Submitted: 28 October, 2024 Accepted: 21 February, 2025 Published: 30 May, 2025 DOI:10.22514/jomh.2025.066

ORIGINAL RESEARCH

JOMH Journal of Men's Health

Does cognitive flexibility enhance decision-making in sports?

Burhan Başoğlu[1], Erdil Keyf[2], Mustafa Vural[3], Mehmet Gül[4], Abdullah Doğan[5], Fatih Karakaş[6], Gökhan Arıkan[7], Furkan Çamiçi[8,*]

[1]Department of Physical Education and Sports, Faculty of Sport Sciences, Nevşehir Haci Bektaş Veli University, 50300 Nevşehir, Türkiye
[2]Faculty of Sport Sciences, Mersin University, 33110 Mersin, Türkiye
[3]Department of Sport Management, Faculty of Sport Sciences, Ağrı İbrahim Çeçen University, 04100 Ağrı, Türkiye
[4]Department of Sport Management, Faculty of Sport Sciences, Sivas Cumhuriyet University, 58140 Sivas, Türkiye
[5]Ministry of Youth and Sports, 06000 Ankara, Türkiye
[6]Department of Physical Education and Sports, Yaşar Doğu Faculty of Sport Sciences, Ondokuz Mayis University, 55280 Samsun, Türkiye
[7]Department of Physical Education and Sports, School of Physical Education and Sports, Harran University, 63000 Şanlıurfa, Türkiye
[8]Coaching Education Department, Faculty of Sport Sciences, Hitit University, 19030 Çorum, Türkiye

***Correspondence**
furkancamici@hitit.edu.tr
(Furkan Çamiçi)

Abstract

Background: Decision-making is a multifaceted process crucial in both individual and organizational settings, particularly in high-pressure environments like sports. Cognitive flexibility plays a vital role in enhancing athletes' decision-making abilities. This study examines the relationship between cognitive flexibility and decision-making processes among athletes, focusing on the sub-dimensions of "Alternatives" and "Control". **Methods**: A quantitative research design utilizing a relational survey model was employed. Data were collected from 743 male athletes across various sports disciplines in Türkiye. The Sports Effective Decision-Making Scale and the Cognitive Flexibility Inventory were used as measurement tools. Confirmatory factor analysis confirmed their validity and reliability in the sports context. Regression analysis was conducted to examine the predictive relationships between cognitive flexibility sub-dimensions and decision-making effectiveness. **Results**: Regression analysis revealed significant findings. The "Alternatives" dimension positively predicted effective decision-making in sports, particularly in external decision-making scenarios ($\beta = 0.207$, $t = 5.427$, $p < 0.001$). In contrast, "Control" was a stronger determinant of intrinsic decision-making ($\beta = 0.210$, $t = 5.607$, $p < 0.001$). The R^2 values indicated that cognitive flexibility factors explained 18.1% of the variance in effective decision-making and 10.9% in intrinsic decision-making, highlighting the need to explore additional contributing factors. **Conclusions**: These findings provide practical implications for coaches and sports psychologists. Coaches can enhance athletes' decision-making abilities by fostering a sense of control and offering diverse alternatives in training and competition. Sports psychologists may develop interventions to strengthen cognitive flexibility and perceived control among athletes. The study emphasizes the necessity of a broader framework for understanding decision-making, suggesting that future research should explore the interplay of emotional, social and cultural factors in athletic decision-making.

Keywords

Organisation; Cognitive flexibility; Decision-making; Sports

1. Introduction

Decision-making, a complex and multifaceted process, serves as a cornerstone in both individual and organizational contexts [1, 2]. It has been a subject of great importance throughout human history, evolving alongside societal advancements and becoming increasingly intricate in modern conditions. While decision-making has been widely studied, there is a need to contextualize these theories within specific domains, such as sports, where high-pressure and dynamic environments uniquely shape decision-making processes. Cognitive flexibility, in particular, has emerged as a critical factor in understanding how individuals adapt their decision-making strategies in such settings. This study contributes to the theoretical framework by examining how the subdimensions "Alternatives" and "Control" interact with decision-making in sports contexts, offering novel insights into their specific roles and implications.

The quality and quantity of these decisions are predicted to vary according to the current development of the individual and the quality of the decision-making process. Carneiro *et al.* [3] (2019) developed a general decision-making scale to assess perceived decision quality in web-based group decision support systems, pioneering the analysis of decision-making aspects. Similarly, a decision-making style measure is presented that aims to systematically assess and categorize individual decision-making behaviors. These styles are shaped by individual characteristics, external environmental factors, and organizational contexts, underscoring the complexity of decision-making behaviors [4].

The influence of various factors, such as religion, race, educational status and gender, on decision-making has been

widely discussed in the literature [5]. For instance, research by Sanchez *et al*. [6] (2009) revealed that female basketball players do not experience significant pressure when making decisions during games, suggesting that their decision-making processes may differ contextually from their male counterparts. Similarly, Buckley *et al*. [7] (1998) observed that women demonstrate a lower tendency to engage in unethical decision-making behaviors compared to men, indicating potential gender-based differences in decision-making ethics. However, while these studies offer valuable insights, the relationship between gender and decision-making remains underexplored and inconclusive, with findings varying across different contexts and populations. Despite the descriptive understanding of factors influencing decision-making, there is limited critical examination of how these factors interact and why they impact decision-making outcomes [7]. For example, while it is acknowledged that decision-making styles are influenced by individual and external factors, the specific mechanisms through which these factors shape decision effectiveness, particularly in athletic environments, remain unclear. Moreover, the literature lacks a focused discussion on the relevance of decision-making theories to athletes and practitioners, who must navigate high-pressure and dynamic situations [7–9]. This study seeks to address these gaps by exploring the specific ways in which decision-making processes, informed by cognitive flexibility, contribute to performance in sports.

In addition, cognitive flexibility is considered to have significant implications for decision-making styles. It has been defined from various perspectives in the literature, but it is generally described as the ability to adapt to change, think about multiple concepts and factors, and perceive diverse opinions and perspectives [8, 9]. Cognitive flexibility is a valuable trait for athletes, enabling them to reorganize their cognitive structures in response to suggestions from the sports environment or to devise new solutions when faced with unique challenges [10]. While some studies have highlighted positive associations between cognitive flexibility and decision-making skills, such as openness to discussion, conflict tolerance [11], interpersonal communication skills [12], assertiveness, communication self-efficacy [13], openness to cooperation, adaptability [14], and self-sensitivity [15], the specific nature of these relationships remain underexplored. Moreover, although cognitive flexibility is often linked to decision-making styles, its direct impact on gendered perceptions of decision-making processes has been scarcely investigated. In this context, this study seeks to address this gap by examining whether cognitive flexibility provides an advantage in decision-making processes, particularly from a gender perspective.

2. Materials and methods

2.1 Research model

This study adopts a quantitative research approach to systematically examine the relationship between cognitive flexibility and decision-making processes among athletes. Quantitative methods were chosen for their ability to provide objective and measurable insights into complex phenomena, ensuring replicability and generalizability of findings. Specifically, survey models were employed, as they enable the collection of data from a broad population, facilitating a comprehensive understanding of the variables under investigation. In the literature, general survey models are described as arrangements designed to derive judgments about an entire population or a representative sample. These models are particularly effective for identifying patterns, relationships, and trends across diverse groups. The recruitment period and collection of participant data took place between 28 September and 26 October 2024, and ensured a comprehensive representation of athletes from various levels of competition and sport disciplines.

For this study, a relational survey model was selected to explore the existence and magnitude of relationships between key study variables such as cognitive flexibility and decision-making outcomes. This approach allows for the analysis of correlations, which reveals the strength and direction of associations between interest variables, as well as comparative analyses to identify differences or changes across groups. By utilizing relational analysis, the study seeks to uncover the underlying dynamics that link cognitive flexibility and decision-making, providing actionable insights for both researchers and practitioners in the field of sports psychology. This model's capacity to quantitatively assess attitudes, tendencies, and interactions between interest variables makes it particularly suitable for addressing the research questions posed in this study [16, 17].

2.2 Participants and procedure

The study involved 743 male athletes competing in various sports disciplines across Turkiye, representing different branches such as football, basketball, volleyball, and athletics. Athletes were recruited from local, regional, and national-level clubs to ensure diversity in competitive experience and skill levels. Participants ranged in age from 18 to 35 years, with an average age of 24.5 $\pm$ 3.80 years. The data collection process utilized a questionnaire distributed to 956 athletes. Among these, 865 athletes voluntarily completed the survey, adhering to ethical principles, and after removing incomplete or erroneous responses, 743 valid questionnaires were included in the analysis.

All participants were informed about the purpose of the study and their rights, including the voluntary nature of their participation and the ability to withdraw at any stage without consequences. No financial incentives were provided to ensure unbiased responses. Ethical approval was obtained, and an informed consent form was signed by all participants prior to data collection. These forms highlighted the confidentiality and anonymity of the data collected, ensuring compliance with ethical standards.

2.3 Data collection

The survey method was used as a data collection technique for this research. One of the data collection methods used in quantitative research is the questionnaire. The questionnaire is a method of preparing question lists to be answered by the people from whom the information is to be collected. First, questions related to the research subject were identified or

created. All questions in the questionnaire must be directly related to the research problem and subject, and must be consistent within themselves. The variables for these questions should also be determined, and the target group that answers the questions should be identified. Thus, information about the attitudes and opinions of the target group can be obtained [18].

2.4 Data collection tools

2.4.1 The scale of effective decision-making in sport

The Sports Effective Decision Making Scale developed by Çetin and Kara (2024) was designed to measure effective decision-making ability in sports. The scale consists of 15 items and 2 sub-dimensions categorized as internal decision making and external decision making. The two-factor structure of the scale with 15 items was confirmed by confirmatory factor analysis (CFA) as a model. An examination of the convergent and divergent validity as well as the convergent reliability values of the scale items showed that the scale fulfills the relevant criteria. The internal consistency coefficient of Cronbach's alpha was calculated at 0.87 for the external decision-making sub-dimension and 0.85 for the internal decision-making sub-dimension [19].

2.4.2 The cognitive flexibility ınventory

The Cognitive Flexibility Inventory (CFI), originally developed by Dennis and Vander Wal (2010), has been adapted to sports environments in recent research [8]. A Turkish adaptation study was conducted by Sapmaz and Doğan (2013), which confirmed that the inventory retained the original structure and content, consisting of 20 items [20]. The inventory is composed of two sub-dimensions—Alternatives and Control—and is evaluated on a 5-point Likert scale. More recently, Yarayan, Turhan and Demir (2023) further adapted and validated the CFI specifically for athletes, ensuring its applicability within sports settings [21].

2.5 Data analysis

In this study, multiple linear regression analysis was used to analyze the data. Before data analysis, the validity of normality, linearity, and multiple assumptions of linear regression were confirmed. This study examined the relationship between a dependent variable and one or more independent variables through regression analysis. There is a cause-and-effect relationship between these variables in the regression analysis, which is explained by a mathematical model. This model is called a regression equation or regression model. A model consisting of one dependent variable and one independent variable is called a simple regression model, whereas a model consisting of one dependent variable and multiple independent variables is called a multiple regression model. The aim here is to provide information about the dependent variable with the help of the independent variable(s), and to construct a prediction equation that can make accurate forecasts [22]. The normality of the distribution of athlete cognitive flexibility scale scores and effective decision-making in sport scale scores were examined using Skewness and Kurtosis coefficients. Spss program was used for the analyses.

As a result of the normality analysis performed to determine the normality of the distribution of the data, Skewness and Kurtosis coefficients were between −1 and +1 [23]. The data were normally distributed (Table 1).

3. Results

The R value (0.318) indicates a moderate positive correlation between the independent variables (both "Alternatives" and "Control") and effective decision-making in sports. The R^2 value of 0.111 suggests that 18.1% of the variance in effective decision-making can be explained by the variables "Alternatives" and "Control". This indicates that while the model has significant explanatory power, other factors are likely to contribute to effective decision-making. The F-value of 23.21 for "Alternatives" indicates that the overall regression model is statistically significant. A high F value suggests that the model fits the data well for this independent variable. For "Alternatives", the β coefficient is 0.207, indicating a positive impact of alternatives on effective decision-making. This means that, as the availability of alternatives increases, effective decision-making in sports improves. For "Control", the β coefficient is −0.023, suggesting a very slight negative relationship between control and decision-making, though the effect size is minimal. The t-value for "Alternatives" is 5.427, which is high and statistically significant. This suggests that "Alternatives" is a strong predictor of effective decision-making in sports. The t-value for "Control" is 2.031, but because the p-value is not significant (as explained below), this relationship is not meaningful in this context.

The R value (0.242) indicates a weak positive correlation between the independent variables ("Alternatives" and "Control") and extrinsic decision-making. The R^2 value of 0.058 means that 9.5% of the variance in extrinsic decision-making can be explained by "Alternatives" and "Control". While this model has some explanatory power, other factors likely contribute to extrinsic decision-making, which is not accounted for in this analysis. The F-value of 21.88, suggests that the overall regression model is statistically significant. This indicated that the model fit the data well. For "Alternatives", the β coefficient is 0.143, meaning that an increase in alternatives is associated with a small but positive increase in extrinsic decision-making. This suggests that the availability of alter-

TABLE 1. Normality distributions of variables.

Measurement tools	Min	Max	S.d.	Skewness	Kurtosis
Athlete cognitive flexibility inventory	49.00	79.00	5.85	−0.347	−0.046
Effective decision-making in sport	39.00	65.00	5.70	0.882	0.299

Min: Minimum; Max: Maximum; S.d.: Standard deviation.

natives positively affects decisions based on external factors. For "Control", the β coefficient is 0.235, indicating that having a greater sense of control has a stronger positive effect on extrinsic decision-making than alternatives. The t-value for "Alternatives" is 3.792, which is statistically significant ($t >$ 2). This suggests that "Alternatives" is a meaningful predictor of extrinsic decision-making. The t-value for "Control" is 6.218, which is quite high, indicating that "Control" is a stronger and highly significant predictor of extrinsic decision-making compared to "Alternatives".

The R value of 0.270 suggests a moderate positive correlation between both "Alternatives" and "Control" with Intrinsic Decision-Making, meaning that both factors have some positive association with intrinsic decision-making processes. The R^2 value of 0.073 indicates that 10.9% of the variance in intrinsic decision making can be explained by the combination of these two variables. This shows that the model has modest explanatory power. The F-value for "Alternatives" is 27.78, which indicates that the regression model is statistically significant. A high F value suggests that the model fits the data well. For "Alternatives", the β coefficient is 0.124, suggesting that an increase in the availability of alternatives leads to a small positive increase in intrinsic decision-making. For "Control", the β coefficient is 0.210, indicating a stronger positive effect on intrinsic decision-making compared to "Alternatives". This suggests that a greater sense of control significantly enhances intrinsic decision making. The t-value for "Alternatives" is 3.456, which is statistically significant ($t > 2$), meaning "Alternatives" is a meaningful predictor of intrinsic decision-making. The t-value for "Control" is 5.607, which is much higher, indicating that "Control" is a more significant and impactful predictor of intrinsic decision-making compared to "Alternatives".

4. Discussion

This study provides valuable insights into the relationship between cognitive flexibility and decision-making processes among athletes, with a particular focus on the sub-dimensions of "Alternatives" and "Control". By integrating these dimensions into the broader theoretical framework of cognitive flexibility, the study advances our understanding of how decision-making effectiveness is shaped in high-pressure environments. Specifically, "Alternatives" emerged as a significant predictor of effective decision-making, particularly in external scenarios, where the availability of diverse options enhances adaptability and creativity in problem-solving. In contrast, "Control" was identified as a stronger determinant in intrinsic decision-making, emphasizing the role of autonomy and self-regulation in optimizing internal choices (Table 2). These findings extend the works of Dennis and Vander Wal (2010) by illustrating how these subdimensions operate within athletic environments, where rapid and adaptive decisions are critical [24]. Furthermore, they align with existing literature that underscores the importance of cognitive flexibility in fostering effective and innovative decision-making processes [25–27].

The extrinsic decision-making findings of this study align with previous research that highlighted the role of external factors in decision-making processes. The weak positive correlation (R = 0.242) suggests that while "Alternatives" and "Control" contribute to extrinsic decision-making, their impact is relatively limited (Table 3). This result supports the findings of Epstein and Gramling (2015), who also reported that decision-making often involves multiple complex factors beyond those measured in their model [26]. The low R^2 value (0.058) reinforces this notion, indicating that a substantial portion of the variance in extrinsic decision-making remains unexplained (Table 3). Future studies could explore additional variables, such as social influences or emotional states, as potential contributors to extrinsic decision-making [28].

The statistically significant F-value (21.88) demonstrates the robustness of the model despite its limited explanatory power (Table 3). This is consistent with the conclusions of Mõttus *et al*. [29] (2019), who emphasized that even models with modest explanatory capacities can yield valuable insights into specific behavioral tendencies. The positive β coefficients for both "Alternatives" (0.143) and "Control" (0.235) further illustrate the nuanced interplay between these predictors and extrinsic decision-making (Table 3). Specifically, the stronger impact of "Control" compared to "Alternatives" highlights the importance of autonomy in shaping decisions influenced by external factors, as noted by Morelli *et al*. [30] (2022).

The findings indicate that while the "Control" factor shows a

TABLE 2. Regression analysis results of the relationship between athlete cognitive flexibility and effective decision making in sport (n = 708).

Independent variables	Dependent variable: effective decision-making in sport					
	R	R^2	F	β	t	p
Alternatives	0.318	0.111	23.21	0.207	5.427	0.001
Control				−0.023	2.031	0.550

TABLE 3. Regression analysis results of the relationship between the sub-dimensions of athlete cognitive flexibility and extrinsic decision making (n = 708).

Independent variables	Dependent variable: extrinsic decision-making					
	R	R^2	F	β	t	p
Alternatives	0.242	0.058	21.88	0.143	3.792	0.001
Control				0.235	6.218	0.001

stronger contribution to extrinsic decision-making ($\beta = 0.235$) compared to "Alternatives" ($\beta = 0.143$), the overall explanatory power of the model remains low ($R^2 = 0.058$), suggesting that other factors may play a significant role (Table 3). This relatively weaker contribution of "Control" in explaining extrinsic decision-making aligns with previous studies highlighting the complex interplay of external influences and individual autonomy in decision-making processes [31–33]. Future research could investigate additional variables, such as emotional state or social pressures, to better understand the conditions under which "Control" becomes a more or less dominant factor. This would provide a deeper theoretical understanding of its role in extrinsic decision-making and offer practical insights for designing targeted interventions.

Overall, while this study provides valuable insights, its limitations should be acknowledged. The weak correlation and low R^2 value point to the need for a more comprehensive model that incorporates additional predictors (Table 3). Furthermore, the reliance on self-reported measures may introduce biases, as highlighted by Brown *et al*. [34] (2020). Future research could benefit from using experimental designs or longitudinal approaches to capture the dynamic nature of decision-making processes. Additionally, cultural and contextual factors should be examined to determine their moderating effects on the relationship between "Alternatives", "Control" and extrinsic decision-making [35].

The intrinsic decision-making findings of this study also align with previous research that emphasizes the importance of intrinsic factors in decision-making (Table 4). The moderate positive correlation ($R = 0.270$) between "Alternatives" and "Control" and intrinsic decision-making supports prior findings by Schaefer *et al*. [36] (2020), who highlighted the role of autonomy and available options in enhancing decision-making processes. The R^2 value of 0.073, while modest, suggests that these factors contribute meaningfully to intrinsic decision-making (Table 4), echoing the conclusions of Morelli *et al*. [30] (2022) that decision-making is influenced by a complex interplay of variables.

The statistically significant F-value for "Alternatives" ($F = 27.78$) underscores the robustness of the regression model (Table 4). This finding is consistent with Mahdavi's (2018) research, which demonstrated that even modest explanatory models can provide critical insights into behavioral tendencies [37]. The positive β coefficients for "Alternatives" (0.124) and "Control" (0.210) indicate that both predictors positively influence intrinsic decision-making, with "Control" exerting a more substantial impact. This aligns with the works of Ratcliff *et al*. [38] (2018), who found that perceived control plays a pivotal role in fostering intrinsic motivation and decision-making.

The significant t-values for "Alternatives" ($t = 3.456$) and "Control" ($t = 5.607$) further validate their predictive relevance (Table 4). The stronger impact of "Control" aligns with findings from Nie *et al*. [27] (2015), who emphasized the critical role of autonomy and control in intrinsic motivation. This suggests that strategies aimed at enhancing intrinsic decision-making should prioritize fostering a sense of control while also ensuring the availability of alternatives.

While these findings provide valuable insights, the study's limitations should be considered. The moderate correlation and modest R^2 value highlight the need for further exploration of additional variables that may contribute to intrinsic decision-making (Table 4). Future research could investigate the role of individual differences, cultural factors, or emotional state, as suggested by Lim (2016). Moreover, incorporating longitudinal or experimental designs could provide deeper insights into the dynamic and contextual nature of intrinsic decision-making [39].

5. Conclusions

This study provides valuable insights into the relationship between athletes' decision-making processes and the sub-dimensions of "Alternatives" and "Control". The findings demonstrate that while both factors positively influence decision-making, their impact varies depending on the context. Specifically, "Control" emerged as a stronger determinant in intrinsic decision-making, underscoring the importance of athletes' perceived autonomy and self-regulation in making effective choices.

For coaches, the findings suggest creating an environment where athletes feel a sense of control and are provided with diverse alternatives, such as incorporating decision-making drills and allowing input in training routines. Sports psychologists could design interventions like mindfulness exercises or role-playing sessions to enhance cognitive flexibility and perceived control. These approaches can improve athletes' self-regulation and adaptability, fostering better decision-making under high-pressure conditions.

Additionally, this study contributes to the broader framework for understanding effective decision-making by emphasizing the roles of "Alternatives" and "Control" across different contexts. Future research should explore how emotional and social variables, such as stress management and team dynamics, interact with cognitive dimensions to influence decision-making. Integrating these factors into a broader theoretical framework could provide insights into their interplay with cultural and competitive contexts, highlighting how these elements evolve over time. Such an approach would deepen the understanding of the mechanisms underpinning effective

TABLE 4. Regression analysis results of the relationship between the sub-dimensions of athlete cognitive flexibility and intrinsic decision making (n = 708).

Independent variables	Dependent variable: intrinsic decision-making					
	R	R^2	F	β	t	p
Alternatives	0.270	0.073	27.78	0.124	3.456	0.001
Control				0.210	5.607	0.001

decision-making in sports and offer a more holistic perspective for both researchers and practitioners. The findings of this study are based exclusively on a sample of male athletes from Turkiye, which limits the generalizability of the results to broader populations. Future research involving participants from diverse genders and cultural contexts would provide a more comprehensive evaluation of the findings. Such an approach would enhance the study's external validity and contribute more broadly to sports psychology literature.

AVAILABILITY OF DATA AND MATERIALS

Due to the limitations specified in the ethics committee approval, the data collected for this research cannot be shared with third parties.

AUTHOR CONTRIBUTIONS

BB, EK, MV, MG, AD, FK, GA, FÇ—designed the research study; wrote the article. MV, MG—carried out the research. AD, FK—provided help and advice on the research. GA, FÇ—analysed the data. All authors contributed to the editorial changes in the manuscript. All authors read and approved the final version of the article.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This article complies with the journal's writing and publication principles, research and publication ethics, and journal ethical guidelines. The responsibility for any violations that may arise regarding the article belongs to the authors. The study was deemed ethically appropriate by the Ethics Committee of Ağrı İbrahim Çeçen University Graduate Education Institute, with the decision dated 26 September 2024 and numbered 333. Informed consent was obtained from all participants prior to their inclusion in the study, and participation was entirely voluntary.

ACKNOWLEDGMENT

Not applicable.

FUNDING

This research received no external funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

REFERENCES

[1] Al Shra'ah AE. The impact of decision-making styles on organizational learning: an empirical study on the public manufacturing companies in Jordan. International Journal of Business and Social Science. 2015; 6: 55–62.

[2] Hosseinzadeh Lotfi F, Allahviranloo T, Pedrycz W, Shahriari M, Sharafi H, Razipour GhalehJough S. Foundations of decision. In Hosseinzadeh Lotfi F, Allahviranloo T, Pedrycz W, Shahriari M, Sharafi H, Razipour GhalehJough S (eds.) Fuzzy decision analysis: multi attribute decision making approach (pp. 1–56). 1st edn. Springer International Publishing: Cham. 2023.

[3] Carneiro J, Saraiva P, Conceição L, Santos R, Marreiros G, Novais P. Predicting satisfaction: perceived decision quality by decision-makers in web-based group decision support systems. Neurocomputing. 2019; 338: 399–417.

[4] Burton JW, Stein MK, Jensen TB. A systematic review of algorithm aversion in augmented decision making. Journal of Behavioral Decision Making. 2020; 33: 220–239.

[5] Ford RC, Richardson WD. Ethical decision-making: a review of the empirical literature. Journal of Business Ethics. 1994; 13: 205–221.

[6] Sanchez ACJ, Calvo AL, Bunuel PS, Godoy SJ. Decision-making of Spanish female basketball team players while they are competing. Revista de Psicologia del Deporte. 2009; 18: 369–373.

[7] Buckley MR, Wheeler DS, Halbesleben MG. An investigation into the dimensions of unethical behavior. Journal of Education for Business. 1998; 73: 284–290.

[8] Palmiero M, Nori R, Piccardi L, D'Amico S. Divergent thinking: the role of decision-making styles. Creativity Research Journal. 2020; 32: 323–332.

[9] Bakken BT, Hansson M, Hærem T. Challenging the doctrine of "non-discerning" decision-making: investigating the interaction effects of cognitive styles. Journal of Occupational and Organizational Psychology. 2024; 97: 209–232.

[10] Dania A, Kaltsonoudi K, Ktistakis I, Trampa K, Boti N, Pesce C. Chess training for improving executive functions and invasion game tactical behavior of college student athletes: a preliminary investigation. Physical Education and Sport Pedagogy. 2023; 28: 380–396.

[11] Dawson C, Julku H, Pihlajamäki M, Kaakinen JK, Schooler JW, Simola J. Evidence-based scientific thinking and decision-making in everyday life. Cognitive Research: Principles and Implications. 2024; 9: 50.

[12] Salahshouri A, Fathi S, Jiba M, Mohamadian H, Kordzanganeh J. A confirmatory factor analysis of the Iranian version of the interpersonal communication skills scale among healthcare professionals. BMC Medical Education. 2023; 23: 885.

[13] Nikolaiev L, Herasina S, Hrechanovska O, Vlasenko O, Skliarenko S, Hrande K. The development of assertiveness of the individual as a subject of communication. Revista Romaneasca pentru Educatie Multidimensionala. 2023; 15: 210–228.

[14] Jiang W, Shi K, Zhang L, Jiang W. Modelling of pricing, crashing, and coordination strategies of prefabricated construction supply chain with power structure. PLOS ONE. 2023; 18: e0289630.

[15] Effendi YR. Strategy for the principal's transformational leadership approach in strengthening the character of Indonesian students. Pedagogika. 2023; 151: 5–33.

[16] Creswell JW. A concise introduction to mixed methods research. 2nd edn. SAGE Publications, Inc: Thousand Oaks. 2021.

[17] Fraenkel J, Wallen N, Hyun H. How to design and evaluate research in education. 10th edn. McGraw-Hill Education: New York, NY. 1993.

[18] Ceylan L, Boyraz D, Caldiran S, Ceylan T, Küçük H. Examination of nutrition knowledge levels of individuals who received sports training. International Journal of Life Science and Pharma Research. 2022; 12: L11–L17.

[19] Çetin ÇM, Kara M. The scale of effective decision-making in sport (SEDMS): validity and reliability study. Gazi Journal of Physical Education and Sports Sciences. 2024; 29: 40–52.

[20] Sapmaz F, Doğan T. Assessment of cognitive flexibility: reliability and validity studies of Turkish version of the cognitive flexibility inventory. Ankara University Journal of Faculty of Educational Sciences. 2013; 46: 143–162.

[21] Yarayan YE, Turhan MÖ, Demir GT. Adaptation of cognitive flexibility inventory for athletes: validity and reliability study. Gaziantep University Journal Of Sport Science. 2023; 8: 221–240. (In Turkish)

[22] Bowerman M, Murray LM, Beauvais A, Pinheiro B, Kothary R. A critical SMN threshold in mice dictates onset of an intermediate spinal muscular atrophy phenotype associated with a distinct neuromuscular junction pathology. Neuromuscular Disorders. 2012; 22: 263–276.

[23] Tabachnick BG, Fidell LS. Using multivariate statistics. 4th edn. Allyn and Bacon: Boston. 2001.
[24] Dennis JP, Vander Wal JS. The cognitive flexibility inventory: instrument development and estimates of reliability and validity. Cognitive Therapy and Research. 2010; 34: 241–253.
[25] Raab M. Simple heuristics in sports. International Review of Sport and Exercise Psychology. 2012; 5: 104–120.
[26] Epstein RM, Gramling RE. What is shared in shared decision making? Complex decisions when the evidence is unclear. Medical Care Research and Review. 2013; 70: 94S–112S.
[27] Nie Y, Chua BL, Yeung AS, Ryan RM, Chan WY. The importance of autonomy support and the mediating role of work motivation for well-being: testing self-determination theory in a Chinese work organisation. International Journal of Psychology. 2015; 50: 245–255.
[28] Lam R, Cheung C, Chan B. The mediating roles of travel motives and social capital on the relationship between cultural intelligence and general life satisfaction. Asia Pacific Journal of Tourism Research. 2024; 29: 1–17.
[29] Mõttus R, Wood D, Condon DM, Back MD, Baumert A, Costantini G, *et al*. Descriptive, predictive and explanatory personality research: Different goals, different approaches, but a shared need to move beyond the Big Few traits. European Journal of Personality. 2020; 34: 1175–1201.
[30] Morelli M, Casagrande M, Forte G. Decision making: a theoretical review. Integrative Psychological and Behavioral Science. 2022; 56: 609–629.
[31] Dobrow MJ, Goel V, Upshur REG. Evidence-based health policy: context and utilisation. Social Science & Medicine. 2004; 58: 207–217.
[32] Papadakis VM, Lioukas S, Chambers D. Strategic decision-making processes: the role of management and context. Strategic Management Journal. 1998; 19: 115–147.
[33] Verhoest K, Peters BG, Bouckaert G, Verschuere B. The study of organisational autonomy: a conceptual review. Public Administration and Development: The International Journal of Management Research and Practice. 2004; 24: 101–118.
[34] Brown VM, Wilson J, Hallquist MN, Szanto K, Dombrovski AY. Ventromedial prefrontal value signals and functional connectivity during decision-making in suicidal behavior and impulsivity. Neuropsychopharmacology. 2020; 45: 1034–1041.
[35] Chen XJ, Ba L, Kwak Y. Neurocognitive underpinnings of cross-cultural differences in risky decision making. Social Cognitive and Affective Neuroscience. 2020; 15: 671–680.
[36] Schaefer GO, Kahane G, Savulescu J. Autonomy and enhancement. Neuroethics. 2014; 7: 123–136.
[37] Mahdavi A. Explanatory stories of human perception and behavior in buildings. Building and Environment. 2020; 168: 106498.
[38] Ratcliff R, Voskuilen C, McKoon G. Internal and external sources of variability in perceptual decision-making. Psychological Review. 2018; 125: 33–46.
[39] Lim N. Cultural differences in emotion: differences in emotional arousal level between the East and the West. Integrative Medicine Research. 2016; 5: 105–109.

How to cite this article: Burhan Başoğlu, Erdil Keyf, Mustafa Vural, Mehmet Gül, Abdullah Doğan, Fatih Karakaş, *et al*. Does cognitive flexibility enhance decision-making in sports? Journal of Men's Health. 2025; 21(5): 39-45. doi: 10.22514/jomh.2025.066.