

Effects of gender, age and match status on the creation of shooting opportunities during the U17, U20 and senior FIFA World Cup: A multilevel analysis

JOAQUÍN GONZÁLEZ-RODENAS¹, MICHALIS MITROTASIOS², VASILIS ARMATAS² , RAFAEL ARANDA³

¹Centre for Sport Studies. Rey Juan Carlos University. Madrid, Spain.

²School of Physical Education and Sport Science. National and Kapodistrian University of Athens. Athens, Greece.

³Department of Physical Education and Sports. University of Valencia. Valencia, Spain.

ABSTRACT

The aim of this paper was to explore the combined effects of gender, age and match status on the creation of shooting opportunities (SO) during the U17, U20 and senior Soccer FIFA World Cup tournaments. The sample included 1992 team possessions that led to shooting opportunities in 96 matches (48 = men: U17 = 16; U20 = 16; senior = 16; 48 = women: U17 = 16; U20 = 16; senior:16) from the different World Cup tournaments. Multilevel logistic regression models revealed that men's teams had lower odds of implementing fast attacks (Odds ratio (OR) = 0.519; 95% Confidence interval (CI): 0.382-706; $p < .001$) than women teams in comparison with combinative attacks. Men's teams also registered higher odds of completing more passes ($p < .001$) and implementing a higher passing tempo ($p < .001$) than women's teams. As far as the effect of the age, senior (OR = 1.415; 95% CI: 1.010-1.983; $p < .05$) and U20 teams (OR = 3.158; 95% CI: 2.278-4.377; $p < .001$) presented higher odds of counterattacking than U17 teams. Finally, drawing ($p < .05$) and losing teams ($p < .001$) had lower odds of counterattacking than winning teams. In conclusion, men's teams had higher odds of presenting a more combinative style of play than women's teams, as well as senior and U20 teams registered higher odds of counterattacking than U17 teams.

Keywords: Performance analysis of sport, Women's football, Youth, Elite athlete, Sports competitions.

Cite this article as:

González-Rodenas, J., Mitrotasios, M., Armatas, V., & Aranda, R. (2023). Effects of gender, age and match status on the creation of shooting opportunities during the U17, U20 and senior FIFA World Cup: A multilevel analysis. *Journal of Human Sport and Exercise*, 18(4), 941-953. <https://doi.org/10.14198/jhse.2023.184.17>



Corresponding author. School of Physical Education and Sport Science, National and Kapodistrian University of Athens, 41 Ethnikis Antistasis Str., 17237, Dafni Athens. Athens, Greece. <https://orcid.org/0000-0003-1689-729X>

E-mail: v-armatas@phed.uoa.gr

Submitted for publication June 16, 2023.

Accepted for publication July 05, 2023.

Published October 01, 2023 (in press September 04, 2023).

JOURNAL OF HUMAN SPORT & EXERCISE ISSN 1988-5202.

© Faculty of Education. University of Alicante.

doi:10.14198/jhse.2023.184.17

INTRODUCTION

The FIFA World Cup is the highest level and most prestigious tournament in soccer globally (Fett, 2020; Lisi, 2022). The first senior edition for men was held in 1930, while the under-20 (U20) modality started in 1977 and the under-17 (U17) in 1985. Nevertheless, this tournament is relatively new for women, so that the first editions took place in 1991, 2002 and 2008 for the senior, U20 and U17 categories, respectively (Barreira & da Silva, 2016; Scelles, 2021). This late emergence of the different FIFA women's world cup editions reflect how women's international soccer is experiencing a rapid growth in terms of number of participants, professionalism and competitiveness (Barreira & da Silva, 2016; Scelles, 2021).

Due to this fast evolution in the last decades, the attention around women's soccer has stimulated the realization of scientific studies not only to describe its specific characteristics, but also to identify the differences with respect to men's soccer (Okholm Kryger, Wang, Mehta, Impellizzeri, Massey & McCall 2021). To date, the vast majority of research has focused on the physiological and physical side (Lesinki, Prieske, Helm & Granacher, 2017) while only a limited number of studies have investigated the technical and tactical attributes of women's soccer (de Jong, Gastin Angelova, Bruce & Dwyer, 2020; Scanlan, Harms, Cochrane, Wilkie & Ma'ayah, 2020), and its comparison with men (Maneiro & Ardá, 2020; Mitrotasios, González-Rodenas, Armatas & Aranda, 2022).

The existing literature has observed that female players seem to lose the ball more often and to display lower pass completion rates than male players (Bradley et al, 2014; Hjelm, 2011; Pappalardo, Rossi, Natilli & Cintia, 2021). For example, the study of Casal et al (2020) found that women teams in Spanish La Liga registered greater number of transitions related to lower number of successful passes, less passes per possession, as well as higher number of interceptions, defensive challenges, ball loses and recoveries. Also, it is worth mentioning that Pappalardo et al. (2021) observed that women had less play accuracy, shorter ball recovery time and shorter passes than their men counterparts during the last FIFA World Cup tournaments.

However, despite the great importance of creating shooting opportunities (SO) and goals in soccer, there are very few studies that have focused on describing and comparing effective attacking strategies that disorder the defensive team in women's soccer (Maneiro, Losada, Casal, & Ardá, 2021; Iván-Baragaño, Maneiro, Losada, & Ardá, 2021). In this sense, Scanlan et al (2020) found that the average time taken to create a SO was under twelve seconds and that gaining the ball in the middle third was very effective to create a SO during the World Cup in 2015. Also, Mara, Wheeler and Lyons (2012) observed that attacking through the wide areas of the field followed by a cross into a central zone inside the 18-yard box was the most effective strategy for creating SO in women's soccer. As far as gender differences in the creation of SO, the recent study of Mitrotasios, et al. (2022) found that men registered longer duration of team possessions, greater proportion of combinative attacks, as well as more passes per possession and faster passing tempo than women during the UEFA Champions League Competition.

Finally, it is crucial to point out that contextual variables such as match status have been shown to have a strong influence on the team's performance during matches (Fernández-Navarro, Fradua, Zubillaga & McRobert, 2018). In this sense, losing teams present more urgency to attack in order to equalize the score, whereas winning teams could prioritize to retain their advantage by implementing a more defensive behaviour (González-Rodenas, Aranda & Aranda-Malavés, 2020). For this reason, it is key to include the effects of contextual variables on the tactical performance of soccer teams.

At this historical moment where women's soccer is evolving rapidly; further research is necessary to advance in our scientific knowledge about the tactical aspects of women's soccer and their similarities and differences with respect to their men counterparts. This knowledge will help coaches improve and specify the training methods to optimize the technical and tactical preparation of female soccer players in different ages, pushing their development towards the excellence and professionalism in multiple parts of the world. In addition to the scarce research in women's soccer, there is a need not only to explore the tactical characteristics of professional teams but also to investigate youth age groups (Sevil, Praxedes, Garcia-González, Moreno & Del Villar, 2017), such as the U17 and U20 categories during the World Cup. Recent scientific evidence has found that age determines collective tactical behaviour (Praca, Rochael, Francklin, Silva & Andrade, 2021), so that comparing different age groups will help coaches understand the evolution of the tactical demands from the U17 tournament to the senior one.

Therefore, the aim of this paper was to explore the combined effects of gender, age and match status on the tactical development of SO during the U17, U20 and senior Soccer FIFA World Cup tournaments. It is hypothesized that men's teams and senior teams have higher odds of implementing combinative attacks, as well as performing more passes per possession and higher passing tempo than women's teams or younger teams, respectively. Also, the authors hypothesize that drawing and losing teams have lower odds of counterattacking in comparison with winning teams, regardless of gender and the age group.

MATERIALS AND METHODS

Sample

A total of 1992 team possessions that led to the creation of SO from 96 qualifying matches from recent FIFA World Cup tournaments in all categories (U17, U20 and senior) were registered and analysed in this investigation. The team possessions that led to SO were selected by the authors of the study after the complete viewing of the matches. All the tournaments embodied the FIFA regulations and all matches were played in accordance with the laws of the game as laid down by the International Football Association Board (i.e., 90 minutes of duration, three substitutions per team and match, field dimensions of 108 meters of length and 68 of width). On one hand, the women's U17 World Cup (Uruguay, November, 2018; champion: Spain) and the women's U20 World Cup (France, August, 2018; champion: Japan) were played by sixteen teams that formed four groups of four teams from where eight teams qualified for the quarter-finals. On the other hand, the U17 Men's World Cup (Brazil, October, 2019; champion: Brazil), the U20 men's World Cup (Poland, May, 2019; champion: Ukraine) and the senior women's World Cup (France, June, 2019; champion: United States of America) were played by 24 teams and the format included a group-stage formed by four groups of six teams, from where eight teams qualified for quarter-finals. Finally the senior men's World Cup (Russia, June, 2018; champion: France) was played by thirty two teams and the format included a group stage formed by eight groups of four teams from where sixteen teams qualified for the round of 16.

It was considered that a SO was created when the team performed a shot during the team possession. The key inclusion criterion was that team possessions had to include a tactical build-up and development to create SO by means of recovering the ball in open play or restarting the team possession (throw in, goal kick, etc.). According to this criterion, 644 team possession (32.3% of the sample) were excluded from the study because they took place after a set piece (corner kick, indirect free kick, direct free kick or penalty kick). Consequently, a total of 1349 team possessions that took place in open play were included in the study.

Dimensions

A total of three tactical dimensions selected from the REOFUT observational framework (Aranda, González-Rodenas, López-Bondia, Aranda-Malavés, Tudela-Desantes & Anguera, 2019) were analysed to describe development and the end of the team possessions (Table 1).

Table 1. Operational definitions of the categories analysed during the possession development.

Dimension	Category	Definition
Style of play	Counterattack	a) The possession starts by winning the ball in play. b) The progression towards the goal attempts to utilize a degree of imbalance right from start to the end with high tempo (Tenga, Kanstad, Ronglan & Bahr, 2009). c) The circulation of the ball takes place more in depth than in width and the intention of the team is to exploit the space left by the opponent when they were attacking. d) The opposing team does not have the opportunity to minimize surprise, reorganize his system and be prepared defensively.
		a) The possession starts by winning the ball in play or restarting the game. b) The progression towards the goal has a high percentage of non-penetrative (any pass towards any direction that does not past opponent player (s)) and short passes. c) The circulation of the ball takes place more in width than in depth (Sarmiento et al., 2018) and the intention of the team is to disorder the opponent using high number of passes and relatively slow tempo (evaluated qualitatively). d) The opposing team can minimize surprise, reorganize his system and be prepared defensively
	Fast attack	a) The possession starts by winning the ball in play or restarting the game b) The progression towards the goal has high percentage of penetrative passes (passes towards the opponent's goal past opponent player (s)) and short passes. c) The circulation of the ball takes place in width and depth (Sarmiento et al., 2018) but the intention of the team is to disorder the opponent with a reduced number of passes and high tempo (evaluated qualitatively). d) The opposing team can minimize surprise, reorganize his system and be prepared defensively.
		a) The possession starts by winning the ball in play or restarting the game. b) The progression towards the goal is based on one long pass from the defensive players to the forward players (evaluated qualitatively). c) The circulation of the ball takes place more in depth than in width and the intention of the team is to take the ball directly near the goal area to have opportunities of finishing by using reduced number or passes and high tempo. d) The opposing team can minimize surprise, reorganize his system and be prepared defensively.
	Direct attack	
Possession length	Passes per possession	Quantitative number of passes made during the team possession.
Passing tempo	Passing tempo	Average duration (in seconds) that elapses between passes made during the team possession.

The REOFUT instrument is a validated observational tool for the tactical analysis in soccer and it has been used in multiple studies to evaluate different aspects such as the tactical effectiveness to create SO in multiple competitions (González-Rodenas, Aranda Malavés, Tudela-Desantes, Calabuig, Sanjurjo & Aranda, 2019), the tactical indicators related to goal scoring (González-Rodenas, López-Bondia, Aranda-Malavés, Tudela-Desantes, Sanz-Ramirez & Aranda, 2020) the tactical differences between top European Leagues (Mitrotasios, González-Rodenas, Armatas & Aranda, 2019) as well as to compare between women and men in the creation of SO during the UEFA Champions League (Mitrotasios et al., 2022).

Match performance analysis

The study was based on systematic observation (Anguera & Hernandez-Mendo, 2013) and its design is nomothetic (several games), point (one game for each pair of teams, and within-session recording throughout the game), and multidimensional (the dimensions correspond with the criteria of the observation instrument). Lince software was used to register and save the data (Soto-Fernandez, Camerino, Iglesias, Anguera & Castañer, 2021).

For the analysis, a researcher experienced in match performance analysed each possession post-event as many times as necessary. The observer was trained during four weeks in the use of the REOFUT tool by the principal researchers of this study. The training included theoretical lessons and practical instruction, following the guidelines of specific studies about observational methodology (Chacón-Moscoso et al., 2019). The analysis was carried out during three months with an average of 170 teams' possessions analysed each week. Regarding the reliability of the data, inter-observer and intra-observer analysis were performed by analysing 100 team possessions (5% of the sample) that were selected randomly from the total sample. In this sense, this analysis showed very good level of reliability according to Altman criteria (Altman, 1991) (inter-observer Kappa coefficient = 0.92-0.97; intra-observer Kappa coefficient = 0.85-0.87).

Statistical analysis

SPSS 20.0 program (SPSS, Chicago, IL) was used to organize and analyse the data. For categorical variables, descriptive statistics including frequencies and confidence intervals for each dependent variable were calculated. For numerical variables, means and standard deviation were calculated to describe the sample.

Due to the hierarchal structure of ball possessions in soccer (each team has its own tactical style), multilevel modelling was carried out to cluster the team possessions (Level 2) within teams (Level 1) (Sommet & Morselli, 2017). With this organization of the data, multivariate logistic regressions were created to predict the effect of the gender (men vs women), age (U17 vs U20 and senior) and match status (winning vs losing, and drawing) (fixed effects) on the attacking style of play implemented by the teams (0 = combinative attack, 1 = fast attack, 2 = counterattack, 3 = direct attack). Also, multilevel mixed liner models were created to predict the effect of gender, age and match status on the number of passes per possession and the passing tempo.

RESULTS

Table 2 shows the descriptive analysis of the sample in relation to different tactical dimensions implemented when creating shooting opportunities. In general, the most used attacking style by teams was the combinative attack (45.2%) followed by the counterattack (30.5%), fast attack (20.7%) and direct attack (3.6%). Men registered higher proportion of combinative attacks than women (50.4% vs 39.8%) and lower proportion of fast attacks (26.1% vs 15.5%). As far as the age differences were concerned, U17 teams had a higher

proportion of combinative attacks but a lower proportion of fast attacks and counterattacks than U20 and senior teams. Finally, losing teams registered a higher proportion of combinative attacks and lower proportion of counterattacks than teams that were drawing or winning.

Men's teams registered higher proportion of volleys and headers than women's teams while U17 teams finished their shots more frequently with the ball on the ground, in comparison with senior and U20 teams. Furthermore, winning teams had a slightly higher proportion of shooting opportunities with the ball on the ground than losing and drawing teams. In general, team possessions that created a shooting opportunity included 5.2 ± 4.1 passes per possession, while a pass was made each 4.4 ± 2.9 .

Table 2. Descriptive statistics for the variables “type of attack”, “final action”, “passes per possession” and “passing tempo” (n = 1348).

Type of attack (%)	Gender		Age			Match status		
	Men	Women	Senior	U20	U17	Losing	Drawing	Winning
Combinative attack	50.4	39.8	50.1	29.6	56.5	48.3	46.7	39.7
Fast attack	15.5	26.1	20.6	24.7	16.8	25.6	18.3	19.5
Counterattack	30.3	30.6	28.3	39.3	23.6	22.7	30.8	37.9
Direct attack	3.8	3.5	1	6.3	3.1	3.4	4.2	2.9
Passes (M \pm SD)	5.9 \pm 4.6	4.4 \pm 3.3	5.7 \pm 4.4	4.8 \pm 3.6	5.2 \pm 4.3	5.3 \pm 3.9	5.4 \pm 4.1	4.9 \pm 4.2
Passing tempo (M \pm SD)	4.2 \pm 2.6	4.5 \pm 3.1	4.3 \pm 2.2	4.1 \pm 2.7	4.7 \pm 3.4	4.2 \pm 2.2	4.5 \pm 3.5	4.5 \pm 2.4

Table 3 shows the interactive effects of gender, age and match status on the attacking style implemented by teams in comparison to the combinative attack. In this sense, Men's teams presented lower odds of implementing fast attacks than women in comparison with combinative attacks (OR: 0.519, 95% CI = 0.382-0.706; $p < .001$). Senior (OR: 1.415, 95% CI = 1.010-1.983; $p < .05$) and U20 teams (OR: 3.158, 95% CI = 2.278-4.377; $p < .05$). had higher odds of counterattacking than U17 teams in comparison with combinative attacks. Also, U20 teams presented higher odds of implementing fast attacks and direct attacks than U17 ones. Regarding the effect of match status, losing and drawing teams presented lower odds of attacking by counterattacks than winning teams, in comparison with combinative attacks.

Table 3. Multilevel multinomial logistic regression predicting the type of attack (Multivariate analysis).

		Type of attack		
		Fast attacks	Counterattacks	Direct attacks
		OR (95% CI)	OR (95% CI)	OR (95% CI)
Gender	Men	0.519 (0.382-0.706)***	0.932 (0.706-1.230)	1.125 (0.596-2.126)
	Women			
Age	Senior	1.324 (0.913-1.921)	1.415 (1.010-1.983)*	0.386 (0.124-1.202)
	U20	2.441 (1.698-3.508)***	3.158 (2.278-4.377)***	4.091 (2.073-8.074)***
	U17			
Match status	Losing	1.116 (0.756-1.647)	0.465(0.323-0.668)***	1.253 (0.589-2.669)
	Drawing	0.888 (0.615-1.282)	0.692 (0.508-0.943)*	0.625 (0.443-0.883)
	Winning			
Intercept		0.437 (0.298-0.640)	0.625 (0.443-0.883)	0.046 (0.20-0.109)

Note. OR = Odds Ratio; CI = Confidence interval for odds ratio; * = $p > .05$ ** = $p > .01$ *** = $p > .001$.

Table 4 present the interactive effects of gender, age and match status on the number of passes per possession and passing tempo of possessions that created SO. It can be observed significant effects of

gender (men vs women; $p < .001$) and match status (losing teams vs winning teams; $p < .05$) on the number of passes per possession when creating SO. In addition, It can be observed that gender and age show significant effects on the speed between passes.

Table 4. Multilevel mixed linear model to predict the number of passes per possession and passing tempo according to the gender, age and match status.

			β	SE	t	P	(95% CI)
Passes per possession	Gender	Men	1.604	0.2597	6.177	0	(1.095-2.113)
		Women					
	Age	Senior	0.362	0.312	1.159	0.247	(-0.250-0.974)
		U20	-0.173	0.2889	-0.6	0.548	(-0.740-0.393)
		U17					
	Match status	Losing	0.744	0.31	2.399	0.017	(0.136-1.352)
		Drawing	0.491	0.269	1.825	0.068	(-0.037-1.019)
		Winning					
Intercept		3.687	0.3536	10.428	0	(2.994-4.381)	
Passing tempo	Gender	Men	-0.41	0.1726	-2.376	0.018	(-0.749-0.072)
		Women					
	Age	Senior	-0.441	0.2096	-2.105	0.035	(-0.853-0.030)
		U20	-0.715	0.2004	-3.566	0	(-1.108-0.322)
		U17					
	Match status	Losing	-0.268	0.2205	-1.215	0.225	(-0.701-0.165)
		Drawing	0.059	0.1977	0.296	0.767	(-0.329-0.447)
		Winning					
Intercept		5.111	0.2198	23.256	0	(4.680-5.542)	

Note. β = Coefficient; SE = Standard error; CI = Confidence interval for coefficient.

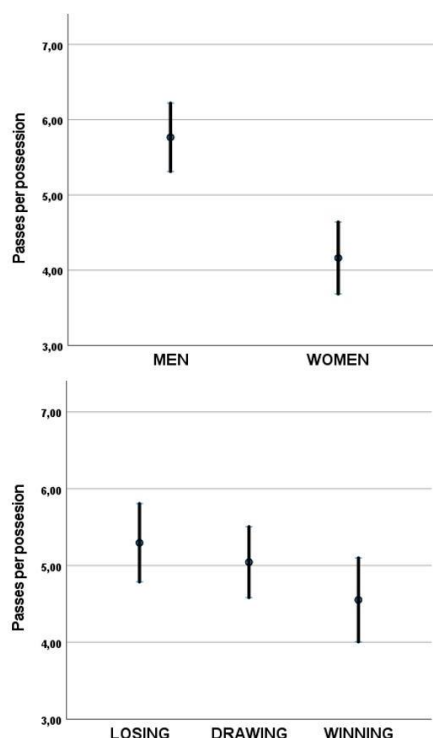


Figure 1. Estimated values and confidence intervals in relation to the effects of gender and match status on the number of passes per possession.

In this regard, Figure 1 shows, how, after controlling for the rest of variables, men teams had higher estimated values of passes per possession than women's teams. Regarding match status, winning teams registered lower passing rate per possession than drawing and especially, losing teams.

Figure 2 shows how, after controlling for the rest of the variables, men's teams had estimated higher passing tempo than their women counterparts. Also, figure 2 shows that senior and U20 teams had higher estimated values of passing tempo than U17 teams.

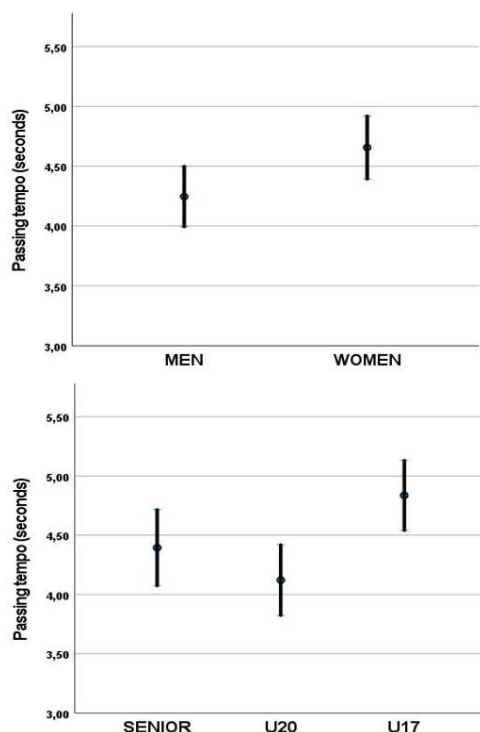


Figure 2. Estimated values and confidence intervals in relation to the effects of gender and age on the passing tempo.

DISCUSSION

The aim of this investigation was to explore the combined effects of gender, age and match status on the tactical development of shooting opportunities (SO) during the U17, U20 and senior Soccer FIFA World Cup tournaments. Our findings showed that men's teams had higher odds of presenting a more combinative style of play than women's teams. Also, senior and U20 teams registered higher odds of achieving SO by counterattacking than U17 teams. In addition, losing and drawing teams had more probabilities to attack by combinative attacks than winning teams.

During the development of team possessions, men's teams presented lower odds of progressing by fast attacks, as well as higher estimated probabilities to perform more passes per possession and with higher passing tempo. Previous studies coincided in highlighting that in general, women teams made fewer passes per possession (Casal et al., 2020), probably due to registering more proportion of unsuccessful ones than men teams (Hjelm, 2011; Pappalardo et al., 2021). In terms of creating goal scoring opportunities, Mitrotasios et al (2022) found similar results to our study, demonstrating that women teams registered less proportion of combinative attacks and fewer passes per possession than men's teams. In this sense, women teams seem

to have a more vertical and quick attacking style of play, with lower number of passes but more penetrating ones. In fact, a recent study (Ivan-Baragaño et al., 2021) observed that the greatest probability of finishing ball possessions successfully during the 2019 FIFA Women's World Cup occurred when teams started their possessions in the opponent's half and had an initial offensive intention to progress quickly towards the goal after recovering the ball. In the same line, Maneiro et al. (2021) revealed that the most successful possessions during the 2015 Women's World Cup were those that were made in the offensive zone, with a clear intention to progress towards the opposing goal and registering low number of passes. In the same tournament, Scalan et al (2020) observed that the average time taken to create a GSO was under twelve seconds during the 2015 FIFA Women's World Cup. All this scientific information points out how women teams' possessions are characterized by their quickness and verticality to create GSO. Our study confirms these findings not only for the senior teams, but also for the U17 and U20 categories.

These differences during team possessions between women's and men's teams may be due to the still early technical and tactical development of women's soccer, consequence of its shorter trajectory in FIFA World Cup in comparison with men's soccer (Mitrotasios et al., 2022). In this sense, the higher passing quantity and quality of male players may be due to the fact that national teams in the men's World Cup are mainly composed of professional players, while several female national teams are composed of non-professional players or professional players for a short time (Pappalardo et al., 2021). Nevertheless, some technical and tactical differences between gender may be due to natural physical and physiological factors (Kinkerdall, 2017). For instance, Pedersen, Aksdal & Stalsbert (2019) argued that most differences between men's and women's soccer can be explained by women having to adapt to rules and regulations that are suited for men and their physical attributes. According to these authors, we should not expect women's soccer to be exactly like men's. For this reason, differences between men and women in soccer should be interpreted with caution and knowing that the spatio-temporal adaptations of women to the constraints of the game may not be equally compared to men (Mitrotasios et al., 2022). In this way, it can be natural and logical that women's soccer has their own technical and tactical style and identity, regardless of how soccer is played by their men counterparts. Within their own style, women's soccer is experiencing an increase in competitiveness among the FIFA World Cup tournaments since the first edition in 1991 (De Araujo & MieBen, 2017).

As far as the effects of the age are concerned, our study found that senior and U20 teams had higher odds of progressing by means of counterattacks than U17 teams in comparison with combinative attacks. Also, senior and U20 teams had a higher passing tempo than U17 teams. These tactical aspects may be related to the evolution of the match demands as the age and the competitive level increases. In this regard, previous studies found that older age groups present higher density of players and higher individual and collective performance (Praca et al., 2021), what may require a higher passing tempo to disorder the defensive team and progress towards the goal. Furthermore, it seems that older age groups tend to cover larger surface area, as well as positioned themselves wider and deeper than younger age groups (Olthof, Frencken & Lemmink, 2015). Our study revealed that the transitions moments seem to gain more importance to achieve SO as the age increases during the World Cup tournaments, regardless of the gender and match status.

Regarding the influence of match status, the present study found how losing and drawing teams had lower odds of progressing by counterattacks in comparison with combinative attacks, as well as higher estimated number of passes per possession than winning teams. In accordance with our results, the study of Gonzalez-Rodenas et al (2020) observed that winning teams had higher odds of implementing counterattacks rather than combinative attacks. Other previous studies observed that losing teams had more ball possession than winning teams (Kubayi & Toriola, 2019; Paixao, Sampaio, Almeida & Duarte, 2015), probably because they need to take the initiative and dominate the ball possession to change the match score, reducing the number

of counterattacks and increasing the positional attacks. Otherwise, the winning teams would prioritize to defend their advantage by reinforcing their defensive system, what at the same time would create an ideal scenario to perform more counterattacks.

This study presents several limitations. On one hand, our investigation only included in the analysis those team possessions that produced SO, so that other possible gender similarities and differences during the rest of team possessions are not shown in this paper. On the other hand, the fact of using observational methodology to register the technical and tactical indicators of the game may not capture the interactive, multifactorial and complex nature of soccer (Glazier, 2010; Vilar, Araujo, Davids & Button, 2012).

Nevertheless, our study provides important findings for soccer coaches, researchers, and practitioners. The insights of this paper can help soccer coaches know how women's and men's teams from different age groups behave tactically to achieve offensive performance, under the effects of match status. These insights can help them in the design of training sessions and prepare match strategies. In addition, this paper provides novel findings about the creation of SO in women's soccer, contributing to advance in the analysis and production of scientific knowledge about the technical and tactical performance of female players during the most prestigious tournament in the planet, the FIFA World Cup.

CONCLUSION

According to the results of this study, it can be concluded that there were combined effects of gender, age and match status on the development of SO in the U17, U20 and senior World Cup tournaments. On one hand, men's teams presented lower odds of progressing by fast attacks and registered higher estimated values of passes per possession and passing tempo than women. On other hand, senior and U20 teams registered higher odds of progressing by counterattack and higher passing tempo than U17 teams. Finally, losing and drawing teams had lower odds of progressing by counterattack than winning teams.

AUTHOR CONTRIBUTIONS

Joaquin Gonzalez-Rodenas: preparation and research design, statistical analysis, result interpretation, manuscript writing, reviewed the final version. Michalis Mitrotasios: data collection, manuscript writing. Vasilis Armatas: preparation and research design, data collection, manuscript writing, result interpretation, reviewed the manuscript. Rafael Aranda: statistical analysis, reviewed the manuscript. All authors have read and agreed to the published version of the manuscript.

SUPPORTING AGENCIES

No funding agencies were reported by the authors.

DISCLOSURE STATEMENT

No potential conflict of interest were reported by the authors.

REFERENCES

- Altman, D.G. (1991). Some common problems in medical research. In D.G. Altman (ed.), *Practical statistics for medical research* (pp. 403-409). London: Chapman & Hall.

- Anguera, M. T., & Hernández-Mendo, A. (2013). La metodología observacional en el ámbito del deporte [Observational methodology in sport sciences]. *E-Balonmano.com: Revista de Ciencias del Deporte*, 9, 135-160.
- Aranda, R.; González-Ródenas, J.; López-Bondía, I.; Aranda-Malavés, R.; Tudela-Desantes, A., & Anguera, M. T. (2019). "REOFUT" as an observation tool for tactical analysis on offensive performance in soccer: mixed method perspective. *Frontiers in Psychology*. 10, 1476. <https://doi.org/10.3389/fpsyg.2019.01476>
- Barreira, J., & da Silva, C. (2016). National teams in Women's Soccer World Cup from 1991 to 2015: participation, performance and competitiveness. *Journal of Physical Education & Sport*, 16(3), 795-799. <https://doi.org/10.7752/jpes.2016.03126>
- Casal, C.A.; Losada, J.L.; Maneiro, R., & Ardá, A. (2020). Gender differences in technical-tactical behaviour of La Liga Spanish football teams. *Journal of Human Sport & Exercise*, 16(1): 37-52. <https://doi.org/10.14198/jhse.2021.161.04>
- Chacón-Moscoso, S., Anguera, M. T., Sanduvete-Chaves, S., Losada, J. L., Lozano-Lozano, J. A., & Portell, M. (2019). Methodological quality checklist for studies based on observational methodology (MQCOM). *Psicothema*, 31(4), 458-464. <https://doi.org/10.7334/psicothema2019.116>
- De Araujo, M., & MieBen, K.M., (2017). Twenty years of the FIFA Women's World Cup: An outstanding evolution of competitiveness. *Women in Sport & Physical Activity Journal*, 25(1), 60-64. <https://doi.org/10.1123/wspaj.2015-0047>
- de Jong, L.M.S.; Gastin, P.B.; Angelova, M.; Bruce, L., & Dwyer, D.B. (2020). Technical determinants of success in professional women's soccer: A wider range of variables reveals new insights. *PLoS ONE*, 15(10), e0240992. <https://doi.org/10.1371/journal.pone.0240992>
- Fernández-Navarro, J.; Fradua, L.; Zubillaga, A., & McRobert, A.P. (2018). Influence of contextual variables on styles of play in soccer. *International Journal of Performance Analysis in Sport*, 18(3) 423-436. <https://doi.org/10.1080/24748668.2018.1479925>
- Fett, M. (2020). The game has changed-a systematic approach to classify FIFA World Cups. *International Journal of Sport Policy and Politics*, 12(3), 455-470. <https://doi.org/10.1080/19406940.2020.1784978>
- Glazier, P.S. (2010). Game, set and match? Substantive issues and future directions in performance analysis. *Sports Medicine*, 40, 625-634. <https://doi.org/10.2165/11534970-000000000-00000>
- González-Ródenas, J.; Aranda, R., & Aranda-Malaves, R. (2020). The effect of contextual variables on the attacking style of play in professional soccer. *Journal of Human Sport and Exercise*, 16(2): 399-410. <https://doi.org/10.14198/jhse.2021.162.14>
- González-Rodenas, J.; Aranda, R.; Tudela-Desantes, A.; Calabuig-Moreno, F.; Sanjurjo, C. A. C., & Aranda, R. (2019). Effect of match location, team ranking, match status and tactical dimensions on the offensive performance in Spanish 'La Liga' soccer matches. *Frontiers in Psychology*, 10, 2089. <https://doi.org/10.3389/fpsyg.2019.02089>
- González-Ródenas, J.; López-Bondía, I.; Aranda- Malavés, R.; Tudela, A.; Sanz-Ramírez, E., & Aranda, R. (2020). Technical, tactical and spatial indicators related to goal scoring in European elite soccer. *Journal of Human Sport & Exercise*, 15(1), 186-201. <https://doi.org/10.14198/jhse.2020.151.17>
- Hjelm, J. (2011). The bad female football player: women's football in Sweden. *Soccer & Society*, 12(2): 143-158. <https://doi.org/10.1080/14660970.2011.548352>
- Iván-Baragaño, I.; Maneiro, R.; Losada, J.L., & Ardá, A. (2021). Multivariate analysis of the offensive phase in high-performance women's soccer: a mixed methods study. *Sustainability*, 13, 6379. <https://doi.org/10.3390/su13116379>
- Kirkendall, D. T. (2007). Issues in training the female player. *British Journal of Sports Medicine*, 41, i64-i67. <https://doi.org/10.1136/bjism.2007.036970>

- Kubayi, A., & Toriola, A. (2019). The influence of situational variables on ball possession in the South African Premier Soccer League. *Journal of Human Kinetics*, 27 (66), 175-181. <https://doi.org/10.2478/hukin-2018-0056>
- Lesinski, M.; Prieske, O.; Helm, N., & Granacher U. (2017). Effects of soccer training on anthropometry, body composition, and physical fitness during a soccer season in female elite young athletes: a prospective cohort study. *Frontiers in Physiology*, 8, 1093. <https://doi.org/10.3389/fphys.2017.01093>
- Lisi, C. (2022). *The FIFA World Cup: A History of the Planet's Biggest Sporting Event*. Rowman & Littlefield.
- Maneiro, R.; Losada, J.L.; Casal, C.A., & Ardá, A. (2021). Identification of explanatory variables in possession of the ball in high-performance women's football. *International Journal of Environmental Research & Public Health*, 18(11), 5922. <https://doi.org/10.3390/ijerph18115922>
- Mara, J.; Wheeler, K., & Lyons, K. (2012). Attacking strategies that lead to goal scoring opportunities in high level women's football. *International Journal of Sports Science & Coaching*, 7(3), 565-578. <https://doi.org/10.1260/1747-9541.7.3.565>
- Mitrotasios, M.; Gonzalez-Rodenas, J.; Armatas, V., & Aranda, R. (2019). The creation of goal scoring opportunities in professional soccer. Tactical differences between Spanish La Liga, English Premier League, German Bundesliga and Italian Serie A. *International Journal of Performance Analysis in Sport*, 19(3), 452-465. <https://doi.org/10.1080/24748668.2019.1618568>
- Mitrotasios, M.; González-Rodenas, J.; Armatas, V., & Aranda, R. (2022). Creating goal scoring opportunities in men and women UEFA Champions League soccer matches. Tactical similarities and differences. *RETOS, Nuevas tendencias en Educación Física, Deporte y Recreación*, 43, 154-161. <https://doi.org/10.47197/retos.v43i0.88203>
- Okholm Kryger, K., Wang, A., Mehta, R., Impellizzeri, F. M., Massey, A., & McCall, A. (2021). Research on women's football: a scoping review. *Science and Medicine in Football*, 1-10. <https://doi.org/10.1080/24733938.2020.1868560>
- Olthof, S.B.H.; Frencken, W.G.P., & Lemmink, K.A.P.M. (2015). The older, the wider: On-field tactical behavior of elite-standard youth soccer players in small-sided games. *Human Movement Science*, 41, 92-102. <https://doi.org/10.1016/j.humov.2015.02.004>
- Paixão, P.; Sampaio, J.; Almeida, CH., & Duarte, R. (2015). How does match status affects the passing sequences of top-level European soccer teams? *International Journal of Performance Analysis in Sport*. 15(1), 229-240. <https://doi.org/10.1080/24748668.2015.11868789>
- Pappalardo, L.; Rossi, A.; Natilli, M., & Cintia, P. (2021). Explaining the difference between men's and women's football. *PLoS ONE*, 16(8), e0255407. <https://doi.org/10.1371/journal.pone.0255407>
- Pedersen, A. V.; Aksdal, I. M., & Stalsberg, R. (2019). Scaling demands of soccer according to anthropometric and physiological sex differences: a fairer comparison of men's and women's soccer. *Frontiers in Psychology*, 10, 762. <https://doi.org/10.3389/fpsyg.2019.00762>
- Praça, G.; Rochaël, M.; Francklin, G.; Silva, T. R. D., & Andrade, A. G. P. D. (2021). The influence of age group and match period on tactical performance in youth soccer: A full season study. *Proceedings of the Institution of Mechanical Engineers, Part P: Journal of Sports Engineering and Technology*, 17543371211024021.
- Sarmiento, H.; Figueiredo, A.; Lago-Peñas, C.; Milanovic, Z.; Barbosa, A.; Tadeu, P., & Bradley, P.S. (2018). Influence of tactical and situational variables on offensive sequences during elite football matches. *The Journal of Strength & Conditioning Research*, 32(8), 2331-2339. <https://doi.org/10.1519/JSC.0000000000002147>
- Scanlan, M.; Harms, C.; Cochrane, W. J., & Ma'ayah F. (2020). The creation of goal scoring opportunities at the 2015 women's World Cup. *International Journal of Sports Science & Coaching*, 15(5-6): 803-808. <https://doi.org/10.1177/1747954120942051>

- Scelles, N. (2021). Policy, political and economic determinants of the evolution of competitive balance in the FIFA women's football World Cups. *International Journal of Sport Policy and Politics*, 13(2), 281-297. <https://doi.org/10.1080/19406940.2021.1898445>
- Sevil-Serrano, J.; Praxedes, A.; Pizarro, A.; García-González, L.; Moreno Dominguez, A., & del Villar Álvarez, F. (2017). Evolution of tactical behavior of soccer players across their development. *International Journal of Performance Analysis in Sport*, 17(6), 885-901. <https://doi.org/10.1080/24748668.2017.1406781>
- Sommet, N., & Morselli, D. (2017). Keep calm and learn multilevel logistic modeling: A simplified three-step procedure using Stata, R, Mplus and SPSS. *International Review of Social Psychology*, 30(1), 203-218. <https://doi.org/10.5334/irsp.90>
- Soto-Fernández, A.; Camerino, O.; Iglesias, X.; Anguera, M. T., & Castañer, M. (2021). LINCE PLUS software for systematic observational studies in sports and health. *Behavior Research Methods*, 54(4), 1263-1271. <https://doi.org/10.3758/s13428-021-01642-1>
- Tenga, A.; Kanstad, D.; Ronglan, L. T., & Bahr, R. (2009). Developing a new method for team match performance analysis in professional soccer and testing its reliability. *International Journal of Performance Analysis in Sport*, 9(1), 8-25. <https://doi.org/10.1080/24748668.2009.11868461>
- Vilar, L.; Araujo, D.; Davids, K., & Button, C., (2012). The role of ecological dynamics in analysing performance in team sports. *Sports Medicine*, 42(1), 1-10. <https://doi.org/10.2165/11596520-000000000-00000>

