

How Do Serbian Gymnastics Coaches Make Decisions?

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Different authors argue that coaching is fundamentally a decision-making (hereinafter: DM) process, while coaches' DM has been identified as a key element of a coach's practice. In the present study, we examined the DM behavior of Serbian gymnastics coaches. The sample consisted of 53 coaches (age: 40.96 ± 13.04 years). Manifested DM behavior was measured during the national coaching seminar using the General DM Style Inventory, which includes five DM styles defined as rational, intuitive, dependent, spontaneous and avoidant DM. Factor analyses were performed to reveal the DM styles' structure. Pearson's correlation coefficient was used to identify the association between DM styles, demographic and professional characteristics, and ANOVA was used to detect differences between more experienced and less experienced coaches. The results showed that coaches use a combination of all five DM styles when making decisions, but mostly use rational and dependent DM styles. Based on the discovered average structure of the DM styles, we can conclude that Serbian gymnastics coaches are mostly rational decision-makers who increase their rationality by seeking advice, opinions, and knowledge from colleagues when making decisions. Furthermore, more experienced coaches can make decisions more independently and also faster when the situation is urgent or time-limited.

Key Words: Serbian gymnastics coaches, decision-making styles, structure, demographic characteristics, professional characteristics, experience

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INTRODUCTION

[32] Different authors argue that coaching is essentially a decision-making (hereinafter: DM) process (Abraham and Collins 2011, 367; Lyle and Muir 2020, 1), with coaches' DM identified as a key aspect of their practice (Kaya 2014, 333; Coutts 2017, 717; Till et al. 2018, 14). It is considered the hallmark of an expert coach (Nash and Collins, 2006) and one of the most important skills a coach must possess (Post and van Gelder 2023). DM is a defining element of coaching expertise (Harvey et al. 2015).

Athletes' performance is mainly determined by their developed capabilities (knowledge, abilities, characteristics, and motivation) and effective training process management, the long-term goal of which is to transform the athlete's capabilities to meet the demands of their sport (Kolar et al. 2006, 11). Nash and Collins (2006, 467) view coaches as managers of the training process, responsible for planning, organizing, implementing, and evaluating. They coordinate experts and athletes and delegate tasks to optimize the training process (Kolar et al. 2025, 2). The aforementioned sets of the coach's managerial tasks within a sports training process represent the substantive aspect of the coach's role, while the basic method of their work is making decisions (Abraham et al. 2006, 549; Kolar and Tušak 2022, 49; Wilson and Kiely 2023, 2).

DM is a process defined as a choice between options (Heller and Hindle 2001, 154), influenced by the interplay of two cognitive systems: System 1 (intuitive, heuristic) and System 2 (rational, analytical) (Kahneman 2017, 576). System 1 enables quick, creative decisions, especially with domain-specific experience (Klein 2015, 164), while System 2 is characterized by slower, more deliberate and conscious thinking used for complex evaluations and long-term planning (Evans and Stanovich 2013; Gonzalez-Loureiro and Vlačić 2016; Kahneman 2017). System 2 also ensures decisions align with strategic goals (Elbanna and Child 2007, 445–6; Bayo and Akintokunbo 2022, 58). DM styles emerge from these fundamental cognitive styles and are influenced by personality, biases, knowledge, and experience (Harren 1979; Scott and Bruce 1995). Various authors have defined DM styles as (1) hierarchically subordinate to the fundamental cognitive styles (Spicer and Sadler-Smith 2005, 146; Kozhevnikov 2007, 473; Dewberry et al. 2013, 784; Kolar et al. 2025, 2) and (2) manifesting at the decision-making level. DM styles are learned responses to specific situations, not mutually exclusive, and occur in various combinations in individuals (Scott and Bruce 1995). The General Decision-Making Style Inventory (hereinafter: GDMS) is the



most commonly used questionnaire for assessing these styles (Berisha et al. 2018, 3; Urieta et al. 2021, 2).

Coaches are highly trained professionals (experts) with specialized knowledge and experience in their sport (Lyle and Muir 2020, 14). Ericsson (2018a, 3–4) describes an expert as someone who is highly skilled and knowledgeable in a particular field, or someone who is widely recognized as a reliable source of knowledge, techniques, or skills, with their judgments being acknowledged as authoritative both publicly and by their peers. Ericsson et al. (1993, 372) argue that expertise and expert performance are developed through extensive experience in a specific domain, which requires long-term involvement (at least 10 years or 10,000 hours) in deliberate practice in that domain. Kolar et al. (2025, 12) argue that a coach's expertise is defined by (1) years of experience (2) within a specific domain, and (3) achieving high-level results in international competitions. Only the coach who fulfills all three criteria can be recognized as an expert, with their decisions – whether long-term or sudden – being highly valid and reliable.

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This study will examine the DM styles of Serbian gymnastics coaches, focusing on (1) the overall DM styles structure and (2) mutual correlations of DM styles, (3) their correlations with coaches' demographic and professional characteristics, and (4) differences in the DM styles used between more and less experienced coaches.

LITERATURE REVIEW

Despite the growing recognition of the importance of coaches' DM in the training process, which involves adapting or tailoring the coach's DM behavior to the specific or even unique needs of the athlete and of the chosen sport (Harvey et al. 2015, 152), research in the field of sports coaching theory still lacks empirical insights into coaches' DM styles.

There are quite a few studies in which the authors dealt mainly with the leadership styles and behaviors of sports coaches (Chelladurai and Arnott 1985; Côté et al. 1995; Marshall 2006; Kaya 2014; Elderton 2020; Jin et al. 2022; Jawoosh et al. 2022) and applied the findings to their DM behavior in various situations and contexts. These studies primarily focus on identifying the coach's leadership style, particularly how it influences the level of athlete involvement in decision-making processes.

Abraham and Collins (2015, 1) report that there has recently been an increased interest in using Naturalistic Decision Making (here-

[34] inafter: NDM) paradigm and the Recognition Primed Decision Making (hereinafter: RPD) model to examine and understand the DM of sport coaches in time-limited situations. The NDM approach (Klein 2008; 2015) is an alternative to the normative, rationalistic DM process approach, whose main orientation is that decision-makers in natural settings rely heavily on expert intuition. Bossard et al. (2022, 1), in their study, note that there is an extensive number of studies where different authors use the RPD model to explore the DM behavior of expert coaches (Abraham and Collins 2015; Harvey et al. 2015; Collins et al. 2016; Collins and Collins 2016; Ashford et al. 2020) from different sports in natural settings. Findings suggest that coaches have an initial desire to engage in RPD-type behavior and have the capacity to be 'experts' but may not use this capacity unless forced to do so (Abraham and Collins 2015, 1). Also, Harvey et al. (2015, 152) stated that NDM can offer a suitable framework to apply to coaches' DM behavior and Collins et al. (2016, 5–6) added that there are considerable variations, both between coaches and between sports, in the perceived frequency of intuitive DM use (RPD model). They found that, in all cases, coaches acknowledged the need for careful planning across all elements of their work, where the intuitive aspects of the coaches' DM emerged differentially across the macro (planning stage) and micro (implementation stage) processes of the training session. Moreover, Richards et al. (2016, 73) argue that the DM process is complex and multifactorial, where a crucial underpinning for the efficient application of the coach's tactical knowledge is the use of a slow, deliberate and reflective examination of the process.

In the field of the sports training process, there are certainly many situations in which coaches make decisions consistent with the NDM paradigm and the use of the RPD model, but as Kahneman and Klein (2009, 524–5) point out, there are three fundamental conditions for valid intuitive reasoning. The environment within which the reasoning takes place (1) must be orderly, there (2) must be the possibility for the decision-maker to learn the rules of its orderliness, and (3) there must be adequate feedback about their thoughts and actions. Only if all conditions are met at the same time will the associative memory (stored tacit knowledge or experience) be able to recognize the circumstances and produce quick and accurate decisions. Introducing the NDM paradigm and the RPD model into sports coaching has provided a deeper understanding of how coaches handle the complexity,



crises, and uncertainty of training. It offers a framework for explaining how coaches make decisions in the dynamic, high-pressure moments of coaching.

Abraham and Collins (2011), together with Martindale and Collins (2007), argue that, like the NDM paradigm, the classic DM model (normative model, hereafter CDM) also has limitations, and they introduced the concept of professional judgment and DM (hereafter PJDM) as a comprehensive model for understanding and facilitating the complex behavior of DM in sports coaches. By integrating the principles of CDM and NDM into PJDM, the authors suggest that coaches make decisions along a continuum from logical and rational options to intuitive, experience-based decision-making. Moreover, Collins et al. (2016, 2) also described the concept of nested DM, which can be understood as an application of PJDM to coaching. They argue that higher-order/longer-term (strategic) decisions should be taken in a more considered, deliberative (CDM) fashion, while immediate, in-session (operative) decisions are more short-term and almost intuitive (more reflective of an NDM approach). This 'nesting' of intuitive, short-term decisions within more deliberate, long-term decisions is a key feature of the coaching process, helping to align immediate actions with broader, long-term goals. The PJDM model, therefore, assumes that the DM process of coaches, depending on the (1) problem situation and the (2) goal of the decision, occurs both within System 1 (specific domain expert intuition) and within System 2 (bounded rational analytical process).

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The latent use of different cognitive styles (System 1 and 2) used by coaches in their DM behavior can be detected through manifest DM styles that shape the coach's DM behavior. Manifested DM behavior was observed and measured with Scott and Bruce's (1995, 829) GDMS inventory by Giske et al. (2013), who investigated soccer coaches' DM styles in relation to elite and non-elite coaching experience and level of playing history. The results of their study show that soccer coaches mostly use the rational or intuitive DM style and almost no avoidant DM style, and that coaches with more expertise in a specific-domain of coaching statistically significantly use more rational and intuitive DM styles than non-experts. Additionally, coaches with elite-level player experience also show statistically significantly greater use of intuitive and rational DM styles than coaches without that experience (Giske et al. 2013, 695). The second study, conducted by Noh et al. (2018) explored

[36] the relationship between soccer club coaches' DM style, basic psychological needs and intention to continue exercising. This study's results showed that coaches' rational and intuitive DM styles have a positive effect on the participants' basic psychological needs, while coaches' dependent and avoidant styles have a negative effect on their basic psychological needs. Furthermore, this study also revealed that coaches' rational and intuitive DM styles have a positive effect on sport participants' intention to continue exercising, while coaches' avoidant style has a negative effect on their intention to continue to exercise (Noh et al. 2018, 10). In both studies, the structure of decision-making styles within all formed samples (entire, experts, non-experts ...) was the same. Coaches demonstrate the highest proportion of use of both functional DM styles (1) rational and (2) intuitive, followed in order by the so-called non-functional DM styles, (3) dependent, (4) spontaneous, and (5) avoidant DM style. The use of functional DM styles in DM processes generally leads to correct and effective decisions, while the increased presence of non-functional styles in the overall DM style structure of coaches could indicate the risk that their DM behavior often leads to negative results and inconsistent decisions (Mitchell et al. 2011, 693-4; Faletič and Avsec 2013, 133).

Kolar et al. (2025, 8) in their study developed a conceptual framework for coaches' decision making in conventional sport (e.g. gymnastics, figure skating) which encompass a wide range of situations that may arise during training and the potential approaches for addressing them. This should result in different types of decisions and characteristic of coaches' decision-making behavior. The developed conceptual framework foresees three types of decisions (strategic, tactical and operational), each of which should have a different role in the comprehensive process of sports training. To define the types of decisions, the (1) expected time frame of validity, (2) time impact, and (3) level of urgency of decisions made were primarily used. The authors point out that these three types of decisions should have a (1) distinct role in the comprehensive process of sports training, should be (2) carried out on the basis of different cognitive processes, (3) be manifested in the forms of different DM style structures and (4) be enforced by using different leadership styles. From this perspective, therefore, each type of decision identified has its own unique role, significance, and meaning in managing comprehensive sport training process. As the authors note, if we are aware of the level of knowledge and the amount of experience



of the coaches and we find out (measure) their DM style structure, the conceptual framework provides clear guidance on which coach should be entrusted with managing athletes during training and competitions (Kolar et al. 2025, 11).

[37]

METHODS

Participants

The sample consisted of 53 Serbian gymnastics coaches (age: 40.96 ± 13.04 years), which represents nearly the entire population of Serbian gymnastics coaches and exceeds the minimum requirement for conducting factor analysis (de Winter et al. 2009). The upper age limit was 79 years, while the lower age limit was 20 years. The most experienced coach had 38 years of experience, and the least experienced had 2 years (12.91 ± 9.21 years). The sample included 17 men (32.1%) and 36 women (67.9%). Participants completed the questionnaire during the national coaching seminar in Kostolac (Serbia, August 2023). All subjects participated in the study voluntarily and without any compensation.

Instrument

The DM style was measured using the GDMS (Scott and Bruce 1995), which was translated into Serbian. The GDMS questionnaire measures five different DM styles: rational, intuitive, dependent, avoidant, and spontaneous. The questionnaire consists of 25 items (5 for each DM style) ranging on a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). A total score for each of the five DM styles was obtained by summing the item scores that measured each DM style, with scores ranging from 5 to 25. The GDMS scales have previously demonstrated good psychometric characteristics across different samples (managers, students, the general population, military officers, sport managers, sport coaches and others) from various countries (Scott and Bruce 1995; Thunholm 2004; Spicer and Sadler-Smith 2005; Gambetti et al. 2008; Curşeu and Schrujjer; 2012; Avsec 2012; Giske et al. 2013; Bavořár and Orosová 2015; Noh et al. 2018; Alacreu-Crespo et al. 2019; Kolar and Tuřak 2022). In this study, the alpha coefficients of the scales ranged between 0.472 (spontaneous) to 0.870 (avoidant) (table 1). The Cronbach's alpha for the entire GDMS is 0.726, which is a good indicator of internal consistency. The reliability coefficient for the spontaneous style was deemed adequate, while other coefficients indicated moderate to strong internal consistency (Taber 2018, 1278). Gen-

eral information questions about gender, age, experience, level of education, status, and success of the coach were also added.

Statistical Analysis

- [38] Statistical data processing was carried out using the Statistical Package for the Social Sciences 29 (IBM SPSS). The factor analysis method – Principal Component Factoring (PCF) and varimax rotation of factors – was used to test the assumption about the structure of DM styles. Factor extraction was carried out using Kaiser-Guttman's criterion (Eigenvalue > 1) and the scree plot diagram (Cattell's Scree Test) (Cattell 1966). Before applying the factor analysis (hereinafter: FA), the data adequacy was tested with the Keiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's test of sphericity. Values of the KMO test above 0.6 indicate that the analyzed data is suitable for the use of FA (Tabachnick and Fidell 2007). Bartlett's test must show significant differences at a risk level of less than 5% ($p < 0.05$), indicating that the correlation matrix is not uniform and that the observed variables are related to some extent. The internal consistency of the overall scale and subscales was measured using Cronbach's alpha coefficient. Pearson's correlation coefficient was used to identify the association between DM styles, demographic and professional characteristics of the sample, and ANOVA was used to detect differences between more experienced and less experienced coaches.

RESULTS

Table 1 shows descriptive statistics for five DM styles. The average values of the individual DM style use (Mean/Value) were calculated from the scores dedicated to items assigned to an individual DM style (Scott and Bruce 1995). The average share of the individual DM style use (Mean/% of maximum) in relation to the maximum possible total value of the sum of items of the individual DM style (maximum = 25) was also calculated for each DM style.

The structure of the DM styles (table 1) revealed that Serbian coaches, on average, most often use the rational and dependent DM styles. These are followed by the intuitive and spontaneous DM styles, whereas coaches are least likely to use the avoidant DM style. Similar results on the structure of DM styles in different samples were also found by other authors (Scott and Bruce 1995; Giske et al. 2013; Ghazi and Hu 2016; Krasniqi et al. 2019; Noh et al. 2018; Kolar and Tušak 2022).



TABLE 1 Descriptive Statistics and Internal Consistency of DM Styles

DM Styles	N	Min	Max	Mean		SD	Skew.	Kurt.	α
				Value	%				
DMSR	53	15	25	21.83	87.3	2.548	-0.883	0.564	0.806
DMSI	53	10	25	16.45	65.8	3.297	0.643	0.584	0.744
DMSD	53	9	25	17.81	71.2	3.294	-0.169	0.116	0.790
DMSA	53	5	22	9.53	38.1	4.145	1.060	0.851	0.870
DMSS	53	8	17	12.81	51.2	2.466	0.010	-0.810	0.472

[39]

NOTES DMSR – rational style, DMSI – intuitive style, DMSD – dependent style, DMSA – avoidant style, DMSS – spontaneous style.

TABLE 2 The Kaiser-Meyer-Olkin (KMO) Test and Bartlett’s Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.639
Bartlett’s Test of Sphericity	Approx. χ^2	682.612
	DF	300.000
	Sig.	0.000

The average structure of DM styles also reveals that Serbian coaches achieve a significantly high proportion of use of the rational DM style (87.3%), as well as high proportions of use of the dependent (71.2%) and intuitive (65.8%) DM styles, while the spontaneous style is used occasionally (51.2%) and the avoidant style is mostly not used (38.1%) in the training process.

Before applying FA, the Kaiser-Meyer-Olkin (KMO) test and Bartlett’s test of sphericity (table 2) were carried out to evaluate the factorability. The KMO measure of sampling adequacy was 0.639 (the required minimum is above 0.6) and the significance of Bartlett’s test of sphericity was 0.000 ($p < 0.01$). The results of both tests show that the studied sample is suitable for performing FA.

The structure of the decision-making styles of Serbian gymnastics coaches was verified by FA using the method of principal components with varimax rotation (table 3). The FA procedure based on Kaiser-Guttman’s criterion extracted six (6) factors, which cumulatively explain 67.820% of the total variance. Table 3 also shows a scree plot diagram with the factor eigenvalue curve bending at the fifth factor, indicating that a five-factor solution corresponds to the GDMS model and could also be considered a valid result of the FA (Scott and Bruce 1995; Spicer and Sadler-Smith 2005). Thus, the rotated solution with five factors explains 62.957% of the total variance of the observed variables.

TABLE 3 FA of the GDMS Inventory and Scree Plot Diagram

	(b)			(c)			(d)		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
1	5.469	21.876	21.876	5.469	21.876	21.876	4.125	16.499	16.499
2	3.906	15.625	37.500	3.906	15.625	37.500	3.431	13.726	30.225
3	3.426	13.704	51.204	3.426	13.704	51.204	3.028	12.113	42.338
4	1.578	6.312	57.516	1.578	6.312	57.516	2.887	11.549	53.887
5	1.480	5.919	63.435	1.480	5.919	63.435	2.268	9.070	62.957
6	1.096	4.384	67.820	1.096	4.384	67.820	1.216	4.862	67.820
7	0.956	3.826	71.645						
8	0.915	3.661	75.307	6.0					
9	0.795	3.178	78.485	5.5					
10	0.723	2.893	81.378	5.0					
11	0.618	2.473	83.851	4.5					
12	0.601	2.406	86.257	4.0					
13	0.508	2.032	88.289	3.5					
14	0.460	1.842	90.131	3.0					
15	0.440	1.761	91.891	2.5					
16	0.373	1.490	93.381	2.0					
17	0.352	1.407	94.788	1.5					
18	0.270	1.080	95.868	1.0					
19	0.217	0.869	96.738	0.5					
20	0.195	0.782	97.519	0.0					
21	0.186	0.745	98.265						
22	0.149	0.597	98.861						
23	0.120	0.482	99.343						
24	0.094	0.375	99.718						
25	0.071	0.282	100.000						

NOTES Column headings are as follows: (a) component, (b) initial eigenvalues, (c) extraction sums of squared loadings, (d) rotation sums of squared loadings, (1) total, (2) percentage of variance, (3) cumulative percentage.

[40]

Table 4 shows the factor structure and factor loadings of the items included in the GDMS inventory. The first factor is associated with all five items measuring the avoidant style and two items from the spontaneous DM style (DMSS4 and DMSS2). The projections of avoidant style items on the first factor are high (factor loadings from 0.700 to 0.816), while the projection of the spontaneous DM style items on the same factor is very low (0.472, 0.382). Therefore, the first factor can be



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TABLE 4 Factor Structure and Factor Loadings of the 25 Items of the GDMS Inventory

Items	Component					
	1	2	3	4	5	6
DMSA1	0.816					
DMSA4	0.809					
DMSA3	0.780					
DMSA2	0.775					
DMSA5	0.700					
DMSS4	0.472					
DMSS2	0.373					
DMSR5		0.837				
DMSR4		0.795				
DMSR3		0.717				
DMSR1		0.623				
DMSR2		0.413				
DMSD1			0.818			
DMSD2			0.800			
DMSD3			0.742			
DMSD4			0.634			
DMSD5			0.531			
DMSI1				0.783		
DMSI2				0.759		
DMSI5				0.735		
DMSI4				0.730		
DMSS3					0.779	
DMSS1					0.647	
DMSS5					0.518	
DMSI3						0.643

[41]

NOTES DMSA1-5 – avoidant style items, DMSR1-5 – rational style items, DMSD1-5 – dependent style items, DMSI1-5 – intuitive style items, DMSS1-5 – spontaneous style items.

named the ‘avoidant style’, explaining 16.499% of the total variance of the rotated solution (table 3). It can be observed that all the items measuring a rational DM style (DMSR1 to DMSR5) are related to the second factor (factor loadings from 0.413 to 0.837). This factor explains 13.726% of the total variance of the rotated solution (table 3) and can be named the ‘rational style’. The third factor is explained with five dependent DM style variables (DMSD1 to DMSD5) with factor loadings from 0.531 to

[42] 0.818. The third factor explains 12.113% of the total variance (table 3) and can be named the 'dependent style'. The fourth factor (table 4) is explained by four items measuring the intuitive DM style (DMSI1, 2, 4 and 5) with factor loadings from 0.730 to 0.783. The fourth factor explains 11.549% of the total variance of the rotated solution (table 3) and can be named the 'intuitive style'. The fifth factor is explained by only three items, belonging to the spontaneous DM style (DMSS1, 3 and 5) with factor loadings 0.518 and 0.779. The fifth factor explains 9.070% of the total variance of the rotated solution (table 3) and can be named the 'spontaneous style'. The sixth factor of the rotated solution is explained by only one variable from the intuitive DM style (DMSI3), with a factor loading of 0.643, explaining 4.862% of the total variance (table 3). This variable was distributed outside the predicted DM styles. Since the scree plot diagram suggests a five-factor solution (table 3) and the sixth factor is defined by only one variable (table 4), we will exclude this factor from further analysis.

Regardless of the clarity of the five-factor structure model, which is consistent with the original GDMS model from Scott and Bruce (1995), some variables are nevertheless distributed outside the predicted DM styles. The obtained factor model shows a good stability for the avoidant, rational and dependent DM styles in terms of the included items. The stability of intuitive DM style is relatively good, while the spontaneous style scale proved to be very unstable and problematic. However, it should be noted that, even in the original paper by Scott and Bruce (1995), the spontaneous style was added at a later stage, and the items and questions are somehow ambiguous. The items, which in the presented study (table 4) were not projected onto the factors in accordance with the original model, are DMSS2 ('I often make decisions on the spur of the moment'), DMSS4 ('I often make impulsive decisions'), and DMSI3 ('I generally make decisions that feel right to me').

Some other authors have also faced a similar problem with the same variables on different samples (Baiocco et al. 2009; Reyna et al. 2014; Fischer et al. 2015; del Campo et al. 2016; Kolar and Tušak 2022). The variables that were not distributed among the factors in accordance with the intended model were named 'problematic items' and due to missing content validity or ambiguity, they were excluded from future considerations in their research. Based on that, we will also, in the continuation of the present study, remove the mentioned variables from



the structure of the DM styles of Serbian gymnastics coaches and consider the DM style structure with 22 items.

In the continuation of the investigation of the characteristics of the DM behavior of Serbian coaches, we examined the connections between the extracted DM styles and also the connections of these styles with some demographic and professional characteristics of the selected sample. Table 5 shows that rational and avoidant DM styles are negatively statistically correlated at a 1% level risk, which is in line with the findings of other authors (Scott in Bruce 1995, 830; Spicer and Sadler-Smith 2005, 141; Baiocco et al. 2009, 968; Faletič and Avsec 2013, 138; Hariri et al. 2014, 293). This type of connection between these two styles was also expected, since the rational DM style depends on the decision-makers fully following the rules and procedures in the judgment process, with the aim of making the best possible decision, while the avoidant DM style is characterized by the fact that the decision maker avoids the decision, is not capable of relevant judgment and manifests itself mainly in indecisive behavior. A statistically significant positive association at a 1% risk level was also found between the intuitive and spontaneous DM styles. Similar conclusions were also reached by other authors (Scott and Bruce 1995; Thunholm 2004; Spicer and Sadler-Smith 2005; Baiocco et al. 2009; Curşeu and Schrujjer 2012; Faletič and Avsec 2013; Reyna et. al. 2014; Hariri et al. 2014; Bavořár and Orosová 2015; Berisha et al. 2018). These findings align with our expectations, as both intuitive and spontaneous decision-making styles are linked at a latent level to the intuitive-experiential cognitive style (Alacreu-Crespo et al. 2019), which defines the manifestation of these styles. The analysis of associations between individual styles also showed a statistically significant positive correlation at a 5% risk level between dependent and avoidant DM styles, which requires caution and is addressed and explained in the discussion section.

Table 5 also shows that the age, experience, status, and success of coaches are all positively correlated at a 1% significance level. This suggests that more experienced coaches are also older, achieve better results with their athletes, and hold higher positions within the national coaching hierarchy. This fact may also indicate a positive human resource strategy within the coaching organization in Serbian gymnastics. An examination of statistically significant associations at different risk levels (table 5) of demographic and professional characteristics of coaches with DM styles shows that female coaches (Faletič and Avsec

[43]

TABLE 5 Correlations between the DM Styles, Demographics and Professional Characteristics

Item	1	2	3	4	5	6	7	8	9	10
1 Gender										
2 Age	0.619									
3 Exper.	0.839	0.000***								
4 Educat.	0.825	0.367	0.639							
5 Status	0.759	0.031**	0.002***	0.549						
6 Success	0.793	0.172	0.021**	0.179	0.000***					
7 DMSR	0.502	0.999	0.795	0.561	0.989	0.555				
8 DMSI	0.449	0.458	0.573	0.714	0.999	0.475	0.935			
9 DMSD	0.437	0.312	0.020**	0.635	0.907	0.740	0.187	0.250		
10 DMSA	0.362	0.411	0.640	0.806	0.536	0.188	0.003***	0.406	0.016**	
11 DMSS	0.013**	0.072*	0.023**	0.831	0.782	0.993	0.595	0.002***	0.314	0.181

NOTES * Correlation is significant at the 0.10 level (2-tailed), ** correlation is significant at the 0.05 level (2-tailed), *** correlation is significant at the 0.01 level (2-tailed).

[44]

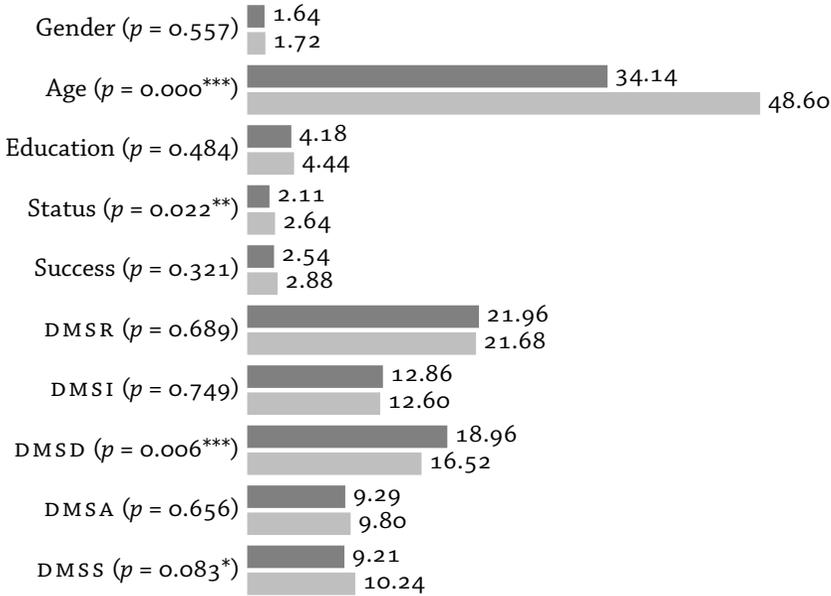
2013, 139; Bayram and Aydemir 2017, 911), older (Faletič and Avsec 2013, 139; Bulog 2016, 399) and more experienced coaches are on average more spontaneous in DM, while younger coaches tend to be more dependent decision-makers.

The analysis of the connections between the measured variables revealed that the experience of the coaches is the parameter that forms the largest number of statistically significant connections with the other measured parameters. We can also assume that experience is the statistical source of some other connections. For this reason, we divided the sample of coaches into two groups based on the number of years of coaching experience and analyzed whether there are any differences between the groups formed in this way in the other measured parameters. Thus, coaches with ten (10) or fewer years of experience were included in the group of less experienced coaches, while those with more than 10 years of experience were classified as more experienced coaches (Ericsson 2018b, 746, Kolar et al. 2025, 12).

Analysis of the differences between more and less experienced coaches (figure 1) shows that more experienced coaches are statistically significantly older ($p = 0.000$) and have a statistically significantly higher coaching status ($p = 0.022$). An examination of the differences in the structure of DM styles between the two groups reveals that more experienced coaches are statistically more likely to be spontaneous decision-makers ($p = 0.083$) while less experienced coaches tend to be more dependent decision-makers ($p = 0.006$). Similar results were also obtained



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[45]

FIGURE 1 Analysis of differences between More and Less Experienced Coaches

NOTES Dark – less experience, light – more experience; * correlation is significant at the 0.10 level (2-tailed), ** correlation is significant at the 0.05 level (2-tailed), *** correlation is significant at the 0.01 level (2-tailed).

in the research on the decision-making styles of football coaches (Giske et al. 2013), but the differences in this study were not significant.

DISCUSSION

The DM style refers to how an individual gathers, interprets, and uses information to make decisions. Thunholm (2004) defined it as a response pattern demonstrated when confronted with a decision. DM styles significantly impact a coach's performance, which in turn affects athlete outcomes (Kolar et al. 2025, 12). As Rowe and Boulgarides (1992) noted, DM styles are essential for effective DM and should be assessed.

This study found that Serbian gymnastics coaches employ a combination of all five DM styles, with rational and dependent styles being the most common, indicating that they are primarily rational decision-makers. Rational decision-makers critically evaluate evidence and follow a structured, time-consuming process before making decisions (Fitzgerald et al. 2017). Interestingly, the dependent style, which

[46] is less prevalent in other coaching studies (Giske et al. 2013; Noh et al. 2018), was the second most frequently used. Alacreu-Crespo et al. (2019) found that dependent decision-makers seek emotional and instrumental support (e.g., moral support, advice, help and information from others), relying on others to increase the rationality of their decisions (Vroom 2003; Khasawneh et al. 2011). This aligns with the theory of extended rationality (Secchi 2010), where coaches reduce limitations in information processing by consulting others (Simon 1976).

However, the correlation analysis (table 5) revealed a significant positive relationship between the dependent and avoidant DM styles. This combination, referred to as a dependent-avoidant DM style, can be seen as dysfunctional (Faletič and Avsec 2013, 133; Fischer et al. 2015, 525), as such individuals are either unable or unwilling to accept responsibility for decisions and tend to avoid DM, shifting responsibility onto others (Scott and Bruce 1995; Harren 1979).

Experience level also impacts DM styles (figure 1). More experienced coaches tend to be older, have higher national coaching status, and are less likely to rely on the dependent style compared to their less experienced counterparts. Phillips et al. (1984, 497) found that decision-makers with a dominant dependent style tend to lack confidence and seek confirmation from others. Less experienced coaches (figure 1), often with lower status in the national coaching hierarchies, are more likely to use the dependent style due to their limited authority to make independent decisions and less domain-specific knowledge (Kahneman and Klein 2009).

Additionally, more experienced coaches tend to be more spontaneous decision-makers. Kolar et al. (2025, 10) noted that spontaneous decisions typically arise during operational-type decisions in the training process and are often driven by a coach's gut feeling (System 1), coupled with the urgency to act quickly. These decisions can also be understood in accordance with Thunholm's (2004, 941) definition as a high-speed, intuitive DM style decision, used in DM situations that are under time pressure. These decisions are essential in unpredictable situations and are valid only when made by experienced coaches who possess sufficient tacit knowledge, acquired in a specific domain environment, and have learned the rules of that domain through frequent and accurate feedback (Kahneman and Klein 2009, 524–5). In contrast, novice coaches may rely on guesswork or be influenced by cognitive biases, which makes their decisions less reliable (Kolar et al. 2025). There-



fore, the frequent use of the spontaneous DM style among experienced coaches was both expected and appropriate.

CONCLUSION

Based on the average structure of the DM styles discovered in this study, we can conclude that Serbian gymnastics coaches are primarily rational decision-makers who enhance their rationality by consulting with colleagues for advice, opinions, and knowledge when making decisions, and that more experienced coaches can make decisions more independently and also faster when the situation is urgent or time-limited. The findings of this research support the theoretical framework of coaches' DM in conventional sports, developed by Kolar et al. (2025), and contribute to a better understanding of the importance of coaches' DM and knowledge expansion. However, the study has some limitations, mostly related to the relatively small sample drawn from a single cultural environment. Therefore, future research in this field is needed. [47]

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