Significance of Age on Archery Performance in Males

Analysis of Recurve Archery

FirstName Surname†  
 Department Name  
 Institution/University Name  
 City State Country  
 email@email.com

Kamil Mieczkowski  
 Marquette University  
Milwaukee, Wisconsin  
 [kamil.mieczkowski@marquette.edu](mailto:kamil.mieczkowski@marquette.edu)

FirstName Surname  
 Department Name  
 Institution/University Name  
 City State Country  
 email@email.com

1 ABSTRACT

The following paper explores the significance of age on performance in recurve archery. The goal of the experiment is to see if younger male competitors score higher during archery competitions compared to their older counterparts. A sample size of (n = 100) best current male recurve archers in the world was used to calculate the performance of the archers based on their age. Participating archers ranged from 17 to 37 years of age, with a mean age of 24.62.

1.1 KEY WORDS

Recurve Archery, Males, Age, Performance, Competition

2 INTRODUCTION

It is generally accepted that as athletes get older, their professional sport performance tends to decline with age [1]. There is little research about this in the world of archery, however. The following research aims to provide evidence to suggest that archery follows this trend, and younger archers tend to perform better in competitive shooting compared to older archers.

2.1 RESEARCH PROCEDURE

The data will be collected through WorldArchery [2], an organization dedicated to competitive archery with a world rankings table. The data will then be compiled and organized into a csv format. This will then be exported to a Jupyter Notebook, where graphs, calculations and inferences will be made.

2.2 RESEARCH RESULTS

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2.3 RESEARCH IMPORTANCE

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3 LITERATURE REVIEW

This section of the paper deals with scholarly articles researched prior, and any questions that arise from the literature.

**3.1**

The first relevant article titled “How fast do we age? Exercise Performance Over Time as a Biomarker” [1] researched how fast the human body tends to decline in terms of performance when it comes to sports. It has found that, generally, professional athletes decline only after the age of 35, at a rate of about 0.5% decrease in performance per year.

**3.2**

The second relevant article titled “Psychological skills of elite archery athletes” [3] researched psychological phenomena that are more commonly observed in younger athletes such as anxiety and stress. It was found, in accordance with the hypothesis, that older athletes (25 and over) had better ability to cope with stress compared to younger archers.

**3.3**

The third relevant article “Prevalence of Shoulder Pain in Competitive Archery” [4] researched shoulder pain that comes with the overuse of the shoulder muscles when doing archery for long periods of time. Of archers aged from 15 to 28, It found that 54.4% of all archers experienced recurrent shoulder pain, drastically increasing at the ages of 20 and up.

**3.4**

The fourth article “Age Differences in Heart Rate Patterns During Concentration in a Precision Sport: Implications for Attentional Functioning” [5] measured heart rate patterns at different ages for precision sports, such as golf or archery. The results of this paper stated that younger athletes (M = 29.5) were able to decrease their heart rate more successfully when focusing compared to older athletes (M = 50.0)

**3.5**

Another article titled “Effects of adult age and level of skill on the ability to cope with high-stress conditions in a precision sport” [6] also measured how age effects the competitor’s ability to focus on a precision sport. This article found that younger athletes (M = 25.5) were able to perform better than older players (M = 50.7), also, that these athletes performed better during practice than they did during the actual competition.

**3.6**

Question 1: If the “standard” age for declining at sports is 35 [1], does the same curve apply to the sport of archery?

Question 2: Since archers 25 and older can cope with stress better [3], does this give them an edge in competing against younger archers?

Question 3: Since recurrent shoulder pains are more prevalent in archers aged 20 [4] and up, can this be observed in their performance or sport retirement age?

Question 4: Since there seem to be many factors such as stress, anxiety, probability of injury, and heart rate control that can influence the performance of an archer, is there a formula for the most optimal archer?

Question 5: If the above question is true, can these trends be noticed in the world of professional archery today?

3 METHODS

This section of the paper details how the data was collected, cleaned, wrangled and transported into a working Jupyter Notebook.

**4.1 DATA COLLECTION**

Data was collected on the current 100 best male recurve archers in the world using the world ranking system of [www.worldarchery.org/world-ranking [2](http://www.worldarchery.org/world-ranking%20%5b2)]. Part of the data (Name, Ranking, Country of Origin, and Score) was able to be copied and pasted into a document as plain text, and with some clever use of the find and replace function of the word processing software, I was able to get the data into a csv format. The rest of the data (Age, Average Arrow) however, had to be entered manually by hand as it required me to navigate to a separate page for each archer. For the purpose of my research, I did not find Country of Origin to be of any use, so the data was dropped to maintain appearances.

**4.1.1 Data Column Details**

World Rank – Current world ranking of the archer

Name – Name of archer

Score – Performance in the last 4 standardized competitions

Age – Age of archer

Average Arrow – Lifetime average competitive individual arrow scores based on F.I.T.A scoring standards [7]. - [Reference](http://texasarchery.info/wp-content/uploads/2015/08/NASP-JOAD-How-to-score.jpg)

**4.2 DATA CALCULATION AND PRESENTATION[[1]](#footnote-2)**

Question 1 Graphs

Question 2 Graphs

Question 3 Graphs

Question 5 Graphs

5 RESULTS

6 DISCUSSION

7 CONCLUSION

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1. <https://github.com/KamilMieczkowski/COSC-3570-Project1> [↑](#footnote-ref-2)