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Relative age effect in Spanish Karate Championships

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1. Introduction

Some voices in karate are asking for grouping athletes into categories with a cutoff based on the year of birth, from January to December, instead of the current system where groups are based on the age at the day of the championship. These voices could be ignoring the possible importance of the relative age effect (RAE).

RAE has been studied in many sports (Wattie, Schorer, & Baker, 2015). In those where athletes are grouped by year of birth it has proved to be born in the early months of the year (January-March) is an advantage. When the division is done by season from August to July, those born between August and October would have the advantage (Barnsley, Thompson, & Legault, 1992). This effect is relevant in children competition because of their maturation and development, but it remains until adult categories due to the lack of opportunities given to athletes born in the last months of the year. Thus, nowadays, professional sport institutions are concerned about the loss of talent because of RAE and some precautions are being taken in order to make a better and fairer distribution of this advantage.

In karate, it is usual to divide age categories based on the age of athletes at the day of the championship. Therefore, it is supposed that general advantage is not for those born in the first quarter of the year but this is distributed throughout the four quarters. Nevertheless, for a specific championship, the advantage would be for older athletes in each age category. The aim of this study was to explore the relative age effect in the Spanish Karate Championships.

2. Methodology

Databases from Spanish Karate Federation were used to get the birthdates of all medalists belonging to every single age categories (-8, 8-9, 10-11, 11-12, 12-13, 14-15, 16-17, 18-20, +18 years old) at individual competition of the Spanish National Championships from 2012 to 2015. A total of 1086 men and women birthdates including all weight categories from kata and kumite were collected.

In the first analysis, athletes were grouped by birthdate in the four classic year quarters (1st January-March, 2nd April-June, 3rd July-September and 4th October-December). Chi-square test ($\chi 2$) was used to assess the differences between the observed and the expected equal relative age quarter distribution in order to know if any trimester was overrepresented in any of the three national championships: children (-13), which is celebrated in April; cadet, junior, U21 (14-20), in November; or senior (+18), in March.

For the second analysis, category quarters were calculated in categories with 2 years of duration (from 8-9 to 16-17). Category quarters were the number of 3-months-periods to the end of one

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category for an athlete in a specific championship. Number 1 was assigned to athletes in the last quarter of this category and 8 to athletes in the first quarter. χ2 was calculated to know if any group was overrepresented. A level of significance of $p<0.05$ was settled.

3. Results

The analysis with classic year quarters showed a no significant χ^2 in Senior Spanish Championship celebrated in March ($\chi^2= 2.20$; $p>0.05$); where medalist were similarly distributed (1st quarter 27%, 2nd quarter 21%, 3rd quarter 28% and 4th quarter 24%). No significant χ^2 was found in the cadet, junior and U21 Spanish Championship celebrated in November ($\chi^2= 4.46$; $p>0.05$) with an equal distribution (1st quarter 23%, 2nd quarter 27%, 3rd quarter 23% and 4th quarter 28%). Nevertheless, χ^2 showed significant differences in the Children Spanish Championship celebrated in April ($\chi^2= 48.83$; $p<0.01$), it revealed that at least one quarter group was overrepresented. The medalist distribution by quarter was 14% in the1stquarter, 30% in the 2nd, 37% in the 3rd and 20% in the 4th.

In the second analysis with category quarters, 717 medalist were distributed in the 8 quarters of each the 2-years-categories depending on the cut-off date to distribute categories in each championship. χ^2 was no significant in junior category (16-17 years) ($\chi^2= 11.56$; $p>0.05$) with a similar distribution of medalist in all the 8 category quarters. Younger categories showed the relative age effect: cadet (14-15 years) ($\chi^2= 18.50$; $p<0.01$), youth (12-13 years) ($\chi^2= 74.45$; $p<0.01$), child (10-11 years) ($\chi^2= 78.94$; $p<0.01$), juvenil (8-9 years) ($\chi^2= 49.31$; $p<0.01$). Quarter distribution analysis showed that those athletes in the last quarters of the category were overrepresented and those in the first quarters were underrepresented. For example, in the 12-13 years category, athletes in the last quarter achieved the 28% of medals, followed by the subsequents quarters 22%, 15%, 9%, 10,8%, 6,8%, 4,0% and finally the 4% in the first quarter in this category.

4. Discussion and conclusion

Results proved that RAE actually exists in the Spanish Karate Championships from the younger categories to cadets (14-15 years). The advantage is not for those born in the first quarter of the year (January-March) but for those older in every age category depending on the cut-off date of a specific championship. As age categories are based on the date of the championship, the advantage is distributed along the year in different moments of a sport career. For example, those born in May-July have advantage in Spanish youth, child and juvenil Championship (-13 years) celebrated in April and those born in December-February in the Spanish cadet Championship (14-15 years) celebrated in November.

RAE was not found in older categories. This is consistent with other combat sports where this effect is not huge in adult categories (Albuquerque, Franchini, Lage, Da Costa, Costa, & Malloy-Diniz, 2015). This could be due to the fact that in younger categories every child has some championships with advantage and this prevents dropout (Wattie, et al., 2015).

In conclusion, RAE is present in young categories but not in older at Spanish Karate Championships.

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