superstitious behaviour on one hand and gender, age, sports (competition) experience, and self-confidence in orienteering skills, on the other hand. They confirm our expectations that demographic characteristics (gender and age) of the respondents and their sports experience are related to their tendency to practice superstitious rituals. Orienteers' age and orienteering experience are negatively correlated with the use of almost all superstitious rituals, and statistically significant with a total number of rituals ( $r=-.40$ ,  $p<.01$ ;  $r=-.38$ ,  $p<.01$ ), tendency to check appearance in mirror ( $r=-.34$ ) and to take part in cheering ritual ( $r=-.34$ ,  $p<.01$ ;  $r=-.31$ ,  $p<.01$ ). As age and sports experience go "hand in hand" ( $r = .81$ ), it is logical that they affect performance almost the same way. In other words, the older the athletes and the longer they play sports, the less they resort to superstitious rituals, especially those regarding the care of their own image and taking part in the team and/or individual cheering. Thus, it could be concluded that the sports self-confidence of orienteers increases with their training and competition experience, with the simultaneous decrease of the tendency to use superstitious rituals.

Respondent's self-confidence in his/her orienteering skills measured on a scale between 1 (not confident at all) to 5 (very confident) is high ( $M=4.10$ ,  $SD=0.81$ ), statistically significant, and positively related to the length of sports/competition experience ( $r=.28$ ,  $p<.05$ ), and negatively with athlete's gender (female gender has the lower confidence;  $r=-.26$ ,  $p<.05$ ). The correlation of self-confidence in orienteering skills with the number of rituals used ( $r=-.39$ ,  $p<.01$ ) and the effectiveness of nine specific superstitious rituals (see Table 3) is also significant and negative. These findings completely confirm the assumption that self-confidence decreases athletes' need to use superstitious rituals. The more confident orienteers are in their athletic abilities, the fewer rituals they use, especially those related to clothing and appearance, prayer, team cheering and encouraging, and the need for team pep talk. Our findings are only partly in conformation with the results of Ptacek's study (2016). In that study, the correlation of self-confidence of college athletes with the effectiveness of team rituals was also significant and negative. In contrast, the correlations with five fetish rituals, three of the clothing and appearance category, and one of the prayer category were significant and positive. We are confident that the results of our study enlighten the positive role of high sports self-confidence. It acts as a factor that frees the athlete from the need for additional superstitious actions, which will create an illusion of control and certainty in the positive outcome of the competitive performance. Being confident in their orienteering skills, they begin the competition with less pressure and uncertainty than the athletes whose confidence in sports skills is insufficient or low; therefore, they are more inclined to use all other means regardless of their irrationality and real logical unfoundedness.

**Table 3.** Coefficients of correlation of demographic, situational, and personal variables with the assessment of the effectiveness of the use of certain superstitious rituals

Variables	Gender n=78	Age n=76	Sports. experience	Sp.confidence n=69
Gender, n=78	-	-.23*	-.32**	-.26*
Age, n=76		-	.812**	
Sports experience, n=70			-	.28*
A1: Check appearance in mirror, n=78		-.34**		-.26*
A3: Dressing well to feel better prepared				-.24*
A8: No shaving on game/meet day, n=78				-.25*
A15: No socks under running spikes, n=78				-.38**
C4: Need silence/seclusion before game n=78	.26*			
D1: Cheerleading, n=78	.24*	-.34**	-.31**	
E2: Team cheer, n=78			-.31**	
E3: Unprepared if no pep talk, n=78	.33**			-.33**
F2: Afraid luck will run out if no prayer, n=78		-.26*		-.38**
The total number of rituals listed by respondent	.25*	-.40**	-.376**	-.39**

Note: \*  $p <.05$ ; \*\*  $p <.01$ ; The total number of respondents (n) for all variables, except the first three is 78.

### III Superstition and Gender

Insight into gender differences could be obtained by the analysis of the prevalence of rituals ranked from 1-15 based on the use by athletes of both genders (Table 4), by reviewing Table 3 with Pearson's coefficients of correlation, and subsequent review of data in Table 5 showing the rituals with statistically significant differences. The positive correlation of female gender is obtained with the total number of used rituals ( $r=.25$ ,  $p<.05$ ), with rituals of preparation before the performance in silence ( $r=.26$ ,  $p<.05$ ), cheering ( $r=.24$ ,  $p<.05$ ), and pep talk for the team ( $r=.33$ ,  $p<.01$ ); the negative correlation is obtained with self-confidence ( $r=-.26$ ,  $p<.05$ ). A much higher percentage of the use of superstitious rituals with a rank of 1-15 (Table 4), and especially the results of the t-test (Table 5) indicate that female orienteers differ significantly from male orienteers by greater use of four types of superstitious behavior, by the larger number of rituals they use, and by the lower level of confidence in their orienteering skills ( $t=2.202$ ;  $p<.031$ ). This confirms the existence of gender differences in superstitious behaviour, that sports experts should not neglect.

This research's data agree with the findings of most studies contemplating gender differences in superstitious behaviour of athletes and non-athletes (Bleak & Frederick, 1998; Brevers et al., 2011; Buhmann & Zaugg, 1982; Gregory & Petrie, 1972; Gupta & Dutt; Hood, 2002; Perkos, Barkoukis & Christopoulos, 2013; Ptacek, 2016; Vyse, 2014; Zaugg, 1980). Wiseman & Watt (2004) found that gender significantly influences adopting both positive and negative superstitions on the general population sample. They found that women in the general population exhibited both types of superstition significantly more than men. Gregory and Petrie (1972) also found that the university female athletes, as well as female students not playing sports, generally practice a higher number of general superstitions than the men. However, when it comes to superstition related to sports, the picture is different. Of the total number of such superstitions, 55.5% were stated by male athletes, and 45.5% by female athletes. The same authors (Gregory & Petrie, 1972), and later also Gupta and Dat (2019) noticed that university female athletes practice a larger number of superstitions related to personal

**Table 4.** Frequency of using of certain rituals in male (n=45) and female (n=33) athletes

Rituals	Male %	Rituals	Female %
1. Team cheer – E2	46.7	1. Cheerleading - D1	84.8
1. Cheerleading - D1	45.6	2. Team cheer – E2	63.6
2. Warm-up using same routine – C6	40.0	3. Warm-up using same routine – C6	51.5
4. Pep talk important for good performance - E4	32.3	4. Pep talk important for good performance - E4	51.5
5. Tape shoes identically before game/meet - A14	28.9	5. Check appearance in mirror – A1	49.5
6. Check appearance in mirror – A1	26.7	6. Dressing well to feel better prepared – A3	49.5
7. Dressing well to feel better prepared - A3	26.7	7. Need silence /seclusion before game – C4	45.5
8. Need silence /seclusion before game – C4	26.7	8. Tape shoes identically before game/meet - A14	36.4
9. Discarding lucky charms – B6	22.2	9. Discarding lucky charms – B6	29.3
10. Wear warm-up top or bottom the same way-A4	15.6	10. Unprepared if no pep talk – E3	21.2
11. No shaving on game/meet day – A8	15.6	11. Music during warm-up – C2	18.2
12. Music during warm-up – C2	15.6	12. Have lucky item of clothing – B1	12.1
13. Have lucky item of clothing – B1	13.3	13. Team mascot helps cause – B2	12.1
14. Eat same pre-game/meet meal on game day- A13	11.1	14. Stacking hands – E1	12.1
15. Wearing lucky charm on game/meet days - B3	11.1	15. Pray for success before each game – F1	12.1

**Note:** Item groups A - Clothing and Appearance; B - Fetish; C -Pre-game/Meet Rituals; Game/Meet Rituals; E – Team's Rituals; F - Prayer; G - Coach

appearance and social activities (team cheering, activities the night before the match, tying hair in a ponytail, not wearing white jerseys and sweatbands) than their male colleagues. Although there is also a tendency among female orienteers to practice rituals related to their appearance (e.g., *checking their appearance in a mirror*) more than male orienteers, while male orienteers feel better prepared if they are *sloppily dressed*, these differences do not reach the level of statistical significance. Compared to male orienteers, female orienteers use a larger number of sports rituals (Mf=6.39, Mm=4.64;  $t=-2.26$ ,  $p<.027$ ), they believe more in the effectiveness of the team/club mascot ( $t=-1.99$ ,  $p<.050$ ), practice

silence/seclusion before the performance ( $t=-2.35$ ,  $p<.021$ ), and use cheering and encouraging more ( $t=-2.16$ ,  $p<.034$ ). These data are quite in accordance with Ptacek's (2016) who found that university female athletes were more superstitious than the male athletes regarding team rituals, while male athletes were more superstitious regarding rituals before the performance.

**Table 5.** Significant gender differences on the t-test with the addition of two rituals with almost significant level

Variables / rituals	Gender	N	M	SD	t	Sig	df
Age	M	43	38.74	20.60	2.045	.044	74
	F	33	29.21	19.53			
Sports experience	M	40	19.13	15.80	2.796	.007	68
	F	30	9.94	9.94			
Team mascot helps cause - B2	M	45	.02	.15	-1.989	.050	76
	F	33	.36	1.14			
Need silece/seclusion before game – C4	M	45	.69	1.44	-2.355	.021	76
	F	33	1.61	2.00			
Cheerleading - D1	M	45	1.73	2.06	-2.157	.034	76
	F	33	2.73	1.94			
Unprepared if no pep talk - E3	M	45	.00	.00	-3.035	.003	76
	F	33	.58	1.27			
The average number of rituals listed by respondent	M	45	4.64	3.30	-2.261	.027	76
	F	33	6.39	3.47			
Cumulative efficiency score of superstitious rituals	M	45	13.07	10.95	-2.002	.049	76
	F	33	18.61	13.47			
Confidence in orienteering abilities	M	38	4.29	.83	2.202	.031	67
	F	31	3.87	.72			
Check appearance in mirror - A1	M	45	.64	1.30	-1.158	.250	76
	F	33	1.00	1.39			
Dressing sloppily – feel better prepared - A5	M	45	.22	.88	1.454	.150	76
	F	33	.00	.00			

We should bear in mind that there are also studies (Buhrmann et al., 1982; Burke et al., 2006; Flangan, 2013; Mutlu et al., 2016; Ofori, Tod & Lavalee, 2018) in which no statistically significant differences in the number of uses of superstitious rituals between athletes of different gender have been confirmed. Although the differences in the number of superstitious rituals were not great and significant (Burhman et al., 1982), they did, however, exist in the kind of rituals used - women were more involved than men in rituals related to clothing and appearance (jersey numbers, sweatbands, eyeshadows, etc.) which the authors explained by different patterns of socialization of men and women. Perkos, Barkoukis & Christopoulos (2013) and numerous other researchers have also come to a conclusion that gender differences are mainly related to the type of rituals used by athletes.

#### IV Age, competing experience and superstitious behavior

The influence of age and sports experience was examined by variance analysis for a total of used superstitious rituals, the effectiveness of each one, and self-confidence as dependent variables. Tukey Post Hoc test was used to determine the direction and level of differences. The first two data in Table 6 (and in most other tables) contain information on average age and the average length of competing experience in each athlete's category. Data analysis confirms our hypotheses that age and sports experience are predictors of a tendency for superstitious rituals because they significantly differentiate the youngest from the oldest orienteers (Table 6), as well as the orienteers with the least sports experience from those with the longest competitive experience in this sport (Table 7). Age and experience affect not only significant differences in the number of rituals used by orienteers [ $F(2,73)=5.80$ ,  $p<.005$ ;  $F(2,67)=5.03$ ,  $p<.009$ ] but also their beliefs about the effectiveness of certain rituals they practice. Thus, the youngest orienteers (up to 17 years) and those between 18 and 50 years pay significantly more attention to their appearance and clothing. They check their appearance in a mirror more than the orienteers older than 50 [ $F(2,73)=4.18$ ,  $p<.019$ ]. Younger athletes believe more in

the magical power of team fetishes/mascots. They are more confident in the effectiveness of the cheering/encouraging ritual, prayers for success before the performance, and are more afraid they will have no luck without a prayer [ $F(2,73)=3.85$ ,  $p<.026$ ;  $F(2,73)=6.10$ ,  $p<.004$ ;  $F(2,73)=3.04$ ,  $p<.054$ ;  $F(2,73)=4.95$ ,  $p<.010$ , respectively]. The results of Zaugg's study (1980) conducted on basketball players also confirmed younger athletes to be more superstitious than the older. This finding is not unexpected since younger athletes are generally characterized by a lower level of sports self-confidence, insufficient competitive experience, and undeveloped mechanisms for coping with stress. Therefore, it is logical that they are more inclined to fight the stress, psychological tension, and uncertainty of competition with irrational actions that they believe can bring them luck and control over many external factors, which in this sport can actually affect the competitive result.

**Table 6.** Results of ANOVA: significance of differences between orienteers of different ages

Variables / rituals	Age in years	N	M	SD	F	Sig
Age	9.92-16.83	26	13.50	1.95	273.077	.000 1 & 3 & 2 2 & 3
	17.5-49.58	25	31.18	10.79		
	50.4-70.08	25	59.99	5.96		
Sports experience	9.92-16.83	23	3.24	3.00	60.024	.000 1 & 3 & 2 2 & 3
	17.5-49.58	22	11.82	6.43		
	50.4-70.08	23	30.74	13.24		
A1: Check appearance in mirror	9.92-16.83	26	1.12	1.53	4.182	.019 2 & 3 1 & 3
	17.5-49.58	25	1.12	1.56		
	50.4-70.08	25	.20	.500		
B2: Team mascot helps cause	9.92-16.83	26	.50	1.27	3.854	.026 1 & 2 1 & 3
	17.5-49.58	25	.00	.00		
	50.4-70.08	25	.00	.00		
C4: Need silece/seclusion before game	9.92-16.83	26	.46	1.07	4.996	.009 1 & 2
	17.5-49.58	25	1.92	2.18		
	50.4-70.08	25	.92	1.63		
D1: Cheerleading	9.92-16.83	26	2.88	2.06	6.100	.004 1 & 3 2 & 3
	17.5-49.58	25	2.60	1.87		
	50.4-70.08	25	1.12	1.83		
F1: Pray for success before each game	9.92-16.83	26	.65	1.62	3.043	.054
	17.5-49.58	25	.12	.60		
	50.4-70.08	25	.00	.00		
F2: Afraid luck will run out if no prayer	9.92-16.83	26	.65	1.47	4.953	.010 1 & 2 1 & 3
	17.5-49.58	25	.00	.000		
	50.4-70.08	25	.00	.000		
The total number of rituals listed by the respondent	9.92-16.83	26	6.77	3.64	5.798	.005 1 & 3
	17.5-49.58	25	5.76	3.33		
	50.4-70.08	25	3.68	2.85		

The data show that self-confidence in orienteering is not influenced by age but by the length of playing this sport (Table 7). This is expected since the competitors start this sport at different ages. It happens that someone over 40 has less competition experience than someone who is 15 or 16 and has been competing in orienteering since he/she was 12. Our results are opposite to the findings of Barkoukis, Perkos & Kokkinopoulos (2011), which indicate that age and competitive experience do not influence the positive superstitious beliefs of the basketball players of the professional league of Greece. However, these variables have a significant moderating influence on the connection of negative superstitious beliefs with cognitive anxiety/worries. The authors refrain from generalizing that emphasizing that this statement applies only to basketball players from their study because they did not study athletes of both sexes from different teams and individual sports. Questioning students playing tennis, Mutlu et al. (2016) found that age and sports experience did not significantly affect their tendency for superstitious behavior. Basiaga-Pasternak (2019) studying the sample of young Polish and Ukrainian football players, also found that their age was not the significant predictor for their superstitious behavior. However, all three components of competitive anxiety (somatic, cognitive, and attention deficit) played a role. It is also understandable why the study findings of Todd & Brown

(2003) did not confirm the predictor role of competitive experience on the superstitions of university athletes of the I and III divisions, since the differences in the length of their sports experience were negligible.

**Table 7.** ANOVA results: significance of differences between orienteers of different competitive experience

Variables / rituals	Sport experience in years	N	M	SD	F	Sig
Age	0.17-5	25	18.56	12.60	53.715	.000
	6-20	23	31.55	15.02		1 & 3 & 2
	23-45	20	58.00	9.94		2 & 3
Average length of engagement in each category of sports. experience	0.17-5	25	2.34	1.54	283.354	.000
	6-20	25	11.88	4.32		1 & 3 & 2
	23-45	20	35.40	7.18		2 & 3
A1: Check appearance in mirror	0.17-5	25	.64	.86	8.762	.000
	6-20	25	1.52	1.78		2 & 3
	23-45	20	.05	.22		1 & 2
B2: Team mascot helps cause	0.17-5	25	.52	1.29	3.618	.032
	6-20	25	.00	.00		
	23-45	20	.00	.00		
D1: Cheerleading	0.17-5	25	2.88	2.05	4.021	.022
	6-20	25	2.08	1.95		1 & 3
	23-45	20	1.20	1.91		
F2: Afraid luck will run out if no prayer	0.17-5	25	.52	1.33	3.447	.038
	6-20	25	.00	.00		
	23-45	20	.00	.00		
Confidence in orienteering abilities	0.17-5	21	3.86	.91	3.771	.029
	6-20	24	4.08	.71		1 & 3
	23-45	19	4.53	.70		
The total number of rituals listed by the respondent	0.17-5	25	6.60	3.55	5.032	.009
	6-20	25	5.96	3.06		1 & 3
	23-45	20	3.70	2.72		

However, as the differences in the sports experience of our orienteers were significant and great (the most inexperienced had an average of 2.34 years of experience; experienced 11.88, and the most experienced over 35 years), they had a tremendous impact - first on their sports self-confidence, and then indirectly on the number and the type of rituals used. Orienteers with the least competitive experience and at the same time the youngest (18 years old on average) showed a significantly lower level of sports self-confidence than the most experienced [ $F(2,61)=3.77$ ,  $p<.029$ ]. They used a far greater number of rituals [ $F(2,67)=5.03$ ,  $p<.009$ ], had more confidence in the effectiveness of the team mascot [ $F(2,67)=3.62$ ,  $p<.032$ ], used more cheering/encouraging [ $F(2,67)=4.02$ ,  $p<.022$ ] and prayer rituals for fear that they would not have luck if they did not pray [ $F(2,67)=3.45$ ,  $p<.038$ ]. Interestingly, the orienteers with the average experience and average age of 31.5 years pay much more attention to their appearance before the performance than the least or the most experienced [ $F(2,67)=8.76$ ,  $p<.000$ ]. In any case, the findings of this study confirm that age and sports experience are significant predictors of their tendency to practice superstitious rituals, influencing the nature of rituals preferred by younger and less experienced over older and more experienced individuals.

## V Methodological steps towards the superstition questionnaire for orienteering

Most authors of previous research on superstition in sports have used the original and/or slightly modified version of the Bleak & Frederick (1998) questionnaire to assess superstitious rituals. (e.g., Burke et al, 2006; Deol & Singh, 2017; Dureja & Singh, 2016; Flangan, 2013; Ofori, Biddle, Lavallee, 2012; Ofori, Todd & Lavalee, 2018, Ptacek, 2016). Others wanted to adapt it to the specifics of the sport and the culture of their athletes. E.g., new questionnaires adapted to athletes of their country were constructed by Gregory & Petrie (1972), Donti et al. (2007), Ciborowski (1997). On the

other hand, the others assessed superstition on their scales or scales intended for athletes or the general population (Basiaga-Pasternak, 2019; Baselga, 2013; Barkoukis et al., 2011; Buhrmann et al., 1982; Hannan, 2019; Fisher, 1997; Hood, 2002; Lindeman & Aranio, 2007; Mutlu et al., 2016; Ofori, Tod & Lavalee, 2017; Rutkowska & Rut, 2020; Todd & Brown, 2003; Yadav & Agashe, 2017), via semi-structured interviews (Allen, Thornton & Riby, 2020; Baselga, 2013; Bonk, 2020; Farley, 2015; Gupta & Dutt, 2019), open questions or listing rituals by athletes (Baselga, 2013; Brevers et al., 2011; Burger & Lynn, 2005; Schippers & Van Lange, 2006), or experimental studies (Brevers et al., 2011; Brooks et al., 2016; Damisch et al., 2010; Foster & Weigand 2006; Rudski & Edwards, 2007; Van Raalte et al. 1991; Wright & Erdal, 2008).

Since the Superstitious Rituals Questionnaire of Bleak & Frederick (1998) is intended for athletes in general and used by contemporary authors only as a starting point for constructing questionnaires that better reflect the specifics of superstition in particular sports and certain cultures, one of the goals of this preliminary research is to check its adequacy for the assessment of superstition of our orienteers. The answer to the instrument's behavior was obtained not only based on descriptive statistics but also by applying exploratory factor analysis. The results indicate that the applied questionnaire does not suit athletes of our culture, and especially not orienteers, because it contains many superstitions that are not practiced at all in our country (e.g., *good luck marking on shoes, face painting, haircut on performance day, getting a tattoo before the season, team prayer, praying together/with a team*), and at the same time, it lacks the typical forms of superstitious behaviour characteristic of orienteering that the orienteers themselves added (*hydration a certain number of times, going to the toilet, cleaning the chip, tidying up hair, choosing a clothing combination, checking the compass, sweatbands on the forehead and wrist, tying shoelaces, starting times of competition, etc.*).

**Table 8** Data on the number of extracted factors and the percentage of variance they explain

FACTORS	Total	% of Variance	Cumulative %
1 (5)	4.515	12.901	12.901
2 (3)	3.115	8.901	21.802
3 (3)	2.853	8.150	29.952
4 (4)	2.434	6.954	36.907
5 (2)	2.138	6.108	43.015
6 (3)	2.054	5.868	48.883
7 (3)	1.643	4.696	53.579
8 (4)	1.474	4.212	57.791
9 (2)	1.389	3.969	61.760
10 (1)	1.237	3.535	65.295
11 (2)	1.181	3.376	68.671
12 (1)	1.092	3.120	71.791
13 (2)	1.038	2.966	74.757

**Note:** Exploratory FA, principal component method (The number of items that saturate each factor is given in parentheses)

The data presented in Table 2 sufficiently confirm the assertion made. They show that none of the 78 orienteers used six rituals, 12 rituals were used by only 1-5% of respondents, and eight rituals by 6-9% of participants. The rituals of the original Bleak & Frederick questionnaire cover seven areas: clothing and appearance, fetishes, rituals before the performance, during the performance, team rituals, prayer and coach. Factor analysis (principal component analysis with varimax rotation and Kaiser normalization) did not confirm such a questionnaire structure since 35 superstitious rituals (excluding 6 items mentioned by no one) were found to saturate 13 factors and explain 74% of superstitious behavior (Table 8). The results of our FA are very similar to the results of Donti, Katsikas, and Stavrou (2007), who obtained 15 factors on 42 items of Bleak & Frederick questionnaire (1998). That was reason enough for them to construct a new 10-item questionnaire to assess the superstition of Greek

athletes. We still have such a task ahead of us, and this preliminary research provided enough data to complete it successfully.

## CONCLUSION

The goal of this study, performed on a sample of 78 Serbian orienteers of both sexes, the average age of 34.6 years and competitive experience of 15.2 years, was to gain insight into the prevalence of superstitious behavior among orienteers, level of confidence in the effectiveness of such behavior, its relation to age, sports experience and self-confidence, and to test the adequacy of the original Superstitious Ritual Questionnaire by Bleak & Frederick (1998) for the application to our athletes.

The obtained results justify the attribute "preliminary" because they indicate the need to conduct new research with the newly constructed Superstitious Rituals Questionnaire explicitly developed for orienteering. The reason for this may be the results of this observation. The Exploratory FA identified 13 factors, which is not in line with the authors' claim of the applied questionnaire (Bleak & Frederick, 1998) that sports rituals fall into 7 different categories. The need to construct a specific questionnaire is also indicated by the fact that no orienteers use six rituals from the SRQ, that only one participant mentioned five rituals, and only 2-3 participants mentioned four rituals.

The study findings reveal that superstitious behavior is moderately prevalent among Serbian orienteers because they used 0-14 rituals, an average of 5.4, which is in line with the results of other studies. At the same time, the respondents are not particularly convinced of the effectiveness of the ritual, which on a scale of 1-5 reaches the level of moderate effectiveness ( $M=2.88 \pm 1.31$ ). The largest percent of orienteers use the rituals related to team and individual cheering, appearance and clothing, the way of warming up and preparation for the performance, as well as wearing the lucky charm (amulet). They do not perceive most of the mentioned rituals as superstitions but as pre-start routines because they do not have the properties of rigid timing, fixed order, and magical meaning but serve them as techniques of psychological preparation and physical warm-up.

All cognitive assumptions of this preliminary study on the connection of superstitious behavior of athletes with their gender, age, competitive experience, and sports self-confidence have been confirmed. Compared to male orienteers, female orienteers, like female athletes in other sports, are more prone to superstitious behavior, use a more significant number of ritual behaviors that are different in nature than those used by male competitors (use more team cheering, team mascots, team pep talk is more important to them, and they have a more pronounced need for silence/isolation before the performance). At the same time, their sports self-confidence (level of confidence in their orienteering skills) is significantly lower than the self-confidence of their male colleagues.

Research has shown that younger orienteers and those with shorter competitive experiences, use a significantly higher number of superstitious rituals than older and more experienced competitors and pay much more attention to their appearance [ $F(2,73)=5.80$ ,  $sig=.005$ ;  $F(2,73)=8.76$ ,  $sig=.000$  respectively], cheering/encouraging, prayer, and club mascot. Since the competitive experience of orienteers is highly correlated with their age ( $r=.81$ ), it is logical that both variables affect the practice of superstition almost equally. More experienced orienteers have significantly more sports self-confidence than insufficiently experienced (beginners and younger). Their need to control the outcome of their performance with superstitious behavior is significantly smaller, especially with the rituals of prayer, cheering, club mascots, and checking their appearance.

Orienteers mostly perceive their superstitious behavior as useful pre-start routines, as part of the preparation for the performance. In additional notes, they point out that it does not have the character of magic and superstition, but activities that calm them, concentrate and introduce them to the race. They state that they use deep breathing, meditation, visualization, isolation, and concentration; these are not rituals but psychological preparation techniques helping them optimize the level of

excitement before the performance, reduce pressure, and raise their self-confidence. Generally, study findings confirm that orienteers' superstitious behavior goes "hand in hand" with low confidence in orienteering skills, female sex, competitive inexperience, and younger age.

This preliminary study, conducted only on a sample of orienteers of insufficient size, has certain shortcomings that limit the generalization of its results to the behavior of other athletes. However, its results may help coaches working with young orienteers and women better understand their superstitious rituals without denying their psychological benefits, manifested in the placebo effect and the illusion of controlling the outcome of the competition.

The results also underline the importance of sports self-confidence as a factor significantly influencing the tendency of athletes to use superstitious ritual behaviors to feel better prepared for the performance and to have luck on their side. The orienteering instructors and coaches should get acquainted with superstitious rituals of athletes they lead, start training them early with useful psychological skills that will help them strengthen self-confidence and psychological resilience, which will contribute to successfully replacing or at least reducing the practice of superstitious behavior, the effectiveness of which they doubt, by effective psychological routines. Of course, it is a continuous process that includes joint engagement and commitment not only of athletes and their coaches, but also sports psychologists, because it is not easy to develop a sense of control, not succumb to pressure and stress, accept the challenge and uncertainty of competition and perform at the current level of achieved sports form.

## REFERENCES

1. Allen, G., Thornton, C. & Riby, H. (2020). 'Don't touch my bag': The Role of Superstition in Professional Male Boxing. *The Sport Psychologist*, 34(1), 35–42.
2. Barkoukis, V., Perkos, S. and Kokkinopoulos, S. (2011). Being superstitious in sports: Effect of superstitious beliefs on athletes' cognitive and affective responses. In B. D. Gerato (Ed.), *Sport Psychology* (pp. 71-91). Nova Science Publishers, Inc.
3. Baselga, M. A. (2013). An investigation of professional ballet dancers' pre-performance routines and superstitious behaviours. *A thesis of Master of Philosophy*, University of Birmingham. Retrieved from <https://etheses.bham.ac.uk/id/eprint/5331/1/Baselga14MPhil.pdf>
4. Basiaga-Pasternak, J. (2019). Pre-performance rituals and anxiety among young Polish and Ukrainian football players. *Baltic Journal of Health and Physical Activity*, 11(4): 69-76.
5. Bisht, S., Sardar, S. & Pandey, A. K. (2016). A study of association between superstitious rituals and locus of control among intervarsity male players. *International Journal of Physical Education and Sports*. 1(3), 1-4.
6. Bleak, J. L. & Frederic, C. M. (1998). Superstitious behaviour in sport: Levels of effectiveness and determinants of use in three collegiate sports. *Journal of Sport Behaviour*, 21, 1-15.
7. Bonk, D. N. (2020). Athletes' Perceptions of Pre-Game Rituals in Open-Skill Sports. *Theses, University of Toronto*. Retrieved from <https://tspace.library.utoronto.ca/handle/1807/101209>
8. Brevers, D., Dan, B. & Noel, X. (2011). Sport superstition: Mediation of psychological tension on non-professional sportsmen's superstitious rituals. *Journal of Sport Behavior*, 34, 3–24.
9. Brooks A. W., Schroeder, J., Risen, J. L., Gino, F., Galinsky, A. D., Norton, M. I. & Schweitzer, M. E. (2016). Don't stop believing: Rituals improve performance by decreasing anxiety. *Organizational Behavior and Human Decision Processes* 137, 71–85.
10. Buhrmann, H. G. & Zaugg, M. K. (1981). Superstitions among basketball players: An investigation of various forms of superstitious beliefs and behavior among competitive basketballers at the junior high school to university level. *Journal of Sport Behavior*, 4, 163-174.
11. Buhrmann, H., Brown, B., & Zaugg, M. (1982). Superstitious beliefs and behavior: A comparison of male and female basketball players. *Journal of Sport Behavior*, 5(4), 175–185.
12. Burger, J. M. & Lynn, A. L. (2005). Superstitious Behavior Among American and Japanese Professional Baseball Players. *Basic and applied social psychology*, 27(1), 71–76.



13. Burke, K. L., Czech, D. R., Knight, J. L., Scott, L. A., Joyner, A. B., Benton, S. G., & Roughton, H. K. (2006). An exploratory investigation of superstition, personal control, optimism and pessimism in NCAA Division I Intercollegiate student-athletes. *Athletic Insight: The Online Journal of Sport Psychology*, 8(2).
14. Ciborowski, T. (1997). Superstition in the Collegiate Baseball Player. *The Sport Psychologist*, 11, 305-317.
15. Damisch, L., Stoberock, B., & Mussweiler, T. (2010). Keep your fingers crossed! How superstition improves performance. *Psychological Science*, 21(7), 1014-1020.
16. del Rosario, Danyel, "Superstition in Sport: A Phenomenological Study" (2017). *Ithaca College Theses*. 393. Retrieved from [https://digitalcommons.ithaca.edu/ic\\_theses/393](https://digitalcommons.ithaca.edu/ic_theses/393)
17. Deol, N. S. & Sing, D. (2017). *European Journal of Physical Education and Sport Science*, 3(10), 217-225.
18. Domotor, Z., Ruiz-Barquin, R. & Szabo, A. (2016). Superstitious Behaviour in Sport: A literature review. *Scandinavian Journal of Psychology*, 57, 368-382.
19. Donti, O., Katsikas, Ch., Stavrou, N. A. & Psychountaki, M. (2007). Superstitious Behavior Inventory in Sport: A Preliminary Study. *12th European Congress of Sport Psychology*, Halkidiki. Retrieved from <https://www.researchgate.net/publication/268390302>
20. Dureja, G. & Singh, G. (2016). Superstitious behavior among judo, taekwondo and boxing players. *Physical Education of Students*, 20(2), 50-59
21. Flanagan, E. (2013). Superstitious Ritual in Sport and the Competitive Anxiety Response in Elite and Non-Elite Athletes. *Bachelor Thesis*, Retrieved from [https://esource.dbs.ie/bitstream/handle/10788/1599/ba\\_flanagan\\_e\\_2013.pdf?sequence=1&isAllowed=y](https://esource.dbs.ie/bitstream/handle/10788/1599/ba_flanagan_e_2013.pdf?sequence=1&isAllowed=y)
22. Farley, A. (2015). A Qualitative Analysis of Superstitious Behavior and Performance: How it starts, why it works, and how it works. *Masters Thesis, WU Graduate School Collection*. 408. Retrieved from <https://cedar.wvu.edu/wwuet/408>
23. Fischer, G. J. (1997). Abstention from sex and other pre-game rituals used by college male varsity athletes. *Journal of Sport Behavior*, 20(2), 176-184.
24. Foster, D. J. & Weigand, D. A. (2006). The effect of removing superstitious behavior and introducing a pre-performance routine on basketball free-throw performance. *Journal of Applied Sport Psychology*, 18, 167-171.
25. Gregory, C. J. & Petrie, B. M. (1972). Superstition in sport. *Proceedings of the Fourth Canadian Psychomotor Learning and Sports Psychology Symposium* (pp. 1-30). Waterloo: University of Waterloo.
26. Gupta, B. & Dutt, S. (2019). Superstitious Behaviour in Sportspersons in Relation to Their Performance at Intercollegiate Level. *Indian Journal of Mental Health*, 6(2), 192-202.
27. Hannan, C. E. (2019). „Very Superstitious: The Relationship Between Desperation and Superstitious Behavior“. *Murray State Theses and Dissertations*. 145. Retrieved from <https://digitalcommons.murraystate.edu/etd/145>
28. Hood, J. S. (2002). The Relationship Between State-Trait Anxiety and the Use of Superstitious and/or Ritualistic Behaviors in Athletics: An Exploratory Study. *Masters Theses*. Retrieved from <https://thekeep.eiu.edu/cgi/viewcontent.cgi?article=2417&context=theses>
29. Linderman, M & Aarnio, K. (2007). Superstitious, magical and paranormal beliefs: An integrative model. *Journal of Research in Personality*, 41, 731-744.
30. Mutlu, O., Onturk, Y., Zorba, E., Karafily., Yildiz, M. & Kartal, R. (2016). Analysis on Some Superstitious Behaviors of University Students Engaging in Tennis. *Batman University: Journal of Life Sciences*; 6(1), 317-330.
31. Neil, G. I. (1982). Demystifying sport superstition. *International Review for the Sociology of Sport*, 17(1), 99-124.
32. Ofori, P. K., Biddle, S., & Lavalley, D. (2012). The role of superstition among professional footballers in Ghana. *Athletic Insight: The Online Journal of Sport Psychology*, 4(2), 115-126.
33. Ofori, P. K., Tod, D., and Lavalley, D. (2017). Predictors of superstitious beliefs. *Journal of Psychology In Africa*, 27(1), 1-12.
34. Ofori, P. K., Tod, D. & Lavalley, D. (2018). An exploratory investigation of superstitious behaviours, coping, control strategies, and personal control in Ghanaian and British student-athletes. *International Journal of Sport and Exercise Psychology*, 16(1), 3-19.
35. Perkos, S., Barkoukis, V. & Christopoulos, I. (2013). Superstitious beliefs and behaviours in sport: Association with locus of control, anxiety and demographic characteristics. *Inquires in Sport & Physical Education*, 11, 20-31.

36. Ptacek, T. J. (2016). "The Relationship Between Superstition and Confidence in Sport". *Theses and Dissertations*. 742. <https://commons.und.edu/theses/742>
37. Rudski, J. M. & Edwards, A. (2007). Malinowski Goes to College: Factors Influencing Students' Use of Ritual and Superstition. *The Journal of General Psychology*, 134(4), 389-403
38. Rutkowska, K. & Rut, A. (2020). Selected Aspects of the Pre-and Post-Match Rituals of Female Football Players. *Perspektywy Kultury*, 28(1), pp. 127–147.
39. Schippers, M. C., & Van Lange, P. A. M. (2006). The Psychological Benefits of Superstitious Rituals in Top Sport: A Study Among Top Sportspersons. *Journal of Applied Social Psychology*, 36, 10, 2532- 2553.
40. Superstition. (2021). *Merriam-Webster.com Dictionary*, Merriam-Webster. Retrieved from <https://www.merriam-webster.com/dictionary/superstition>
41. Todd, M., Brown, C. (2003). Characteristics associated with Superstitious Behaviour in Track and Field Athletes: Are there NCAA Divisional Level Differences? *Journal of Sport Behavior*, 26, 1, 168-187.
42. Van Raalte, J. L., Brewer, B.W., Neneroff, C. J., & Linder, D. E. (1991). Chance orientation and superstitious behaviour on the putting green. *Journal of Sport Behavior*, 14, 41-50.
43. Vyse, S. A. (2014). *Believing in magic*. New York, NY: Oxford University Press.
44. Wiseman, R., & Watt, C. (2004). Measuring superstitious belief: Why lucky charms matter. *Personality and Individual Differences*, 37, 1533-1541.11
45. Womack, M. (1992). Why athletes need ritual: A study of magic among professional athletes. In S. J. Hoffman (Ed.), *Sport and Religion* (pp. 191-202). Champaign, IL: Human Kinetics.
46. Wright, P. B. & Erdal, K. J. (2009). Sport superstition as a function of skill level and task difficulty. *Journal of Sport Behavior*, 32(2), 187-199.
47. Yadav, P. K., Agashe, CD. (2018). Evaluation superstitious behaviour in elite male sportsperson. *International Journal of Physiology, Nutrition and Physical Education*, 3(1), 2031-2032.
48. Zaugg, M. K. (1980). Superstitious beliefs of basketball players. *Graduate Student Theses, Dissertations, & Professional Papers*. 3784. <https://scholarworks.umt.edu/etd/3784>
49. Živanović, N., Randelović, N. i Savić, Z. (2012). Superstitions and rituals in modern sport. *APES*, 2(2), 220-224.