Analysis of the USA Running Circuit: What is the Depth of Competition and Who Competes?

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Introduction

The career development of a professional endurance athlete can be a meticulous process. For a distance runner, this means a careful balance in the preparation process to achieve optimal performance. Such factors include maintaining an appropriate diet, incorporating strengthening exercises into his or her training routine, allowing for proper recovery, and having the necessary support, financial and emotional. There is a lot of time and consideration when building and maintaining a fitness regimen, and the manipulation of a minute detail can boast substantial results or be detrimental to an athlete's career.

Moreover, preparing for an athlete's season requires planning his or her training around, and for, specific races. For instance, an athlete may decide upon a goal or championship race at the end of the season and may supplement his or her training with other races throughout the season. When deciding to include a race in his or her season's schedule, the decision may be based upon the distance and the location of the race, the availability of prize money, who is competing, and the date of the race. While there are others, these are most prominent factors when deciding upon a race.

The USA Running Circuit (USARC) is a popular road racing series where professional runners can compete in to supplement their training. The USA Running Circuit is sanctioned by USA Track & Field (USATF), the national governing body for track and field, and features championship races from distances of one mile through the marathon (USA Running Circuit, n.d.). There are ten to eleven races per year with one held once a month in various locations throughout the United States and can change from year to year.

Furthermore, the championship races are hosted by other organizations. For instance, the 2013 USA 25k Championships were hosted by Fifth Third River Bank Run in Grand Rapids,

Michigan and the 2013 USA Half-Marathon Championships were hosted by Grandma's

Marathon in Duluth, Minnesota. If a runner places in the first ten positions, then he or she is

eligible to compete in the .US National Road Racing Championships at the end of the year.

These races are open, allowing anyone who wants to compete, from the recreational runner to the

elite athlete, to do so. This is attractive because it allows sub-elite and post-collegiate runners the

opportunity for national recognition and financial support. The USARC also boasts a total prize

purse of $600,000, emphasizing its mission of encouraging competition and supporting US

Runners (USA Running Circuit, n.d.).

The USA Running Circuit can be a great tool for the development of athletes and can

provide insight into the racing community. The following is a discussion of the insights gleaned

from an analysis of the USARC. These insights will be determined through counts and

simplification, primarily using comparison and centrality measures. The goal is to examine the

depth of participation between the men and women who scored in each of the running circuit's

races through exploratory data analysis.

Description of Data

The majority of the data was gathered from the official website of the USA Running

Circuit, www.runnerspace.com/USARunningCircuit. The data supplied from this website was

gathered from the host race's result listing and from the USATF. For certain races, the USARC

website did not provide the full results, and where there were missing data such as the athlete's

age or affiliated sponsor or club team, other websites were consulted. These included, the

Medtronic Twin Cities Marathon full result listings at

http://www.mtecresults.com/race/show/1760/2013_Medtronic_Twin_Cities_Marathon-Marathon

and the .US National Road Championships at

http://www.nationalroadracingchampionships.us/Home.aspx. If further information about an athlete could not be found, the USATF database of athlete bios, http://www.usatf.org/Athlete-Bios.aspx, was used.

The scope of the data is limited to only those athletes who scored in the top ten places in one or more of the eleven USA Running Circuit races. This results in a total of 119 records, with 61 of the records women and 58 of the records men. The record includes the athlete's name, age, residence, shoe sponsorship, training club, points scored, and races competed in. Once the data was gathered, it was placed and manipulated in an excel workbook.

Once in an excel workbook, the data was organized into different spreadsheets. These included listings of shoes sponsors and club teams, prize money, races competed in, races placed in, distance between an athlete's residence and race.

To gain insights into the data, measurements of centrality and counts were used to make comparisons between the male and female athletes. Another calculation used was to determine the most frequent occurrence of sponsor and club team within a race. The formulas used were:

- Count [excel formula: =COUNT(*range*)]

- Median [excel formula: =MEDIAN(*range*)]

- Mean [excel formula: =AVERAGE(*range*)]

- Mode [excel formula: =MODE(*range*); for text
  =INDEX(*Range*,MATCH(MAX(COUNTIF(*Range,Range*)),COUNTIF(*Range,Ra nge*),0))] (How to Calculate the Mode of Text in Excel, n.d.)

- Mode, for text [excel formula:
  {=INDEX(*Range*,MATCH(MAX(COUNTIF(*Range,Range*)),COUNTIF(*Range,R ange*),0))}]

- Maximum value [excel formula: =MAX(*range*)]

- Minimum value [excel formula: =MIN(*range*)]

In addition to measures of centrality and counts, other calculations to determine the distance between an athlete's residence and location of the race were made. The latitude and longitude measures used to determine distance were generated by the NASA Latitude/Longitude Finder (n.d.). After the distance was calculated, the use of a PivotTable was applied to the data displaying the count of races competed in and who competed in what race and their distance from place residence to the location of the race. After the PivotTable was developed, to move data around within the spreadsheets VLookUp was applied. The formulas used for these calculations and data manipulations are below:

- Distance [excel formula: =ACOS(COS(RADIANS(90-$A4)) *COS(RADIANS(90-D$1)) +SIN(RADIANS(90-$A4)) *SIN(RADIANS(90-D$1)) *COS(RADIANS($B4-D$2))) *3958.756] (Hook, 2014).

- VLOOKUP [excel formula: =VLOOKUP(*value,range,column*,FALSE)]

Using these methods, insights into the participation between men and women in the 2013 USA Running Circuit can be sought.

Results

The purpose of analyzing the participation of men and women in the USA Running Circuit is to gain insight into the professional running community. The elements examined were the number of races competed and points scored, age of the athlete, amount of prize money collected, support offered through shoe sponsorship and club teams, and distance needed to travel to the race's location. After analyzing the data, the results show that depth of female competitors is slightly greater than male competitors.

Number of races and points scored. When looking at the number of races competed in compared to the actual placement of the athlete in the race, the men performed better. The men had a 78% placement rate and the women had a 74% placement rate. However, the average number of races the women placed in was 1.82 races compared to the 1.72 races the men competed in. The average number of participation for women was 2.7 races and 2.33 races for men. This discrepancy may be due to the women having an extra race to compete in. The reason unknown, but the women had one race where the men did not compete. This was the US 10 Mile Championships.

When looking at the points scored between women and men, average was 15.164 for women and 14.569 for men where the median score for women was 10 and for men it was 7.5. To note again, the difference in the number of races between men and women may also affect the median and average number of points scored. However, the most occurring score for women was 10 and the mode score for men was 2. This concentration of higher points in the middle displays more depth in the women's competition than men's competition.

Age. When examining the age of the athletes, there were no extreme outliers and the results between the men and women were comparable. The maximum age of the woman competitor was 42 and the maximum age of the male competitor was 38. These ages were displayed in the longer races where it is common for older runners to perform well at this level. Both had a minimum age of 22. This minimum age displays post-collegiate eligibility. Both genders had a median age of 27. The age boasts nothing significant between the performances of men and women.

Prize Money. Like the age of the athletes, the results of the analysis produced nothing significant. The average prize money earned between the women and men was very similar, $5,040,98 and $4,958.62 respectively.

Support. The difference of support of between male and female athletes shows great significance. The results show more females have shoe sponsor and club support than their male counterparts. 42 women have sponsorship from a major shoe company where 33 men have shoe sponsorship. In terms of training and being part of a club team, 42 women and 34 men train with a club and between shoe sponsorship and club support, more women than men have both. This support may signify the ability for women to travel and compete in more races.

Looking at the number of shoe sponsors and club support, Adidas and Brooks sponsored the most women and Nike sponsors the most men. Team USA Minnesota had the highest number of female team members, and clubs, Mammoth Track Club and Oregon Track Club had the highest number of male members.

Distance. After calculating the distances each athlete traveled to the races, the results showed that distance was not a significant factor in determining where the athletes raced. Many athletes live and train in the western part of the United States and all USARC races were east of the Mississippi River, with the exception of the USA Cross Country Championships in St. Louis, Missouri. The average distance travelled for a female runner was 1008.55 miles and the average distance travelled for a male runner was 1303 miles.

Although, those competing in race distances between 12 kilometers and 25 kilometers traveled the farthest and those competing in the USA Mile Championships travelled no more than 1500 miles. In addition to individual race distances, the clubs who traveled the farthest were

the women members on the Boulder Running Company team and the men on the Mammoth Track Club.

Conclusion

After examining the results, the depth of competition and participation of women is only slightly greater than the men. The results showed women having greater support from shoe companies and club membership as well as having a higher median, average, and mode score than men. The age, prize money, and distance did not show much significance between the genders. However, if only looking at the percentage of placement out of the total number of races raced, the men performed better. The men raced less the women, but the placement percentage was higher than the women. Therefore, the depth in female competitors is slightly greater than men, but the men performed better than the women.

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