ANALYSIS OF THE SETTER'S TACTICAL ACTION IN HIGH-PERFORMANCE WOMEN'S VOLLEYBALL

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Abstract:

Performance analysis is of fundamental importance to understand the factors underlying participation in top-level sports. Recently, an increased importance has been given to the preservation of the situation's ecology, thus attempting the comprehension of game patterns through the establishment of relationships between variables of several orders. The purpose of this study was to analyse some match variables that could constraint the setter's tactical action in high-performance women's volleyball, as well as its outcomes. Six matches of the Women's World Champhionships 2006 were analysed following a category system, recurring to observational methodology, namely the technique of sequential lag analysis. Attack tempo has emerged as the crucial variable of the setter's tactical action. Patterns with closed blocks from the opponent, setting in the ideal zone with a jump set, attack simulation by the middle attacker and block anticipation, through committing strategies, tended to culminate in quick attacks. These, in turn, stimulate a debilitated block opposition. Open block formations, receptions in zones 4 and 1, setting in non-ideal zones, no simulation by the middle attacker and a non-anticipative block (read-and-react strategy) stimulated slow attacks, which, in turn, stimulated cohesive block opposition. Attack efficacy emerged as independent of the setter's action, although the latter largely influenced the type of block opposition. Hence, match analysis provides a window into aspects involving the tactical actions in high-level athletes.

Key words: *performance, match analysis, game patterns, ecological analysis*

Introduction

Performance analysis is of fundamental importance to understand the factors underlying participation in elite-level sports (Hughes & Bartlett, 2002; Afonso, Mesquita, & Marcelino, 2008). Sport actions that succeed in a short period of time are submitted to a high level of stress and are dependent on the match evolution, since every decision is influenced by the previous one and, in turn, influences the ones yet to be taken (McPherson & Kernodle, 2003; Araújo, Davids, & Hristovski, 2006; Jäger & Schöllhorn, 2007). Recently, an increased importance has been given to the preservation of the situation's ecology (French & McPherson, 1999), since it allows a better understanding of the relationships between the variables, contributing to a systemic comprehension of the phenomenon (Lames, 2003; McPherson & Kernodle, 2003; Jäger & Schöllhorn, 2007).

At this level, notational or match analysis emerges as a tool to understand the context of tactical action in team sports settings (Williams & Ward, 2003). It permits the comprehension of the game constraints and situational probabilities, and also respects the ecology of the scenario, due to the following characteristics: a) the player submits to real, dynamic and representative images, respecting perspective and dimensionality; b) the pressure inherent to the competition is present; c) the actions are continuous; d) the motivation is in its natural context; e) as the game proceeds, emotions, anxiety and fatigue emerge; f) the athlete is receptive to kinaesthetic, visual, and auditory information. This methodology follows McPherson's (1999) proposal of studying expertise in the field.

Therefore, the comprehension of game patterns must be accomplished establishing relationships between diversified variables. Traditional bivariate statistics (e.g. chi-square) allow a limited insight into the complexity of the game (Hale, 2001). More complex statistics, like T-patterns, log-linear analysis, Markov chains and sequential lag analysis, provide a wider vision of game patterns (Lames & McGarry, 2007) due to a greater insight and comprehension of the interaction between different variables and of the dynamics between a team and its opponents (Lames, 2003).

In the specific case of volleyball, the setter is considered the leader of the attack phase (Mesquita & Graça, 2002), having to weigh a number of

constraints that will, according to the context, influence decision-making, which is expected to culminate in an action that will originate difficulties upon the block opposition. Since the block is the first line of defence, it is expected to pose constraints upon the attack, thus interfering with its efficacy. As research has shown, time is a major constraint in high-level sports (Williams, Singer, & Frehlich, 2002; Savelsbergh, Van Der Kamp, Williams, & Ward, 2005), including the specific case of volleyball (Mesquita & César, 2007; Afonso, Mesquita, Marcelino, & Coutinho, 2008). Namely, attack tempo is considered a crucial variable when analysing the relationships between attack and defence (Mesquita & Graça, 2002). The concept of attack tempo is more strongly related to the rhythm and synchronization of the actions of the setter and the attackers than to its duration.

It is important for match analysis to consider the variables that reveal the relationships of the opposition and the cooperation of the teams in confrontation (Lames & McGarry, 2007). In this context, one important variable is the notion of the attacker's availability: for the setter to play a quick attack tempo, a middle-attacker must be effectively available for such attacks. This implies an adequate spatial relationship between the middle-attacker, the setter and the ball, but also a precise timing of these two players' actions. Another example concerns the responses of the blockers to such availability - it must be established if they choose to wait for the set, only then initiating any action, or if they start moving in advance, anticipating a possible predictable outcome.

Therefore, this study intends to analyse the setter's tactical action context in elite women's volleyball, as well as its consequences. The purpose is to unfold the game patterns of the setter according to certain types of constraints (*spatial* - blockers' starting positions, zone of first contact, setting zone, attack zone; *task* - type of set, availability of the middle-attacker, blocker's anticipation movements; and *time* - attack tempo), and to observe if different patterns induce distinct responses on the block opposition and on attack efficacy.

Methods

Sample

This study analysed six matches, in a total of 24 sets of the Volleyball Women's World Championships of 2006. The national teams of Brazil, Russia, China, Cuba, Italy, the USA, Germany and Azerbaijan were analysed. The sampling was intentional, fulfilling three criteria: a) to represent the highest level of the game, since all the teams have classified among the 13 best ranked of the analysed championship; b) to correspond to a high-level competition; the World Championships are one of the most important competitions in women's volleyball; and c) to be a recent sample. Only the plays in which the setter was responsible for the action of setting were analysed, totalling 670 sequences observed.

Instrument and variables

Two strategies were used to develop variables and categories for the instrument, while fulfilling the requirements for content and construct validity (Mesquita, Rosado, Januário & Barroja, 2008). To analyse the game plays, an instrument of observation was developed, since there was none available in the literature regarding the problems of this study. Indeed, a number of generalized instruments exist, but they are designed mainly to inform the media on general data. Moreover, with the evolution of a high-level game, the need to specify certain performance indicators emerges, considering both their ecological context and their functional meaning. The construction of the instrument was firstly based on extended literature and subsequently submitted to a validation process (pilot studies to test its objectivity and appropriateness and a subsequent expert validation process, one coach twice World Champion, and one University Professor specialist in volleyball match analysis). The experts were given a list of variables with respective categories that configures the instrument of observation and a sample of volleyball matches and were asked to observe and categorize the rallies. Intra-observer and inter-observer reliability was carried out showing values of Cohen's Kappa between .86 and .95 (Afonso & Mesquita, 2007; Afonso, Mesquita, & Marcelino, 2008).

The instrument of observation was composed of the following variables, which are detailed according to the order of their occurrence during a play.

Blockers' starting positions – This variable respects the positions assumed by the blockers when preparing for countering the opponent's attack. Open block (BSPO) means that all three blockers are equally distributed along the net, closed block (BSPC) implies the concentration of the three blockers in the centre of the net, while closed block in 4 (BSP4) and closed block in 2 (BSP2) relate to mixed formations.

Zone of first contact – It corresponds to the zone where the first contact takes place. This study intended to analyse the zone of first contact regarding its functional implications for the subsequent action: the setting. The official rules divide the court into 6 non-equal zones (zones 4, 3, and 2 in the front row, zones 5, 6, and 1 in the back row). However, despite being a formal classification, it does not reveal functional differences between the constraints posed on the action of the setter. Therefore, a new model was created, as the functional zone of the first contact had strong implications on the setter's action

(Esteves & Mesquita, 2007). Established categories were RZ4 (equivalent to the official zone 4), RZ3 (from zone 4 till 2 metres of the right line), RZ2 (from zone 3 till the right line), RZ5L (from the left line till 1.5 metres inside; from the 3 metres line till 1.5 metres of the end line), RZ5B (extension of 5 left till the end line), RZ5 (from zone 5 left till 4.5 metres of the right line), RZ6 (from zone 5 till 1 metre of the right line), RZ1 (from zone 6 till the right line), RZ1B (from zone 1 till the end line), and the outside zones, which were considered as one (RTSRE).

Setting zone – The zone where the setter proceeds to building the attack: SZ1 (ideal; sites from 4 metres of the left line till 2 metres of the right line, and from the net to 1.5 metres away from it), SZ2 (non-ideal, but allowing numerous setting options; sites from 5 metres of the left line to 2 metres of the right line, and from 1.5 metres of the midline till the 3 metre line), and SZ3 (reduced setting options; consists of the remaining area).

Type of set – Jump set (TSJ), regular set (TSR), resource (TSRE), and attack at second contact (TSA), and forced jump set (TSF). Resource actions are all those that do not fit the remaining categories. For example, a forearm set fits into the category of resource, as does a set in a low position, with knees on the ground.

Middle-attacker's availability – The middle-attacker's availability for quick attacks is necessary for the team to play a quick and diversified offensive: simulating a quick attack in front, close to the setter (MAQC) or away from her (MAQA), simulating a quick attack behind the setter (MAQB), and unavailability for the quick attack (MAQU) are the four possibilities.

Blocker's anticipation – The blockers might use two distinct strategies: a read-and-react strategy, where the blockers wait for the setter's action, or, alternatively, a commit strategy, where the blockers anticipate the setter's action, based on the knowledge of situational probabilities (Selinger & Ackermann-Blount, 1986). The latter translates into movement initiation before the set has occurred. The category representing read-and-react strategy was waiting (MBWA); the categories representing commit strategies were: displacement of the middle blocker towards zone 2 (MBM2), displacement of the middle blocker towards zone 4 (MBM4), middle blocker jumping with quick attacks close (MBJQC) or away from the setter (MBJQA), zone 4 joining the middle blocker (MB4J), zone 2 joining the middle blocker (MB2J), zone 4 opens to block China play (MB4C), zone 4 and middle blocker open to block China play (MBCH), any blocker jumping with a probable attack by the setter (MBJS),

Attack zone – It corresponds to the zone where the hitter establishes contact with the ball. The six formal attack zones of the volleyball game do not provide information regarding the functional role of space utilization in attack, and neither in its implications on the block opposition. The model applied in this study is sensitive to functional regularities of the high-level game, such as the virtual inexistence of attacks through zone 5 and the high specificity of the space used to attack (Afonso, et al., 2008). The established categories were: six offensive - AZ4 (till 1.5 metres from the left line), AZ4I (2 metres inside, starting form AZ4), AZ3 (1.5 metres inside, starting from AZ4I), AZ3I (1.5 metres inside, starting from AZ3), AZ2I (1 metre inside, starting from AZ3I), and AZ2 (from AZ2I till the right line), and four defensive zones: AZ5 (from the left line to 2 metres inside), AZ6L (2 metres inside, starting from AZ5), AZ6R (from AZ6L till 3 metres from the right line), and AZ1 (from AZ6R till the right line).

Attack tempo – A thorough literary analysis revealed inconsistencies among definitions. There was not, for instance, a solid reference point for the timing of departure for the ball (Afonso & Mesquita, 2007). Furthermore, the existing definitions did not allow for cataloguing all the possible occurrences in women's high-level volleyball, and did not reflect the coordination of the movements between the setter, the set, and the attacker (Afonso & Mesquita, 2007). Therefore, *attack tempo* was categorized as follows – tempo 1 (the attacker jumps during or slightly after the set, possibly taking one step after the set), tempo 2Q (the attacker takes two steps after the set), tempo 2S (the attacker takes three steps after the set), and tempo 3 (the attacker waits after the set, and only the starts a three-step approach).

Block opposition – This variable congregates three parameters: number of blockers, block intentionality, and block cohesiveness (Afonso, et al., 2008). The following categories were considered: no-blocking by option (BONO), no-blocking by merit of the opponent (BONB), a single block by option (BOSO), a single block by merit of the opponent (BOSB), a single block arriving late (BOSL), double block (BODB), broken double block (BODO), triple block (BOTB), open triple block (BOTO) and setter's error (BOSE), making it impossible to analyse the block opposition.

Attack efficacy – Attack error (ATR), blocked attack (ATB), negative attack (ATN – does not pose difficulties to the opponent's defence), covered attack (ATC), positive attack (ATP) and point attack (KIL).

Data gathering and analysis

The matches were filmed in digital format from 9 metres behind the end line, and 3 metres above the floor. Data was analysed with GSEQ for Windows 4.1.2. Each play was analysed at least twice. Sequential lag analysis (SLA) was used; chi-square statistics were applied to the criteria conducts in order to reject the null hypothesis. The level of

significance was stipulated in α=.05, recurring to the adjusted residuals to obtain the sequential patterns, considering values ≥|1.96|. SLA pattern interpretation rules are as follows: if there are two or more empty lags in sequence, it is considered that there is not a pattern; also, if two or more codes originate two or more conducts in the following lag, it is not possible to establish a connection between the lags.

The setter's tactical action consists in a set, which comprises two interdependent parameters: *attack zone* and *attack tempo* (Mesquita & Graça, 2002). Due to this understanding, these two variables were recoded as one, having considered all the observed combinations. The set was the elected criteria conduct, from which the lags were analysed. The cells marked in bold within the tables stipulate the beginning of each pattern, according to the SLA pattern interpretation rules.

Reliability

Reliability was assured by the inter- and intra-observers' agreement, within a 30-day interval, calculated with Cohen's Kappa. One hundred and twenty plays were re-analysed, corresponding to 17.91% of the sample, the value substantially higher than the reference mark (10%) suggested by Tabachnick and Fidell (2000). Intra- and inter-observer reliability exhibited Kappa values ranging from .941 to 1.00, fulfilling the minimum of .75 appointed by the literature (Fleiss, 2003).

Results

The analysis of the emergent patterns of the setter's tactical actions revealed that the determining factor was *attack tempo*, whilst the *attack zone* had no interference when considering both retrospective and prospective patterns.

Table 1. Emergent patterns related to quick attacks (symbol definitions in the text)

-5	-4	-3	-2	-1	0	+1	+2
			TSJ (3.18)	MBJQC (2.35) MBJQA (5.20) MB2J (6.19) MAQA (7.71)	AZ4IT1	BOSB (3.39)	
BSP4 (2.28)	RZ6 (2.12)	SZ1 (3.90)	TSJ (2.39) TSF (5.00)	MBJS (2.98) MBJQC (4.22) MB4J (6.07) MAQC (8.71)	AZ3T1	BOSB (4.53) BOSL (4.39)	
BSP4 (2.35)	RZ2 (2.33)	SZ1 (3.68)	TSJ (3.87) TSF (2.76)	MBJQC (2.20) MB4J (4.44) MAQB (4.39)	AZ3IT1	BOSB (2.09) BONB (2.19)	ATR (2.78)
BSP4 (3.26)		SZ1 (4.40)	TSJ (3.38)	MBCH (3.59) MB4C (2.21) MAQB (6.41)	AZ2T1	BOSB (4.46) BODO (2.98)	
BSP4 (2.14) BSPC (2.26)		SZ1 (4.14)	TSJ (2.25)	MBCH (4.20) MB4C (4.86) MAQB (7.22)	AZ2IT1	BONB (2.15)	ATP (2.26)
			TSJ (3.64)	MBJQC (2.62) MB4J (2.26) MAQA (4.12)	AZ1T2Q	BOSB (2.08)	
	RZ5L (2.50)	SZ1 (3.18)	TSJ (4.04)	MBCH (2.29) MB2J (2.26) MAQB (4.42)	AZ6DT2Q	BOSL (4.71) BOTO (7.56)	
		SZ1 (2.42)		MBJS (2.46) MBCH (3.17) MB4C (2.12) MAQB (3.16)	AZ6ET2Q		
BSP4 (3.08)		SZ1 (4.71)	TSJ (2.32)	MBJQA (2.68) MAQC (3.42)	AZ4T2Q	BODO (4.65)	
BSP4 (2.29)				MBJS (2.08)	AZ4IT2Q	BODB (1.98)	ATN (2.08)
	RZ6 (2.19)	SZ1 (2.90)		MBCH (3.48) MAQB (3.39)	AZ3T2Q	BOSB (3.70)	
	RZ1 (2.38)			MBCH (3.52) MAQB (2.60)	AZ3IT2Q	BOSB (2.90)	
		SZ1 (2.80)	TSJ (3.11)	MAQC (2.36) MAQA (2.55)	AZ2T2Q	BODO (4.89)	
	RZ1 (2.54)			MBJQC (3.48)	AZ2IT2Q		ATB (2.48)

Regarding the constraints to the setting speed, considering the *attack tempo* as the nuclear factor, certain game patterns that were independent of the *attack zone* emerged, both retrospectively and prospectively. Therefore, there was the need to determine which patterns induced quicker attack tempos (1 and 2Q), by the opposition to those that tended to generate slower attacks (2S and 3). Table 1 exhibits the patterns that potentiated the occurrence of the quicker attacks (lags –5 to –1) and those that were excited by these quicker attacks (lags +1 to +2).

Although it is possible to identify a multiplicity of patterns, some characteristics were common to all. Tempo 1, which represents the quickest form of attack, consistently emerged in response to a closed block formation (BSP4; BSPC). This phenomenon also occurred before 2Q attacks, but with less frequency. Moreover, while the *zone of first contact* did not relate to quicker attacks, the *setting zone* was strongly associated with the *attack tempo*; namely, quicker attacks were expected when the setter played in SZ1 (the ideal zone), preferably through the jump set (TSJ). Another key factor for the execution of quicker attacks was the need of any sort of *middle-attacker's availability* (MAQA, MAQB, MAQC), usually followed by the *blocker's anticipation* through the committing block strategies.

Additionally, as shown in Table 2, an open formation of the block (BSPO) induced a slower attack construction. Furthermore, the execution of the first contact on zone 4, zone 1, and outside zones (RTSRE) potentiated slow attacks. Whenever the setter had to set outside the ideal setting zone (SZ2 or SZ3), the attack tended to be slower. Setting from these zones was usually accompanied by a regular set (TSR) or by a set using technical resources (TSRE). Accordingly, there was a clear trend for an unavailability of the middle-attacker (MAQU), which in turn was allied to a non-anticipative block (read-and-react strategy).

Tables 1 and 2 also exhibit prospective game patterns, which were induced by the setting speed, providing useful information relating to functional differences. Generally, quicker attack tempos (1 and 2Q) induced a pattern of debilitated block opposition (lag +1), as they potentiated the occurrence of non-

Table 2. Emergent patterns related to slow attacks (symbol definitions in the text)

-5	-4	-3	-2	-1	0	+1	+2
BSPO (3.18)	RZ4 (394) RTSRE (3.76)	SZ3 (2.42)		MAQU (2.84)	AZ1T2S		
	RZ5L (3.30)	SZ3 (3.29)		MBWA (3.16) MAQU (3.86)	AZ6DT2S	BOSO (5.07) BOTB (5.96) BOTO (2.71)	
BSPO (2.65)	RZ2 (2.17)	SZ2 (2.56)		MAQU (3.14)	AZ6ET2S		
BSPO (2.34)		SZ2 (2.80) SZ3 (3.78)	TSR (5.39)	MBWA (3.43) MBM4 (4.00) MAQU (4.78)	AZ4T2S	BODB (7.39)	
	RZ1 (2.88)		TSR (2.05)	MBM4 (2.19)	AZ4IT2S	BODB (3.79)	
		SZ3 (2.10)		MBCH (2.04)	AZ3T2S	BOTB (7.76)	ATC (3.07)
BSPO (2.77) BSP2 (2.36)		SZ2 (2.26)	TSR (2.41)	MBWA (4.26) MBM2 (4.33) MAQU (3.10)	AZ2T2S	BODB (2.55) BOSO (2.90)	
	RZ3 (4.09)		TSRE (2.81)	MAQU (2.21)	AZ2IT2S		
	RZ1 (4.34)	SZ3 (2.97)	TSRE (3.74)	MAQU (2.56)	AZ1T3	BODB (2.21)	
BSPO (2.42)		SZ3 (3.32)	TSRE (4.53)	MBWA (2.03) MAQU (2.86)	AZ6DT3	BONO (6.67) BOTB (2.13)	
			TSRE (2.62)		AZ6ET3		ATP (2.36)
BSPO (2.44)		SZ3 (8.15)	TSR (2.84) TSRE (7.84)	MBM4 (5.62) MAQU (9.09)	AZ4T3	BODB (4.05) BONO (5.68) BOTB (5.10)	ATN (2.79)
	RZ1 (3.33) RTSRE (4.97)	SZ3 (3.79)	TSRE (6.44)	MBM4 (3.41) MAQU (5.32)	AZ4IT3	BODB (4.09)	
	RZ4 (4.40)		TSRE (2.62)		AZ3IT3	BOSB (2.69)	ATN (2.14)
	RZ4 (2.28)	SZ3 (2.57)		MAQU (2.21)	AZ2T3	BONO (4.26)	
			TSRE (2.62)		AZ2IT3		

cohesive blocks (namely BOSB, BOSL, and BODO). Rather, slower attacks (2S and 3) potentiated mainly cohesive blocks (BOSO, BOTB, BOTO, BODB, BOTB, and BONO). The *attack zone* did not interfere with the *block opposition*. Furthermore, the search for patterns that stimulate a certain type of conducts at the level of the *attack efficacy* (lag +2) revealed that this variable was independent both for the zone and the tempo of the attack.

Discussion and conclusions

This study revealed the emergence of distinct patterns according to the setter's tactical action context and its consequences, with the attack tempo having emerged as the most powerful variable. The timing of the attack emerged as a strong predictor of block opposition, configuring itself as a key variable to be controlled by the attacking team (Afonso, Mesquita, & Palao, 2005). The fact that tempo 1 tended to be preceded by closed block formations constitutes a possible attempt of the setter to counterbalance the cohesiveness of the block (Mesquita & Graça, 2002), and reveals high--level attunement to the contextual affordances (Handford, Davids, Bennett & Button, 1997; Renshaw & Davids, 2004). The need for a jump setting in zone 1 was evident for quick attacks to happen, supporting the importance of a high-quality first contact (Marelić, Rešetar & Janković, 2004). Whenever the setter had to set outside the ideal setting zone (SZ2, SZ3), the attack construction tended to be slower. Also, the availability of the middle attacker emerged as a nuclear issue relating to the construction of quick attacks, confirming the results of the study of Afonso, et al., (2008). As all three types of availability of the middle-attacker induced quicker attacks and the blocker's anticipation, through the committing strategies, there is accordance with the characteristics of complex dynamical systems, where a structure emerges containing both stable patterns and an inherent degree of variability, as in team sports (Passos, Araújo, Davids, & Shuttleworth, 2008).

Summarizing, a number of constraints emerged that potentiated the occurrence of quick sets. These constraints were spatial (blockers' starting positions; setting zone), temporal (type of set), and task-related (availability of the middle-attacker; blockers' anticipation movements) in nature, and they also potentiated the patterns exciting slow attacks, although in a different mode. The novelty is that some zones of first contact excited slow attacks, while none excited quick attacks being the only constraint specific to slow attack patterns.

There was an absence of a relationship between the setter's tactical action and the attack efficacy. The ability to select the attacker and other factors (technical quality of the opposing blockers, height that the block reaches, psychological factors) may be of more importance in this ambit (Mesquita & Graça, 2002). This is consistent with the nature of volleyball: being a game of non-invasion, the attacker has the ultimate word on the action of spiking. As such, the setter's tactical action should be grounded on the attacker's individual capacity (Mesquita & Graça, 2002).

These findings strongly support the need to analyse sport settings as dynamical systems, respecting its ecology (McPherson & Kernodle, 2003; Jäger & Schöllhorn, 2007). It was confirmed that the interaction of distinct constraints stimulates the emergence of specific patterns, providing support for a complex systems approach in the utilization of match analysis (Lames & McGarry, 2007).

This study revealed the emergence of game patterns, their association to certain constraints, and their most common effects. These patterns admitted a certain amount of variability, as expected by a complex dynamical system. For instance, all three types of availability of the middle-attacker for the quick attack induced both faster attacks and anticipation block strategies. Emergent game patterns were influenced by actions directly related to the ball trajectory, but also by behaviours connecting to the *middle-attacker's availability. Attack tempo* was the determining factor regarding the unbalancing of the *block opposition*, meaning that the velocity of the attack plays a major role on destabilizing the opponent's defence.

Despite the tremendous importance of *attack timing* for unbalancing the block, *attack efficacy* relies on variables other than the ones considered in this study. Ultimately, the setter's decision-making should be grounded on the attacker's individual capacity, together with psychological constraints. It is recommended that the various specific constraints of the game should be analysed with further extension in future researches. Therefore, match analysis represents a valid methodology in order to study tactical action contexts in real-sport settings, based on a more ecological research methodology.

Also, match analysis may provide a window into the decision-making process. Although it only reveals behaviours, and not intentions or motives, it might contribute to a new approach of decision-making research. The comprehension of such phenomena will be substantially expanded if further research using a mixed methodology integrates a player's verbal reports, eye tracking and match analysis.

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ANALIZA TAKTIČKIH AKCIJA VRHUNSKIH DIZAČICA U ODBOJCI

Analiza izvedbe ima temeljnu ulogu u razumijevanju čimbenika koji utječu na realizaciju akcija u vrhunskom sportu. U posljednje se vrijeme sve veća važnost daje očuvanju situacijske prirode igre, te se u tu svrhu do boljeg razumijevanja obrazaca igre pokušava doći utvrđivanjem odnosa između različitih vrsta varijabla. Cilj ovog istraživanja bio je analizirati neke od varijabla koje opisuju odbojkaški susret, a koje bi mogle ograničiti taktičke akcije dizačica u ženskoj odbojci te utjecati na njihove ishode za vrijeme susreta. Šest susreta Svjetskog prvenstva za odbojkašice 2006 bilo je analizirano prema sistemu kategorija koristeći ponavljajuću opservacijsku metodologiju, odnosno tehniku sekvencionalne usporene analize. Tempo napada pokazao se kao ključna varijabla taktičkih akcija kod dizačica. Akcije sa zatvorenim blokovima prema protivničkim ekipama, dizanje lopte u idealnu zonu kroz skok, simulacija napada srednjeg napadača i predviđanje bloka, izvedeno uz maksimalnu koncentraciju na definiranu strategiju igre, najviše su dolazili do izražaja kod brzih napada. To posljedično dovodi do slabljenja protivničkog bloka. Otvorene formacije bloka, primanja u zoni 4 i 1, dizanje u neidealnim zonama, izostajanje simulacije napada od strane srednjeg napadača te nepredviđanje bloka (strategija *pročitaj-i-reagiraj)* poticali su spore napade, koji su, pak, poticali vezani blok kod protivničkih ekipa. Učinkovitost napada pokazala se nezavisna od akcija dizačica, iako je ona uvelike utjecala na tip bloka kod protivničkih ekipa. Stoga se može zaključiti da analiza susreta pruža uvid u aspekte igre uključujući taktičke varijante kod vrhunskih sportaša.

Ključne riječi: *izvedba, analiza susreta, obrasci igre*

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