AN ANALYSIS OF DEFENSIVE STRATEGIES USED BY HOME AND AWAY BASKETBALL TEAMS[1]

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Summary.— The aim of the present study was to identify differences in defensive strategies used during basketball games, to compare the defensive strategies used by home and away basketball teams, and to analyze the effectiveness of home and away ball possessions when playing against each defensive strategy. The sample was composed of 10 games of the Spanish men's 2005–2006 regular basketball season ($N = 1,785$ ball possessions). The analyzed variables were the number of types of defenses used, points per possession, foul percentage, and turnover percentage according to the type of defensive strategy and game location. The game location main effect was significant in points per possession, with home teams having lower values than away teams. The defensive strategy main effect was significant in number of types of defenses used, with man-to-man as the most frequently utilized defense, and foul percentages with higher values in zone defenses. There was a statistically significant interaction in turnover percentages, with significantly lower values for man-to-man defense and home games. Overall, it is suggested that team performance for the studied variables changed according to the factors and, thus, it may be beneficial to change defensive (and offensive) strategies according to game location.

Home advantage in team sports has an important role in determining the outcome of a game. This phenomenon has been widely studied from different perspectives (i.e., historical, psychological, physiological, sociological, and game-analysis), in different countries and sports (i.e., basketball, volleyball, football, rugby, baseball, and hockey), as demonstrated in the available literature (Courneya & Carron, 1992; Pollard, 2006, 2008; Ortega, Giménez, & Olmedilla, 2008; Marcelino, Mesquita, Sampaio, & Anguera, 2009). The study by Pollard and Pollard (2005) determined home advantage values near 60% in the National Football League (NFL) and in the National Basketball League (NBA). In basketball, Pollard and Gómez (2007) found that 60% of NBA games are won by the home team and

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showed that the home advantage in European leagues was higher than in the NBA, particularly in Spain (61%), France (63%), Italy, and Greece (66% each). The most likely explanations are crowd support, travel, familiarity, or referees (Courneya & Carron, 1992). Other authors describe the importance of special tactics used according to game location. From a tactical viewpoint, Pollard (2008) argued that teams use different strategies according to home and away games, and some studies have found that coaches use different plans according to game location (Gayton, Broida, & Elgee, 2001). In ice hockey, Dennis and Carron (1999) found a more aggressive forechecking style at home versus when playing away. On the other hand, in football, Page and Page (2007) suggested tactical differences in the home advantage during the second leg of the European Cup games.

In basketball, some studies have investigated the defensive strategies used during games. Mikes (1987) analyzed 30 Division I U.S. college basketball games (over 5,000 ball possessions) and found that man-to-man defenses were the most common during these games in contrast to zone, press, and combined defenses. Along these lines, Mexas, Tsiskaris, Kyriakou, and Garefis (2005) studied 40 basketball games from the Greek Basketball League and the Euroleague, and their results also reflected that man-to-man defenses were used more than zone and press defenses. More recently, Gómez, Tsamourtzis, and Lorenzo (2006) studied eight games of the Spanish playoff series from the 2004–2005 season, and their results supported the previous findings, with man-to-man defenses being the main defensive strategy used during basketball games. Thus, the first hypothesis predicted that man-to-man defenses are the most common defensive strategy used by home and away teams. However, no study has focused on the differences according to the defensive strategy used between home and away teams. Varca (1980) argued that defensive style is a major factor differentiating the two groups and also reported that there are no data concerning what successful strategies were used by home and away teams. This author interviewed several U.S. college basketball coaches and found that zone defenses are more common in away games than home games. On the other hand, Silva and Andrew (1987) pointed out that press defenses were used more at home in an attempt to rattle the visiting team. Therefore, the second hypothesis predicted differences between home and away teams with regard to the defensive style used, with more zone defenses used by away teams and more press defenses used by home teams. According to these authors, game analysis may allow researchers to obtain more information about the importance of tactics and strategies used in the home advantage effect.

Basketball researchers have studied the home advantage effect from a quantitative perspective through game-related statistics. Varca (1980) studied one regular season (1977–78) of the Southeastern Conference

in U.S college basketball ($N=90$ games) and found better performances from home teams in rebounds, steals, blocks, and fouls compared to away teams. Silva and Andrew (1987) studied 10 years (from 1971–1981) of the Atlantic Coast Conference (ACC) and found that home teams had better performances for field-goal percentage, turnovers, fouls, and rebounds than away teams. According to these authors, home teams defend better than away teams while committing fewer fouls and making more blocks, more rebounds, and fewer turnovers. Also, as Silva and Andrew (1987) reported, away teams shoot worse than home teams from field-goal positions. Therefore, the third hypothesis predicted that home teams perform better with their ball possessions when playing against different defensive strategies, with more points per possession scored, fewer turnovers made, and more fouls received.

In summary, the aims of the present study were: (1) to examine the differences in defensive strategies used during basketball games, (2) to compare the defensive strategies used by home and away basketball teams, and (3) to analyze the effectiveness of home and away ball possessions when playing against each defensive strategy.

METHOD

Sample

The sample was composed of 1,785 ball possessions (home $n=896$; away $n=889$), corresponding to 10 regular season games from the 2005–2006 Spanish men's first division basketball league. These games were randomly selected from the regular season games. To avoid problems with the sample, only set plays were analyzed (without fast breaks and unusual possessions).

Procedure

The 10 games were analyzed through systematic observation by four experienced observers trained for this observational analysis. Before the analysis of the games, two separate observations were done to calculate interrater reliability (Cohen's Kappa was greater than .98). Additionally, after the observation of the 10 games, four games were randomly selected and again observed to verify the register's reliability. Finally, for a reliable register, all the ball possessions were compared using the official play-by-play box scores of the League (www.acb.com). Only the games with 100% agreement between the two samples were selected ($n=10$ games), and two games were excluded from the sample ($n=257$ ball possessions) to avoid inconsistencies.

The variables were determined by expert coaches and researchers and were registered by experienced observers (licensed in Sport Science and with a minimum of 5 yr. of experience as basketball coaches). The vari-

ables registered were the following: (1) Game location: home or away; (2) Defensive strategy: man-to-man (defense where each defender is responsible for preventing a single offensive player from scoring), zone (defense where each defender is responsible for preventing any player in an assigned zone of the court from scoring), press (defense where the defenders try to stop the offensive players from baseline to baseline over the entire court), and combined defenses (defense where individual, zonal, and press defenses are mixed to prevent the offensive players from scoring; Mikes, 1987); 3) Ball possession's effectiveness: points per possession (free-throw: 1 point, 2-point field goal: 2 points, and 3-point field goal: 3 points), foul percentage (the percentage of ball possessions that end in fouls with or without free-throws), and turnover percentage (the percentage of ball possessions that end in a turnover, such as a block, an interception, or a steal by the defensive team; Mikes, 1987).

Statistical Analysis

To test the hypotheses, a 2 × 4 factorial analysis of variance (game location: home and away; and defensive strategy: man-to-man, zone, press, and combined) was performed for each variable (number of types of defenses used, points per possession, turnover percentage, and foul percentage) to identify main effects and interactions. When appropriate, Tukey HSD was used for multiple comparisons. The level of confidence was set to 95%.

RESULTS

The descriptive results are presented in Table 1. The inferential analysis allowed for the identification of several statistically significant differ-

TABLE 1
DESCRIPTIVE STATISTICS BY GAME LOCATION AND DEFENSIVE STRATEGY

	Man-to-man ($n = 1,507$)		Zone ($n = 71$)		Press ($n = 191$)		Combined ($n = 16$)	
	M	SD	M	SD	M	SD	M	SD
N Defenses								
Home	76.40	6.29	2.20	1.90	8.30	4.03	0.90	1.91
Away	74.30	10.7	4.90	8.20	10.80	8.23	0.30	0.94
Turnovers, %								
Home	6.77	2.41	11.28	11.53	18.35	10.05	35.0	21.12
Away	8.44	2.25	0.94	1.89	8.66	11.62	60.0	56.56
Fouls, %								
Home	10.08	1.85	3.52	3.79	12.21	8.39	8.35	11.81
Away	10.53	1.78	31.88	4.25	11.93	8.68	10.01	14.14
Points per Possession								
Home	0.88	0.10	0.27	0.26	0.77	0.38	0.00	0.00
Away	0.87	0.48	0.78	0.58	0.89	0.39	1.00	1.41

ences in both factors and interactions (Table 2). The game location main effect was significant in points per possession, and home teams had lower values than away teams ($M = 0.67$, $SD = 0.39$ and $M = 0.86$, $SD = 0.53$, respectively). The defensive strategy main effect was significant in number of types of defenses and foul percentages. The most frequent defense was man-to-man ($p < .05$); however, foul percentages were significantly higher for zone defenses. There was a statistically significant interaction for turnover percentages, with significantly lower values for man-to-man defense and home games.

TABLE 2
RESULTS OF FACTORIAL ANALYSIS OF VARIANCE

Variable/Effect	SS	DF	MS	F	p	η^2
N Defenses						
Game Location	7.8	1	7.8	0.2	.658	0.00
Defense	75,986.2	3	25,328.7	642.0*	.0e+00	0.96
Interaction	83.7	3	27.9	0.7	.551	0.03
Turnovers, %						
Game Location	25.8	1	25.8	0.2	.656	0.00
Defense	5,917.1	3	1,972.4	15.3	3.37e-7	0.48
Interaction	1,287.5	3	429.2	3.3*	.027	0.17
Fouls, %						
Game Location	532.6	1	532.6	1.6	.206	0.03
Defense	492.5	3	164.2	0.5*	.030	0.03
Interaction	1,973.5	3	657.8	2.0	.122	0.11
Points per Possession						
Game Location	1.5	1	1.5	7.6*	.008	0.13
Defense	1.4	3	0.5	2.3	.091	0.12
Interaction	1.2	3	0.4	2.0	.128	0.11

*$p < .05$.

DISCUSSION

The aim of this study was to examine the defensive strategies used by home and away basketball teams. The first hypothesis of this study predicted that the man-to-man defense would be the most used type of defense by home and away teams. As previous studies have found (Mikes, 1987; Mexas, *et al.*, 2005; Gómez, *et al.*, 2006), this defensive system is based on keeping the ball far from the basket, reducing slow defensive movements, and reducing the opponent's fastbreak opportunities. This defense is very common in junior categories because young players have lower technical and tactical scoring abilities. Since this defense forces the offensive team to shoot from the 3-point line, it consequently reduces the field goal percentage (Sampaio, Ibáñez, & Feu, 2004). In senior categories, zone defenses are also used to modify the game pace, confuse the offense, and force a change in the offensive team strategy (Mikes, 1987).

The second hypothesis predicted differences between home and away

teams in the defensive strategies utilized. From a subjective perspective and based on coaches' opinions, home teams use more zone defenses than away teams (Varca, 1980), and away teams use more press defenses than home teams (Silva & Andrew, 1987). The results obtained in the present study do not support this hypothesis, as the home and away teams were not differentiated according to the defensive strategy used. This fact may demonstrate that coaches' opinions were based on critical moments of the game when their teams made a turnover, a foul, or a missed shot versus a zone or a press defense, and coaches then established a subjective idea according to some specific moments in a game (Bar-Eli & Tractinsky, 2000).

The third hypothesis predicted that home teams would obtain more points per possession, receive more fouls, and make fewer turnovers in the different defensive systems. The results showed that differences exist between home and away teams in points per possession in all games. However, these variations did not indicate any statistically significant difference in any defensive strategy between home and away teams. This fact may be associated with the better field goal percentage showed by home teams in comparison to away teams (Silva & Andrew, 1987). Also, these results suggest that defensive strategies may affect the game pace during a specific moment of the game, shutting down the offensive behaviors of the opponent. On the other hand, when both groups played against man-to-man defenses, these teams generated more points per possession than versus other defenses. Along these lines, Gómez, *et al*. (2006) found that winning teams used more man-to-man defense than away teams, and this defensive strategy allows a team to press the team on offense and may generate more turnovers and consequently easy field goal positions near the basket in fastbreaks.

The results concerning foul percentage do not indicate statistically significant differences between home and away teams, nor do they support the results obtained in previous studies that cited fouls as a discriminative variable (Varca, 1980; Silva & Andrew, 1987). This fact may reflect a better defensive performance that does not allow for committing fouls. Recently, Gómez, Lorenzo, Barakat, Ortega, and Palao (2008) studied home and away wins during the 2004–2005 Spanish regular season and did not find that fouls were discriminant between winning and losing teams at home or away, as opposed to defensive rebounds and assists. This study may explain that teams try to generate more situations with better field goal positions to obtain a basket, rather than individual situations that allow going to the free-throw line. On the other hand, the results showed that zone defenses generated a higher foul percentage than other defensive strategies. These results are in accordance with Varca's (1980) suggestion, zone defenses generated more fouls than man-to-man defenses due to slowing defensive movements. One interesting finding from the study was the dif-

ference in foul percentage between home and away teams when they attack versus zone defenses. The away teams receive more fouls than home teams. This fact may be related to the offensive strategies used to break the zone defenses. One author, Osborne (2001), found higher winning percentages in those teams that focused their offensive game on getting to the free-throw line as often as possible, as the offensive team receives more fouls and may obligate the defensive team to change defensive strategy.

The turnover percentage results indicated statistically significant differences, with better performances for away teams using other defensive strategies than man-to-man defense. These results may indicate the importance of this variable in discriminating home and away teams (Silva & Andrew, 1987) and may reflect that defensive strategies are decisive for ball recovery. This was also suggested by Mikes (1987), when arguing that greater defensive pressure increases the turnover percentage. Present results support this idea for zone and press defenses by home teams and for man-to-man defenses by away teams. In fact, man-to-man defense is the most used defense in a game, and it generates more turnovers than the other defensive strategies. The importance of turnovers should be related to game styles. Along these lines, Trninić, Dizdar, and Lukšić (2002) found that turnovers were not relevant in discriminating winning and losing teams in final tournaments of European Club Championships. This was due to the fact that in games with controlled game styles, teams reduce risks in resolving game situations and consequently reduce turnovers. On the other hand, the present study analyzed regular season games that are characterized by different game styles that may generate passing errors, players losing balance, or poor dribbling when defensive teams modify the defensive strategy. These situations indicate that man-to-man defensive strategies should be trained more in depth to obtain better turnover percentage values in a game. The importance of defense may be related to psychological aspects. As Otto (1998) argued, defenses may generate a more cohesive team as well as increase team communication, responsibility, and self-confidence, thus increasing turnovers such as blocks received, bad passes, steals, or violations. Also, defense in and of itself does not win games, but if the team in defense keeps the opponent from scoring, the team increases its possibilities for winning the game.

Overall, team performance in the studied variables changed according to the factors and, thus, it may be beneficial to change defensive (and offensive) strategies according to game location.

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