

The relative age effect in school and federative sport in basketball

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THE RELATIVE AGE EFFECT IN SCHOOL AND FEDERATIVE SPORT IN BASKETBALL

KEY WORDS: Basketball, Relative age, Selection, Federated Sports, Scholar Sports.

ABSTRACT: The aim of this study was to analyze the distribution of birth dates among Portuguese basketball players participating in national competitions (academic and federal). The study sample consisted of 1497 federated athletes (744 female and 753 male), and by 411 athletes (214 female and 382 male.) who participated in the finals of Scholar Sports. We analyzed the distribution of birth dates per quartile in federated and scholar sports by gender. In the federated analysis this distribution depended also on the classification and ranking of the teams. All data were analyzed with SPSS for Windows, version 14.0. The statistical significance level was maintained at $p \leq .05$. The results suggest that there is a prevalence of athletes born in the first months of the year in both scholar and federated sports. However, only in de the sub-14 federated male group were found significant values ($p < .05$).

The sports and school organizations group children and teenagers by categories according to their chronological age in order to ensure a balanced and likewise development. In sports, this feature allows the training to be appropriate to the children's development level, providing a fair competition and equal success opportunities for all practitioners (Helsen, Starks and Van Winckel, 1988). However, it does not seem to avoid the negative effects on the selection and participation due to the heterogeneity in the physical and cognitive domain (Baker and Logan, 2007).

Given the fact that the ranks in sports in Portugal take into consideration a period of 24 months, government policies include in the same competition players who have a difference of almost two years of age (whether chronological or biological). Therefore, the relative age refers to the age differences observed among children from the same age group (Barnsle, Thompson and Legault, 1992). The consequences from this lagged interaction yields the effects of relative age and such inequalities, seem to provide an advantage to older players, persisting during adolescence and later in elite competitions (Cobley, Wattie and Baker, 2009). During adolescence (where one can observe a broad biological variation among young people), a one year gap can be decisive (Baxter-Jones and Helms, 1994), imposing significant maturational differences, which manifests itself in the anthropometrical features (height and body weight) or in the physical fitness (aerobic power, muscle strength, endurance and speed). In addition to the phenotypic characteristics, the available literature suggests that this difference may be positively manifested in the cognitive - game analysis, perception, concepts tactics or strategies - and psychological abilities/ emotional maturity (Helsen, Van Winckel and Starks, 2000; Philippaerts et al. 2006; Reilly, Bangsbo and Franks, 2000). Other benefits include as well, the advantage of the initial performance, a concept which consists of years of increased experience that the players born in the beginning of the year acquire (Helsen, Van Winckel and Williams, 2005).

According to Augste and Lames (2011), there are two mechanisms that contribute to perpetuating this performance advantage acquired by older players. The first one relates to the fact that sporting success is accompanied by a positive feedback provided by coaches, parents and team-mates, resulting on the increase of intrinsic and extrinsic motivation and self perception of competence expressed by players who, in turn, helps to achieve better *performance* in the short term. Secondly, since these athletes are more easily identified as talents and better prospects for recruitment by good teams, with experienced and qualified coaches, where they compete with more evolved adversaries, allows them to improve their skills and thus achieve an elite sports career.

All of these unnumbered particularities seem to favour the selection of players that have matured early. In fact, it's evident that the identifying process and talent selection has its foundations on the effects of relative age, becoming its main enhancer. The reason to this behaviour has to do with the achievement of immediate success instead of a sustained development in the long-term (Augste and Lames, 2011).

Studies conducted in the field of the effects of relative age on associated sports prove the assumptions previously mentioned. These point out to a higher frequency of athletes born in the first months of the selection year in sports such as ice hockey, baseball, cricket, tennis, football or basketball (Cobley et al., 2009). However, little information is available about these effects in school, more specifically in the selection process of the participants representing the school sports teams. That is why, it is reasonable to compare the effects of relative age between the associated sports and school sports, involving the same modality, e.g. basketball. Thus, the goal of this study is to analyse the distribution of birth dates among Portuguese basketball players participating in national competitions (school and associated sports).

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We claim the possibility of the existence of a partial distribution of dates of birth, in an independent way for each type of sport, suggesting a benefit to relatively older athletes.

Methodology

The sample comprised 1497 associated athletes (744 female/ 753 male), sorted in 125 teams, that participated in the Juvenile basketball festival at Albufeira in 2011 and 2012 and by 411 athletes (214 female/ 382 male.) that participated on the finals of school sports in the 2010 and 2011 editions.

To analyse the distribution of birth dates, the athletes were divided into four quarters (Q1, Q2, Q3 and Q4), equivalent to the quarters of the chronological year according to their date of birth. The effects of relative age can be identified when there is a significant difference between the theoretical expected number of athletes born per month or quarter and the number of athletes observed (Musch and Grondin, 2001). Chi-square tests were performed for dates of birth, according to the four quarters of the chronological year, to identify deviations from the expected

number of dates of birth of each quarter. The expected theoretical value was calculated based on the assumption of a biased distribution in the first months of the year (especially first trimester), similar to other studies on relative age (Delorme, Chalabaev and Raspaud, 2010).

All data were analysed with SPSS software for Windows, version 14.0. The level of significance was kept at $p \leq .05$.

Results

Table 1 presents the data concerning the effect of relative age on associated sports. The distribution of birth dates by quartiles indicates that most athletes were born in the first half of the year (Q1 and Q2). Note that Q4 is where we find the smallest percentage of athletes in all levels. Only in the male under-14 level was identified data of significant value, by distribution of quartiles depending on the final ranking of teams ($\chi^2 = 6.36$ and $p < .05$). In these, the teams ranked between 1st and 2nd place have 47.9% of their athletes born in Q1, 29.2% for Q2 and only 6.3% for Q4.

Class.	Q1	Q2	Q3	Q4	Total	χ^2		<i>p</i>							
	(%)	(%)	(%)	(%)		F	M	F	M	F	M	F	M		
Sub 14	1°-2° R.a.	12(33.3%) 1.6	23(47.9%) 1.6	11(30.6%) 0.6	14(29.2%) 0.6	10(27.8%) -0.8	8(16.7%) -0.8	3(8.3%) -1.5	3(6.3%) -1.5	36	48	1.60	6.36	0.20	0.01
	3°-6° R.a.	36(42.9%) 1	24(33.3%) 1	20(23.8%) -1.8	27(37.5%) -1.8	14(16.7%) -1.2	18(25%) -1.2	14(16.7%) 2.1	3(4.2%) 2.1	84	72				
	7°-10° R.a.	29(30.2%) -0.9	27(32.1%) -0.9	33(34.4%) 0.7	22(26.2%) 0.7	20(20.8%) 0.8	22(26.2%) 0.8	14(14.6%) -0.7	13(15.5%) -0.7	96	84				
	11°-18° R.a.	42(26.9%) -1.1	50(29.9%) -1.1	55(35.3%) 0.5	57(34.1%) 0.5	37(23.7%) 0.9	38(22.8%) 0.9	22(14.1%) -0.3	22(13.2%) -0.3	156	167				
	Total	119(32%) 4%	124(33.4%) 4%	119(32%) 32%	120(32.3%) 3%	81(21.8%) %	86(23.2%) %	53(14.2%))	41(11.1%) %	372	371				
Sub 16	1°-2° R.a.	14(38.9%) 1.6	12(25%) 1.6	11(30.6%) 0.6	19(39.6%) 0.6	7(19.4%) -0.8	10(20.8%) -0.8	4(11.1%) -1.5	7(14.6%) -1.5	36	48	1.10	0.90	0.29	0.34
	3°-6° R.a.	27(32.1%) 1	25(34.7%) 1	16(19%) -1.8	24(33.3%) -1.8	17(20.2%) -1.2	14(19.4%) -1.2	24(28.6%) 2.1	9(12.5%) 2.1	84	72				
	7°-10° R.a.	20(23.8%) -0.9	26(31%) -0.9	25(29.8%) 0.7	29(34.5%) 0.7	24(28.6%) 0.8	16(19%) 0.8	15(17.9%) -0.7	13(15.5%) -0.7	84	84				
	11°-18° R.a.	42(25%) -1.1	56(31.5%) -1.1	47(28%) 0.5	43(24.2%) 0.5	46(27.4%) 0.9	48(27%) 0.9	33(19.6%) -0.3	31(17.4%) -0.3	168	178				
	Total	103(27.7%) 7%	119(31.2%) 2%	99(26.6%) %	115(30.1%) 1%	94(25.3%) %	88(23%))	76(20.4%) %	60(15.7%) %	372	382				

Table 1. Percentage of relative age effect in associated sport.

The effects of relative age on school sports are shown in Table 2, for ages under-16 and under-14, not differentiated. Based on the results, it appears that there were no significant differences in

the distribution of birth dates by quartile ($\chi^2 = 3.3$ and $p > .05$). In both genders it appears that Q1 is where the biggest share of athletes is present (33.2% and 28.9% respectively).

Gender	Q1 (%)	Q2 (%)	Q3 (%)	Q3 (%)	Total	χ^2	p
Male R.a.	57 (28.9%) -0.9	51 (25.9%) -1.1	50 (25.4%) 0.8	39 (19.8%) 1.6	197	3.30	0.07
Female R.a.	71 (33.2%) 0.9	66 (30.8%) 1.1	47 (22.0%) -0.8	30 (14.0%) -1.6	214		
Total	128 (31.1%)	117 (28.5%)	97 (23.6%)	69 (16.8%)	411		

Table 2. Percentage of relative age effect in school sports.

Discussion

This study had as objective to analyse the effect of the distribution of athlete's dates of birth that have participated in national competitions of school and associated sport. In associated sport, we've analysed the distribution of dates of birth by quartile, in function of the final ranking of teams, grade and gender while in school sport we've only assessed that distribution relating to gender.

Regardless of sport rank, it's noticeable a majority of players born in the first two quartiles, as it is stated in the study conducted by Delorme and Raspaud (2009). However, only in sub-14 males were verified significant differences for athletes born in the start of the year of selection ($\chi^2 = 6.36$ and $p < .05$), since it was registered an accentuated percentage of birth dates in Q1 (47.9%) and Q2 (29.2%) on the teams ranked first and second.

During these ages is registered a broad biological variation between young people (Pineau, 1987; Baxter-Jones and Helms, 1994), with some players often presenting a more advanced maturation, gathering higher levels of strength, power and speed besides the more prominent anthropometric characteristics. This data constitutes a great advantage in basketball, especially in these ranks (Folgado et al., 2006).

The effect of relative age implies that the physical maturation is an assumption contemplated on the identification of young talents and, in the long term, have a positive impact on the development of sports players who are subject to best practice processes. The fact of going through beneficial experiences at an early age, increases motivation and improves the perception of competence on their capabilities (Augste and Lames, 2011), enabling the achievement of high performance. These privileges contribute to increase the gap that exists between younger players that mature later and are more likely to abandon the sport (Delorme, Boiché and Raspaud, 2010).

The searches for short-term results, together with the emphasis on competition are factors that entice coaches to select older

players (Helsen et al., 1998; Hirose, 2009; Scherar et al., 2007).

For the school sports, there is a distribution of birth dates more focused on Q1 and Q2, however, this is not significant ($p > .05$). These results contradict the studies by Wilson (1999) and Cogley, Abraham and Baker (2008) within the school sports, whose representation of players for the Q1 is evident. However, comparing with international studies, the unequal structure of educational systems is a plausible reason to argue the highlighted discrepancy.

We should consider that the purposes of the school sports are not governed by the same principles of the associated sports, that is why, the results were not agreeing. The primacy given to competition and early specialization in associated sport is a developing principle of the effects of relative age, however, school sports excel in educational practice and training, which reduces the possibility of the manifestation of these effects.

In this study, a comparison of genders has been considered and, although the distribution tendency is for the first two quartiles, the absence of significant values prevailed. The available literature (Glamer and Vincent, 2006; Helsen et al., 2005) does not reveal itself to be unanimous as to the size of the effects of relative age in females, but there is consensus that these effects are clearly reduced when compared with males. One reason for these results has to do with the fact that puberty occurs earlier for girls, whilst for boys it occurs later and shows a large variance (La Rochebrochard, 2000).

Despite the latest models of sports preparation already consider the long term effects of this relative age problem (Balyi et al., 2006; Côté, Baker and Abernethy, 2007), it's still not enough to overcome the stereotype created by the coaches in that the advantage resulting from the anthropometric component is transmitted into practical results. So while coaches are not aware of this problem and not privileging technical capabilities tactics instead of physical qualities, the relative age effect will remain and thus motivate a self-exclusion of athletes who mature late in basketball.

EFEITO DA IDADE RELATIVA NO DESPORTO ESCOLAR E FEDERADO EM BASQUETEBOL

PALAVRAS CHAVE: Basquetebol, Idade relativa, Seleção, Desporto Federado, Desporto Escolar.

RESUMO: O objetivo do presente estudo foi analisar a distribuição das datas de nascimento entre os jogadores de basquetebol portugueses que participam em competições nacionais (escolar e federativo). A amostra de estudo foi constituída por 1497 atletas federados (744 fem. e 753 masc.), e por 411 atletas (214 fem. e 382 masc.) que participaram na fase final de Desporto Escolar. Foram analisadas as distribuições das datas de nascimento por quartil no desporto federado e escolar em função do género, sendo que no federado analisou-se ainda essa distribuição em função da classificação das equipas e escalão. Todos os dados foram analisados com o software SPSS para o Windows, versão 14.0 (SPSS Inc., Chicago, IL). O nível de significância foi mantido em $p \leq .05$. Os resultados sugerem que há uma prevalência de atletas nascidos nos primeiros meses do ano, tanto no desporto federado como escolar. Contudo, apenas no escalão de sub-14 masculino do desporto federado se registaram valores significativos ($p < .05$).

EL EFECTO DE LA EDAD RELATIVA EN EL DEPORTE ESCOLAR Y FEDERADO EN BALONCESTO

PALABRAS CLAVE: Baloncesto, Edad relativa, Selección de jugadores, Deporte federado, Deporte escolar.

RESUMEN: El objetivo de este estudio fue analizar la distribución de las fechas de nacimiento de los jugadores de baloncesto portugueses que participan en competiciones nacionales (escolar y federativo). La muestra del estudio consistió en 1.497 deportistas federados (744 femeninos y 753 masculinos), y 411 atletas (214 femeninos y 382 masculinos) quiénes participaron en las finales nacionales del deporte escolar. Se analizó la distribución de las fechas de nacimiento del federado y escolar por cuartil y por sexo. Además, en el federado se ha analizado la distribución en función de la clasificación final de los equipos y categoría. Todos los datos se analizaron con el programa SPSS para Windows (SPSS Inc., Chicago, IL). El nivel de significancia se mantuvo en $p < .05$. Los resultados sugieren que existe una prevalencia de atletas nacidos en los primeros meses del año, tanto en el deporte federado como en el escolar. Sin embargo, sólo en el masculino y en el categoría sub-14 del deporte federado se han identificado valores significativos ($p < .05$).

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