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### Match Analysis of a Women's Volleyball Championship Game

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Match Analysis of a Women's Volleyball Championship Game

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## **Abstract**

Match analysis is an influential tool used in sports to evaluate performance. It allows researchers to view different procedures and contexts in order to get a better understanding of the game.

This study analyzed three matches in the 2013 USA Volleyball Cup in international level women's volleyball. The purpose was to examine the in system plays made up of a pass, set, and hit and compare those to the final outcome of the game. It is important to note that a majority of the in system plays resulted from serves rather than other actions. The results show that the team with the most in system plays won the match.

## **Introduction**

In certain sports such as volleyball, match analysis is an important factor used to evaluate personal and team performances (Zetou et al, 2006). Observation and match analysis allow researchers to characterize a great range of technical procedures in diversified situational contexts (Silva et al, 2014). In many situations, a series of related performances takes place within an offensive or defensive phase. The successful connection of these performances often dictates the success of team play and increases the probability of achieving a goal or point in an offensive phase (Eom and Schutz, 1992). A variety of studies have been conducted in order to examine different aspects of the game. The available research is mainly performed under static conditions, by describing how the final outcome is affected by tactical responses, technical requirements, or physical determinants. The results show that performance in attack is highly related to success in volleyball (Marcelino et al, 2012). Such studies have mainly observed men and women elite athletes. Not many observational studies, however, have examined the role of on system plays in international-level women's volleyball. It is of importance to examine these athletes in order help them excel at their sport.

## **Purpose**

The purpose of this analysis is to examine in system plays performed in three USA championship matches in international-level women's volleyball.

## **Methods**

This study analyzed three championship matches in the 2013 USA Volleyball Cup in international-level women's volleyball. Each match was analyzed using Kinovea software. The exact times that each touch occurred were recorded, as well as the side of the court that the play was made and the type of contact that occurred. The following categories were used to distinguish between actions: serve, pass, set, hit, dig, block, and touch. The number of in system plays was calculated and analyzed. In system plays consisted of a pass, set, and hit by a team in that order. The in system plays were evaluated by what they resulted from and what they resulted in, whether that was a point or another play. Points scored as a result of in system plays were compared to the total number of points in order to see if in system attacks affect players' reactions and outcomes of a match.

## **Results**

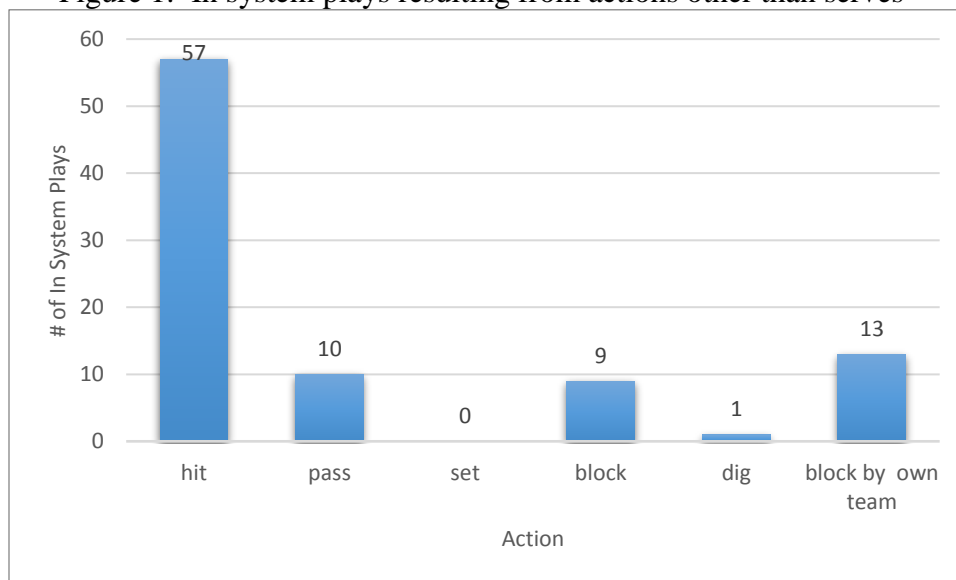
In the 2013 USA Volleyball Cup, USA played Japan in a match that consisted of five sets as seen in Table 1. The USA won the match 3 sets to 2 sets for a combined 109 points. Altogether, there was a total of 203 points accumulated during the match.

Table 1: Match outcome for USA vs Japan in the 2013 USA Volleyball Cup

Set	1	2	3	4	5	Total
<b>USA</b>	25	25	21	23	15	109
<b>Japan</b>	15	19	25	25	10	94
<b>Total</b>	40	44	46	48	25	203

Out of the 203 points, 189 rallies were examined. These rallies included anywhere from one to over forty actions including things such as serves, passes, sets, hits, digs, blocks, and touches. During the 189 rallies, there were a total of 221 in system plays observed. One-hundred and thirty-one of the in system plays were in response to serves. This equates to 59% of the total in system plays. Ninety in system plays were in response to other plays as demonstrated in Figure 1.

Figure 1: In system plays resulting from actions other than serves



Japan had a total of 101 in system plays, which was 46% of the in system attacks. The USA on the other hand, had 121 in system plays, or 54% of the in system attacks. The USA had

more in system plays resulting from both serves and other plays as indicated in Figure 2. The other plays are listed in Table 2.

Figure 2: Total number of in system plays resulting from either a serve or other plays by each team

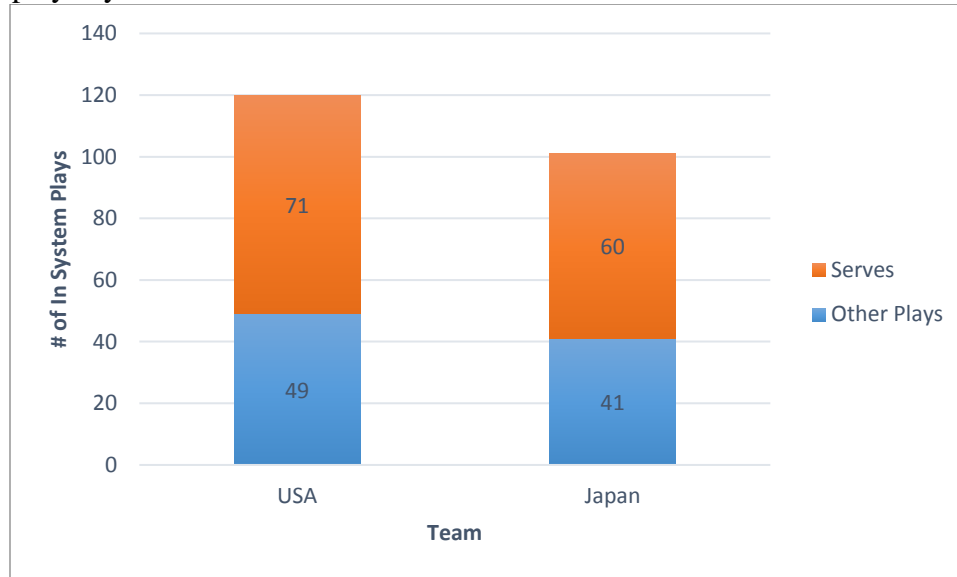


Table 2: Actions, other than serves, by each team that resulted in an in system play

	USA	Japan
<b>Hit</b>	32	25
<b>Pass</b>	6	4
<b>Block</b>	2	7
<b>Dig</b>	0	1
<b>Block by own team</b>	9	4

In system plays led to many actions by the opposing team as described in Table 3. Some of the actions were successful, while others were not. Actions that were unsuccessful resulted in a point for the team that utilized the in system attack.

Table 3: Actions by each team as a result of in system plays, and whether the actions were successful

	USA	Japan	Total	Failed
<b>Dig</b>	14	7	21	6
<b>Pass</b>	45	27	72	10
<b>Set</b>	5	2	7	0
<b>Hit</b>	0	3	3	0
<b>Touch</b>	0	3	3	3
<b>Blocks</b>	24	33	57	19

Out of the 189 total points accumulated after rallies in the match, only 79 of them resulted from in system plays, which is 42% of the points. The 79 points were scored in a variety of ways. The most prominent result of scoring off of an in system attack was hitting the floor on the opposing team's side of the court. This occurred 41 times (15 points for Japan and 26 points for the USA). While this accounted for 52% of in system points, it only accounted for 22% of the total points. Additionally, 6 points were scored due to failed digs (3 points for Japan and 3 points for the USA), 10 points were scored due to failed passes (2 points for Japan and 8 points for the USA), 3 points to failed touches (3 points for Japan), and 19 points to failed blocks (9 points for Japan and 10 points for the USA). The percentages of points scored by failed actions that resulted from in system plays are demonstrated in Figure 3a. All of the other points scored during the match resulted from either out of system plays, serves, or serving errors. The comparison of these values to points from failed actions that resulted from in system plays is demonstrated in Figure 3b. If service points and service error points were excluded, points from in system plays would make up almost half of the total points acquired.

Figure 3a: The percentage of points by each failed action that resulted from in system plays

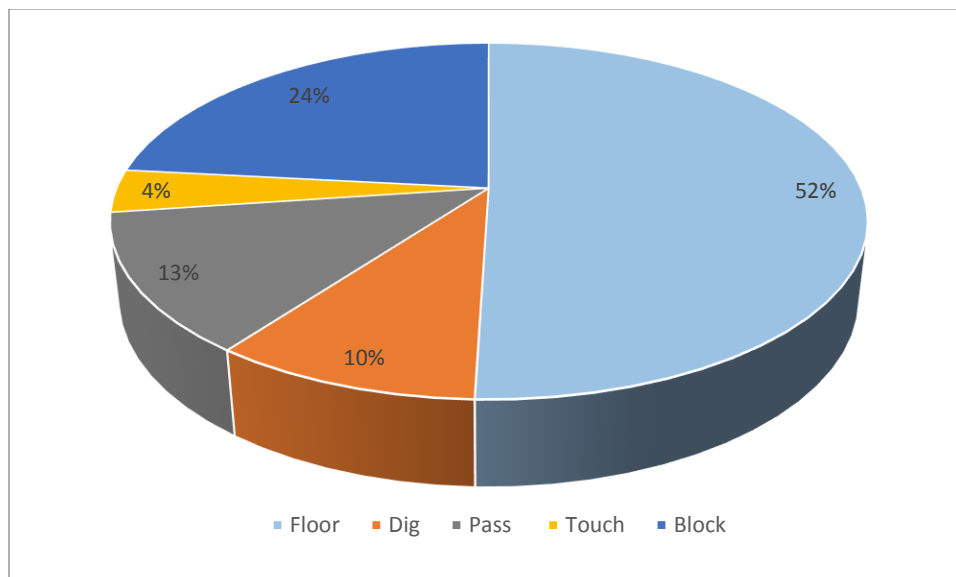
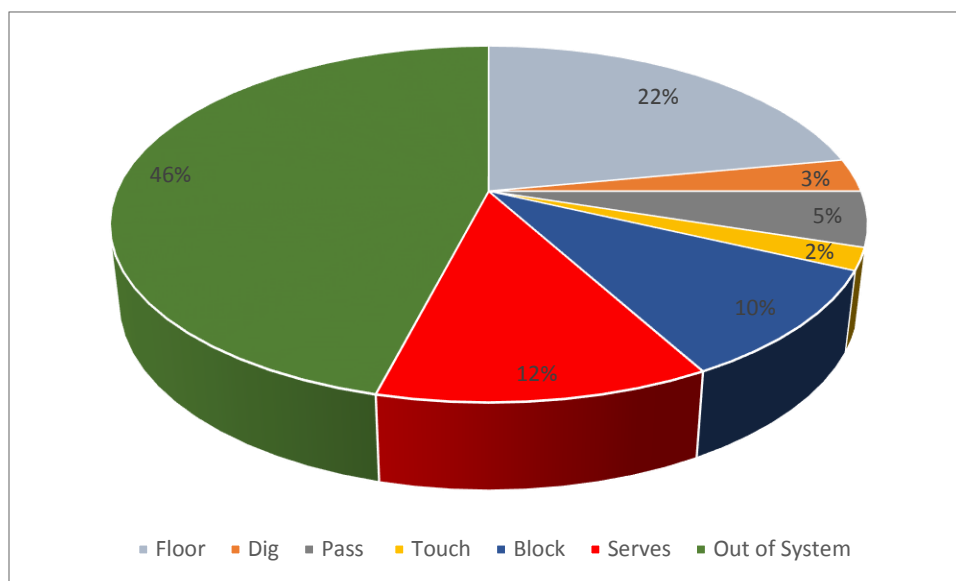


Figure 3b: The percentage of points by each failed action that resulted from in system plays in comparison to all points scored



## Discussion

The results of this match analysis suggest that the team that has the most in system attacks is likely to win the match. This could be because in system plays are more controlled



than out of system plays. As the result of a good pass, a setter is able to place the ball exactly where the hitter needs it in order to exert the most power. The hitter can then spike the ball harder and have a more accurate aim. This gives the opposing team less time to react. It also explains why the losing team had more failed actions in response to in system plays.

Also, most in system plays were in response to serves. This is most likely because serves are slower and more predictable. The receiving team has more time to react, which is useful for setting up an in system play. Interestingly, the percent of in system plays that resulted from serves and the percent of in system plays that resulted from other actions were the same for each team, even though the total number of in system plays was different. USA and Japan both had 59% of in system plays in response to serves and 41% in response to other actions. Therefore, it can be determined that the result of an in system play does not relate to the action that led to the in system play.

Additionally, almost a quarter of the total points resulted from in system plays to the opposing team's floor. An in system play presents the hitter an opportunity to inspect the positions of the players on the opposing team and see if there is a gap where the ball can be placed. Also, the defense does not have as much time to react to the powerful hit.

Overall, although in system plays were important in determining the outcome of the match, they did not account for the majority of attacks. There is still much research to be performed on how system attacks affect the game of volleyball.

## References

- Afonso, J., Mesquita, I., Marcelino, R., & Da Silva, J. A. (2010). Analysis of the setter's tactical action in high-performance women's volleyball. *Kinesiology*, 42(1), 82-89.
- Eom, H. J., & Schutz, R. W. (1992). Transition play in team performance of volleyball: a log-linear analysis. *Research quarterly for exercise and sport*, 63(3), 261-269.
- Häyrynen, M., & Blomqvist, M. (2007). Match analysis of elite sitting volleyball. In *Science for Success II, Promoting Excellence in Sport and Exercise, Congress Book*. Jyväskylä, Finland (Vol. 62).
- Marcelino, R. O., Sampaio, J. E., & Mesquita, I. M. (2012). Attack and serve performances according to the match period and quality of opposition in elite volleyball matches. *The Journal of Strength & Conditioning Research*, 26(12), 3385-3391.
- Marelić, N., Rešetar, T., & Janković, V. (2004). Discriminant analysis of the sets won and the sets lost by one team in A1 Italian volleyball league-A case study. *Kineziologija*, 36(1), 75-82.
- Silva, M., Lacerda, D., & João, P. V. (2013). Match analysis of discrimination skills according to the setter attack zone position in high level volleyball. *International Journal of Performance Analysis in Sport*, 13(2), 452-460.
- Silva, M., Lacerda, D., & João, P. V. (2014). Match analysis of discrimination skills according to the setter defence zone position in high level volleyball. *International Journal of Performance Analysis in Sport*, 14(2), 463-472.
- Zetou, E., Tsigilis, N., Moustakidis, A., & Komninakidou, A. (2006). Playing characteristics of men's Olympic Volleyball teams in complex II. *International Journal of Performance Analysis in Sport*, 6(1), 172-177.