

PERFORMANCE INDICATORS ANALYSIS AT BRAZILIAN AND ITALIAN WOMEN'S VOLLEYBALL LEAGUES ACCORDING TO GAME LOCATION, GAME OUTCOME, AND SET NUMBER¹

FABIO A. D. CAMPOS

Air Force Academy, Pirassununga, Brazil

Human Movement Sciences Graduate Program

School of Health Sciences

Methodist University of Piracicaba, Brazil

LUIZ C. R. STANGANÉLLI

*Center of Physical Education and Sport
State University of Londrina, Brazil*

LEANDRA C. B. CAMPOS

Air Force Academy, Pirassununga, Brazil

BRUNO N. PASQUARELLI

*State University of Campinas,
Brazil*

MIGUEL-ÁNGEL GÓMEZ

*Faculty of Physical Activity and Sport Sciences
Polytechnic University of Madrid, Spain*

Summary.—This study was done to investigate the advantage of playing at home in elite women's volleyball leagues and the influence of performance indicators in the game score according to set number. The sample consisted of 240 games of the Brazilian Volleyball League ($n = 132$ games) and the Italian Volleyball League ($n = 108$ games) from the 2011–2012 season. The relationship of performance indicators (including serve, attack, block, and opponents' errors) with the game outcome (win or lose) was assessed. The results showed that there was a home advantage effect in women's volleyball leagues, with a higher prevalence of victory for the home teams in Brazilian and Italian leagues (58 and 56%, respectively). When related to the performance indicators and among the aspects that were most highly correlated with victory, the attack was the technical indicator that explained most of the results of volleyball games.

Home advantage is the term used to describe the advantage that a team or an athlete has to win more than 50% of games played at home in a balanced season, meaning the same number of home and away games (Courneya & Carron, 1992). Carron, Loughhead, and Bray (2005) have proposed changes to the conceptual model of Courneya and Carron (1992), which includes the following variables: venue (home/away); factors related to the venue (crowd support, familiarity, travel, and rules); critical psychological and physiological states (competitors and coaches); critical behavioral states (competitors and coaches); and performance results (pri-

¹Address correspondence to Fabio A. D. Campos, Air Force Academy - R D05, 10 - Pirassununga, SP, Brazil, 13643-208 or e-mail (fabiocampos06@gmail.com).

mary, secondary, and tertiary). Additionally, Pollard (2008) also described the influence of playing tactics on the home advantage.

The home advantage phenomenon has been studied with conclusive results in several team sports such as soccer (Dosseville, 2007; Pollard & Gómez, 2009), basketball (Gómez, Lorenzo, Sampaio, & Ibáñez, 2006; Pollard & Gómez, 2007), rugby (Thomas, Reeves, & Bell, 2008), and handball (Pollard & Gómez, 2012). A recent meta-analysis (Jamieson, 2010) established general values around 60% in different sports (e.g., soccer had the highest home advantage at 67.4%). The study presented by Gómez, Pollard, and Luis-Pascual (2011) investigated nine professional team sports in Spain and showed that volleyball had lower home advantage (55.7%) when compared to other sports, e.g., rugby (67.0%). These authors suggested that is because in volleyball there is neither body contact nor aggressive and territorial protection, as there is in rugby (Gómez, *et al.*, 2011). Particularly in volleyball, only a few studies have assessed the home advantage. Specifically related to volleyball, Marcelino, Mesquita, Sampaio, and Anguera (2009) analyzed the men's senior World Volleyball League during the 2005 season and found home advantage was 57.5%. More recently, Laios, Kountoris, and Kyprianou (2012) revealed the existence of a large home advantage effect in Greek and Italian men's and women's volleyball leagues from 2000 to 2010. These authors showed a remarkable consistency throughout gender, country, set, league stage, and competition year. This article's outcome also enhances the importance of controlling some performance indicators that might affect home advantage in volleyball.

The available research designed to study home advantage in team sports has mainly focused on European leagues, but only one study analyzed the particularities of the Brazilian soccer league with concluding remarks about the importance of territoriality, travel, and referee bias (Pollard, Silva, & Medeiros, 2008). Although the home advantage effect is a worldwide phenomenon that appears in volleyball leagues from different continents, it still needs further analysis, considering there is no available study in elite leagues like the Brazilian ones, either for men or women, since these leagues are among the most important in the world when looking at the international results of the Brazilian teams worldwide.

Traditionally, home advantage studies have been focused on male samples, and there are only few studies in women's sports. A recent study analyzed the home advantage effect in 26 European women's soccer leagues (Pollard & Gómez, 2014). The results of this study showed the existence of home advantage in women's soccer with a mean value of 54% (ranging from 51.0% to 58.8%). Also, Pollard and Gómez (2012) studied the home advantage effect in Spanish women's first and second division handball leagues during 12 seasons. These authors found that women's leagues had a mean home advantage value of 59.2%. More recently, Pri-

eto, Gómez, and Pollard (2013) studied the Spanish women's water polo leagues (from the 2007–2008 to the 2010–2011 seasons). Their results revealed the existence of home advantage with values of 53.7%. Specifically, Laios, *et al.* (2012) found in Italian and Greek volleyball leagues values of 57.9%. These available researches reflected the existence of the home advantage in women's sports, including volleyball. Therefore, according to the specific framework of home advantage phenomenon:

Hypothesis 1. The home advantage will be found in women's volleyball leagues from Brazil and Italy.

Performance analysis research in team sports has shown that most teams that play on their home courts have a psychological advantage over their rivals, with not having to travel, having knowledge of the court and referees, and also having familiarity with the stadium or the fans (Pollard & Pollard, 2005). Published research focused on the relationship between performance indicators and home and away teams' performance in women's volleyball is inconclusive because the available studies were mostly conducted on samples from other team sports such as basketball (Gómez, Lorenzo, Ortega, & Olmedilla, 2007). But João, Leite, Mesquita, and Sampaio (2010) investigated volleyball and studied the differences between men's and women's teams. These authors studied 132 games from the World Championship in 2007, and their results demonstrated that men's team wins were more associated with terminal actions (e.g., errors of service) and, conversely, the women's team wins were more related to continuous actions (e.g., offensive and defensive performance indicators). These results suggest that anthropometric and physiological gender differences may configure different performance profiles in volleyball when controlling for game location and for game outcome.

The available research considering various performance indicators that best discriminated winning and losing teams have shown the importance of serve, attack, block, and opponents' errors (Marelić, Resetar, & Janković, 2004; Rodríguez-Ruiz, Quiroga, Miralles, Sarmiento, De Saá, & García-Manso, 2011). Another interesting characteristic of the volleyball game is its distribution by sets, and the game ends when one team wins three out of five sets. This fact was studied by Marcelino, Mesquita, Palao, and Sampaio (2009), who assessed the probability of winning a volleyball game according to its location. The results revealed that home teams more frequently won the first, fourth, and fifth sets. Some explanations for these trends were offered, such as familiarity and crowd support. The influence of performance indicators indicated the relevance of risky actions, mainly attack and block, during the first and last sets of the game. Laios, *et al.* (2012) studied Italian and Greek volleyball leagues and found that a home advantage

exists during the games won by 3–0 or 3–1; however, home advantage was not observed when the game was decided in the fifth set (e.g., marginal 3–2 win). According to these authors, the differences between winning and losing teams in volleyball are probably influenced by game location, gender, and set number, which support different game tactics and strategies. However, the teams' performances studied through performance indicators may vary according to the standard of competition (e.g., Brazilian and Italian leagues) because it can affect players' performance (Marcelino, Mesquita, Palao, & Sampaio, 2009). Logically, in relation to the sample, different decisive performance indicators differentiate groups. This fact suggests a need to improve knowledge about team performance in home and away victories according to set number so that these results can be used by coaches and performance analysts to adapt the training to competition constraints.

Hypothesis 2. Female volleyball performance indicators will be influenced by game location, game outcome, and set number.

Considering all the assumptions mentioned above, particularly about women's volleyball, the goals of this study were to investigate the presence of the home advantage in women's volleyball national leagues (Brazilian and Italian leagues) during their regular season and to assess the differences among the performance indicators in these two leagues according to game location, game outcome, and set number.

METHOD

The data collection was performed using the Volleyball Information System (FIVB, 2000) generated by official statistics and published on the web sites of the Brazilian Volleyball Confederation (2012) and the Italian Volleyball Federation (2012). Data were obtained from official reports of the Brazilian ($n=132$ games) and Italian ($n=108$ games) women's volleyball leagues from the 2011–2012 season during their regular season when each team played against each opponent at home and away. The play-off games were not considered in this study. In total, the results of the 12 teams in the Brazilian league and 11 teams in the Italian league were included. These leagues were chosen due to their high technical level since they are considered two of the most important leagues in the world. The publicly available box scores and reports were collected by professional technicians of the leagues; this source of data has been used previously for other team sports (Marelić, *et al.*, 2004; Gómez, *et al.*, 2007; João, *et al.*, 2010). All procedures were previously approved by the local ethics committee (State Univer. of Londrina, Protocol Number 2009/31).

Procedure

Firstly, the home advantage was calculated for both leagues according to the ratio win/loss of each team when playing at home. A score of 50%

would indicate no home advantage, since the same number of victories would have been gained at home and away (Courneya & Carron, 1992).

Secondly, three dependent variables were defined, relating the final outcome to game location (home win, home loss, away win, and away loss), the country (Brazilian and Italian leagues), and the number of sets of each game (three, four, or five sets). Performance indicators were based on the points scored (home/away) and quantified the following independent variables: serve, block, attack, and opponents' errors. These data were also collected according to the official statistics based only on terminal actions; data were collected neither by the way these actions were executed nor according to their efficacy, which might have limited the study.

Statistical Analysis

The descriptive analysis involved the calculation of the means and standard deviations. Data distribution was analyzed using Shapiro–Wilks test, which showed a normal distribution. Separate 2-Game Location (home or away) \times 2-Game Outcome (win or lose) \times 2 League (Brazilian or Italian) analyses of variance (ANOVAs) were run for games with three, four, and five sets. Independent variables were the performance indicators attack, block, serve, and opponents' errors. All studied variables' distributions were verified with the Mauchly test, and the Greenhouse–Geisser adjustment was used when necessary (Zar, 1999). Bonferroni *post hoc* tests were carried out where it was necessary to establish comparisons between groups. Effect sizes (η^2) were calculated to show the magnitude of the effects, and their interpretation was based on the following criteria: 0–0.1 = weak, 0.1–0.3 = modest, 0.3–0.5 = moderate, and >0.5 = strong (Bliese & Halverson, 1998). Data were analyzed using SPSS Version 17.0 (2013; SPSS, Inc., Chicago, IL, USA) software. Statistical significance was assumed at $p < .05$.

RESULTS

Based on the results obtained for the number and percentage of games won, home teams won 58.0% and 56.0% in the Brazilian and Italian leagues, respectively, as shown in Table 1.

TABLE 1
NUMBER AND PERCENTAGE OF GAMES IN BRAZILIAN AND
ITALIAN LEAGUES DURING THE 2011–2012 SEASON

League	Number of Teams	Number of Games	Number of Games Won by the Home Teams	Percentage of Games Won by the Home Teams (%)
Brazilian	12	132	76	58
Italian	11	108	61	56
Total	23	240	137	57

According to set number, the results showed that in games with three sets, the game location variable was statistically significant for attack, block, serve, and opponents' errors with better values for home teams. Also, the game outcome effect was significant for all the performance indicators, attack, block, serve, and opponents' errors, with better values for winning teams. The effect of league was significant for attack, block, and serve, with higher values for Brazilian teams. The Game Location \times Game Outcome interaction effects were significant for block and serve performance indicators, with better values for wins at home, and also Game Outcome \times Country for opponents' errors, with better values for the Brazilian league in winning games.

The results showed that in games with four sets, the game location variable was statistically significant for attack, block, serve, and opponents' errors, with better values for home teams. The game outcome effect was significant for all the performance indicators: attack, block, serve, and opponents' errors, with better values for winning teams. The effect of league was significant for blocks, with higher values for Brazilian teams. The Game Location \times Game Outcome interaction effects were significant for attack, block, serve, and opponents' errors, respectively, with better values for wins at home for all the performance indicators. On the other hand, there were significant Game Location \times League effects for block, with better values for Brazilian teams playing at home, and Game Location \times Game Outcome \times League, with better values for Brazilian teams when playing at home in winning games.

Finally, the results showed that in games with five sets, the game location variable was statistically significant for block and serve, with better values for home teams. The game outcome effect was significant for attack and opponents' errors, with better values for winning teams. League was not significant for any performance indicator in games with five sets. Also, the Game Location \times Game Outcome interaction effects were significant for attack, with better values for wins at home. On the other hand, there were significant Game Location \times League effects for attack and opponents' errors, with better values for Brazilian teams playing at home. Lastly, there were significant Game Location \times Game Outcome \times League effects for serve, with better values for Italian teams playing at home in winning games.

See Appendix A for detailed descriptive statistics for win/loss results by predictor and number of sets; see Appendix B for ANOVA tables.

DISCUSSION

The aims of this study were to investigate the presence of home advantage in women's volleyball national leagues (Brazilian and Italian leagues) and to assess the differences among the performance indicators in these

two leagues according to game location, game outcome, and set number. The results of the present study may add new knowledge for coaches and performance analysts, providing them important data for preparing the volleyball teams during training sessions and competitions either at home or away.

Home Advantage in Women's Volleyball

The first hypothesis predicted home advantage values in women's volleyball higher than 50%. The presented data supported this hypothesis and described that the percentage of games won by home teams was higher in the Brazilian league (58%) when compared to the Italian league (56%). The results obtained are similar to those found by Laios, *et al.* (2012), who assessed home advantage in the Greek and Italian women's leagues and found that the home teams had home advantage at 57.9%. Also, these results are similar to those found in women's handball, soccer, and water polo (i.e., values below 60, 59.2, 54.0, and 53.7%, respectively). According to these results, it was possible to consider that the home advantage phenomenon occurred in women's volleyball independently of the championships (Laios, *et al.*, 2012). There are some considerations in the literature trying to explain why home advantage occurs. Specifically in volleyball, Laios *et al.* (2012) argued that home advantage is due to greater familiarity (i.e., the crowd noise, the referees, court colors and dimensions, and lighting) that makes the home teams more familiar with and less distracted by the home court.

It is not clear yet whether the presence of an audience might increase performance in tasks which could affect the execution of the specific skills during volleyball games, although the results of the present investigations indicated that the home team had improved performance and these variables could influence the athletes' performances, leading teams to a higher percentage of home wins. Certainly, there are some other variables that influence home advantage. Bray and Widmeyer (2000) stated that players from the home team presented lower values in pre-competitive anxiety and felt more concentrated and motivated, which in turn resulted in a better overall team performance.

Differences by Context (Game Location, Game Outcome, and Set Number)

The second hypothesis predicted that the teams' performance (i.e., points scored in block, serve, attack, and opponents' errors) would be influenced by game location, game outcome, and set number. The analyses indicated the importance of the attack in all game contexts (games played with three, four, and five sets, in both Italian and Brazilian leagues). This result corroborates previous studies (Gubellini, Lobiatti, & Di Michele, 2005; Oliveira, Mesquita, & Oliveira, 2005; Lobiatti, Michele, & Merni, 2006; Marcelino

& Mesquita, 2006), all highlighting that the attack is how most teams score more points during the sets; thus, attack is an important factor in obtaining a victory (Marcelino & Mesquita, 2008). An important aspect to consider is that of all the situations during the game, the attack is the final action of the rally to score points. It is a sensitive indicator related to aggressive behavior that might be aroused when playing at home (Gómez, *et al.*, 2007). The results reflect that in women's volleyball, the games played to three, four, or five sets are different than those played in men's volleyball. Therefore, during training sessions, the teams must perform different attack scenarios, since this variable is the largest contributor to the wins either at home or away. The attack is the procedure by which teams score more points during the game, discriminating both victory and defeat (Lobietti, *et al.*, 2006; Oliveira, *et al.*, 2005, Marcelino & Mesquita, 2008).

Another point to consider is that when specifically comparing the Brazilian to the Italian leagues according to the wins/losses at home/away, the performance indicator most prevalent for any score (3–0; 3–1; 3–2) was the block. In any situation, this indicator was a statistically significant predictor. The Brazilians scored more points than the Italians off the block.

According to the study of Marcelino and Mesquita (2008), the team that serves best eventually wins the games. Some studies argue teams that are losing should take more risks in service actions, since they have nothing to lose, and maybe this could make them more effective in service and allow them to score more points. Such actions may increase the effectiveness of the service, and since it is considered a terminating action (Marcelino, Mesquita, Sampaio, & Anguera 2009, p. 193), the serve may result in a direct point. Future research should be conducted addressing different ages and levels of athletes as well as a further analysis of the sequence of the actions within the rally and specific moments of the set the indicators were performed. This would add more important information in studies investigating home advantage in women's volleyball.

Conclusion

In conclusion, home advantage was found in women's volleyball, where the local teams won 57% of the games at home. The performance indicators revealed that the attack was the action with the strongest association to performance and defining who wins or loses a game (home or away). Thus, this study, in spite of its limitations, provided important information that could be helpful when planning training sessions as well as preparing women's volleyball teams to play either at home or away.

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APPENDIX A
DESCRIPTIVE STATISTICS

DESCRIPTIVE STATISTICS FOR THE BRAZILIAN AND ITALIAN LEAGUES WITH HOME TEAM WINS BY
NUMBER OF SETS PLAYED AND SCORE ON PERFORMANCE INDICATORS

League and Performance Indicator	3 Sets				4 Sets				5 Sets			
	Home		Away		Home		Away		Home		Away	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Brazilian league	<i>n</i> = 39 (51%)				<i>n</i> = 20 (26%)				<i>n</i> = 17 (22%)			
Serve	4	2	2 ^a	2	5	2	4	1	3	3	4	2
Attack	42	5	33 ^a	5	55	8	47 ^a	7	59	7	61	9
Block	11	4	6 ^a	2	15	5	11 ^a	4	15	6	14	2
Opponents' errors	18	4	15 ^a	4	22	5	21	6	28	5	23 ^a	6
Italian league	<i>n</i> = 25 (41%)				<i>n</i> = 22 (36%)				<i>n</i> = 14 (23%)			
Serve	3	2	2 ^a	1	5	2	3 ^a	2	4	2	3	2
Attack	47	5	35 ^a	6	58	5	51 ^a	7	64	8	59 ^a	5
Block	9	3	6 ^a	2	11	3	10	3	12	3	12	3
Opponents' errors	18	4	16	4	23	4	22	6	24	6	27	5

^aDifferent from home teams ($p < .05$).

COMPARATIVE RESULTS OF WINNING TEAMS AT HOME IN BRAZILIAN AND ITALIAN LEAGUES

Performance Indicator	3 Sets				4 Sets				5 Sets			
	Brazilian		Italian		Brazilian		Italian		Brazilian		Italian	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Serve	4	2	3 ^a	2	5	2	5	2	3	3	4	2
Attack	42	5	47 ^a	5	55	8	58	5	59	7	64	8
Block	11	4	9 ^a	3	15	5	11 ^a	3	15	6	12	3
Opponents' errors	18	4	18	4	22	5	23	4	28	5	24 ^a	6

^aDifferent from Brazilian League ($p < .05$).

RESULTS OF BRAZILIAN AND ITALIAN LEAGUES WITH AWAY TEAM WINS BY NUMBER OF SETS PLAYED
AND SCORE ON PERFORMANCE INDICATORS

League and Performance Indicator	3 Sets				4 Sets				5 Sets			
	Home		Away		Home		Away		Home		Away	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Brazilian League	<i>n</i> = 28 (50%)				<i>n</i> = 18 (32%)				<i>n</i> = 10 (18%)			
Serve	2	2	4 ^a	1	4	2	4	2	4	3	3	10
Attack	33	6	43 ^a	5	50	6	53	5	58	5	64 ^a	6
Block	7	2	11 ^a	3	10	3	15 ^a	4	11	3	13	2

(continued on next page)

^aDifferent from home teams ($p < .05$).

RESULTS OF BRAZILIAN AND ITALIAN LEAGUES WITH AWAY TEAM WINS BY NUMBER OF SETS PLAYED AND SCORE ON PERFORMANCE INDICATORS (CONT'D)												
League and Performance Indicator	3 Sets				4 Sets				5 Sets			
	Home		Away		Home		Away		Home		Away	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Brazilian League	<i>n</i> = 28 (50%)				<i>n</i> = 18 (32%)				<i>n</i> = 10 (18%)			
Opponents' errors	14	4	18 ^a	4	21	5	24 ^a	4	26	6	26	5
Italian League	<i>n</i> = 23 (49%)				<i>n</i> = 17 (36%)				<i>n</i> = 7 (15%)			
Serve	2	2	4 ^a	3	4	3	5	3	3	2	5	2
Attack	33	6	45 ^a	5	51	8	56 ^a	6	60	4	61	6
Block	6	3	8 ^a	2	8	3	12 ^a	4	11	3	12	3
Opponents' errors	17	5	18	4	21	5	23	6	23	4	27	8

^aDifferent from home teams (*p* < .05).

COMPARATIVE RESULTS OF TEAMS WINNING AWAY FROM HOME IN BRAZILIAN AND ITALIAN LEAGUES												
Performance Indicator	3 Sets				4 Sets				5 Sets			
	Brazilian		Italian		Brazilian		Italian		Brazilian		Italian	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Serve	4	1	4	3	4	1	5	3	3	10	5 ^a	2
Attack	43	5	45	5	53	5	56	6	64	6	61	6
Block	11	3	8 ^a	2	15	4	12 ^a	4	13	2	12	3
Opponents' errors	18	4	18	4	24	4	23	6	26	5	27	8

^aDifferent from Brazilian teams (*p* < .05).

APPENDIX B
ANOVA DETAILS

EFFECT OF GAME LOCATION, GAME OUTCOME, LEAGUE, AND INTERACTIONS ON PERFORMANCE INDICATORS (ATTACK, BLOCK, SERVE, AND OPPONENTS' ERRORS) IN GAMES WITH THREE SETS						
Performance Indicator	Effect	<i>df</i>	MS	<i>F</i>	<i>p</i>	η ²
Attack	Game Location (GL)	1	1527.40	151.40	.003	0.41
	Game Outcome (GO)	1	2142.60	382.20	.001	0.50
	League (C)	1	300.06	70.01	.03	0.11
	GL × GO	1	0.01	0.01	.98	
	GL × C	1	26.70	1.45	.23	
	GO × C	1	2.62	10.03	.06	
	GL × GO × C	1	2.52	0.80	.37	

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EFFECT OF GAME LOCATION, GAME OUTCOME, LEAGUE, AND INTERACTIONS ON PERFORMANCE INDICATORS (ATTACK, BLOCK, SERVE, AND OPPONENTS' ERRORS) IN GAMES WITH THREE SETS (CONT'D)

Performance Indicator	Effect	<i>df</i>	MS	<i>F</i>	<i>p</i>	η^2
Block	Game Location (GL)	1	2242.60	112.20	.001	0.61
	Game Outcome (GO)	1	4152.30	2282.21	.001	0.55
	League (C)	1	1070.10	857.01	.002	0.41
	GL \times GO	1	66.70	8.45	.02	0.29
	GL \times C	1	0.61	0.03	.85	
	GO \times C	1	3.63	0.80	.37	
	GL \times GO \times C	1	687.94	17.42	.01	0.19
Serve	Game Location (GL)	1	90.06	6.01	.005	0.24
	Game Outcome (GO)	1	6142.60	182.27	.001	0.65
	League (C)	1	726.70	41.45	.03	0.09
	GL \times GO	1	40.60	190.30	.02	0.11
	GL \times C	1	4.61	0.80	.37	
	GO \times C	1	6.95	0.42	.51	
	GL \times GO \times C	1	68.50	15.60	.05	
Opponents' errors	Game Location (GL)	1	81.01	5.01	.001	0.30
	Game Outcome (GO)	1	42.60	82.27	.001	0.50
	League (C)	1	1.84	0.03	.85	
	GL \times GO	1	1.12	0.87	.37	
	GL \times C	1	5.54	0.42	.51	
	GO \times C	1	68,075.50	369.60	.001	0.94
	GL \times GO \times C	1	3.01	2.91	.36	

EFFECT OF GAME LOCATION, GAME OUTCOME, LEAGUE, AND INTERACTIONS ON PERFORMANCE INDICATORS (ATTACK, BLOCK, SERVE, AND OPPONENTS' ERRORS) IN GAMES WITH FIVE SETS

Performance Indicator	Effect	<i>df</i>	MS	<i>F</i>	<i>p</i>	η^2
Attack	Game Location (GL)	1	15.79	0.53	.47	
	Game Outcome (GO)	1	71.94	2.79	.03	0.31
	League (C)	1	5.57	0.82	.37	
	GL \times GO	1	211.40	24.04	.03	0.11
	GL \times C	1	1.15	2.86	.09	
	GO \times C	1	515.10	15.50	.01	0.72
	GL \times GO \times C	1	0.77	0.07	.78	

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EFFECT OF GAME LOCATION, GAME OUTCOME, LEAGUE, AND INTERACTIONS ON PERFORMANCE INDICATORS (ATTACK, BLOCK, SERVE, AND OPPONENTS' ERRORS) IN GAMES WITH FIVE SETS (CONT'D)

Performance Indicator	Effect	<i>df</i>	MS	<i>F</i>	<i>p</i>	η^2
Block	Game Location (GL)	1	50.40	2.79	.02	0.31
	Game Outcome (GO)	1	5.96	0.82	.37	
	League (C)	1	1.46	0.04	.83	
	GL \times GO	1	5.10	2.86	.09	
	GL \times C	1	15.16	0.58	.45	
	GO \times C	1	2.51	0.07	.78	
	GL \times GO \times C	1	6.60	0.24	.65	
Serve	Game Location (GL)	1	235.90	28.80	.02	0.10
	Game Outcome (GO)	1	2.55	0.04	.83	
	League (C)	1	2.11	2.86	.09	
	GL \times GO	1	1.16	0.58	.45	
	GL \times C	1	0.57	0.07	.78	
	GO \times C	1	1.66	0.21	.65	
	GL \times GO \times C	1	652.90	12.12	.001	
Opponents' errors	Game Location (GL)	1	1.45	0.04	.83	0.32
	Game Outcome (GO)	1	95.15	4.85	.04	
	League (C)	1	15.16	0.58	.45	
	GL \times GO	1	1.57	0.07	.78	
	GL \times C	1	1.60	0.41	.65	
	GO \times C	1	80.05	4.13	.001	
	GL \times GO \times C	1	4.95	1.27	.12	

EFFECT OF GAME LOCATION, GAME OUTCOME, LEAGUE, AND INTERACTIONS ON PERFORMANCE INDICATORS (ATTACK, BLOCK, SERVE, AND OPPONENTS' ERRORS) IN GAMES WITH FOUR SETS

Performance Indicator	Effect	<i>df</i>	MS	<i>F</i>	<i>p</i>	η^2
Attack	Game Location (GL)	1	28.78	2.08	.007	0.61
	Game Outcome (GO)	1	138.01	1.64	.02	0.13
	League (C)	1	0.09	0.01	.91	
	GL \times GO	1	413.33	33.58	.02	0.60
	GL \times C	1	12.56	5.92	.02	
	GO \times C	1	13.55	6.60	.01	
	GL \times GO \times C	1	4.43	9.75	.002	

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EFFECT OF GAME LOCATION, GAME OUTCOME, LEAGUE, AND INTERACTIONS ON PERFORMANCE INDICATORS (ATTACK, BLOCK, SERVE, AND OPPONENTS' ERRORS) IN GAMES WITH FOUR SETS (CONT'D)

Performance Indicator	Effect	<i>df</i>	MS	<i>F</i>	<i>p</i>	η^2
Block	Game Location (GL)	1	48.05	1.64	.003	0.53
	Game Outcome (GO)	1	980.00	26.01	.007	0.61
	League (C)	1	137.33	2.58	.05	0.14
	GL \times GO	1	192.56	5.62	.02	0.54
	GL \times C	1	82.51	7.20	.01	0.16
	GO \times C	1	4.28	1.75	.002	
	GL \times GO \times C	1	985.00	39.20	.04	0.25
Serve	Game Location (GL)	1	50.09	4.01	.02	0.01
	Game Outcome (GO)	1	43.33	5.58	.03	0.02
	League (C)	1	1.56	0.92	.10	
	GL \times GO	1	183.55	6.60	.01	0.43
	GL \times C	1	64.42	9.75	.002	
	GO \times C	1	0.02	0.52	.64	
	GL \times GO \times C	1	1.27	0.31	.001	
Opponents' errors	Game Location (GL)	1	583.33	52.58	.006	0.16
	Game Outcome (GO)	1	192.56	5.92	.02	0.54
	League (C)	1	3.55	0.60	.01	
	GL \times GO	1	84.32	7.52	.002	0.86
	GL \times C	1	5.02	0.22	.64	
	GO \times C	1	1.27	19.17	.41	
	GL \times GO \times C	1	29.45	5.06	.58	

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