

## Relative Age Effect of Olympic Athletes in Beijing 2008

Romaneiro, C., Folgado, H., Batalha, N., Duarte, R.

*Department of Sport and Health, University of Évora, POR*

### Abstract

Research on expert performance field revealed a strong trend in the association of the birth dates of elite athletes to the first trimesters of the year (Wattie et al. 2008). The aim of this study was to analyze the birth date distribution of all top elite athletes who participated in Olympic Games at Beijing 2008. Athletes ( $n = 18.132$ ) were divided according to gender, continent and sports. The birth dates of the athletes were divided into quarters. To analyze the distribution of the population by quarter we used the Chi-square test. Results showed statistical differences in the distribution for the total population, and for females and males population, showing a trend for athletes to born in the earlier part of the year. Relatively to the continent, statistical differences appear only in Africa, Asia and Europe. In terms of sports, statistical differences were found in the distribution of 6 sports in females (athletics, badminton, basketball, modern pentathlon, rowing, and swimming) and 9 sports in males (athletics, basketball, canoeing, road cycling, football, handball, rowing, swimming, and volleyball). In all cases, distribution showed a higher participation of athletes born in the beginning of the year. These results show a clear influence of the athlete's date of birth in the achievement of expert performance, in several sports and continents.

**Keywords:** Sports, Birth date, Elite athletes.

### Introduction

In daily activities such as sports and school children are often grouped by year of birth to improve the control of the effects of differences in development. However, even when the groups are limited to one year physical and psychological differences can be large. According Muschi & Grondin (2001), the

definition of years of selection based on chronological age causes differences among children of up to one year, depended was born at the beginning or the end of the year of selection.

The concept "relative age" is used in many studies and refers to the difference in ages between the children of the same age and same group, resulting from differences in birth month of the year (Barnsley et al, 1992). In literature, there are numerous studies that show the importance of the effect of age on the various sports and in particular levels of training, however, few who have the sample the absolute levels, and mostly focus on football. One of these studies was conducted by Barnsley et al (1992) and analyzed the effects of age on the football through a sample of players of the 1990 World Cup and where there was a strong relationship between age and international success on the same effect was verified by Vaeyens et al (2005), Cobley et al (2008), Thompson et al (1991) whit Baseball players and Barnsley & Thompson (1988) whit senior hockey players . Instead, Macdonald et al (2009) found no significant evidence on the age of the players of the NFL American Football, as Jiménez & Pain (2008) also found no significant differences in the players of the first Spanish league of football Spanish.

The level of individual sports Edgar & O'Donoghue (2005) found that the effect of relative age is also evident in male and female elite tennis. The studies found evidence, most of the effect of age on, however, are mostly made in soccer players, missing information for most sports. The aim of this study was to analyze the birth date distribution of all top elite athletes who participated in Olympic Games at Beijing 2008, by gender, continent of origin and sport and try to understand the trend evidenced by the various study remains at the level of various sports.

## **Methods**

### **Samples**

The sample included all the Olympic Athletes in Beijing 2008, (n = 18132). Data was collected through the site "The Official Website of the Beijing 2008 Olympic Games: <http://en.beijing2008.cn/>. Data were collected for each athlete, including: Gender, Nationality and Sport

### **Procedures**

Athletes birthdates was grouped by quarters, Q1 (January, February, March), Q2 (April, May, June), Q3 (July, August, September), Q4 (October, November, December).

For the purposes of this study, it is assumed that the date of birth of the athletes were born in different countries is random throughout the year.

### **Statistical**

The Athletes birthdates distribution analysis through the year (total and by different groups) was made using chi-square. Statistical significance level was maintained at 95%

## **Results**

### *By Gender*

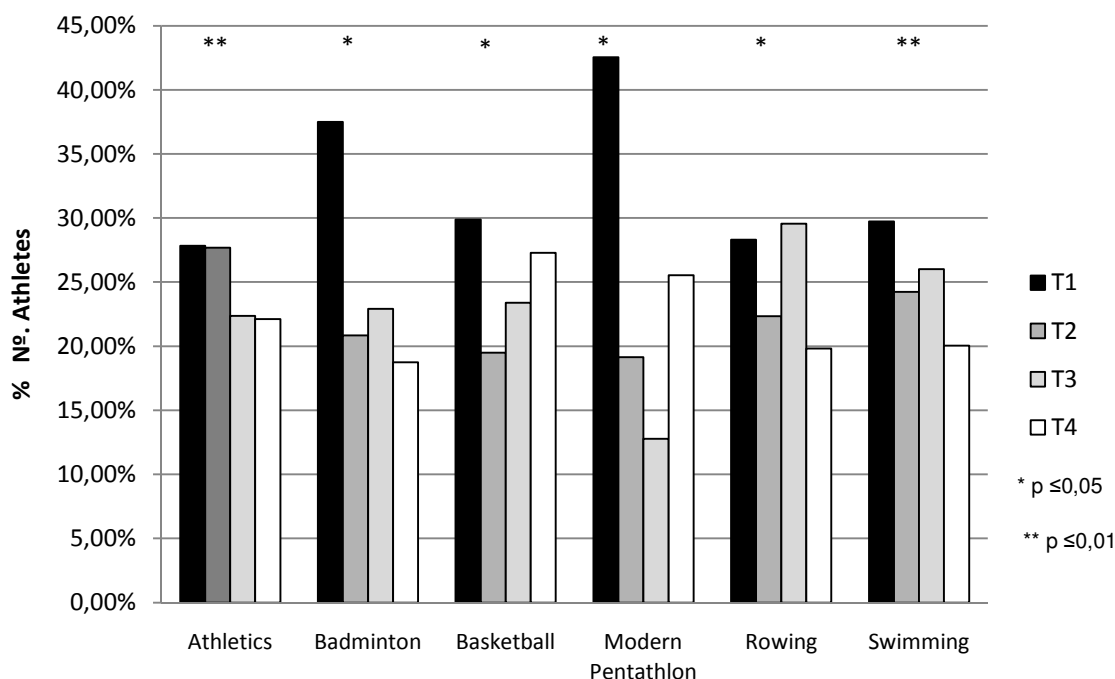
For the total population under study (n = 18132) there are significant differences in the distribution of dates of birth over the quarters of the year ( $X^2 = 142.251$ ,  $p \leq 0.01$ ), maintaining the trend if we analyze by gender, females ( $X^2 = 46.767$ ,  $p \leq 0.01$ ) and male ( $X^2 = 100.065$ ,  $p \leq 0.01$ ).

### By Continent

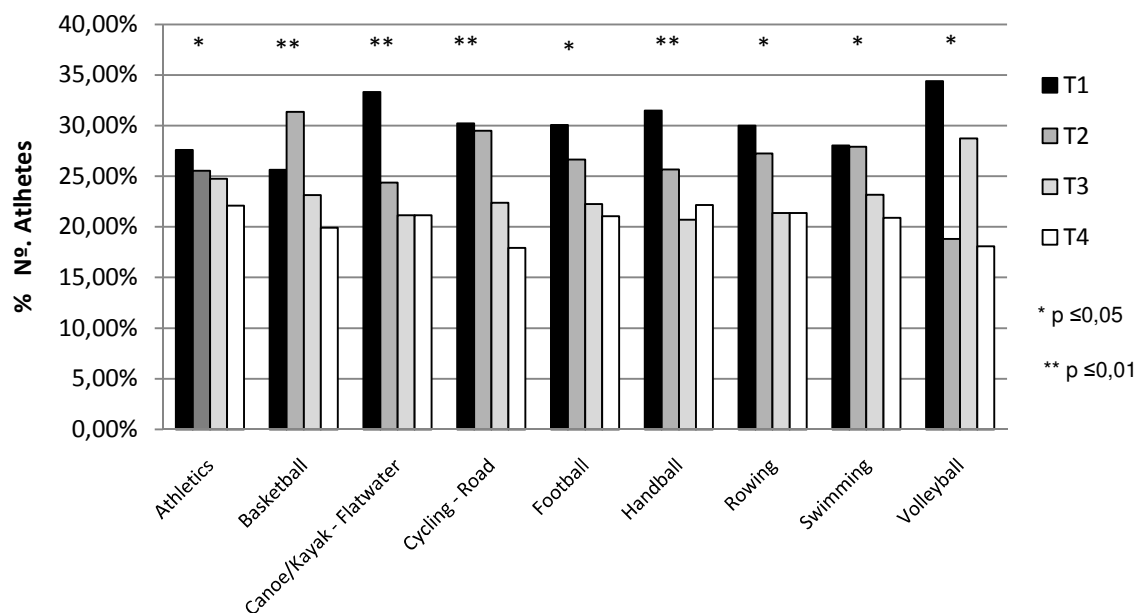
The distribution of dates of birth over the quarters of the year depending on the continent only found significant differences in the African Continent ( $X^2=9,60142,251,p\leq 0,022$ ), Asia ( $X^2=59,794,p\leq 0,01$ ), and European ( $X^2=105,048,p\leq 0,01$ )

### By Sport and Gender

Figures 1 and 2, we can observe the distribution of dates of birth over the quarters of the year depending on the type and gender. Of 38 Olympic sport in Beijing 2008, only 6 are significant differences in female gender and 9 in masculine gender.



illustrations 1: Graph illustrating the distribution of female athletes per quarter according to the sport



illustrations 2: Graph illustrating the distribution of male athletes per quarter according to the sport

## Discussion

The results presented showed that the sample of this study is influenced by the effect of age on, only some of the categories analyzed. On the distribution of births in the total population shows a significant trend for athletes with dates of birth near the beginning of the year. This trend remains unchanged when considering the two genders separately.

Depending on the nationality, the effect of relative age is reflected in our continents Asia, Europe and Africa, showing a higher frequency of birth dates of the beginning of the year. In the American continents and Ocean did not exist on the effects of age, with a symmetry between almost all quarters.

As there is no significant difference between American and Oceania Continents, which might show that selection criterions in several sports are probably different in these continents than from all others.

The effects of relative age are more present in the male gender than in female gender. we found the effects of age on the athletics, swimming, badminton, basketball, Modern Pentathlon, and Rowing. In males see the effects of age on the basketball, canoeing, soccer, cycling-road, Athletics, Swimming, Handball, volleyball and rowing.

Although initially appear that the effects of relative age has little expression on the level of different sports, these arrangements represent 50% (9145 athletes) of elite athletes who participated in Olympic Games at Beijing 2008.

For future studies we suggest as a longitudinal analysis of the different Olympic games in order to verify whether these trends has been maintained or that this is a recent phenomenon. We also suggest examining the results at the Olympic Games and see how far the effects of age on manifested at this level.

## References

1. Musch, Jochen e Grondin, Simon. Unequal Competition as an Impediment to Personal Development: A review of the Relative Age Effect in Sport. *Developmental Review* 21. 2001, pp. 147-167.
2. Macdonald, Dany, et al. Place but not Date of Birth Influences the Development and Emergence of Athletic Talent in American Football. *Journal of Applied Sport Psychology*, 21. 2009, pp. 80-90.
3. Barnsley, Roger, Thompson, A.H. e Legault, Philippe. Family Planning: Football Style. The Relative Age Effects in Football. *International Review for the Sociology of Sport*, 27. 1992, pp. 27-77.
4. Vaeyens, Roel, Philippaerts, Renaat e Malina, Robert. The Relative Age Effect in Soccer: A Match-Related Perspective. *Journal of Sport Sciences*, 23. 2005, pp. 747-756.
5. Thompson, Angus, Barnsley, Roger e Stebelsky, George. "Born to Play Ball" The Relative Age Effect and Major League Baseball. *Sociology of Sport Journal*, 8. 1991, pp. 146-151.
6. Jiménez, Iñaki e Pain, Matthew. Relative Age Effect in Spanish association football: Its extent and Implications for Wasted Potential. *Journal of Sport Science*, 26. 2008, pp. 995-1003.
7. Coble, Stephen, Schorer, Joerd e Baker, Joseph. Relative Age Effects in Professional German Soccer: A historical Analysis. *Journal of Sport Science*, 26. 2008, pp. 1513-1538.
8. Barnsley, Roger e Thompson, Angus. Birthdate and Success in Minor Hockey: The Key to the NHL. *Canad. J. Behav. Sci./ Rev. Canad. Sci. Comp*, 20(2). 1988, pp. 167-176.
9. Edgar, Susan e O'Donoghue, Peter. Season of Birth Distribution of Elite tennis Players. *Journal of sport sciences*, 23. 2005, pp. 1013-1020.
10. Edgar, Susan e O'Donoghue, Peter. Season of Birth Distribution of Elite tennis Players. *Journal of sport sciences*, 23. 2005, pp. 1013-1020.