Original Article

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Evaluation of offensive and defensive agility depending on the type of visual cue and personal decision-making styles in basketball

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Abstract: *Background:* The specific goal was to determine the level and differences in the performance of reactive agility (RA) depending on the type of visual stimulus and to identify the role of selected psychological patterns in the decision-making process. *Method:* 13 female basketball players (17.12 ± 1.09 years; mean BW 58.17 kg ± 7.68 kg; mean BH 1.73 ± 0.11, BMI 19.53 ± 3.86) playing top Slovak junior league. The diagnosis of specific game reactions was carried out using a Y-shaped reaction agility test. The stimulus for the action effect was a light direction indicator and a video sequence. Decision-making style was assessed using the Melbourne Decision Making Questionnaire (MDMQ). *Results:* The significance of the differences between offensive actions according to the type of stimulus was revealed by statistically significant differences between offensive reaction agility to a light stimulus and a stimulus with a contextual stimulus, and also in the case of defensive actions. Correlation analysis revealed significant correlations between offensive and defensive skills in the light stimulus, between the performance in offensive skills in the light stimulus, between the two types of defensive agility (light and video) and in the context stimulus, and a correlation between vigilance and both offensive activities was also found. *Conclusion:* The player's sensorimotor mechanisms are different depending on the type of stimulus, not on the type of actions, which leads to the conclusion that specific contextual information can lead to faster and more accurate decisions during the game 1:1 and improve the timing of action effects.

Keywords: decision making, basketball, visual stimuli, agility

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INTRODUCTION

Successful and effective decision-making is a key part of athletes' performance. It is defined as the ability to use information from the current situation and knowledge about it to plan, select and carry out an appropriate action or set of actions aimed at a goal [1]. The decision-making process is considered an integral part of goal-oriented behaviour influenced by functional limitations in the scope of the environment-athlete relationship, and its quality selects elite players and can be improved during life [2,3]. Finally, as stated by [4] at the highest level, the ability of a player in sports games to make quick and correct decisions distinguishes successful players from less successful hookers and they call this ability game intelligence [5,6]. It is proven that experienced athletes have excellent decision-making and anticipatory skills in assessing game situations [7-9]. In this regard, we discuss the ecological character of behaviour, as a contrast to the traditional understanding of decision-making given exclusively by the internal assumptions of the athlete [10]. Ecological psychology assumes reciprocity and reciprocity between the athlete and the environment, in which both combine to form a whole ecosystem in which the actions of the individual are synergistically linked to the environment [11]. In this regard, sports games differ from individual sports in their difficulty and structure. In sports, such as shot put, the time dimension of performing a motor task is limited, on the other hand, in sports games, where the player's activity is coordinated by teammates, opponents and other game circumstances, the task of decision-making is extraordinary. The circumstances of the decision-making process (specifically in sports) are widely debated among the professional public. In essence, the player creates possible solutions to the task when they are not limited to choosing from a set of available alternatives [12,13], which, according to [14] have kinematic and non-kinematic (situational) dimensions. They define anticipatory structures, or they call it contextual anticipation. However, they consistently distinguish between game intelligence (reading the game) and game strategy. The chosen solution should then lead to the desired effects in a specific situation [15]. However, it should be remembered here that the player's overall skills in this area, which [16] call technical-tactical perception, include the ability to decide on a strategy that is optimal from the player's point of view and the ability to execute the chosen strategy.

A person makes decisions at the intersection of feelings and reason, which are intertwined in a relationship of mutual dependence [17]. Difficulties with making the decision itself in relation to the game situation and the player's personal characteristics lead to conflicts and stress. It is further enhanced by the fact that the player is aware of the potential consequences of his decisions. The match environment in sports games produces a large number of conflict situations (score status, time, mental and physical fatigue, environment, verdicts, social imbalance of players, etc.). Conflicts arise when opposite internal tendencies occur at the same time and these create stress from not meeting expectations or needs [18]. However, the ability to make decisions is viewed as a competence that can be acquired over the course of a person's life [2,19]. The personal pattern of coping with decision-making stress characterizes the way an individual makes choices and judgments. The Melbourne Decision Making Questionnaire (MDMQ), based on Mann's conflict theory, allows to set references for personal and interpersonal comparisons of possible changes in the decision-making process. It analyses these personal decision-making patterns and is used in various domains to assess four main strategies: vigilance (vigilance), hypervigilance (sensitivity), decision avoidance and procrastination). The vigilance subscale is thought to represent the most effective and rational strategy associated with moderate stress and has been identified as an important aspect in the interpretation of decision-making ability [2]. Defence subscales (hypervigilance, buck-passing and procrastination) generally represent less effective strategies [20], associated with severe emotional stress [18].

The questionnaire retained the original four scales, which represent four different decision-making patterns, showing good reliability and validity - concurrent and predictive - and invariance for gender and age [21]. Basketball is a dynamic game with an intermittent character. It requires a high level of physical, technical, tactical and psychological preparedness of the players. Elite players are identified by differences in the quality of motor skills, primarily in agility, which [22] defines as rapid movement of the whole body with a change of speed or direction in response to a stimulus. [23] demonstrated a large to very large relationship of response time (r=0.76; p=0.004) and decision time (r=0.58; p=0.049) with reactive agility time. [24] attempted at the first determination model, which emphasized the strength component of agility [25,26] demonstrated that performance in the RAT in basketball is determined in first-order factors by the linear sprint speed at 5 m (63.2 %), followed by the sprint speed at 20 m (45,7 %) and reactive power (38.3 %).

The successful implementation of action effects is determined by the ability to predict possible game alternatives [27]. The effectiveness of this process can be controlled by various factors related to specific abilities for the given area (cognitive, physiological and behavioural indicators). The work of [28] emphasized the importance of picking up postural cues, or biological motion information, from the movements of an opponent (and potentially teammates) when attempting to anticipate the action. In summary, the results of these studies provide evidence that especially basketball and volleyball players [29] are equipped with better cognitive abilities compared to other sports games and that there are position-specific cognitive ability differences in trained basketball players [30]. Cognitive abilities are genetically limited because their heritability coefficient is very high (H2=0.85-0.92). Development reaches its maximum around the age of 16 and is maintained until the age of 25, after which it begins to decline [31]. Regarding the above, our findings suggest that basketball players are equipped with excellent visuospatial attention and movement timing ability. Therefore, we believe that cognitive capacity will be a relatively limiting factor [32] in effective response.

Many international studies observing the relationship between cognitive abilities and motor development have confirmed through their results a mutually positive relationship between these two components in preschool children [33,34], however, other studies [35,36] do not prove a relationship between cognitive abilities and motor development at the global or general level. They mention the existence of specific relationships and connections between different components of motor skills and different components of cognitive abilities, meaning that different motor skills require specific abilities for performance [37].

The aim of the study was to find out the differences in the performance of offensive and defensive reaction agility depending on the type of stimulus (light and contextual), and to demonstrate a possible relationship between this performance and the decision-making style.

MATERIAL AND METHODS

Study Design

The diagnosis of specific game reactions was performed using a reliable and valid Y-shaped reaction agility test [38]. Due to the preference for reaction and acceleration capabilities, it was modified in length parameters (Figure 1). All participants completed a 15-minute warm-up including dynamic stretching exercises. A Witty timing system® based on light semaphores with LED technology was used to record time and set reactive conditions. The device was placed at a height of 1.2m and the distance between the timer transmitter and receiver was 1.5m. A Witty precision measuring device with an accuracy of 0.01 s and Witty SEM light-emitting diodes (Microgate, Bolzano, ITA) were used for time measurement. All tests were performed in a sports hall with a wooden deck floor with reduced exterior visibility. The reaction time to a visual stimulus in the form of a displayed video sequence was registered. Video sequences were filmed in advance: offensive and defensive game activities of an individual in a 1:1 situation (table 1; figure 3,4). Demonstrations of game activities were performed by an independent person - a player at the performance level of the tested group, while she was instructed in advance about the type of activity. The sequences were recorded with a SONY HDR-PJ200 high-frequency camera and edited using specialized Kinovea® software. Before the testing, the tested persons attended a familiarization meeting, where the testing protocols were explained. The study used real absolute research of the studied group. The Personal Information Form and the Melbourne Decision-Making Questionnaire (MDMQ) were administered before the diagnostic procedures as a pre-test and were subsequently administered.

Participants

The study was conducted on 13 female basketball players of the BKM Junior UKF Nitra sports club of the junior category (17.12 ± 1.09 years; body weight 58.17 kg ± 7.68 kg; body height 1.73 ± 0.11, BMI 19.53 ± 3.86) in September 2023. The team completed 4 training units per week. The average sports age of female players was 8.6 years ± 1.71. Only the players, who met the condition of participating in training at least 90% 1 month before the testing, were healthy and showed willingness to participate in the research, were included in the research.

Testing procedures

The tested person stood in front of (above) the starting line, on which the electronic timer was placed. At a distance of 5 m from the tested person, a) WittySem light semaphore was placed in a vertical plane b) a screen on which individual video sequences in the form of offensive and defensive activities of the player were projected by a projector. The projector was placed behind the test person's back so that the projected image was fully visible to the test person. 6 offensive and 6 defensive activities were presented to the player in random order - video clips with the duration of each clip being 3s. The tested person had to react by moving in the appropriate direction. The tested person's activity time was measured and the correctness of the specific game reaction was assessed. A total of 4 test procedures were performed:

1. Y Agility test – OS/l: offensive reaction agility (Figure 1). A green direction indicator arrow (left, right) was used as a stimulus. The tested person stood 30 cm behind the starting line and, at the moment of the stimulus display, performed a 2m sprint as quickly as possible at an angle of 45 in the appropriate direction through the target gate at maximum speed.
2. Lateral defensive movement – DS/l: defensive agility (Figure 2). The tested person performed a lateral defensive movement (slide) to the left, or to the right at an angle of 90 degrees according to the direction determined by the light semaphore.
3. Y Agility test – OS/v: offensive agility (6x). Offensive reactions: the tested person had to make a diagonal (45 degrees) movement in the opposite direction to the defender in the video projection. As a stimulus, the defensive actions of the defender in the left or right direction were projected. The person was supposed to escape in the opposite direction to the defender's direction of movement.
4. Lateral defensive movement - DS/v: defensive agility (6x). Defensive reactions: The tested person was projected the attacker's offensive actions in the left or right direction. The person was supposed to move in the same direction as the attacker's escape direction.
5. Test of personal decision-making patterns: The Melbourne Decision Making Questionnaire (MDMQ [18] was used to determine personal decision-making patterns (DM). The questionnaire was designed to determine the potential of factors hypothesized to influence game-specific reaction time performance. As part of the study, it was first translated into Slovak by a certified person. Part of the questionnaire was a personal information form to determine the gender, age and sports age of the participants. The MDMQ consisted of 22 items divided into four scales: a) vigilance

(vigilance, 6 questions); b) hypervigilance (excessive vigilance, 5 questions); c) buck-passing (avoiding a decision, 6 questions); d) procrastination (postponing a decision, 5 questions). Lasting approximately 10 minutes, the respondent was asked to rate the extent to which they describe her behaviour on a Likert scale ranging from „True for me" (score 2), „Sometimes true for me" (score 1) and „Not true for me" (score 0). Total scores for each scale are ⟨0; 10⟩ (procrastination and hypervigilance) or ⟨0; 12⟩ (vigilance and decision avoidance).

Statistical Analysis

Normality of data distribution and sphericity were confirmed using the Shapiro–Wilk statistic and Levene's test for equality of variances, and thus parametric analyses were used. The hypotheses of the study were examined using a paired t-test to test the differences of 2 mean values. A p value of <0.05 was considered significant. The measure of substantive significance of differences (*Effect size*) for all pairwise comparisons was determined using Cohen's *d* with 95 confidence intervals. Cohen's d was interpreted as follows: trivial = 0 to 0.19, small = 0.2 to 0.59, medium = 0.6 to 1.19, large = 1.2 to 1.99, very large = 2.0 up to 3.99, and almost perfect = ≥4.0 [39]. Pearson's correlation coefficient was used to find the relationship between Y-shaped agility test performance to the video stimulus and performance to the simple directional stimulus, vigilance, hypervigilance, buck-passing and procrastination. The correlation was considered trivial ($r < 0.1$), weak ($0.1 \le r < 0.3$), moderately strong dependence ($0.3 \le r < 0.7$), strong ($0.7 \le r < 0.9$), very strong (> 0.9) [40]. The level of significance was set at $p < 0.05$. All statistical analyses were performed in the statistical program IBM SPSS for Windows (22.0, Inc., Chicago, IL, USA). The sample size (13 participants) appeared necessary to detect the relationship between the performance of specific hermetic responses and the measured DM variables. The number of participants in this study was slightly reduced due to health restrictions of the players, or training breaks during the 7-day period for testing.

Ethics

All research participants, including legal representatives, were thoroughly informed about the content of the study, its goals, progress, possible risks and benefits. All participants had a valid player's license, which entitled them to participate in official competitive matches. The tests carried out did not present any health or other risks beyond the normal ones. In addition, all participants underwent medical examinations before the start of the season. The tests were carried out without injury. The testing was in accordance with the requirements of the Declaration of Helsinki.

Table 1. Video Sequences

Skills	No.	Abilities
Offensive	1	Left hand dribbling + Crossover to the Right
	2	Right hand dribbling + Crossover to the Left
	3	Left hand dribbling + Hesitation + Cut to the Left
	4	Right hand dribbling + Hesitation + Cut to the Right
	5	Left hand dribbling + deceptive movement to Left + Crossover to the Right
	6	Right hand dribbling + deceptive movement to Right + Crossover to the Left
Defensive	1	Closeout + defensive slide to the Left
	2	Closeout + defensive slide to the Right
	3	Closeout with right leg extension
	4	Closeout with left leg extension
	5	Closeout + deceptive movement to Left + defensive slide to the Right
	6	Closeout + deceptive movement to Right + defensive slide to the Left

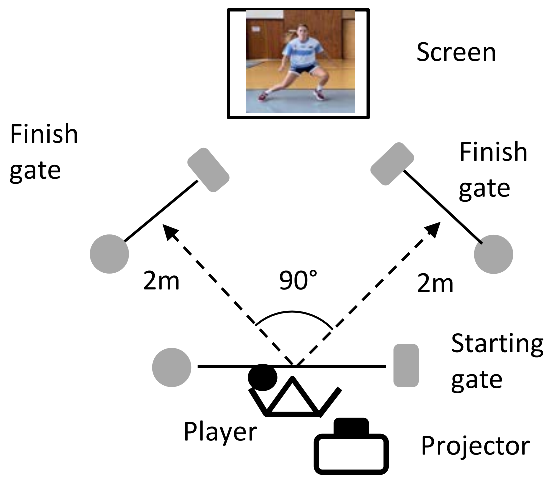

Figure 1. Test I – Offensive skills

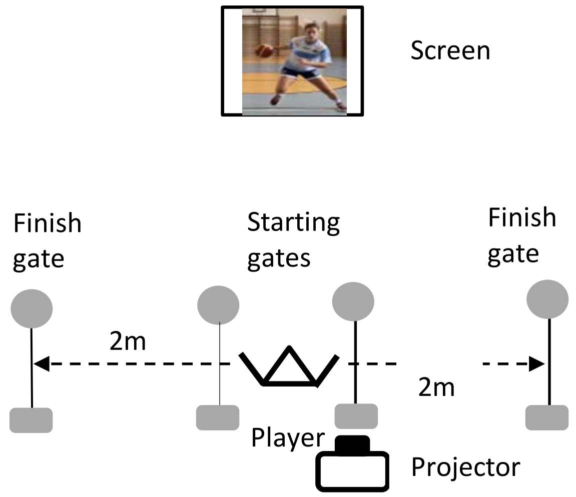

Figure 2. Test II – Defensive skills

Figure 3. Offensive skills / Video Sequences

Figure 4. Defensive skills / Video Sequences

RESULTS

The results of the tests used in this study, descriptive data and variability of the variables are shown in Table 2. Agility tests (light and video) reflect the sensorimotor component, the values of the MDMQ questionnaire reflect the mental component.

The significance of the differences between offensive actions according to the type of stimulus (Light vs Video) revealed statistically significant differences between offensive reaction agility to a light stimulus (Light) and a stimulus with a specific context (Video) ($p=0.004$) and also in the case of defensive reaction agility ($p=0.011$). The effect sizes (*d*) for all pairwise comparisons between conditions are shown in Table 3. In the indicated cases, we evaluate the degree of substantive significance of the differences as trivial (OS/l vs OS/v: $d=0.46$ (−0.65–0.89); or small (DS/l vs DS/v: $d = -0.44$ (-1.22–0.33). In the case of a comparison between tests according to the type of activity (Offense vs Defence) there were $p = 0.107$), but also for a stimulus with a specific contextual stimulus ($p=0.179$) the differences are insignificant and the degree of substantive significance is small ($d=0.39$-0.45).

Table 2. Descriptive statistics

Indicator	OS/l	DS/l	OS/v	DS/v	Vig	Hpv	Bp	Proc
N Valid	13	13	13	13	13	13	13	13
N Missing	0	0	0	0	0	0	0	0
Mean	1.03	1.01	1.00	1.03	8.00	6.31	5.85	5.62
Median	1.03	1.01	0.99	1.03	8.00	6.00	6.00	6.00
Mode	0.99	0.95[a]	0.86[a]	1.05	8.00	6.00	6.00	5.00[a]
Std. Dev.	0.06	0.04	0.08	0.47	0.82	0.95	0.80	0.65
Variance	0.01	0.00	0.01	0.01	0.67	0.90	0.64	0.42
Min	0.94	0.95	0.86	0.96	7.00	5.00	4.00	5.00
Max	1.14	1.08	1.15	1.11	9.00	8.00	7.00	7.00
25 P*i*	0.99	0.97	0.95	0,98	7.00	6.00	5.50	5.00
50 P*i*	1.03	1.01	0.99	1.03	8.00	6.00	6.00	6.00
75 P*i*	1.07	1.04	1.05	1.05	9.00	7.00	0.00	6.00

OS/l: Offensive skills/light; DS/l: Defensive skills/light; OS/v: Offensive skills/video; DS/v: Defensive skills/video; Vig: Vigilance; Hpv: Hypervigilance; Bp: Buck-passing; Proc: Decision procrastination

Table 3. Significance of differences between tests according to the type of stimulus (Light vs Video) and between tests according to the type of activity (Offense vs Defence)

Stimulus vs Skills / Statistical indicators		Paired Differences					t	p	d
		Mean	SD	SEM	95% Confidence Interval of the Difference				
					Lower	Upper			
Light vs Video	OS/l – OS/v	0.032	0.033	0.009	0.012	0.052	3.535	0.004**	0.12
	DS/l -DS/v	-0.021	0.025	0.007	-0.036	-0.006	-2.997	0.011*	-0.46
Offense vs Defence	OS/l – DS/l	0.024	0.050	0.014	-0.006	0.054	1.740	0.107	0.45
	OS/v – DS/v	-0.029	0.074	0.021	-0.074	0.015	-1.427	0.179	0.39

* Significant at the 0.05 level (2-tailed); ** Significant at the 0.01 level (2-tailed); SD: standard deviation; SEM: standard error mean; d: Effect size Cohen

Table 4. Pearson's (r) correlations between performance tests according to skills, type of stimuli and psychological characteristics of female athletes

Indicator	OS/l	DS/l	OS/v	DS/v	Vig	Hpv	BP
DS/l	0.038*						
OS/v	0.000**	0.230					
DS/v	0.060	0.000**	0.170				
Vig	0.037*	0.200	0.024*	0.070			
Hpv	0.814	0.670	0.885	0.777	0.726		
BP	0.797	0.088	0.898	0.091	0.401	0.179	
Proc	0.216	0.544	0.170	0.684	0.296	0.251	0.905

* Significant at the 0.05 level (2-tailed); **; Significant at the 0.01 level (2-tailed); OS/l: Offensive skills/light; DS: Defensive skills/light; OS/v: Offensive skills/video; DS/v: Defensive skills/video; Vig: Vigilance; Hpv: Hypervigilance; Bp: Buck-passing; Proc: Decision procrastination

The results of Pearson's correlation analysis pointed to medium to strong correlations according to the type of skills (offensive and defensive) and according to the type of stimulus (light, video). Significant relationships were found between offensive (OS/v) and defensive skills (OS/l) in the light stimulus ($r = 0.5790$; $p<0.05$), between performance in offensive skills in the light stimulus (OS/l) and in the context (OS/v) stimulus ($r=0.925$; $p<0.01$) and between performance in defensive skills in the light stimulus (DS/l) and in the context (DS/v) stimulus (r=0.851; p<0.01). From the point of view of the observed psychological characteristics, the significance of the relationship between vigilance and attacking skills was found for the light stimulus (r=0.581; p<0.05) and for the contextual stimulus (r=0.620; p<0.05). In addition, there were no correlations between the psychological characteristics of female athletes and performance tests.

DISCUSSION

The main aim of this study was to primarily assess the effects of two types of visual stimuli on performance in ecological game situations in basketball and secondarily to investigate the contribution of some psychological characteristics to this performance. It has been shown that the use of video projection can be used to distinguish the level of athletes in accordance with the works of [41,42]. Significance of differences in offensive actions by stimulus type revealed statistically significant differences in performance in offensive actions between the light stimulus and the context-specific stimulus (p<0.01). In the case of the video stimulus, the total activity time was lower by 0.03s, which is 3.1, compared to the light stimulus. Given the importance of quick decision-making in team sports such as basketball, this improvement could be a decisive advantage for a player in a 1:1 situation, which is consistent with the conclusions of [43]. It should be noted that the response time (or the length of the movement trajectory) are not the only factors in the evaluation of activities, it is necessary to apply qualitative criteria, such as level of defensive pressure, offensive creativity, tactical strategy of activities, efficiency, etc., which were not assessed in the work. If the reaction is a purposeful reaction to various stimuli, then we must demonstrate differences in the performance of agility in relation to the types of these stimuli, or to the nature of the movement. Previous studies [44,45] showed that players primarily use cues related to the movement of the ball and the opponent's body. With regard to the conducted research, however, it can be concluded that visual perception has an impact on the ability and quality of assessing the game situation, and thus also on the production of action effects in the context of the game plot. Moving objects apparently initiate movement more effectively than dynamic light stimuli [46]. Finally, there is no doubt that skilled players extract and use the available information (the opponent's movement pattern) faster than less skilled athletes. There is also some evidence of improvements in response time and accuracy following video-based perceptual training [47,48]. This is underlined by the fact that we also found significant significance in the case of defensive reaction agility between both types of stimulus (p<0.05). On the contrary, the overall time was lower for the light stimulus compared to the video stimulus (0.029s), which indicates that the defender only reacts to the movements of the attacker and this fact causes a partial delay. In addition, it can also be attributed to higher tactical creativity during offensive game situations than in defensive situations [49]. The light stimulus eliminates the contribution of contextual information and prefers the sensory component. The differences in the time of offensive and defensive activities were insignificant, which may be the result of several causes: bilateral asymmetry [50], different mechanical determinants of linear forward movement and lateral movement [51,52], respectively, the type of information processing strategies used [53]. Existing methods of developing athletes' decision-making skills separate the physical and perceptual aspects of their performance. Research suggests that personality is related to general performance and what influences decision-making [54]. From the point of view of the observed psychological characteristics, significant interactions of vigilance and offensive skills were found for the light stimulus (r<0.05) and for the contextual stimulus (r<0.05). This finding is supported by the statement [55] that in externally paced sports (e.g. basketball) psychomotor alertness leads to significantly shorter RT reaction times compared to self-paced sports (e.g. triathlon) and therefore faster motor actions.

The importance of vigilance points to the necessary interventions in the structure of the training unit, where fluctuating vigilance is natural and can lead to wrong decisions. These procedures should be integrated into training strategies to support adaptations that effectively optimize sports performance [56-59]. In addition, there were no correlations between the psychological characteristics of female athletes and performance tests, which can be justified by the absence of stress during decision-making [21], also point out the different effect of vigilance and the remaining characteristics who evaluate hypervigilance, decision avoidance and procrastination as ineffective, or inadequate in decision-making. It should also be noted that the MDMQ was originally developed according to the descriptive theory of decision-making under stress [60] and therefore relies more on emotions than reasoning. However, stress factors are absent in the laboratory conditions of the questionnaire, thus pointing to its shortcomings.

Limitations of the study

The limit of our study was the relatively small number of participants, which makes it difficult to normalize the obtained results or discuss them in the context of similar studies, as well as gaps in the continuity of the training process and other circumstances that reduce data validity and the possibility of comparison in the context of similar studies. However, the implementation of research in this form also leads to questions related to the credibility of the display of the plot through video, where the ecological conditions of the environment (teammates, opponents, game environment, tactics and game strategy factors) are absent, respectively. by transforming it into real conditions. We consider the absence of stress during testing associated with the risk of a wrong decision to be a relatively significant shortcoming, or risk associated with other personal or situational factors.

CONCLUSION

The general conclusion of this study is the fact that the player's sensorimotor mechanisms are different depending on the type of stimulus, not on the type of actions, which leads to the conclusion that specific contextual information can lead to faster and more accurate decisions during the game 1: 1 and improve the timing of action effects. These results reinforce the idea of including cognitive tools in training, such as video-feedback and video simulation, with the aim of increasing the informational variability of the training tools in decision-making training and probably thus improving the player's performance. In addition, we can consider vigilance as an existing predictor of general decision-making competence, on the contrary, non-vigilance styles (Hypervigilance, Buck-passing and Decision procrastination) as insignificant personality domains, but they could reach statistical significance with a larger sample, different age or gender. These findings represent fractions of the still not completely clarified intra psychological ties mutually associating and regulating the complex behavioural responses of the player in the context of the game. The decision-making process seems to have common and unifying starting points, but it is different in terms of course for each individual.

Despite this progress, several other questions and challenges remain to be clarified, including the contribution of visual and motor experience to anticipation, intraindividual variability in specific player actions, and the influence of non-kinematic (contextual or situational) information or influence of gender and sport age. A key question remains to what extent our findings are transferable (from the laboratory to the field) and generalizable (from closed activities to open play).

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Institutional Ethical statement: All research participants, including legal representatives, were thoroughly informed about the content of the study, its goals, progress, possible risks and benefits. All participants had a valid player's license, which entitled them to participate in official competitive matches. The tests carried out did not present any health or other risks beyond the normal ones. In addition, all participants underwent medical examinations before the start of the season. The tests were carried out without injury. The research was approved by a local research ethics committee, and the study was approved by the Institutional Review Board of the Constantine the Philosopher University in Nitra, Slovakia - University Ethic Committee (registration number: UKF-2020/1355-1:191013) and conducted according to the Declaration of Helsinki.

Conflicts of Interest: The authors declare no conflict of interest.

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