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Differences in Finishing Actions between Winning and Losing Teams in Top-League Women's Basketball

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ABSTRACT

This study aimed to identify structural differences in offensive styles between winning and losing teams in women's basketball. The focus was on offense types, distribution, efficiency, and finishing actions. Data from 12 games in the Danish women's 2020–21 season involving five teams were analyzed. A total of 1915 possessions were categorized into four basic offense types and 13 finishing actions using notational analysis. The findings revealed that a) losing teams utilized shots by the ball handler in pick-and-roll situations statistically significantly more; b) winning teams demonstrated significantly higher efficiency in finishing actions such as off-ball screens, cuts, isolation plays facing the basket, and miscellaneous situations; and c) in set plays, winning teams were superior in cuts and off-ball screen categories. These results accentuate differences in finishing action preferences between winning and losing teams, with winning teams showing dominant play without the ball, exemplified by the higher efficiency in cuts and off-ball categories. Understanding these differences can support coaching practices and professional strategies in women's basketball.

Key Words: women's basketball, finishing action, offense, performance analysis.

INTRODUCTION

Basketball is a game under constant change. The game has been scientifically analyzed through a wide variety of studies of highly diverse characters. It is of the utmost importance to collect information that can help to identify trends and structures to increase efficiency in decision-making, successful outcomes, and overall improved performance in games (Hughes & Bartlett, 2002; Courel-Ibáñez et al., 2018).

Previous studies based on traditional game statistics have shown that differences between winning and losing teams are mostly influenced by the ability to perform defensive rebounding, 2-point field goal shooting, and assists (Mandić et al. 2019). The game related statistics are naturally important factors, but it is considerably more interesting to find out how these numbers materialize.

Trninić et al. (2002) suggested that winning teams were successful in controlling the play on offense and the ball until able to find an open shot with a high shooting percentage. Similar conclusions were presented by Çene (2018) regarding close games. Other researchers have investigated how offensive possessions end trying to clarify or predict outcomes of possessions (Matulaitis & Bietkis, 2021; Selmanović et al. 2019). Most studies have investigated high level men's basketball like the NBA or Euroleague. However, studies on women's basketball are scarce. One study done solely on women's basketball suggests that winning teams possessed the ball in the offensive zone considerably longer, using more offensive elements (Bazanov & Rannama, 2015), and another investigating the use of pick and roll in women's basketball suggests that a drive from the ball handler, as well as a pop out from the screener, were the finishing actions that ensured greater success after the ball screen (Noivo et al. 2022). On the other hand, Vencúrik et al. (2022) claim that the successful outcome of a possession is not significantly determined by possession duration but by defensive pressure and distance from the basket (Vencúrik et al. 2022).

The aim of this study is to investigate finishing actions in women's basketball with an increased focus on pick and roll options to determine if there are any structural differences, in terms of distribution and efficiency, between winning and losing teams.

MATERIALS & METHODS

All research material used for this observational study is publicly available online. Informed consent from athletes was not necessary as games were publicly broadcast online. Collected data were exported to Microsoft Excel for processing and to RStudio for additional statistical processing. Data were analyzed using the software RStudio (version 1.3.1093; RStudio PBC, Boston, MA, USA). Percentages were calculated using descriptive statistics. For the purpose of testing the difference between the winning and losing teams nonparametric statistical methods were applied, using Chi^2 test in nominal value ($p<0.05$), while t-test was used for independent samples for the purpose of determining differences in variables.

Sample procedure

The sample was collected by analyzing 12 games of highest qualitative level of the Danish women's competition (Dameligaen) during the 2020–21 season. The games were randomly selected and carefully analyzed through systematic observation. The analyzed games generated a total of 1915 entities (n = 1915).

Sample variables

- Outcome of possession
- Numerical result (points scored)
- Phase of offense
- Finishing action
- Winning (W) or losing (L) team.

In previous research and in literature, possessions have been defined in multiple ways. In this study, start of possessions and end of possessions are defined as described in Jørgensen et al. (2021). The possible outcomes possessions are: Field goal (FG) missed, FG scored, Free throws (FT), FG scored + one FT and turnover. The numerical outcomes are points scored on given possessions: 0, 1, 2, 3, 4. Phase of offense is also defined as outlined in Jørgensen et al. (2021) and the possible phases are transition, early offense, set offense, and other. Finishing actions used in this study are adopted by Selmanović et al. (2015), Selmanović et al. (2019) and Jørgensen et al. (2021) with the following change. The pick and roll (PNR) category has been separated in several categories to investigate this section deeper, since previous research suggests that PNR is a very important component in determining and separating winning teams from losing teams (Remmert & Lysien 2020; Nunes et al., 2016). The PNR category were split into "Shot by the ball handler following PNR action" (PNR BH shot), "Finish close to the rim by the ball handler following a drive from a PNR situation" (PNR BH drive), and "Finish by roller who initially set the screen following a pass from the ball handler" (PNR Roller). PNR drive must end with one of the following shot types: layup, floater, or short jump shot in paint. Whereas the PNR BH is characterized by being a jumper performed by the ball handler outside paint directly following the pick and roll. PNR roller is self-explanatory but not to be confused by pick and pop. Finally, all actions were categorized as W or L depending on whether they were performed by a winning or losing team.

RESULTS

In this study, a comprehensive analysis was conducted on a total of 12 basketball games from the 2020–2021 season. Over the course of these games, a total of 1915 possessions were meticulously examined, encompassing various phases of play and tactical maneuvers. Additionally, the study involved a cumulative duration of 485 minutes of gameplay, providing a robust dataset for in-depth analysis and interpretation (Table 1).

Table 1: **Basic descriptive statistics of the analyzed sample**

Number of games analyzed	12
Number of teams in sample	5
Minutes played	485
Total possessions	1915
Possessions/game*	159.8
Possessions/minute	3.95
Points/game*	137
Points/minute	3.38

**includes overtime games*

Tables 2 and 3 show all possessions combined – including all four phases. In comparison the winning and losing teams did not differ greatly in the use of the various finishing actions as outlined in Table 2. Only the use of pull up jump shots out of pick and roll situations (PNR BH shot) were statistically significantly higher with losing teams.

Table 2: **Finishing Actions – All Possessions**

	Winning Teams		Losing Teams			
	n	%	n	%	Chi^2	*p*-value
Off ball	40	5.26	42	5.51	0.05	.816
Hand off	12	1.58	11	1.44	0.04	.836
Pick and Pop	10	1.32	11	1.44	0.05	.824
PNR-BH drive	34	4.47	26	3.41	1.10	.294
PNR-BH shot	25	3.29	44	5.77	5.51	.019*
PNR-roller	16	2.11	19	2.49	0.26	.613
Face	183	24.08	180	23.62	0.03	.868
Post	83	10.92	80	10.50	0.06	.810
Spot	173	22.76	179	23.49	0.14	.705
Cut	103	13.55	98	12.86	0.14	.712
Dish	6	0.79	12	1.57	2.00	.154
Putback	42	5.53	32	4.20	1.41	.236
Misc.	33	4.34	28	3.67	0.42	.517
$Chi^2 = 10.761$, $df = 12$, $p = 0.550$						

In terms of points per possession (PPP), winning teams are statistically significantly more efficient in off-ball screening situations, isolation plays with players playing face to the basket, movement without the ball, and scoring of cuts. Additionally, they excel in miscellaneous situations. However, the miscellaneous category has not been the focal point of this study.

Table 3: **PPP (Point per possession) – All Possessions**

	Winning Teams		Losing Teams			
	PPP	SD	PPP	SD	T-score	*p*-value
Off ball	1.550	1.395	0.976	1.199	2.000	.049*
Hand off	0.917	1.084	0.727	1.272	0.385	.704
Pick and Pop	1.000	1.333	0.818	1.168	0.333	.743
PNR-BH drive	1.088	0.965	0.923	0.977	0.653	.516
PNR-BH shot	0.640	1.075	1.068	1.336	-1.369	.176
PNR-roller	1.188	1.109	1.105	1.049	0.225	,823
Face	1.142	1.039	0.922	1.016	2.038	.042*
Post	1.108	1.024	0.975	0.981	0.849	.397
Spot	1.150	1.406	1.073	1.382	0.523	.602
Cut	1.252	1.109	0.929	1.096	2.081	.039*
Dish	1.333	1.033	1.500	0.798	-0.380	.709
Putback	1.286	0.995	0.969	1.031	1.337	.186
Misc.	1.364	0.783	0.857	0.848	2.423	.019*

Tables 4–7 show that no significant differences were observed in either transition or early offense both in terms of percentual distribution and points per possession (PPP). This suggests that winning and losing teams exhibit similar patterns and efficiency levels during these phases of play.

Despite potential variations in strategies, these findings indicate a lack of statistically significant distinctions in how teams initiate and execute their offensive actions during the transition and early offense stages of the game.

Table 4: **Finishing Actions – Transition**

	Winning Teams		Losing Teams			
	n	%	n	%	Chi^2	*p*-value
Face	57	49.57	39	43.33	0.79	.375
Post	3	2.61	2	2.22	0.03	.859
Spot	17	14.78	17	18.89	0.62	.433
Cut	25	21.74	22	24.44	0.08	.776
Dish	1	0.87	3	3.33	1.60	.206
Putback	5	4.35	3	3.33	0.14	.710
Misc.	7	6.09	4	4.44	0.27	.605
$Chi^2 = 3.081$, $df = 6$, $p = 0.799$						

Table 5: **PPP (Point per possession) – Transition**

	Winning Teams		Losing Teams			
	PPP	SD	PPP	SD	T-score	*p*-value
Face	1.316	0.948	1.359	1.038	-0.211	.833
Post	1.333	1.155	0.500	0.707	0.889	.440
Spot	0.647	1.222	1.118	1.409	-1.040	.306
Cut	1.120	1.013	1.136	1.082	-0.054	.958
Dish	0.000	-	2.000	0.000	-	-
Putback	1.600	0.894	0.667	1.155	1.292	.244
Misc.	1.571	0.535	1.750	0.500	-0.544	.599

Table 6: **Finishing Actions – Early Offense**

	Winning Teams		Losing Teams			
	n	%	n	%	Chi^2	*p*-value
Off ball	1	1.23	3	3.75	1.051	.305
Hand off	0	0.00	1	1.25	-	-
Pick and Pop	1	1.23	0	0.00	-	-
PNR-BH drive	0	0.00	0	0.00	-	-
PNR-BH shot	1	1.23	3	3.75	1.051	.305
PNR-roller	1	1.23	1	1.25	0.000	.993
Face	23	28.40	15	18.75	2.077	.150
Post	7	8.64	7	8.75	0.001	.983
Spot	33	40.74	36	45.00	0.298	.585
Cut	8	9.88	11	13.75	0.580	.446
Dish	0	0.00	0	0.00	-	-
Putback	4	4.94	2	2.50	0.667	.414
Misc.	2	2.47	1	1.25	0.327	.567
$Chi^2 = 7.282$, $df = 10$, $p = 0.699$						

Table 7: **PPP (Point per possession) – Early Offense**

	Winning Teams		Losing Teams			
	PPP	SD	PPP	SD	T-score	*p*-value
Off ball	3.000	-	1.667	1.528	-	-
Hand off	-	-	0	-	-	-
Pick and Pop	0.000	-	-	-	-	-
PNR-BH drive	-	-	-	-	-	-
PNR-BH shot	-	-	-	-	-	-
PNR-roller	2.000	-	0	-	-	-
Face	1.087	1.164	0.867	0.990	0.603	.550
Post	1.714	0.760	1.714	0.756	0.000	1.000
Spot	1.455	1.460	1.056	1.433	1.145	.256
Cut	1.250	1.389	0.636	1.120	1.067	.301
Dish	-	-	-	-	-	-
Putback	1.500	1.000	0.000	0.000	2.000	.116
Misc.	1.500	0.707	2.000	-	-	-

Table 8 shows a statistically significant difference between winning and losing teams, particularly when analyzing set plays. It is observed that losing teams are attempting more pull-up jumpers with the ball handler out of pick-and-roll situations.

Table 8: **Finishing Actions – Set Plays**

	Winning Teams		Losing Teams			
	n	%	n	%	Chi^2	*p*-value
Off ball	39	7,13	39	6,81	0.045	.831
Hand off	12	2,19	10	1,75	0.292	.589
Pick and Pop	9	1,65	11	1,92	0.120	.729
PNR-BH drive	34	6,22	26	4,54	1.554	.212
PNR-BH shot	24	4,39	41	7,16	3.922	.048*
PNR-roller	15	2,74	18	3,14	0.156	.693
Face	103	18,83	125	21,82	1.538	.215
Post	71	12,98	71	12,39	0.088	.767
Spot	123	22,49	126	21,99	0.040	.842
Cut	70	12,80	64	11,17	0.704	.401
Dish	5	0,91	9	1,57	0.977	.323
Putback	33	6,03	27	4,71	0.963	.326
Misc.	9	1,65	6	1,05	0.758	.384
$Chi^2 = 10.339$, $df = 12$, $p = 0.586$						

Table 9 displays statistically significant differences in effectiveness between winning and losing teams. Winning teams demonstrate greater efficacy in movement without the ball. Moreover, they excel in scoring from off-ball situations and cuts.

Table 9: **PPP (Point per possession) – Set Plays**

	Winning Teams		Losing Teams			
	PPP	SD	PPP	SD	T-score	*p*-value
Off ball	1.513	1.393	0.923	1.178	2.018	.047*
Hand off	0.917	1.084	0.800	1.317	0.228	.822
Pick and Pop	1.111	1.364	0.818	1.168	0.518	.611
PNR-BH drive	1.088	0.965	0.923	0.977	0.653	.516
PNR-BH shot	0.583	1.060	1.146	1.352	-1.748	.085
PNR-roller	1.133	1.125	1.167	1.043	-0.088	.930
Face	1.058	1.056	0.800	0.984	1.909	.058
Post	1.000	1.014	0.915	0.982	0.504	.615
Spot	1.138	1.404	1.071	1.375	0.379	.705
Cut	1.300	1.121	0.891	1.100	2.131	.035*
Dish	1.600	0.894	1.333	0.866	0.546	.595
Putback	1.212	1.023	1.074	1.035	0.517	.607
Misc.	1.222	0.833	0.667	1.033	1.152	.270

DISCUSSION

Traditional studies investigating the disparities between winning and losing teams typically cite various statistical factors found in box scores (Gomez et al., 2008; Ibáñez et al., 2009). This study suggests that successful teams excel in off-ball movement, resulting in higher efficiency in points per possession. Additionally, it was discovered that winning teams employ cuts and off-ball screens significantly more frequently. This finding aligns with one of Remmert's conclusions, advocating for increased cutting by offensive players to engage their defender's attention (Remmert, 2003). Similar results regarding cuts and off-ball movement were also reported to be present in the NBA (Demenius, 2020). In contrast, teams that lose tend to rely more on difficult shots, such as PNR-BH shot, which typically have lower success rates compared to set shots/catch-and-shoot jump shots (spot). It is widely acknowledged that spot shots generally yield better outcomes than those attempted off the dribble (Chang et al., 2014). Spot opportunities often emerge from prior movement, creating space as defenders adjust. Shots off the dribble are more likely to be contested, a factor highlighted by Vencúrik et al. (2022).

This holds particularly true, as suggested by other studies which claim that female basketball players may find it more challenging to adapt to situations with an increase in shooting distance from the basket (Erčulj and Štrumbelj, 2015; Vencúrik et al., 2022). This is because the fluidity of the shooting motion tends to be smoother when catching and shooting compared to pulling up off the dribble.

In contrast to the findings of this study, another study found that the most efficient finishes in women's basketball are a drive from the ball handler and a pop out from the screener. They also suggest that PNR situations should be particularly efficient in the transition phase (Noivo et al., 2022), neither of which were found to be the case in the current study. Previously, it was found that in men's basketball, the PNR-BH drive is more efficient than the PNR-BH shot (Koutsoridis et al., 2018; Marmarinos et al., 2016).

The shooting frequency from various distances from the basket should be balanced, and shooting proficiency should be enhanced even when facing moderate to high defensive pressure, because it has been found that shooting efficiency is significantly affected by defensive pressure and shooting distance (Vencúrik et al., 2022). This is very much in line with the findings of this study, as losing teams tend to finish significantly more with PNR-BH shots than their winning opponents. Given that the PNR-BH shot is often more contested, shooters must adapt, potentially leading to decreased efficiency. It has been reported that defenders influence the actions of offensive players (Gorman & Maloney, 2016), and this is likely also the case in this instance.

To improve the quality of results, future research could expand on this study. Given the relatively limited sample size in the current study, conducting further research across various seasons and leagues could provide more extensive knowledge and provide a more meticulous understanding of the dynamics present in women's basketball.

CONCLUSION

The dynamics of basketball in the current study unveil a significant difference between winning and losing teams, emphasizing the importance of off-ball movement, and shot selection. It becomes obvious that winning teams demonstrate higher proficiency in movement without the ball, a treat that probably contributes significantly to the higher efficiency (PPP) of winning teams. On the other hand, it appears that losing teams often resort to settling for harder shots, in this case pull up jumpers out of PNR situations. This might indicate that they struggle to find better scoring options. Therefore, this article suggests that the correlation between off-ball movement and shot selection emerges as an important factor of success on the court, reiterating the significance of players' decision-making and strategic game planning for teams to emerge as winners.

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REFERENCES

Bazanov, B., & Rannama, I. (2015). Analysis of the offensive teamwork intensity in elite female basketball. *Journal of Human Sport and Exercise*, *10*(1), 47–51.

Çene, E. (2018). What is the difference between a winning and a losing team: insights from Euroleague basketball. *International Journal of Performance Analysis in Sport*, *18*(1), 55–68.

Chang, Y. H., Maheswaran, R., Su, J., Kwok, S., Levy, T., Wexler, A., & Squire, K. (2014, February). Quantifying shot quality in the NBA. In Proceedings of the 8th Annual MIT Sloan Sports Analytics Conference. MIT, Boston, MA.

Courel-Ibáñez, J., McRobert, A. P., Ortega Toro, E., & Cárdenas Vélez, D. (2018). Inside game effectiveness

in NBA basketball: Analysis of collective interactions. Kinesiology: International journal of fundamental and applied kinesiology, 50(2), 218–227.

Demenius, J. (2020). *Offensive modalities and their influence on basketball efficiency between winning and losing teams* (Doctoral dissertation, Lietuvos sporto universitetas.).

Gomez, M. A., Lorenzo, A., Sampaio, J., Jose Ibanez, S., & Ortega, E. (2008). Game-related statistics that discriminated winning and losing teams from the Spanish men's professional basketball teams. Collegium antropologicum, 32(2), 451–456.

Gómez, M. A., Lorenzo, A., Ibañez, S. J., & Sampaio, J. (2013). Ball possession effectiveness in men's and women's elite basketball according to situational variables in different game periods. Journal of sports sciences, 31(14), 1578–1587.

Gorman, A. D., & Maloney, M. A. (2016). Representative design: Does the addition of a defender change the execution of a basketball shot? Psychology of sport and exercise, 27, 112–119.

Hughes, M. D., & Bartlett, R. M. (2002). The use of performance indicators in performance analysis. *Journal of sports sciences*, *20*(10), 739–754.

Ibáñez, S. J., García, J., Feu, S., Lorenzo, A., & Sampaio, J. (2009). Effects of consecutive basketball games on the game-related statistics that discriminate winner and losing teams. Journal of sports science & medicine, 8(3), 458.

Jørgensen, J., Selmanović, A., & Thomann, K. (2021). Difference of offensive structure between European and American top-level basketball. *Journal of physical education and sport*, *21*, 1988–1997.

Koutsouridis, C., Karamousalidis, G., & Galazoulas, C. (2018). The efficacy of "High Pick and Roll" in relation to the defence's reaction and its effect on the result of the game. International Journal of Performance Analysis in Sport, 18(4), 554–567.

Mandić, R., Jakovljević, S., Erčulj, F., & Štrumbelj, E. (2019). Trends in NBA and Euroleague basketball: Analysis and comparison of statistical data from 2000 to 2017. *PloS one*, *14*(10), e0223524.

Marmarinos, C., Apostolidis, N., Kostopoulos, N., & Apostolidis, A. (2016). Efficacy of the "pick and roll" offense in top level European basketball teams. Journal of human kinetics, 51(1), 121–129.

Matulaitis, K., & Bietkis, T. (2021). Prediction of Offensive Possession Ends in Elite Basketball Teams. International Journal of Environmental Research and Public Health, 18(3), 1083.

Noivo, A., Amorim, A. P., Guimaräes, E., & Janeira, M. A. (2022). Ball screen effectiveness in elite women's basketball. Journal of Physical Education and Sport, 22(3), 757–766.

Nunes, H., Iglesias, X., Daza, G., Irurtia, A., Caparrós, T., & Anguera, M. T. (2016). Influencia del pick and roll en el juego de ataque en baloncesto de alto nivel. *Cuadernos de Psicología del Deporte*, *16*(1), 129–142.

Remmert, H. (2003). Analysis of group-tactical offensive behavior in elite basketball on the basis of a process orientated model. European journal of sport science, 3(3), 1–12.

Remmert, H., & Lysien, M. (2020). Analyse der Interaktionen im direkten Block als vorbereitende und abschließende Angriffshandlung in zufällig ausgewählten Hauptrundenspielen der easyCredit Basketball Bundesliga 2017/18. *German Journal of Exercise and Sport Research*, *50*(2), 320–330.

Selmanović, A., Milanović, L., & Škegro, D. (2019). Finishing actions in relation with basketball offense outcome types in NBA and Euroleague. *Acta Kinesiologica*, *13*(1), 29–34.

Selmanović, A., Škegro, D., & Milanović, D. (2015). Basic characteristics of offensive modalities in the Euroleague and the NBA. *Acta Kinesiol*, *9*, 83–87.

Trninić, S., Dizdar, D., & Lukšić, E. (2002). Differences between winning and defeated top quality basketball teams in final tournaments of European club championship. *Collegium antropologicum*, *26*(2), 521–531.

Vencúrik, T., Milanović, Z., Lazić, A., Li, F., Matulaitis, K., & Rupčić, T. (2022). Performance factors that negatively influence shooting efficiency in women's basketball. *Frontiers in physiology*, *13*, 2491.

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