Biomechanics Assignment 2

Notational Analysis

Tennis (Individual Sport)

Performance Criteria:

- Forehand error's
- Backhand error's
- Percentage of first serves in
- Return Success Rate
- Number of Winners created

Forehand Errors need to be monitored as it affects the outcome of the game, having less forehand errors will improve the consistency of the athlete to win the point. This will be reasonably difficult to record as at an elite level it will be quite fast paced and they will be many shots being played within a rally.

Backhand Errors will be relatively the same as above, Recording will be reasonably hard but as long as I focus on the individual player it should be quite accessible.

Percentage of First Serves in is a good start to a players game as have a hig h percentage of first serves in gives you a higher chance of winning the point quickly as it is the stronger serve. This will be easy to record as it is quite simple to see and the judges call it in or out.

Return Success Rate allows the player to be able to have a chance of winning the point from the opponents serve, if the athlete had a low return success rate it would mean that the he/she would struggle to win the game. This will be quite hard to record as nor the athletes nor me have much time to react to the return so I will have to keep a close eye on it.

Number of winners created allows the athlete to win points through their own skill rather than through unforced errors.

Mean:

The most common expression for the mean of a statistical distribution w ith a discrete random variable is the mathematical average of all the terms. To calculate it, add up the values of all the terms and then divide by the number of terms. This expression is also called the arithmetic mean. There are other expressions for the mean of a finite set of terms but these forms are rarely used in statistics. The mean of a statistical distribution with a continuous random variable, also called the expected value, is obtained by integrating the product of the variable with its probabil ity as defined by the distribution.

Median:

The median of a distribution with a discrete random variable depends on whether the number of terms in the distribution is even or odd. If the number of terms is odd, then the median is the value of the term in the middle. This is the value such that the number of terms having values greater than or equal to it is the same as the number of terms having values less than or equal to it. If the number of terms is even, then the median is the average of the two terms in the middle, such that the number of terms having values greater than or equal to it is the same as the number of terms having values less than or equal to it. The median of a distribution with a continuous random variable is the value m such that the p robability is at least 1/2 (50%) that a randomly chosen point on the function will be less than or equal to m, and the probability is at least 1/2 that a randomly chosen point on the function will be greater than or equal to m.

Mode:

The mode of a distribution with a discrete random variable is the value of the term that occurs the most often. It is not uncommon for a distribution with a discrete random variable to have more than one mode, especially if there are not many terms. This happens when two or more terms occur with equal frequency, and more often than any of the others. A distribution with two modes is called bimodal. A distribution with three modes is called trimodal. The mode of a distribution with a continuous random variable is the maximum va lue of the function. As with discrete distributions, there may be more than one mode.

Range:

The range of a distribution with a discrete random variable is the difference between the maximum value and the minimum value. For a distribution with a continuou s random variable, the range is the difference between the two extreme points on the distribution curve, where the value of the function falls to zero. For any value outside the range of a distribution, the value of the function is equal to 0.

Standard Deviation:

Standard deviation measures the stretch of data concerning the mean value. It is helpful in comparing sets of data which may have the same mean but a different range. For example, the mean of the following sets of data are the same: 15, 15, 15, 14, 16 and 2, 7, 14, 22, 30. However, based from those statistics, it is clear the second set is more spread out. If a set has a low standard deviation, the values are not spread out too much.

Percentage:

A percentage is a way of expressing a number as a fra ction of 100. It is often denoted using the percent sign, "%". For example, 45% (read as "forty -five percent") is equal to 45/100, or 0.45.

Percentages are used to express how large/small one quantity is, relative to another quantity. The first quantity us ually represents a part of, or a change in, the second quantity, which should be greater than zero . For example, an increase of £0.15 on a price of £2.50 is an increase by a fraction of 0.15/2.50 = 0.06. Expressed as a percentage, this is therefore a 6% in crease.

Will Hawkins

Tennis Ratio Table Studying Novak Djokovic

Novak Djokovic vs Andy Murray 30/01/2011:

Forehand Errors	15
Backhand Errors	26
Serve's In	55
Winners Made	20
Return Success Rate	35

Rafael Nadal vs Novak Djokovic 26/01/2011:

Forehand's Errors	18
Backhand's Errors	30
Serve's In	64
Winners Made	24
Return Success Rate	52

Statistics From 3 Performance Criteria:

Forehand Errors:

Mean	16.5
Median	(15+18)/2 = 16.5
Mode	15,18
Range	3
Standard Deviation	2.12132
Percentage	2.69%

Backhand Errors:

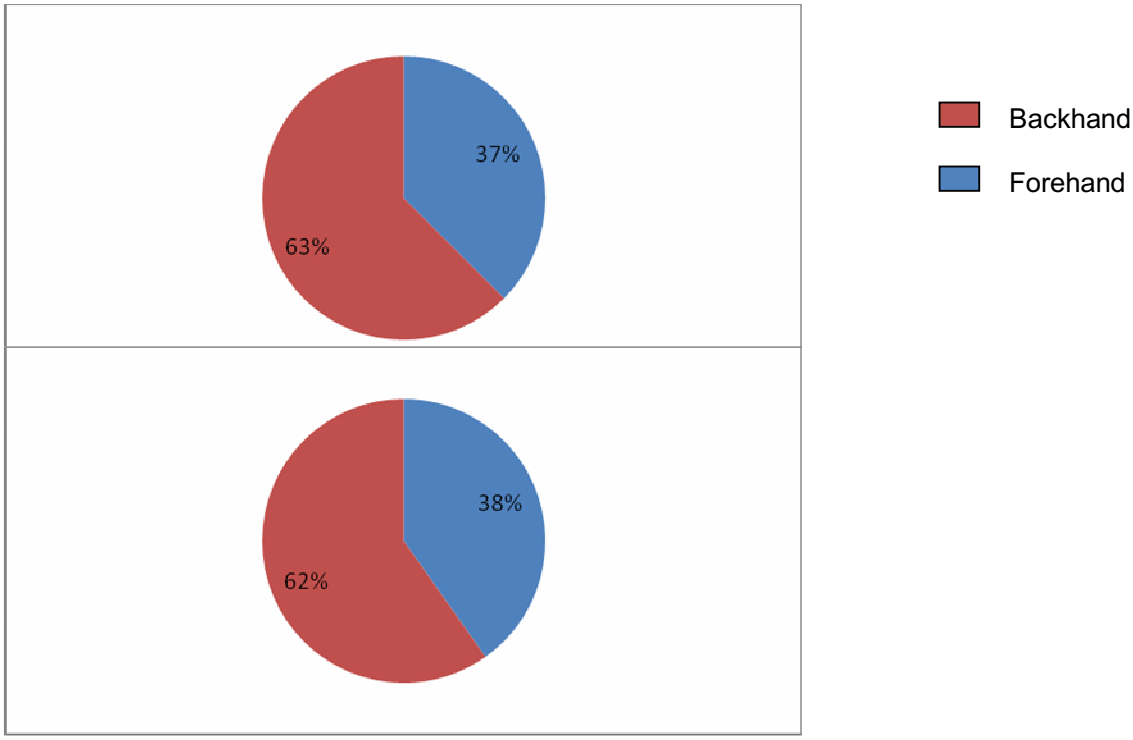
Mean	28
Median	(26+30)/2 = 28
Mode	26,30
Range	4
Standard Deviation	2.82843
Percentage	7.81%

Return Success Rate:

Mean	43.5
Median	(35+52)/2 = 43.5
Mode	35,52
Range	17
Standard Deviation	12.02082
Percentage	18.2%

Pie Chart Showing Differences Of Forehand and Backhand Errors in each game:

(Novak Djokovic vs Andy Murray 30/01/11)

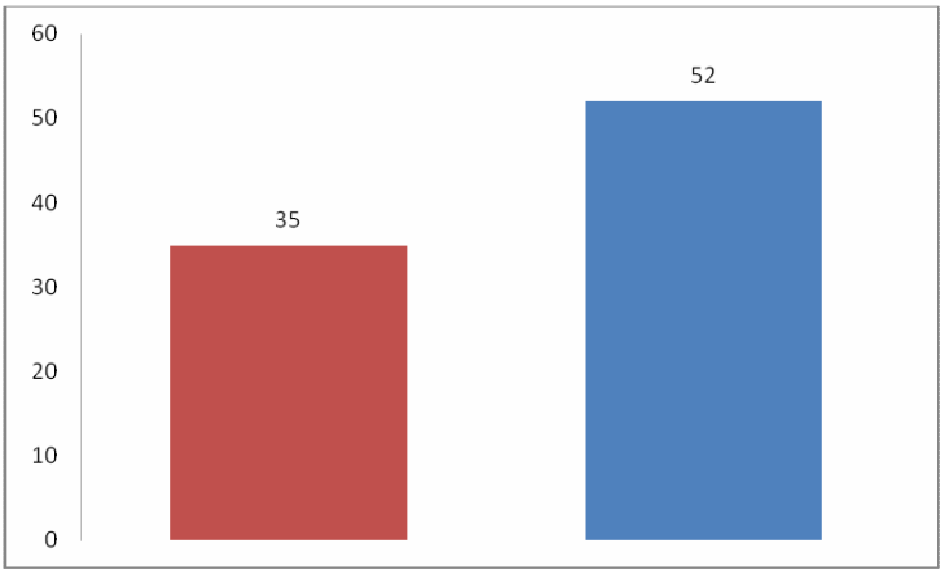


(Novak Djokovic vs Rafael Nadal 26/01/11)

of Djokovic's performances are very similar. The pie chart shows that Djokovic has a strong

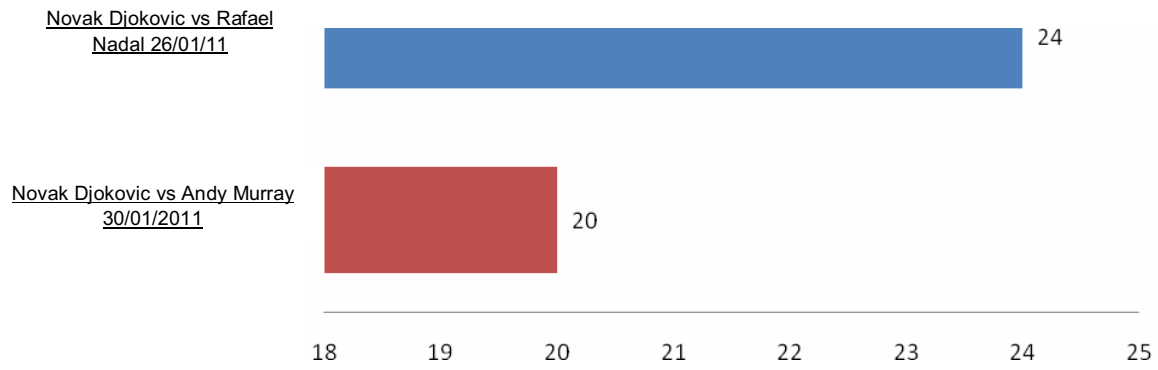
forehand with a impressive success to error percentage but a weak backhand. Both Andy Murray and Rafael Nadal have a strong forehand and are known for h itting strong 'Down the line' shots, hence putting more pressure on Djokovic to make more errors with his backhand.

Column Graph Showing The Comparison Of Return Success Rate From The Two Games:



This Column graph shows that Novak Djokovic had a higher return success rate against Nadal than Murray. This is because Rafael Nadal has a weaker serve speed than Andy Murray. With an average serve speed of 115 MPH, It is easier for Djokovic to return and direct Nadal's Serves. In comparison, Andy Murray has an average serve speed of 128 MPH which henceforth makes it more challenging for Djokovic to return. This trend that has been explained is supported by the results on the bar chart. Djokovic is a generally quick player and is quick on his feet. Return Success Rate is one of his strengths of his game.

Bar Chart To Show Winners Made In Both Games:



The Bar graph shows that Djokovic had made more winners against Nadal than Murray but only by a small amount difference. However, although the data collected is reliable as it is from the Australian Open, if it was data that was collected from the entire grand slams this year; I believe that Djokovic would have conflicted more winners against Murray than Nadal as Nadal is one of the quickest players in tennis today and has a very impressive reputation for being a counter -winner player. Statistics aside, according to professional reviewers, it was told that Nadal was a weaker hard court player and Murray was a strong hard court player. This trend is shown within the data shown.