WORLD AGE GROUP COMPETITIONS (WAGC) AS A DEVELOPMENT PILLAR FOR TRAMPOLINE GYMNASTICS: ANALYSING NATIONAL FEDERATIONS' RESULTS BETWEEN 1999 AND 2019

Miguel Vicente-Mariño

Universidad de Valladolid, Facultad de Ciencias Sociales, Jurídicas y de la Comunicación, Spain

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Abstract

Trampoline Gymnastics is a consolidated sport within the gymnastics family. Since the International Trampoline Federation (FIT) and the International Gymnastics Federation (FIG) merged in 1999, the growth and expansion of Trampoline Gymnastics have remained constant. In this process, the role played by the World Age Group Competitions (WAGC) is worth to be mentioned, as this event has been established as the main entrance pathway to any gymnast or national federation willing to reach the international elite level. The first edition of these competitions dates back to 1973 in London, and the 27th took place in Tokyo in November 2019. This article aims to explain the key role played by WAGC in the evolution and consolidation of this Olympic sport, by conducting an in-depth analysis of the participation data and medal distribution during the last fourteen editions, all the ones taking place under the FIG umbrella. In order to complete a broader picture of these competitions, a detailed analysis in terms of editions, gender and disciplines is presented. Results return a clear dominance of the Russian Federation national team and a group of international contenders that built up their strong presence at the international scene on top of a constant and well-planned strategy in WAGC. These events have achieved to become part of the sports' internal culture and the education system has incorporated them into all the recommended procedures at the international level.

Keywords: *trampoline gymnastics, age group development, history of gymnastics.*

INTRODUCTION

Trampoline Gymnastics is a well-established sport within the Gymnastics environment, comprising four different, but complementary, disciplines: Individual Trampoline (TRA), Synchronized Trampoline (SYN), Tumbling (TUM) and Double Mini-Trampoline (DMT). Since George Nissen initially developed trampoline as an apparatus to perform acrobatic skills back in the 1930s, the evolution and practice of this sport have constantly grown. The first World Championships in Trampoline Gymnastics took place in 1964 at the Royal Albert Hall in London (United Kingdom), reaching its 34th edition in Tokyo (Japan) in November 2019.

The incorporation of Individual Trampoline in the Olympic Games programme in Sydney 2000 became a milestone that changed the way Trampoline Gymnastics was organized at

the national and international levels. At the institutional level, the merge of the International Trampoline Federation (FIT) as a governing body of Trampoline Gymnastics since 1960s and the International Gymnastics Federation (FIG) completed in 1998 and in force since 1999 is key to understanding how the sport has changed in the last two decades.

This article explores the relevance of the World Age Group Competitions (WAGC) in the consolidation of Trampoline Gymnastics. This event - formerly labelled as World Age Group Games and International Age Group Competitions - completed 27 editions, including Tokyo (JPN), as it is usually staged the week after the World Championships. WAGC turned into a necessary key to understand how educational programmes are conceived and developed. Additionally, its relevant turnout in terms of participation makes it a profitable business for local organizers. Historicizing a crucial event to comprehend Trampoline Gymnastics is the gap that this article is trying to cover.

An overview of the geographical distribution of WAGC events returns interesting information about how Trampoline Gymnastics was established as a sport on the international scene. Nine years after the first World Championships took place in London (GBR) in 1974, the International Trampoline Federation (FIT) put into motion its age group competitions.

Table 1
List of WAGC editions, host cities and national federations (1973-2019).

Edition	Year	Host City	NF	Edition	Year	Host City	NF
1st	1973	London	GBR	14th	1999	Sun City	RSA
2nd	1974	San Mateo	USA	15th	2001	Odense	DEN
3rd	1975	Toronto	CAN	16th	2003	Hannover	GER
4th	1976	Cedar Rapids	USA	17th	2005	Eindhoven	NED
5th	1978	Honolulu	USA	18th	2007	Québec	CAN
6th	1984	Kanazawa	JPN	19th	2009	St. Petersburg	RUS
7th	1986	Moulins	FRA	20th	2010	Metz	FRA
8th	1988	Birmingham	USA	21st	2011	Birmingham	GBR
9th	1990	Dillenburg	FRG	22nd	2013	Sofia	BUL
10th	1992	Auckland	NZL	23rd	2014	Daytona Beach	USA
11th	1994	Vila do Conde	POR	24th	2015	Odense	DEN
12th	1996	Kamloops	CAN	25th	2017	Sofia	BUL
13th	1998	Sydney	AUS	26th	2018	St. Petersburg	RUS
				27th	2019	Tokyo	JPN

The first five editions were hosted in English-speaking countries and cities, as leading authorities in FIT (George Nissen, Jeff Hennessy, etc.) used their own contacts to host these events. It should be noted that at this point in time, WAGC were organized at different times and locations than World Championships. After six years of absence, WAGC reappeared in Kanazawa (JPN) in 1984. Since then, all WAGC editions were organized in connection with World Championships, sharing organizing committees and, most of the times, also location and venues. At the institutional level, the frequency of the event changed from two editions per Olympic cycle to three since 2009.

FIG WAGC Rules remained, to a great extent, constant during the analysed period, but some modifications need to be highlighted: a) the increase in the amount of participating gymnasts in Finals from six to eight established in 2009; b) the

fluctuation in the ages' range in the older age group of the event, starting as an open-ended group of 17-and-plus-years old as a FIT legacy to a 17-18 age group between 2005 and 2015, and currently with a 17-21 age group; and c) the absence of a NF limitation to qualify for the Final Round, opening the chance to the four gymnasts in the individual events and the two pairs in the synchronized events to reach their best rank, regardless of what their teammates have accomplished.

As a valid proof of these competitions' success, FIG has already announced the location of the next three WAGC, to be hosted by Baku (AZE) in 2021, Sofia (BUL) in 2022, and Birmingham (GBR) in 2023.

Scientific research on Trampoline Gymnastics is smaller than the one published about other gymnastics and acrobatics disciplines. Its main focus has traditionally been placed on the technical (Farquharson, 2012; Briggs, 2014; Chen, Guo, Gao, An, Wang & Chen, 2016), physiological (Erkut Atilgan, 2012; Jensen, Scott, Krustrup & Mohr, 2013; Arabatzi, 2018) and biomechanical (Blajer & Czaplicki, 2001; Sands, Varmette, Bogdanis, Donti, Murphy Bryce & Taylor, 2019; Sands, Kelly, Bogdanis, Barker, Donti, McNeal & Penitente, 2019) aspects of the sport, together with a significant attention to injuries and other medical concerns (Hammer; Schwartzbach & Paulev 1981; Chalmers, Hume & Wilson, 1994; Ashby, Pointer, Eager & Day, 2015; Rodríguez-Iniesta, 2016).

Contributions exploring the judging system and how scores are built are also common in the specialized literature. Judging performance attracted the interest of researchers as Heinen & Krepela (2016) who paid special attention to age group gymnasts, aiming to find differences in terms of age and gender in the different factors composing a score for a trampoline exercise. Leskošek, Čuk & Peixoto (2018) analysed judging performance during the men's individual trampoline event at 2014 European Championships in Guimaraes (POR). The classical comparison between human and computer judgement is also present (Johns & Brouner, 2012; Johns & James, 2013)

Ferger & Hackbarth (2017) explored the last factor included in the individual trampoline scoring system, the horizontal displacement. This aspect derived in a comparative analysis of different solutions to measure and build up the final score for a gymnast (Ferger, Helm, and Zentgraf, 2020). The introduction of time of flight as a component of the score in individual trampoline in 2010, and of horizontal displacement in both individual and synchronized events fostered analysis about the impact on gymnasts' performances (Harden & Earnest, 2015)

As far as gymnasts' performances are concerned, interesting research has been published in China identifying effective patterns to maximize the effort during competition (Chen, Zhuo, He & Zeng, 2006; Luo & Wang, 2012; Wang, 2013). However, there is an absence of historical articles exploring and explaining how the sport is developing and how results are shaping up the role played by events and national federations (Esposito & Esposito, 2009). Leading academic databases return scarce bibliography on Trampoline Gymnastics, most of them not directly related with the analysis of historical results in competition.

Bortoleto, Carrara & Roveri (2018) conducted an analysis of the Brazilian performance across recent history, devoting part of it to the WAGC participation. This article is the one with a closer relation to our contribution in these pages. Key works to keep memories about Trampoline Gymnastics alive can be found outside Academia, like Dagmar Nissen Munn's history blog (https://trampolinehistory.blogspot.com/), the joint venture between Acrobatic Sports and Trampoline Pundit (http://www.acrobaticsports.com/) or more recently Trampoline Insight, Nuno Merino

and Steven Gluckstein's YouTube Channel. All these projects are valid sources to collect information regarding the past, present and future of Trampoline Gymnastics, although they are not present in the scholarly publications' circuit. Consequently, this article aims to open a historical research stream on Trampoline Gymnastics, collecting significant data and analysing them as a proof of the evolution of the sport.

METHOD

The purpose of this article is to explore the role played by the WAGC in the consolidation of Trampoline Gymnastics. In order to do so, an in-depth analysis of these competitions was conducted, limiting the historical reach to those editions conducted within the FIG authority. Research questions leading this project were:

1. Which NFs have historically dominated WAGC events?
2. Are there differences in these dominances, in terms of disciplines (individual trampoline, synchronized trampoline, tumbling and/or DMT), of gender (boys and girls) and of age?
3. Are WAGC helping to spread Trampoline Gymnastics worldwide?

Data were gathered from diverse online sources, ranging from official FIG book results reporting the last editions to the useful results' open repertoire provided by Gymnastics Canada (http://www.gymcan.org/disciplines/trampoline/results), which covers most of these competitions. Missing information was found on specific websites' archive (GymMedia.com) and by personal contacts with individuals participating at the events. The final database was published as an open access resource in Zenodo (Vicente-Mariño, 2020) and shared with the Trampoline Gymnastics community in order to identify mistakes and provide an accurate and updated resource.

Data collection was limited to WAGC completed under the FIG umbrella, between 1999 and 2019, covering the fourteen editions conducted since the incorporation of Trampoline Gymnastics in the official Olympic Games' programme. The age structure remained almost constant in this period, allowing the longitudinal comparison across time: the only age group affected by modification was the older one, as explained in the introductory section. Statistical data analysis consisted of frequency measures and descriptive information, presented in several graphic visualizations.

RESULTS

WAGC are the entrance door to the elite sports performance for thousands of young gymnasts. The consolidation of the age group programme is meant to be one of the main strengths of Trampoline Gymnastics. Every edition is attracting around 1000 participants, making a significant contribution to the hosts cities and federations to balance their budget in connection to the expenses necessary to run the World Championships the week before. The figures of the last three editions (Sofia 2017, Saint Petersburg 2018 and Tokyo 2019) return a solid turnout of gymnasts able to travel around the world to compete at the highest possible level. Between 1999 and 2019, 57 National Federations (NFs) competed in WAGC, as detailed in Table 2.

Table 2
Participating National Federations at FIG WAGC (1999-2019).

Year	Host City	NF	Participating NF
1999	Sun City	RSA	24
2001	Odense	DEN	32
2003	Hannover	GER	36
2005	Eindhoven	NED	39
2007	Québec	CAN	31
2009	St. Petersburg	RUS	38
2010	Metz	FRA	34
2011	Birmingham	GBR	35
2013	Sofia	BUL	44
2014	Daytona Beach	USA	37
2015	Odense	DEN	39
2017	Sofia	BUL	43
2018	St. Petersburg	RUS	42
2019	Tokyo	JPN	41

Table 3
Continental participation at FIG WAGC (1999-2019).

Continental Union	NF (WAGC editions with registered participation)
African Gymnastics Union (5)	ALG (7), ANG (3), EGY (5), NAM (6), RSA (13)
Asian Gymnastics Union (9)	CHN (7), HKG (2), JPN (14), KAZ (14), KGZ (1), QAT (6), SGP (1), TPE (1), UZB (10)
European Gymnastics Union (33 plus Scotland-SCO)	ARM (2), AUT (8), AZE (8), BEL (14), BLR (13), BUL (12), CZE (13), DEN (13), ESP (13), EST (9), FIN (11), FRA (14), GBR (14), GEO (12), GER (14), GRE (9), HUN (5), IRL (9), ISR (6), ITA (12), LAT (8), LTU (12), MDA (3), MON (1), NED (14), POL (13), POR (14), RUS (14), SCO (1), SLO (1), SUI (9), SWE (12), TUR (6), UKR (10)
Oceania Gymnastics Union (2)	AUS (14), NZL (13)
Pan-American Gymnastics Union (7)	USA (14), CAN (14), BRA (14), MEX (12), ARG (12), BOL (2), COL (1),

Table 4
WAGC medal table (1999-2019).

Rank	NF	Gold	Silver	Bronze	Rank	NF	Gold	Silver	Bronze
1	RUS	135	117	114	19	BEL	2	8	7
2	GBR	56	67	51	20	DEN	2	3	6
3	USA	52	53	59	21	NED	2	2	7
4	JPN	46	41	35	22	BUL	1	7	6
5	BLR	31	25	17	23	RSA	1	4	5
6	FRA	20	14	30	24	UZB	1	3	0
7	CAN	15	23	16	25	MEX	1	2	1
8	POR	15	11	11	26	SWE	1	0	0
9	CHN	12	12	4	27	TUR	1	0	0
10	AUS	11	12	18	28	POL	0	2	8
11	GER	8	11	10	29	GRE	0	1	3
12	BRA	8	7	10	30	ARG	0	0	2
13	ESP	6	4	8	31	IRL	0	0	2
14	UKR	6	3	5	32	ITA	0	0	2
15	KAZ	5	6	4	33	SUI	0	0	2
16	GEO	4	3	1	34	ISR	0	0	1
17	NZL	3	7	6	35	LTU	0	0	1
18	AZE	3	1	0	36	SCO	0	0	1

WAGC has helped Trampoline Gymnastics to increase its global outreach, as taking part in these events sets a lower technical demand on participants, opening doors to new federations. Continental distribution presents a clear prevalence of European countries, a consequence of the centrality of Europe in the consolidation of this sport, together with the active implication of the United States and Canada, at the very first steps taken, and by some strong NFs in the southern hemisphere, namely Australia, New Zealand and, to a lesser extent, South Africa and Brazil.

The Olympic hopes attracted some new federations during the last decades, being necessary to highlight the increasing participation of Latin American and Asian countries, whereas Africa still struggles to join the international scene under a regular basis. This continental distribution is presented in Table 3.

Thirteen NFs (RUS, GBR, USA, JPN, FRA, CAN, POR, AUS, GER, BRA, KAZ, BEL, NED) competed in the fourteen WAGC editions completed under the FIG umbrella, returning a comprehensive overview of NFs with a solid and long-lasting education and development programme in Trampoline Gymnastics. There are another six NFs (BLR, ESP, NZL, DEN, RSA, POL) missing only one WAGC edition in the selected period. These 19 NFs present a strong evidence of counting with a solid Trampoline Gymnastics programme, being labelled as the core ground of this sport, as a guarantee of a continuum in the medium and long term.

WAGC is usually an event where gymnasts are partially – when not totally - facing all the costs of the participation expenses (entry fee, transport, accommodation and maintenance), as most NFs worldwide are limiting their budgets to their senior national teams. This circumstance is behind the intermittent presence of some NFs that are able to compete at some editions but do not have the resources to take part in some others.

Medals' distribution. During the analysed 14 editions, 1350 medals were awarded. 36 NFs have obtained a medal

during these editions, showing an enriching diversity for a sport aiming to reach and maintain a universal presence. 27 NFs managed to step on the first place of the podium, as Figure XX synthetizes:

Russian Federation has showed a solid dominance during these two decades, leading every WAGC medal table since the incorporation of the age group tournament in the FIG calendar. A total of 366 medals means a 27.1% of the awarded prizes. GBR and USA are distantly following RUS, both of them over the 12% of the total count (174 medals GBR; 164 USA). Japan, Belarus, France and Canada compose a second group, ranging from 9% to 4% of all distributed medals, whereas Portugal, China, Australia and Germany fluctuate between 28 and 41 medals in the two decades under consideration.

Although Table 5 can show some fluctuations in time, the dominance of some NFs remained clear and constant during the selected period, returning a valid picture about the correlation of forces in Trampoline Gymnastics' youth gymnasts.

Needless to say that there are up to 21 NFs that have not managed to step on the WAGC podium yet, despite their active participation in these educational event. As mentioned before regarding participation, medals' distribution by continental union returns a clear picture of the historical evolution of this age group event.

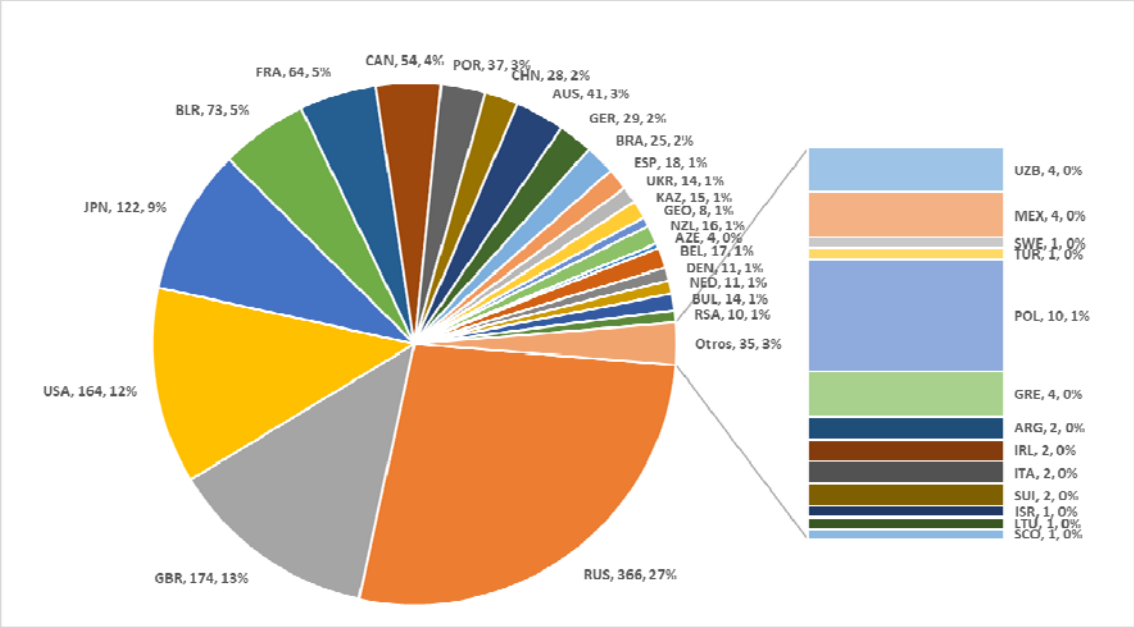

Figure 1. Medals per NF obtained in FIG WAGC in Trampoline Gymnastics (1999-2019).

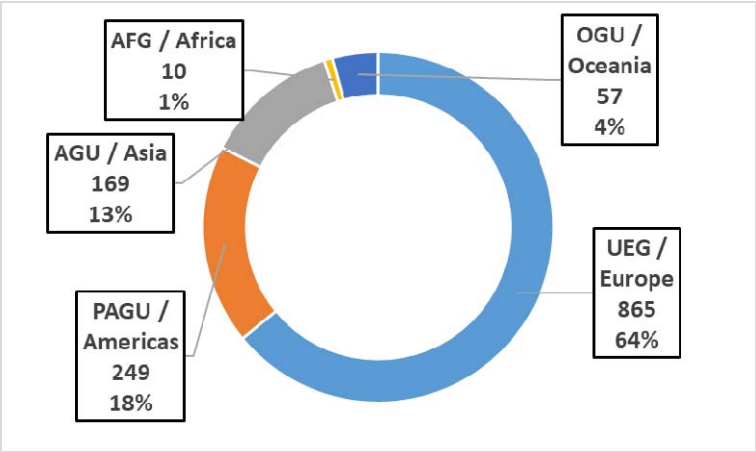

Figure 2. Medals obtained per Continental Union in WAGC (1999-2019).

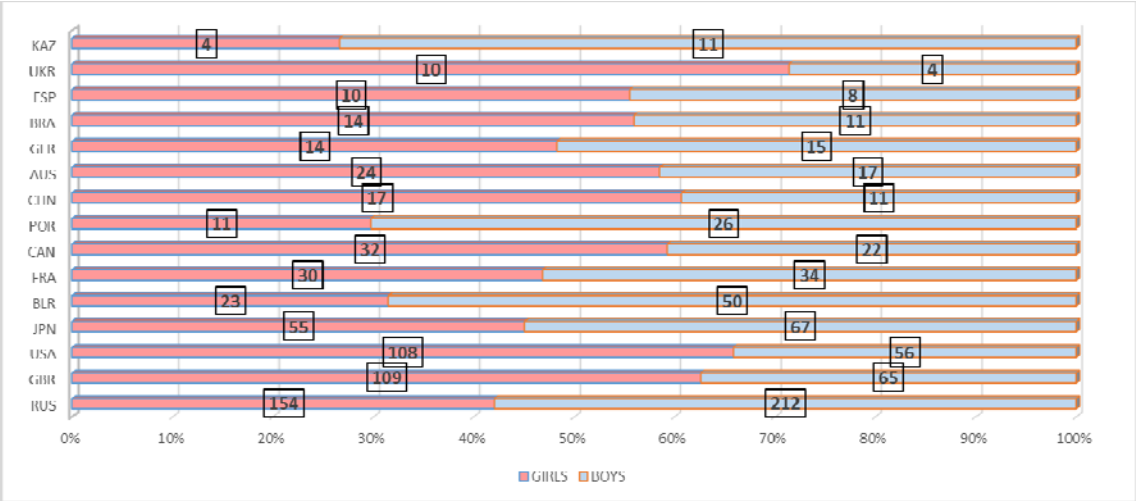

Figure 3. Gender distribution of WAGC medals in Top-15 NFs (N = 1224).

Table 5
Medal distribution between Top 15 NF in WAGC (1999-2019).

	99	01	03	05	07	09	10	11	13	14	15	17	18	19
RUS	13	16	26	33	26	31	28	23	25	23	31	30	34	27
GBR	10	9	15	14	10	9	9	12	9	20	18	16	10	13
USA	19	15	3	11	17	13	13	9	14	16	7	13	9	5
JPN	14	8	8	4	9	9	9	11	8	4	10	6	12	10
BLR	0	5	4	4	1	3	4	2	5	7	10	8	12	8
FRA	15	7	2	3	5	6	3	6	0	2	1	5	3	6
CAN	4	5	5	1	7	5	4	2	7	2	4	4	1	3
POR	4	2	3	3	0	1	3	2	5	6	4	0	2	2
CHN	1	8	5	1	0	0	5	0	6	0	0	0	0	2
AUS	2	4	2	1	5	3	0	3	4	0	2	2	6	7
GER	0	1	2	1	1	1	1	6	3	4	1	2	2	4
BRA	4	3	6	2	0	2	1	3	0	1	1	1	1	0
ESP	0	0	4	1	5	1	1	1	0	1	2	1	1	0
UKR	0	4	3	3	1	2	1	0	0	0	0	0	0	0
KAZ	0	1	2	0	1	1	4	3	1	2	0	0	0	0

Almost two out of three awarded medals (64%) ended up hanging around the necks of gymnasts representing the European continent. American and Asian nations followed the Old Continent in this aggregated level, as NFs representing PAGU obtained 18% of the awarded medals (249) and the four NFs representing AGU that managed to climb to podium positions achieved 13% of the whole medals (169).

The concentration of medals in certain NFs is a signal of the outreach of Trampoline Gymnastics within each continent. Europe is distributing their 865 medals between 24 NFs, whereas in the Americas, 249 medals were obtained by 7 NFs, and in Asia only 4 NFs achieved 169 record. Australia, New Zealand and South Africa are the only Oceanian and African federations stepping up the podium in WAGC history.

Deepening the medal analysis, the 15 top NFs in the medal table were compared in terms of their internal distribution of the 1224 medals they collected out of the total 1350 medals awarded in WAGC events. It is possible to identify different trajectories and strategies among the leading federations in the international scenario.

The most evident is highlighted in red in Table 6, as several national federations are not medalling in some disciplines at all, with some of them not even taking part in these events and developing a national programme on their national soil. This is the evident case in Tumbling and Double Mini Trampoline, both affected by their non-Olympic status. The most impressive performance, however, is coming from the People's Republic of China: this national team has only attended seven of the fourteen WAGC covered, with a reduced number of competing gymnasts who only took part in the individual trampoline event. However, they managed to obtain 28 medals, averaging four per edition and proving an accurate and well-planned strategy oriented towards excellence in their performance and preparation for elite level.

Table 6
Discipline distribution of WAGC medals among Top 15 NFs (N = 1224).

NF	TRA	SYN	TUM	DMT
RUS	84	48	120	114
GBR	34	38	82	20
USA	18	20	51	75
JPN	56	64	0	2
BLR	37	31	5	0
FRA	15	32	17	0
CAN	11	5	5	33
POR	5	6	3	23
CHN	28	0	0	0
AUS	4	8	8	21
GER	8	20	0	1
BRA	2	3	2	18
ESP	3	5	0	10
UKR	7	6	1	0
KAZ	3	3	9	0

Gender distribution of medals within the leading NFs in WAGC confronts us with different scenarios. Kazakhstan, Portugal and Belarus are the three NFs with most of their successes coming from boys' performances (more than 66% of their medals were obtained by male gymnasts), whereas Ukraine, United States and Great Britain are the teams where girls are clinching more medals than their male partners (with 60% or more of the medals obtained by females.

Even this prevalence is not so acute, some NFs (Russian Federation, Japan, France and Germany) are more successful with their boys, while others (Canada, China, Australia, Brazil and Spain) proved to be more effective with their competing girls.

Analysis per discipline. Individual Trampoline is the discipline receiving more attention and a higher funding at the NFs, due to its Olympic status. Consequently, most of the national investment in this sport is addressed to the gymnasts taking part in this event and the highest hopes and expectations are placed on them. Registration figures easily prove that and its priority is something assumed by most of the actors involved in the sport. Russian Federation leads both girls' and boys' overall standings, but Japan is the one holding both second positions in the ranking, comfortably above Great Britain, China and the United States in the girls, and above Belarus, Great Britain and China in the boys. The strength of federations like China and Belarus in the individual trampoline event prove the strategic role played by WAGC in the preparation of gymnasts that will step forward to the senior national team.

Table 7
Internal medal distribution (%) among Top 15 NFs (N = 1224).

NF	GIRLS				BOYS				
	TRA	SYN	TUM	DMT	TRA	SYN	TUM	DMT	TOTAL
RUS	24,7	17,7	27,5	29,9	28,7	15,5	52,0	41,9	29,9
GBR	13,3	14,3	36,6	7,0	8,3	12,0	17,3	5,6	14,2
USA	9,5	8,8	19,6	31,8	1,9	4,9	14,0	15,6	13,4
JPN	14,6	21,8	0,0	0,0	21,0	22,5	0,0	1,3	10,0
BLR	8,2	6,1	0,7	0,0	15,3	15,5	2,7	0,0	6,0
FRA	3,8	9,5	6,5	0,0	5,7	12,7	4,7	0,0	5,2
CAN	4,4	2,0	2,6	11,5	2,5	1,4	0,7	9,4	4,4
POR	1,3	2,0	1,3	2,5	1,9	2,1	0,7	11,9	3,0
CHN	10,8	0,0	0,0	0,0	7,0	0,0	0,0	0,0	2,3
AUS	2,5	2,0	3,3	7,6	0,0	3,5	2,0	5,6	3,3
GER	2,5	6,8	0,0	0,0	2,5	7,0	0,0	0,6	2,4
BRA	0,6	2,0	0,0	6,4	0,6	0,0	1,3	5,0	2,0
ESP	0,6	2,7	0,0	3,2	1,3	0,7	0,0	3,1	1,5
UKR	3,2	3,4	0,0	0,0	1,3	0,7	0,7	0,0	1,1
KAZ	0,0	0,7	2,0	0,0	1,9	1,4	4,0	0,0	1,2
	100	100	100	100	100	100	100	100	100,0

Synchronized Trampoline is under a consistent dominance of Japanese gymnasts, common to boys and girls, that speaks loudly about the relevance attributed to this discipline by this NF. Actually, the numbers of Japan in trampoline events, adding individual and synchronized, place them in the second position behind Russian Federation. The absence of medals in Tumbling and DMT explains, once again, the difference between leading federations in certain disciplines and those federations able to persistently present competitive teams in all disciplines and in all age groups. Following a similar strategy to Japan is Belarus, a federation with an unprecedented success in trampoline events during the last WAGC editions. France and Germany should also be mentioned, as a big part of their overall outcome is also coming from synchronized medals.

The Russian dominance in Tumbling and DMT boys' disciplines is undeniable: obtaining the 52% of the medals in male's Tumbling events during twenty years speaks loudly about a successful technical programme. Similar outcome is observed in DMT, with more than 40% of the medals flying back to Russian soil. This performance is not equalled by girls, as Great Britain in Tumbling and the United States in DMT are leading the historical statistics. Canada, Portugal and Australia rely on a long and solid tradition in DMT to keep their presence among the top NFs in the world of Trampoline Gymnastics.

DISCUSSION AND CONCLUSION

A preliminary analysis of participation in WAGC returns a clear prevalence of European NFs. Promising developments have been identified in both the American (Bortoleto, Carrara & Rovieri, 2018) and Asian Continental Unions, with new NFs reaching WAGC level and joining the experience of leading federations worldwide, such as RUS, USA, CAN and JPN. The FIG investment channelled through the FIG Academies (Fédération International de Gymnastique, 2017) is helping new countries to set Trampoline Gymnastics programmes into motion, and WAGC is always presented as the main first entrance door to the international scene. The constitution of the Oceanian Gymnastics Union in 2019 should be seen as an open door to incorporate new NFs in this geographical area, mainly because the solid experience and tradition encountered in AUS and NZL could lead this development and move Trampoline Gymnastics forward in this area. However, Africa presents an imbalanced distribution, with the traditional presence of RSA, one of the founding federations in the very first steps of the sport, and the intermittent presence of other countries that count with established programmes, but missing budget and stability to consolidate their participation, such as ALG, ANG, EGY or NAM. In any case, targeting a 40 NF participation during the upcoming cycle would be an achievable goal and a good proof of the good health of WAGC in Trampoline Gymnastics.

WAGC performance can be considered as a proxy to understand the recent evolution of Trampoline Gymnastics. The analysis presented in this article returns a clear image about the leading countries worldwide. Russia, Great Britain, USA or Japan are strong contenders. Other NFs relied on a lower presence at WAGC, mainly China, but with some outstanding outcomes. China has topped medal tables in the Olympic discipline, Individual Trampoline, since 2007, under the guidance of a successful generation of gymnasts that are still on top of the World ranking, as Dong Dong (competed in WAGC 2001) or Gao Lei (competed in WAGC 2010). This status quo is not reproduced in Synchronized Trampoline, where the limitations to NF participation (only two pairs can compete) lead to another distribution, with Japan and Belarus proving their vast evolution on

trampolines during the last decade. Tumbling and DMT are clearly dominated by the Russian Federation younger gymnasts, with national federations presenting different strategies in terms of participation and success, privileging one sport over the other, such as France competing only in Tumbling or Australia, Canada or Portugal with a solid and longstanding trajectory in DMT.

More historical and comparative research is necessary to create a critical dialogue about the role played by WAGC in developing Trampoline Gymnastics. The international community share the feeling about its crucial role in development plans of this sport, but scientific literature is still failing to empirically back what is commonly understood among coaches, judges and officials in Trampoline Gymnastics. The scarce published research on this gymnastics sport has prevailed technical and medical matters to the role played by certain events in consolidating a discipline in the long run, as this article claims about World Age Group Gymnastics.

This article calls for more systematic analysis in the future, bringing some challenging questions to the research community interested in Trampoline Gymnastics. First, the analysis of individual trajectories of gymnasts, exploring their performance across time, from its first appearances in WAGC to their main exercises at the elite level. Second, the effects of the Olympic admission of individual trampoline in the Games since Sydney 2000, deepening the emerging inequalities between the four disciplines composing Trampoline Gymnastics. And third, the best way to guarantee a smooth transition between the age group programme to the elite level.

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Corresponding author:

Miguel Vicente-Mariño
Universidad de Valladolid
Plaza de la Universidad, 1.
40005 Segovia (España)
Email: miguel.vicente@uva.es
Tel and fax num: +34637873223

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