

GENDER INEQUALITIES IN PORTUGUESE GYMNASTS BETWEEN 2012 AND 2016

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Original article

Abstract

Gender participation rates are different and the potential reasons are namely sports availability and stereotypes. In spite of gymnastics being recently considered as an “early specialization” sport, characterized by a higher number of female participants than male ones, it has been highlighted that there are much less published studies in female athletes than in males. The aim of this study was to analyze the gender participation among Portuguese gymnasts according to gymnastics’ disciplines. An individual authorized database of all national gymnasts involved in the National School of Gymnastics of the Gymnastics Federation of Portugal among four athletic seasons, namely 2012/2013, 2013/2014, 2014/2015 and 2015/2016 was used. From a sample of 14,742 gymnasts, 81.3% were female and only 18.7% were male ($P < 0.01$) during the athletic season of 2012/2013. Similar results were found in the next three seasons as follows: 83.3% females and 16.7% males in 2013/2014, 84.9% females and 15.1% males in 2014/2015 and 85.3% females and 14.7% males in 2015/2016. Significantly gymnasts-gender differences ($P < 0.01$) were observed for all disciplines. No differences between genders were observed in Rhythmic Gymnastics, Women's Artistic Gymnastics and Men's Artistic Gymnastics due to the exclusive sport participation of female and male gymnasts, respectively. Gymnastics should improve participation and combat gender inequalities.

Keywords: *gymnastics, gender participation, athletes, disciplines.*

INTRODUCTION

One of the ‘Fundamental Principles of Olympism’ is that “Any form of discrimination with regard to a country or a person on the grounds of race, religion, politics, gender or otherwise is incompatible with belonging to the

Olympic Movement” (International Olympic Committee, 2011). However, gender has been considered a significant indicator of athletic performance’s differences and gender participation rates are different and the potential reasons are

namely sports availability and stereotypes (Davis et al., 2006).

Several physical and psychological benefits, namely increased resistance, strength, agility, coordination and improved mood, self-esteem and self-confidence are responsible for sports participation (Slater & Tiggemann, 2011).

Gymnastics is well-known by its aesthetic character that emphasizes creativity and athlete's peak of performance typically obtained earlier than in team sports (Baker, Janning, Wong, Coble, & Schorer, 2014), since gymnasts train intensively from very young ages and maintain that training regime during adolescence and early adulthood (Silva & Paiva, 2015a, 2016). In children (from 2 to 10 years old), pubertal growth is linear and occurs at a relatively constant rate (6 cm per year) (Jeukendrup & Cronin, 2011). However, in adolescence, significant changes in body size occur, influencing physiological and physical performance (Silva & Paiva, 2015a) in both female and male gymnasts (i.e., males tend to have more fat-free mass and a lower body fat than females).

In addition, leanness is also a valuable prerequisite for technical performance and is considered more aesthetically pleasing to judges and for selection at an elite level (D'Alessandro et al., 2007; Michopoulou et al., 2011; Silva & Paiva, 2016; Silva & Barata, 2016). However, and as highlighted by recent studies conducted by Silva and Paiva (2015a, 2016) in elite female gymnasts, a reduced body mass often leads gymnasts to inadequate energy intake, compromising adequate energy availability levels for gymnasts' growth, daily activities and athletic performance.

In spite of gymnastics being recently considered as an "early specialization" sport, characterized by a higher number of female participants than males (Baker et al., 2014), McManus and Armstrong (2011) highlighted that there are much less published studies in female athletes than in males.

In the short-term, energy availability is required to improve gymnasts' health, to prevent injury and, in the long-term, sustained low energy availability may predispose the female athletes to various health hazards such as irregular menstruation, infertility and osteoporosis (Loucks, Kiens, & Wright, 2011; Omiya et al., 2014; Silva & Paiva, 2015a, 2015b). Thus, female athletes may be a more difficult group to study, especially in relation to health issues, including body composition and menstrual function, than male athletes.

On the other hand, the cultural environment and regional tradition in a typical sport also influences sport participation (Weir, Smith, Paterson, & Horton, 2010). In addition, gender is a socially category constructed in the interaction between the individual and the society and self-actualization (Boykoff & Yasuoka, 2013).

In accordance with the International Federation of Gymnastics (*Fédération Internationale de Gymnastique* – FIG, 2015), gymnastics is divided into seven disciplines: Gymnastics for All (GfA), Men's Artistic Gymnastics (MAG), Women's Artistic Gymnastics (WAG), Rhythmic Gymnastics (RG), Trampoline Gymnastics (TRA), Aerobic Gymnastics (AER) and Acrobatic Gymnastics (ACRO).

Apart from gymnastics' discipline and gymnast's gender, competitive routines result from a combination of several different body elements that require high-intensity effort with, in some cases, a unique dexterous manipulation of apparatus (Silva & Paiva, 2015a; Silva & Barata, 2016). Dynamic and static balance is important in balance positions, jumps and rotations; explosive strength is necessary for dynamic elements with rotation and throw, jumps and pre-acrobatic movements; flexibility is dominant during all body elements; and coordination is crucial for apparatus

mastery (Calavalle et al., 2008; Silva & Paiva, 2015a).

Therefore, this study aims to be an extension of the published study by Silva and Barata (2016) by analyzing the gender participation among Portuguese gymnasts according to gymnastics' disciplines.

METHODS

During the sport season of 2012/2013, 14,742 Portuguese gymnasts (11,975 female and 2,767 male) were included in this study. Also from the next three athletic seasons, 15,880 gymnasts (13,225 female and 2,655 male) in 2013/2014, 15,469 gymnasts (13,139 female and 2,330 male) in 2014/2015 and 16,442 gymnasts (13,660 female and 2,782 male) were included.

Data was analyzed from an individual authorized database of all national gymnasts involved in the National School of Gymnastics of the Gymnastics Federation of Portugal (*Federação de Ginástica de Portugal* – FGP) among four athletic seasons, namely 2012/2013, 2013/2014, 2014/2015, and 2015/2016.

This database was constructed by the technical staff of the general directorate office of the FGP and formal permission for full access to the mentioned database was given by the director of the National School of Gymnastics of the FGP.

Regarding gymnastics' disciplines, the FGP involves seven international disciplines mentioned before and two others, such as Teamgym (TG), a *Union Européenne de Gymnastique* (UEG) discipline that promotes group gymnastics competition and Hip Hop (HH) (organizing Open competitions and the National Championship Competition). Thus, disciplines analyzed were as follows: GfA, MAG, WAG, RG, TRA, AER, ACRO, TG and HH. Therefore, gender participation and the represented gymnastics' discipline were then analyzed.

Regarding the statistical analysis, characteristics of the participants are

described with proportions for categorical variables. Spearman correlation coefficient was used to determine associations between categorical and continuous variables; due to the number of subjects evaluated the significance level used was 5% ($p < 0.05$). Data was analyzed using SPSS statistical software version 22.0 for Windows (New York, USA).

RESULTS

GfA was the most practiced gymnastics' discipline in Portugal ($P < 0.01$) during all sport seasons (Figure 1), since it is so-called “for all” due to the possibility of participants of both genders being able to participate it.

Following GfA, there were TRA and ACRO ($P < 0.05$), with exception for the last two sport seasons of 2014/2015 and 2015/2016 ($P > 0.05$), where more participants were involved in ACRO rather than in TRA.

All others disciplines were highly less practiced as follows: RG, WAG, TG, AER, MAG and HH (Figure 1).

T-tests indicated significant differences ($P < 0.05$) in Portuguese gymnasts' gender-participation during the four evaluated sport seasons.

From a sample of 14,742 gymnasts in the athletic season of 2012/2013, 81.3% were female and only 18.7% were male.

Similar results were found in the next three seasons as follows: 83.3% females and 16.7% males in 2013/2014, 84.9% females and 15.1% males in 2014/2015 and 85.3% females and 14.7% males in 2015/2016.

Significantly gymnasts-gender differences ($P < 0.01$) were observed for all disciplines; however, in RG, WAG and MAG, no significant differences were observed due to the exclusive sport participation of female or male gymnasts, respectively.

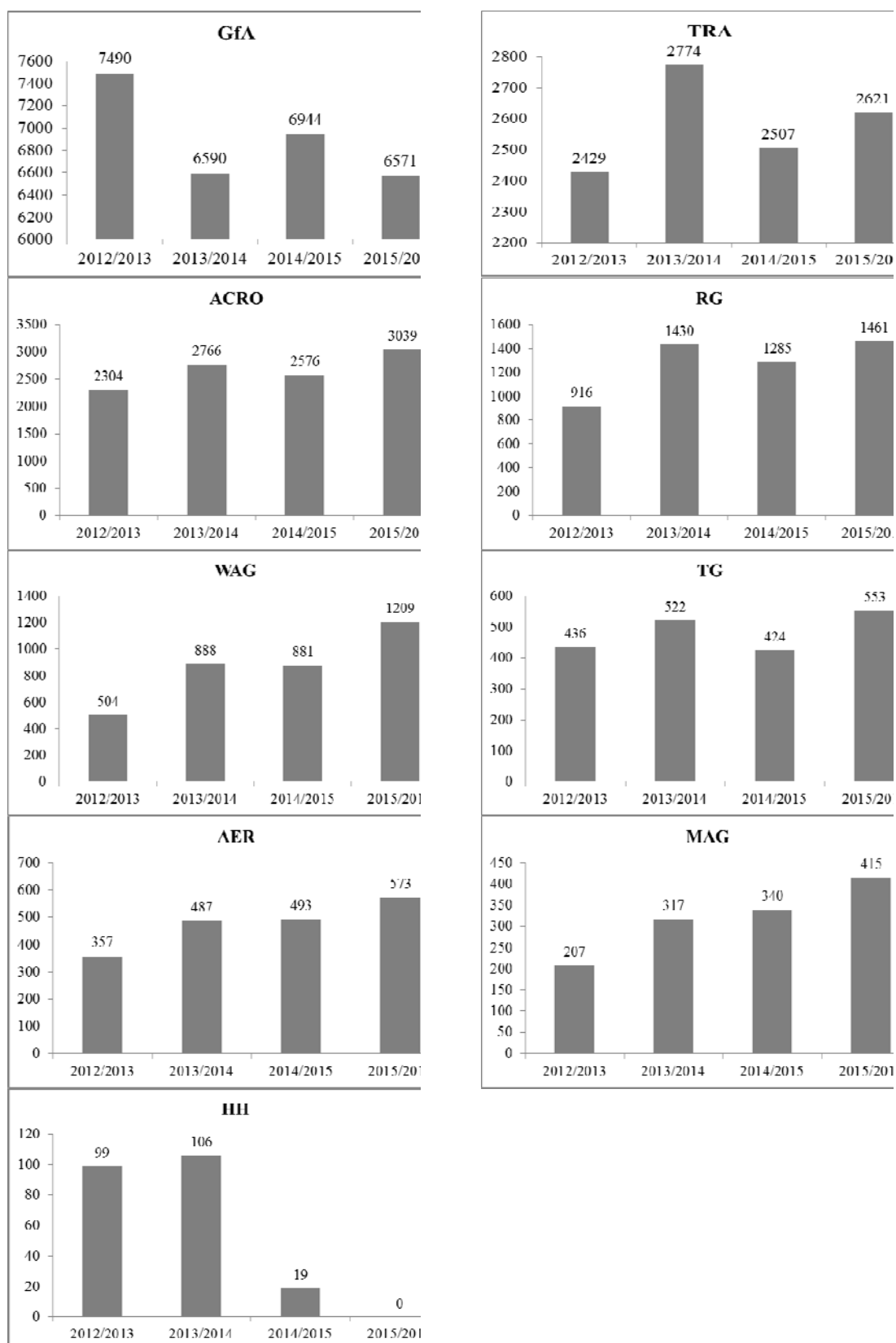


Figure 1. Number of gymnasts participating in the several disciplines of the FGP during the seasons of 2012/2013, 2013/2014, 2014/2015 and 2015/2016 (GfA: Gymnastics for All. TRA: Trampoline Gymnastics. ACRO: Acrobatic Gymnastics. RG: Rhythmic Gymnastics. WAG: Women's Artistic Gymnastics. TG: Teamgym. AER: Aerobic Gymnastics. MAG: Men's Artistic Gymnastics. HH: Hip Hop).

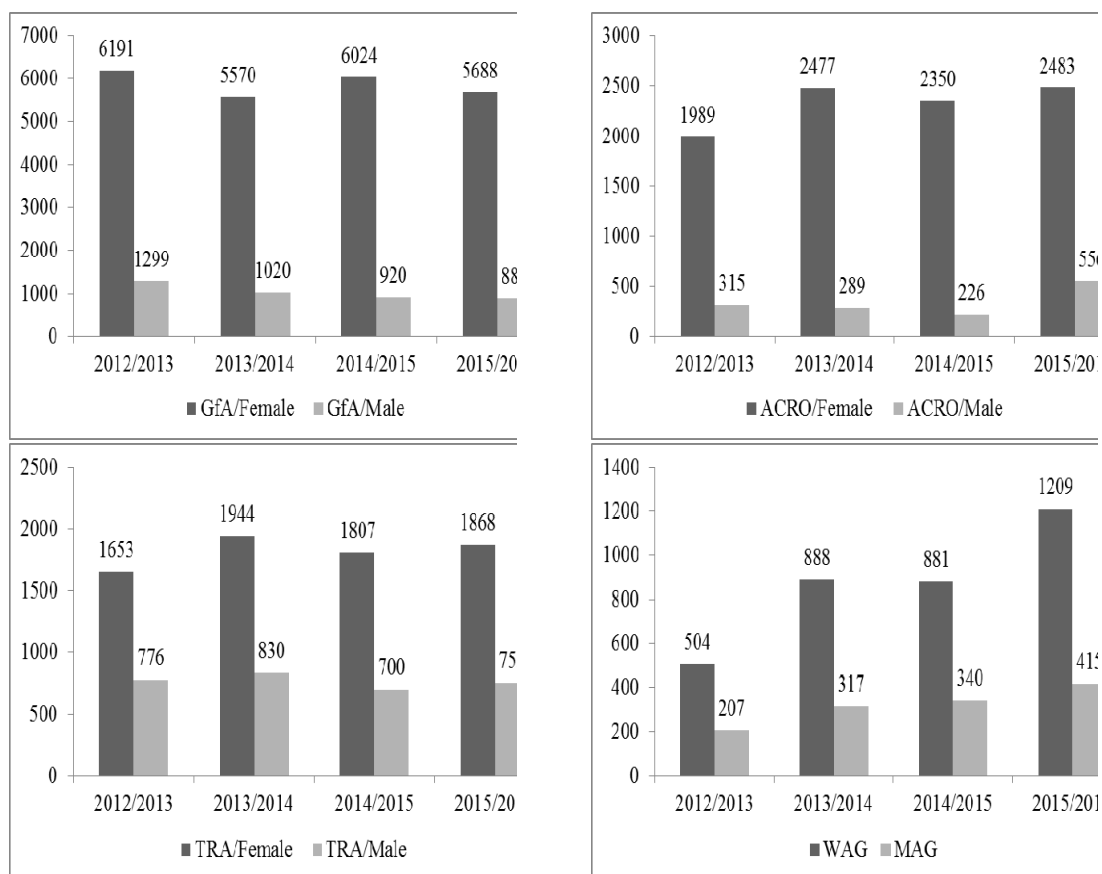


Figure 2. Gender participation in the most practiced disciplines of the FGP during four athletic seasons: 2012/2013, 2013/2014, 2014/2015 and 2015/2016 (GfA: Gymnastics for All. ACRO: Acrobatic Gymnastics. TRA: Trampoline Gymnastics. WAG: Women's Artistic Gymnastics).

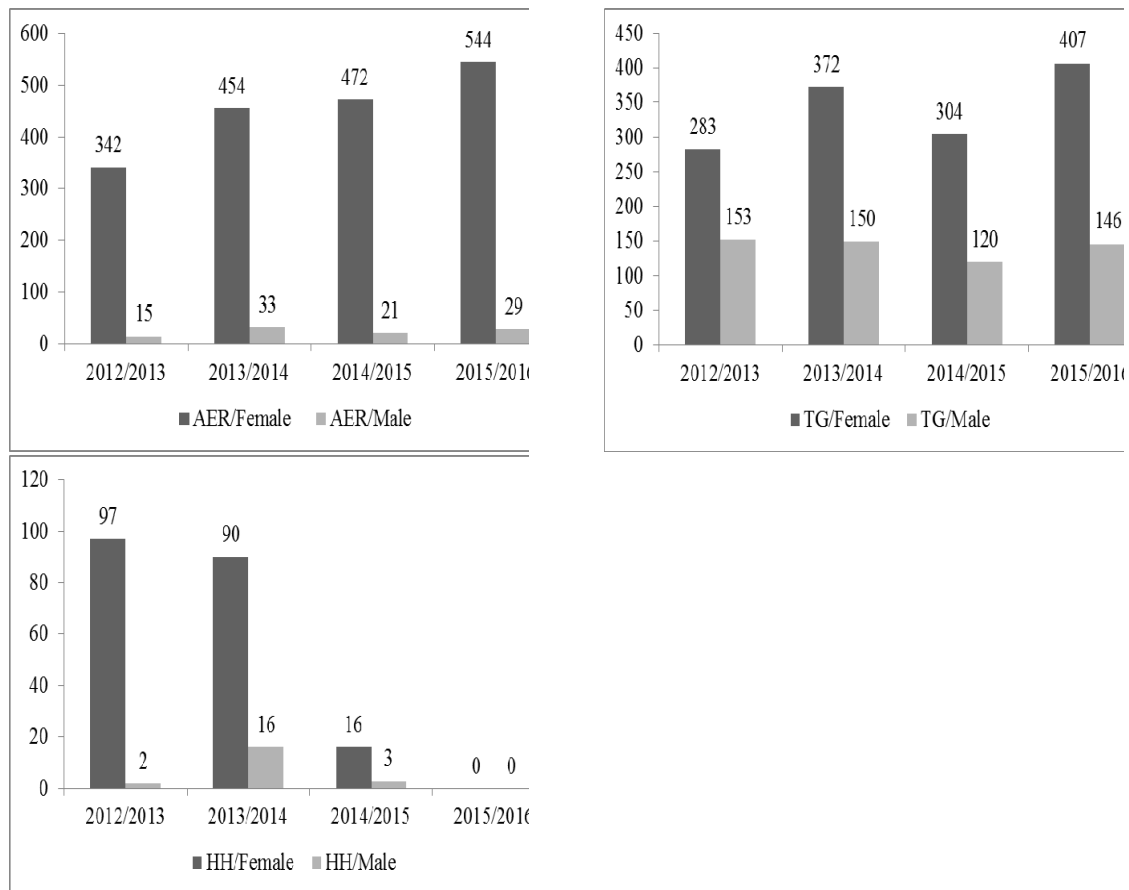


Figure 3. Gender participation in the less practiced disciplines of the FGP during four athletic seasons: 2012/2013, 2013/2014, 2014/2015 and 2015/2016 (AER: Aerobic Gymnastics. TG: Teamgym. HH: Hip Hop).

Curiously, in an intra-athletic season analysis, the athletic season of 2014/2015 was significantly ($P < 0.05$) the worst of all athletic seasons with regard to male participation, since it was observed a decrease in gymnasts participation in all disciplines, with exception for MAG ($n=340$), and for AER ($n=15$) in 2012/2013 (Figures 2 and 3).

Although the situation is not so worrying about female gymnasts, because of their ascending participation from the beginning of this study, also the athletic season of 2014/2015 and the first evaluated season (2012/2013) demonstrated the lowest numbers of female participation in all disciplines, with exception for GfA, AER and HH; in the latter, a great decrease (over 80%) was observed from 2013/2014 to 2014/2015 (Figures 2 and 3).

Fortunately, male participation increased in the last season for almost all disciplines, except in the most practiced discipline in Portugal, that is GfA ($n=883$), and in the less practiced, the HH, which did not have any male or female gymnast participation in the season of 2015/2016 (Figures 2 and 3). In fact, in 2015/2016, male participation increased significantly in ACRO ($P=0.000$) and female participation also increased significantly in WAG ($P=0.023$), AER ($P=0.041$) and TG ($P=0.025$).

DISCUSSION

Although this study is an extension of a previous one, published in this scientific journal (Silva & Barata, 2016), some important and recent indicators about

Portuguese gymnasts' participation during the last four athletic seasons have been demonstrated, including the recent sport season of 2015/2016.

Several studies have been conducted in athletes regarding physiology, biomechanics, psychology, but most of them are reported to males. Therefore, and from our best knowledge, this is one of the very few studies evaluating gender participation in gymnastics.

The former president of the International Olympic Committee (IOC), Jacques Rogge (2012) highlighted at the Games Opening Ceremony that "For the first time in Olympic history, all the participating teams will have had female athletes, and this is a major boost for gender equality". In fact, Donnelly and Donnelly (2013) reported that 4,835 female athletes participated in the 2012 London Olympic Games, no countries excluded female athletes and women competed in every sport. Contrarily, Boykoff and Yasuoka (2013) concluded that in the London 2012 Olympics, there were 39 men-only events, including the pommel horse and rings in gymnastics, and only two women-only events, such as RG and synchronized swimming.

In our study, significantly gender differences ($P < 0.01$) were observed for all disciplines with a female participation's rate much higher than the male one.

As expected, no differences between genders were observed for RG, WAG and MAG due to the exclusive sport participation of female or male gymnasts, respectively.

Although the still most practiced discipline in Portugal is GfA, where gender selection is not a prerequisite for sport's participation, its prevalence decreased in the last season of 2015/2016, contrarily to Barker, Barker-Ruchti, Wals and Tinning (2014), and Silva and Paiva (2016), who concluded that most athletes choose to persist with competitive sport voluntarily. Thus, more research has to be

done in the next sport seasons in order to clarify this evolution.

After GfA, TRA and ACRO were the most practiced disciplines in Portugal, but a recent change was observed in 2015/2016 with ACRO's participants overstepping TRA's participants. In fact, ACRO has a growing number of participants worldwide (Graption, Lion, Gauchard, Barrault, & Perrin, 2013) and Portuguese acrobatic gymnasts seem to be included in this general trend. On the other hand, HH had no participants, being female or male, so this should be weighed by Portuguese local associations and the FGP.

Although the Olympic Movement (International Olympic Committee, 2011) states the need to achieve equality between men and women in sport at all levels and in all structures, a new challenge stands up for the sport worldwide, which is that there is a clear inequality of gender participation in gymnastics, reflected in our results, since Portuguese female gymnasts showed a high and significant presence in the Portuguese Gymnastics ($P < 0.05$). This should be interpreted as part of a solution for the so-called "gender inequality in sport", according to recent literature (Baker et al., 2014; Claringbould, Knoppers & Jacobs, 2015; Di Cagno et al., 2009; Godoy-Pressland & Griggs, 2014; Mackintosh, Darko, Rutherford, & Wilkins, 2014). A plausible explanation might be related to the dominant gender in the social system around gymnastics, i.e., female sport produces a different environment governed by distinct social and developmental factors than those important in male sport (Barker et al., 2014).

On the other hand, political and social time may be an important constraint to gymnastics' practice in Portugal, because athletic seasons of 2012/2013 and 2014/2015 demonstrated the lowest numbers of female participation in all disciplines, with exception for GfA, AER and HH; and, in turn, the athletic season of

2014/2015 was the worst of all athletic seasons with regard to male participation, showing a decrease in all disciplines, with exception for MAG. Therefore, may be the social and economic situation of Portuguese families in those periods of time was not favorable for sport practice (Schubring & Thiel, 2014). Portugal was, and still is, in a terrible socio-economic crisis, which might influence gymnasts sport practice.

Moreover, Weir and colleagues (2010) in a study about the age of sport participation concluded that the number of sport participants might vary due to the cultural importance of different sports with the most capable athletes, the relatively older ones going to sports with the greatest cultural relevance. In addition to physical and cognitive demands, gymnasts should also integrate a high degree of technical (Barker et al., 2014) and artistic skills into their dynamic and aesthetic exercises (Di Cagno et al., 2009).

On the other hand, gymnastics is known to be the oldest sport ever practiced and is often sought to be the better sport to develop physical and mentally the “raw material” at very young ages (Baker et al., 2014; Silva & Paiva, 2015a).

Although not significantly, Portuguese female gymnasts’ participation only increased in GfA and AER in the last athletic season, and the same was demonstrated by male participants in MAG.

Considering that when gymnasts are relatively older, they transfer to other sports (Barker et al., 2014) and that a combination of factors might be responsible for that (Omiya et al., 2014), a problem stands up for the FGP. As mentioned before, age was not available for this study, but it might have a major influence in sport participation (Silva & Barata, 2016).

Education sessions to increase future gymnasts’ participation should be implemented as a new perspective of increasing both female and male

participation in geographical areas with fewer participants.

The limitations of this study should be taken into account when interpreting these results. First, age was not a studied variable. Although its relative effects have been studied (Schorer, Cobley, Büsch, Bräutigam, & Baker, 2009), we assumed that gymnastics’ disciplines would be of greater interest for this publication. Longitudinal studies are being implemented in the FGP in order to study the possible relation between the prevalence of a specific gymnastics’ discipline according to the geographic area and gymnasts’ results in national and international competitions. They would also be interesting and necessary in evaluating gymnastics’ evolution in relation to gender, relative age effects and sport participation.

This study adds additional light on the social, economic and cultural influence of the global economic crisis for sport participation of Portuguese gymnasts, and provides a new insight to reinforce the practice of gymnastics worldwide, in accordance with significant differences between female and male’s participation. Gymnastics should be studied and used as a sport capable of improving participation and combat gender inequalities.

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