



# The Relationship of Opponent Ranking and In-Game Dynamics of Division-1 Women's Basketball

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## ABSTRACT

**Purpose:** The purpose of this study was to examine the relationship between an opponent's ranking and locomotion and physiological factors in collegiate women's basketball. **Methods:** Sixteen Division 1 Women's Basketball Players (Age: 21 ± 3 yrs; Height: 174.21 ± 19.27 cm; Body Mass: 73.98 ± 11.52 kg) were monitored during matches played between December 2021 and March 2022. The participants were given Polar Team Pro Sensors and straps and were instructed to wear the sensors during all games and practice sessions during the season. Using the polar team pro system sampling at 10 Hz, distance, speed, and heart rate were calculated. A Student's T-Test was used to compare the differences in average heart rate, total distance ran, maximum speed, average speed, and distance per minute when faced with a higher-ranked opponent versus a lower-ranked opponent. Cohen's *d* effect sizes were calculated for each dependent variable to determine the practical significance of each variable across load conditions. A Bonferroni Correction was applied to the data. R version 4.1.2 (R Foundation, Vienna, Austria, <https://www.R-project.org>) was used for the data analysis. **Results:** The descriptive data for teams ranked higher and teams ranked lower are in Table 1. The average heart rate was higher when playing opponents ranked lower ( $p < 0.001, d = -0.13$ ). When playing lower-ranked opponents, the athletes had a higher total distance in meters ( $p < 0.001, d = -0.22$ ). The distance per minute in meters was higher when playing lower-ranked opponents than it was when playing higher-ranked opponents ( $p < 0.001, d = -0.19$ ). The maximum speed was higher in games played against lower-ranked opponents ( $p < 0.001, d = -0.25$ ). The average speed in kilometers per hour was higher when playing lower-ranked teams than when playing higher-ranked teams ( $p < 0.001, d = -0.11$ ). **Conclusions:** The main findings from this study were that in-game dynamics change when playing higher and lower rankings. Specifically, when playing teams that are ranked lower, the subjects tended to have higher average speeds, maximal speeds, total distance covered, and heart rates. The opposite was true when playing teams with higher rankings, the athletes tended to move at slower speeds, cover less total distance, and had lower average heart rates.

## INTRODUCTION

- The National Collegiate Athletic Association (NCAA) ranks collegiate basketball teams based on their ability to beat their opponents.<sup>1</sup>
- Research completed in field hockey has indicated that when playing higher-ranked opponents, athletes engage in higher-speed activities.<sup>2</sup>
- During basketball games, a player's ability to change directions and get to the other side of the court quickly impacts the ability of the team to win, requiring athletes to be able to accelerate and decelerate quickly.<sup>3</sup>

### PURPOSE

The purpose of this investigation is to examine the effects that playing higher versus lower-ranked opponents has on speed, distance covered, and heart rate in collegiate women's basketball.

### METHODS

**Participants:**  
16 Division 1 Women's Basketball Players Age: 21 ± 3 years  
Height: 174.21 ± 19.27 cm  
Body Mass: 73.98 ± 11.52 kg  
Monitored between December 2021 and March 2022.

The participants were given Polar Team Pro Sensors and were instructed to wear the sensors during all games and practice sessions during the season. Using the polar team pro system sampling at 10 Hz, distance, speed, and heart rate were calculated. The 2022 NET Rankings for Women's Division-1 Basketball were recorded.<sup>4</sup> A Student's T-Test was used to compare the differences in average heart rate, total distance ran, maximum speed, average speed, and distance per minute when faced with a higher-ranked opponent versus a lower-ranked opponent. Cohen's *d* effect sizes were calculated for each dependent variable to determine the practical significance of each variable across load conditions. A Bonferroni Correction was applied to the data. R version 4.1.2 was used for the data analysis.<sup>5</sup>

## RESULTS

Overall Net Rankings can be found in Table 1. The descriptive data for teams ranked higher and teams ranked lower are in Table 2. The average heart rate was higher when playing opponents ranked lower ( $p < 0.001, d = -0.13$ ). When playing lower-ranked opponents, the athletes had a higher total distance in meters ( $p < 0.001, d = -0.22$ ). The distance per minute in meters was higher when playing lower-ranked opponents than it was when playing higher-ranked opponents ( $p < 0.001, d = -0.19$ ). The maximum speed was higher in games played against lower-ranked opponents ( $p < 0.001, d = -0.25$ ). The average speed in kilometers per hour was higher when playing lower-ranked teams than when playing higher-ranked teams ( $p < 0.001, d = -0.11$ ).

Table 1: Net Rankings<sup>4</sup>

Team	Rank	High or Lower Rank
Boston College	47	High
La Salle University	147	High
Yale University	161	High
Farleigh Dickinson University	222	High
Mount Saint Mary College	243	High
St. Francis Brooklyn College	245	High
Wagner College	250	High
Army University	252	High
Monmouth University	271	High
LIU	306	High
Merrimack College	309	High
Sacred Heart University	321	High
Bryant University	328	High
Saint Francis University	331	High
Central Connecticut State College	337	High

Table 2: Descriptive Data

	Ranked Higher (Mean±SD)	Ranked Lower (Mean±SD)
Average Heart Rate (bpm)	119.49 ± 22.10	122.41 ± 22.0
Total Distance (m)	3271.22 ± 2060.00	3755.44 ± 2070.03
Distance/min (m/min)	23.04 ± 14.00	25.74 ± 14.24
Maximum Speed (km/h)	21.96 ± 4.19	22.96 ± 3.76
Average Speed (km/h)	1.54 ± 0.88	1.64 ± 0.86

## DISCUSSION

The data indicated that when playing against teams that have lower rankings, the athletes had higher average speeds, maximal speeds, total distance covered, and heart rates. The opposite was true when playing teams that had higher rankings, the athletes moved at slower speeds, covered less distance, and had lower average heart rates. Given the differences in field length, game time, and pace between different sports, assessing each sport individually is more appropriate to determine the effects. Future studies should be completed in other sports to assess how each sport varies. Additionally, this study was completed on a team ranked in the bottom fifty in Division-1. This study should be repeated on teams with various ranking to see if the ranking of the team the study is on, effects the outcome of the study.

### Practical Applications

When playing opponents with lower rankings, the athletes covered more total distance, reached higher speeds, and had higher heart rates than when playing against teams with higher-rankings. Coaches should take into consideration additional exertion that may come from the strength of the opponents.

## REFERENCES

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