

Comparison and assessment of the setting zone choices by elite male and female volleyball setters in relation to the reception quality

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Abstract: The purpose of this study was to compare and assess of the setting zone choices by male and female elite setters, in relation to the reception quality. A three-member group of experienced coaches assessed the actions of male (M) and female (F) setters and receivers from 20 volleyball games (M = 10, F = 10) of National Teams competing in the final phase of World League 2017. The assessment was based on a 5-point rating scale (Eom & Schutz, 1992) and included actions that composed a set of 2 contacts in Complex I (M = 1301, F = 1325). Intra-rater and inter-rater reliability coefficients were found to be $r=0.983$ and $r=0.984$ respectively, indicating very high consistency in the assessment procedure. The test of independence for the categorical variables (setting zones and reception quality) was carried out using the Fishers exact test. Following the overall independence test we tested the difference in proportions between men and women for each level of the “setting zone” variable using the statistical package Statgraphics Plus v. 5.1. Results showed that irrespective of the reception quality, men setters preferred to set the ball to zones 1 and 6 more frequently compared to women. This demonstrated that they have incorporated the setting to positions 1 and 6, into their offensive strategy, in order to increase the offensive opportunities of their team multiplying the number of attackers. On the other hand women under moderate and good reception conditions transferred the ball to positions 4 and 6 while under very good and/or optimal conditions preferred the setting to position 2.

Key Words: volleyball, elite, setting zone, reception, gender

Introduction

Volleyball is probably one of the most popular sports in the world (Reeser & Bahr, 2003). Therefore, numerous studies have investigated players' performance with the aim to determine the factors that will result in improving the effectiveness of training and, consequently, competition. Among those factors, service reception has been found to affect the performance of the set, in terms of quality, the strategy of the setter and the effectiveness of the attack (McGown, 1974; Papadimitriou, Pashali, Sermaki, Mellas, & Papas, 2004; Barzouka, Nikolaidou, Malousaris, & Bergeles, 2006; Zetou, Moustakidis, Tsigilis, & Komninakidou, 2007). In addition, several studies have found an association between reception effectiveness and its effects on the result of the match (Silva, Lacerda, & João, 2014). Another important factor that determines the next actions' efficacy and up to a certain level the final result of the game, is the setting (Buscà & Febrer, 2012; Silva, Lacerda, & João, 2013; Palao, Santos, & Urena, 2005). Setting is an essential action in volleyball, not only from the technical point of view, but also from the tactical, as it affects the attack, being the setter the specialist player who is responsible for organising the game (Buscà & Feber, 2012; Silva et al., 2013). It is not uncommon to hear the claim that he or she is 'the brain in the team' (Vujmilovic & Karalic, 2013). The setter is the player that takes the majority of tactical decisions as he or she is responsible for deciding where the ball is to be passed. The setter has to evaluate the limitations encountered in agreement with the game context (Afonso, Mesquita, Marcelino, & Silva, 2010), seeking, with his or her action, to impair the attack-defence of the opposite team (Palao & Martinez, 2013). The higher the performance of the setter, the higher the performance of the attackers in both genders (Bergeles, Barzouka, & Nikolaidou, 2009). Regardless of the previous action efficacy, high-level setters are able to achieve optimum sets from inappropriate preconditions (Papadimitriou et al., 2004; Palao, Santos, & Urena, 2004, 2005; Zetou, Moustakidis, Tsigilis, & Komninakidou, 2006). This results in the setters being able to diversify the attack of their teams, producing a high variability of the setting action (Marcelino, Sampaio, & Mesquita, 2012). This variability causes the teams to be less predictable in attack (Marcelino, Afonso, Moraes, & Mesquita, 2014), destabilizing the opposing block (Mesquita & Graça, 2002).

The reception is the first action of a team after the opponent serve (Zetou et al., 2006). This action is the first inside the complex I (KI or side-out: defined as the situation when the team that receives the serve performs in a sequential order the actions of reception, second set and attack), being the main weapon to counteract the serve. The reception is essential, since it is considered an intermediate action because, through this, a direct point

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cannot be obtained (Mesquita, Manso, & Palao, 2007; Palao & Martínez, 2013). Game analyses have shown that attack success correlates positively with an excellent serve reception because both variables increase the probability of scoring (Mesquita et al., 2007; Papadimitriou et al., 2004). It was further observed that receptions allowing organized play and powerful attacks reduce game continuity. In this sense, the quality of reception constrains the possibilities of attack, as has been demonstrated previously (Rocha & Barbanti, 2004, 2006; João, Mesquita, Sampaio, & Moutinho, 2006). Indeed, receptions of good quality promoted enhanced attack efficacy, showing the influence of the reception quality on the offensiveness of the attack (João et al., 2006). Conversely, low quality receptions coupled with double and triple blocks stimulating the effect of continuity in attack (Castro, Souza, & Mesquita, 2011; Costa, Ferreira, Junqueira, Afonso, & Mesquita, 2011; Marcelino, Mesquita, & Sampaio, 2011). Thus, high-quality receptions are considered predictive factors of the attack effectiveness, by allowing its organized construction (Silva, Lacerda, & Joao, 2014).

As in other sports, differences also occur in volleyball depending on whether the players are male or female. Their competitions are governed by the same rules and regulations, with the only exception being the height of the net. More specifically, in women's competitions the height of the net is at 2.24 m while in men's competitions is at 2.43 m (FIVB, 2018). However, it has been shown that in equally-trained men and women, women's upper and lower body absolute muscular strength corresponded to 55% and 72% of men's strength, respectively (Bishop, Cureton, & Collins, 1987). These distinguishing differences between genders have been found to be relevant with some performance differentiations between male and female volleyball players. For example, in terms of game complexes, the number of moves carried out in complex II is greater in the female gender than in the male (Bergeles et al., 2009; Costa, Afonso, Brant, & Mesquita, 2012). Moreover, the use of the techniques and their efficacy has been found to be different for males and females (Palao, Manzanares, & Ortega, 2009). Men apply more powerful jump serves (Palao et al., 2009; Rocha & Barbanti, 2004), quicker attack tempos (Castro & Mesquita, 2008; Afonso, Mesquita, & Palao, 2005; Palao et al., 2004), stronger attacks (Costa et al., 2011), and play less often in complex II. According to Mesquita and Cesar (2007) the opposite player's attacks from zone 1 accomplished by men were more efficient than those made by women in the 2004 Olympics. Women's attacks from zone 1 were more likely to be a back-up solution rather than an actual tactical option. They also predominantly use ground serves (Palao et al., 2009), develop slower attack plays (César & Mesquita, 2006; Palao et al., 2004), use placed attacks more often (Costa, Mesquita, Greco, Ferreira, Moraes, 2010), and provide longer rallies. Taking into consideration the above, it would be logical to hypothesize that the relation between the setting zone of elite women and men setters in conjunction with the performance level of the reception might be quite different. In any case, the better knowledge of the specificities of men's and women's volleyball, with a thorough awareness of the differences that distinguish them, would be a useful tool for the coaches to improve the effectiveness of training and competition. Therefore, the purpose of this study was the comparison of the setting zone choices by male and female elite setters, in relation to the reception performance.

Materials and Methods

Procedure

A three-member group of experienced coaches assessed the setting zones choices of male and female setters and the preceding reception actions from 20 volleyball games (M = 10, F = 10) of National Teams competing in the final phase of World League 2017. Firstly, the coaches were asked to observe and categorize the reception quality according to the 5-point numerical rating scale proposed by Eom and Schutz (1992), which quantifies the effectiveness of skill performance within a range of points from 0 to 4. Secondly, the coaches were asked to observe and categorize the setting choices according to the consequent attacking area i.e. to the zones 1, 2, 3, 4, 5 and 6. The evaluated actions constituted sets of 2 consecutive contacts (reception performance-setting zone choice) and were 2626 (M = 1301, F = 1325). Data analysis did not include any serve receptions that were assessed with performance score 0, since they were not followed by a setting action. Intra-rater and inter-rater reliability coefficients were found to be $r=0.983$ and $r=0.984$, respectively, indicating very high consistency in the assessment procedure.

Statistical Analysis

The test of independence for the categorical variables (setting zones and reception quality) was carried out using the Fishers exact test (implemented with the statistical package SPSS v. 17). Following the overall independence test we tested the difference in proportions between men and women for each level of the "setting zone" variable using the statistical package Statgraphics Plus v. 5.1.

Results

Setting zone choices by male setters in relation to the reception performance

Male setters carried out 1301 setting actions, in total. Of these, 13.8% (N=179) were sent to zone 1, 18.3% (N=238) to zone 2, 22.9% (N=298) to zone 3, 36.4% (N=473) to zone 4 and 8.7% (N=113) were sent to zone 6. The comparison of percentages and frequencies showed that men set the ball more frequently to zone 4 in

comparison with the zones 1, 2, 3 and 6 ($z=-5.61, p=0.000, z=-4.95, p=0.000, z=-3.94, p=0.000$ και $z=-9.69, p=0.00$, respectively).

More specifically, 3.7% (N=48) of the total receptions were evaluated with the grade 1 (moderate). A 20.8% (N=10) of this percentage was set to zone 1, 12.5% (N=6) to zone 2, 12.5% (N=6) to zone 3, 47.9% (N=23) to zone 4 and 6.3% (N= 3) to zone 6. No significant differences were found in setting distribution choices when reception was moderate.

A 44.8% (N=583) of the total receptions were evaluated with the grade 2 (good) and 15.1% (N=88) of this percentage was set to zone 1, 20.9% (N=122) to zone 2, 15.4% (N=90) to zone 3, 44.4% (N= 259) to zone 4 and 4.1% (N=24) was set to zone 6. Male setters set the ball more frequently to zone 4 ($z=-4.91, p=0.000, z=-4.44, p=0.000$ και $z=-4.91, p=0.000$) and less frequently to zone 6 ($z=-4.91, p=0.000, z=-4.44, p=0.000$ και $z=-4.91, p=0.000$) in comparison with the zones 1, 2 and 3.

A 20.1% (N=262) of the total receptions were evaluated with the grade 3 (very good) and 13.7% (N=36) of this percentage was set to zone 1, 15.6% (N=41) to zone 2, 29.4% (N=77) to zone 3, 31.3% (N= 82) to zone 4 and 9.9% (N=26) was set to zone 6. Under very good reception conditions male setters sent the ball more frequently to zone 4 in comparison with the zones 1 and 6 ($z=-2.01 p=0.04$ and $z=-6.15 p=0.000$, respectively) and less frequently to zone 6 in comparison with the zones 1, 2 and 3 ($z=-6.63, p=0.000, z=6.66, p=0.000$ and $z=-6.15, p=0.000$, respectively).

A 31.4% (N=408) of the total receptions were evaluated with the grade 4 (excellent) and 11% (N=45) of this percentage was set to zone 1, 16.9% (N=69) to zone 2, 30.6% (N=125) to zone 3, 26.7% (N= 109) to 4 and 14.7% (N=60) was set to zone 6. Under excellent reception conditions male setters sent the ball more frequently to zone 3 in comparison with the zones 1, 2, 4 and 6 ($z=-2.59, p=0.009, z=-2.09, p=0.04, z=-4.45, p=0.00, z=2.32, p=0.02$, respectively). Moreover, men sent the ball to position 4 more frequently compared to position 1 ($z=-2.13, p=0.03$) (Figure 1).

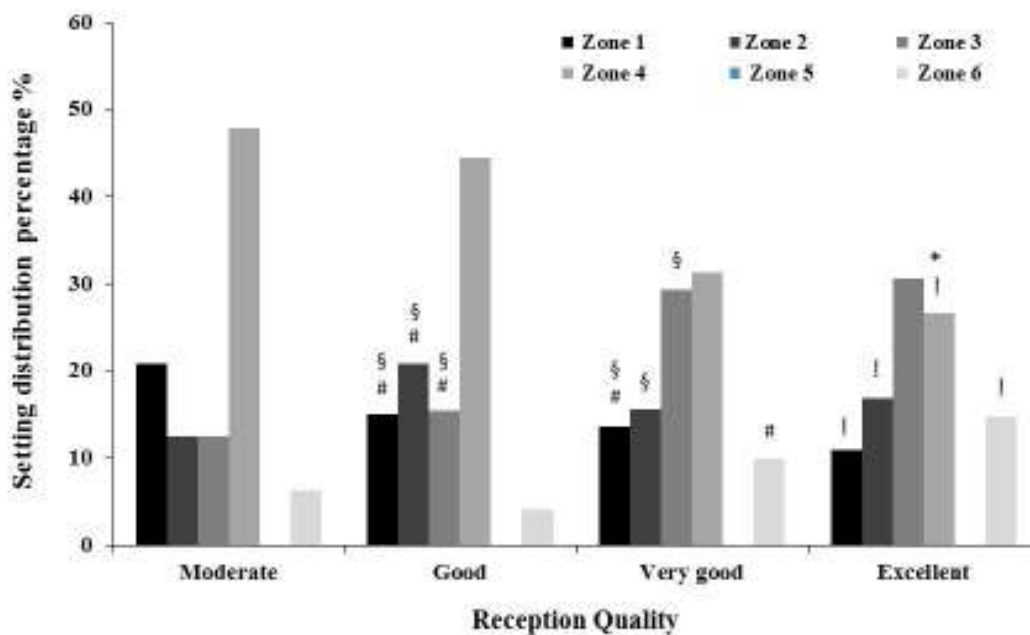


Figure 1. Setting zone distribution percentages of elite male setters. * $p \leq 0.05$ from setting distribution to zone 1, + $p \leq 0.05$ from setting distribution to zone 2, ! $p \leq 0.05$ from setting distribution to zone 3, # $p \leq 0.05$ from setting distribution to zone 4, § $p \leq 0.05$ from setting distribution to zone 6.

Setting zone choices by female setters in relation to the reception performance

Female setters carried out 1325 setting actions, in total. Of these, 4.6% were sent to zone 1, 29% to zone 2, 19.5% to zone 3, 37.6% to zone 4, 0.9% to zone 5 and 8.4% were sent to zone 6. The comparison of percentages and frequencies showed that women set the ball more frequently to zone 4 in comparison with the zones 2, 3 and 6 ($z=2.72 p=0.006, z=-5.09 p=0.000$ and $z=-8.87 p=0.000$, respectively). The second choice of the female setters was zone 2 where they sent the ball more frequently compared to the zones 1, 3 and 6 ($z=2.66, p=0.008, z=2.72, p=0.006$ and $z=-10.36, p=0.000$, respectively). Their third choice was zone 3 where they sent the ball more frequently compared to the zones 1 and 6 ($z=4.33, p=0.000$ και $z=-5.09, p=0.000$, respectively). Finally they preferred to set the ball to zone 6 more frequently than zone 1 ($z=-5.23, p=0.000$).

More specifically, 10.5% of the total receptions were evaluated as moderate. A 6.5% of this percentage was set to zone 1, 14.4% to zone 2, 0.7% to zone 3, 69.8% to zone 4, 2.2% to zone 5 and 6.5% to zone 6. Under moderate reception conditions female setters set the ball more frequently to zone 4 in comparison with the zone

2 ($z=-4.61$ $p=0.000$) and to zone 2 in comparison with the zones 1 and 6 ($z=2.75$, $p=0.006$ and $z=2.75$, $p=0.006$, respectively).

A 51% of the total receptions were evaluated as good and 5.2 % of this percentage was set to zone 1, 29% to zone 2, 15.4% to zone 3, 40.7% to zone 4, 0.7% to zone 5 and 9% was set to zone 6. Under good reception conditions female setters set the ball more frequently to zone 4 in comparison with the zones 2, 3 and 6 ($z=-2.61$, $p=0.009$, $z=-6.77$, $p=0.000$ and $z=-6.97$, $p=0.000$, respectively) and to zone 2 in comparison with the zones 1, 3 and 6 ($z=2.68$, $p=0.007$, $z=-3.85$, $p=0.0001$ and $z=-8.39$, $p=0.000$, respectively). Under the same conditions women set to zone 3 more frequently in comparison with the zones 1 and 6 ($z=2.68$, $p=0.007$ and $z=-9.34$, $p=0.000$, respectively).

A 16.8% of the total receptions were evaluated as very good and 2.7% of this percentage was set to zone 1, 33.6% to zone 2, 27.8% to zone 3, 26% to zone 4, 0.4% to zone 5 and 9.4% was set to zone 6. Under very good reception conditions female setters sent the ball more frequently to zones 2, 3 and 4 in comparison with the zone 6 ($z=-4.90$ $p=0.000$, $z=-5.27$ $p=0.000$ $z=-5.38$ $p=0.000$, respectively) and to zone 6 in comparison with the zone 1 ($z=-3.56$ $p=0.0004$).

A 21.7% of the total receptions were evaluated as excellent and 3.8% of this percentage was set to zone 1, 32.4% to zone 2, 32.1% to zone 3, 23.7% to 4, 1% to zone 5 and 7% was set to zone 6. Under excellent reception conditions female setters sent the ball more frequently to zones 2, 3 and 4 in comparison with the zone 6 ($z=-2.59$, $p=0.009$, $z=-2.09$, $p=0.04$, $z=-4.45$, $p=0.000$, $z=2.32$, $p=0.02$, respectively). Moreover, men sent the ball to position 4 more frequently compared to position 1 ($z=-3.17$ $p=0.002$, $z=-3.15$, $p=0.002$ and $z=-3.83$, $p=0.0001$, respectively) (Figure 2).

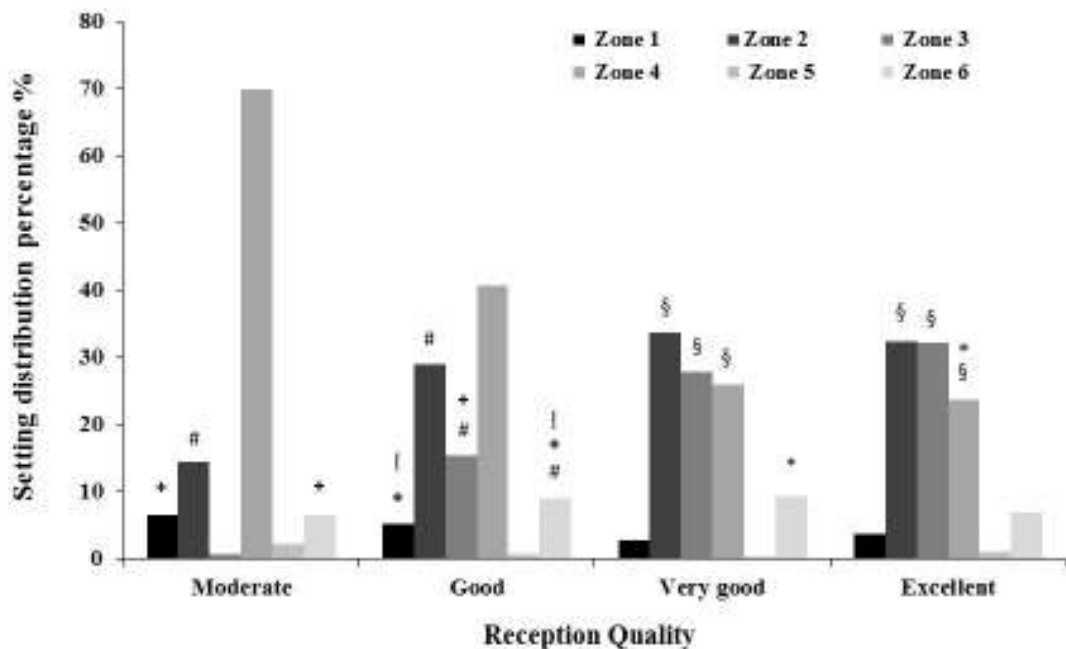


Figure 2. Setting zone distribution percentages of elite female setters. * $p \leq 0.05$ from setting distribution to zone 1, + $p \leq 0.05$ from setting distribution to zone 2, ! $p \leq 0.05$ from setting distribution to zone 3, # $p \leq 0.05$ from setting distribution to zone 4, \$ $p \leq 0.05$ from setting distribution to zone 6.

Comparison and assessment of the setting zone choices by male and female setters in relation to the reception performance.

The comparison of percentages and frequencies between genders (z criterion) showed that under moderate reception conditions male setters set the ball to positions 1 more frequently compared to females ($z= -5.29$, $p=0.000$), who set the ball more frequently to position 4 ($z= -2.73$, $p=0.0006$). Under good reception conditions men chose to set the ball to zone 1 more frequently compared to women ($z= -13.69$, $p=0.0$), who set the ball more frequently to positions 2 and 6 ($z= -3.30$, $p=0.0009$ and $z= -18.48$, $p=0.0$, respectively). Under very good reception conditions women set the ball to zone 2 more frequently compared to men ($z= -4.62$, $p=0.000$) who set the ball more frequently to positions 1 and 6 ($z= -3.66$, $p=0.00002$ and $z= 3.07$, $p=0.002$, respectively). Under excellent reception conditions men set the ball to zones 1 and 6 more frequently compared to women ($z= -8.44$, $p=0.00$ and $z= -14.82$, $p=0.000$, respectively), while the latter chose to set the ball to position 2 more frequently than their male counterparts ($z= -2.23$, $p=0.03$) (Table 1).

Table 1. Setting zones choices for men and women setters in relation to the reception quality

Gender	RQ	Setting zones						χ ²	
		1	2	3	4	5	6	Value	
		% (N)	% (N)	% (N)	% (N)	% (N)	% (N)	Sig.	
Men	1	20.8 (10)	12.5 (6)	12.5 (6)	47.9 (23)	0	6.3 (3)	24.257	
		Women	6.5 (9)	14.4 (20)	0.7 (1)	69.8 (97)	2.2 (3)	6.5 (9)	0.000
		Z	-5.29	-0.33	1.18	-2.73	0	-0.25	
		P	0.000	ns	ns	0.006	-	-	
Men	2	15.1 (88)	20.9 (122)	15.4 (90)	44.4 (259)	0	4.1 (24)	56.089	
		Women	5.2 (35)	29 (196)	15.4 (104)	40.7 (275)	0.7 (5)	9 (61)	0.000
		Z	-13.69	-3.30	0.0	1.32	-	-18.48	
		P	0.0	0.0009	1.0	ns	-	0.0	
Men	3	13.7(36)	15.6 (41)	29.4 (77)	31.3 (82)	-	9.9 (26)	35.754	
		Women	2.7 (6)	33.6 (75)	27.8 (62)	26 (58)	0.4 (1)	9.4 (21)	0.000
		Z	-3.66	-4.63	0.39	1.28	-	3.07	
		P	0.0002	0.000	ns	ns	-	0.002	
Men	4	11 (45)	16.9 (69)	30.6 (125)	26.7 (109)	-	14.7 (60)	41.918	
		Women	3.8 (11)	32.4 (93)	32.1 (92)	23.7 (68)	1 (3)	7 (20)	0.000
		Z	-8.44	-4.76	-0.42	0.89	-	-14.82	
		P	0.0	0.000	ns	ns	-	0.00	

* Men: N= 1301 (100%), Women: N= 1325 (100%), RQ: Reception quality

Discussion

The purpose of this study was the comparison and assessment of the setting zone choices by male and female elite setters, in combination with the serve reception (side out) performance. The results of this study showed that most of the receiving actions carried out by the men were evaluated as good while the next more frequent ones in a hierarchical order were evaluated as excellent. Reception is found to influence the strategy of the setter (Papadimitriou et al., 2004). A crucial factor that determines the choice of the setting zone is found to be the space where receivers touch the ball (Afonso et al., 2010). However, irrespective of the reception quality, the present study revealed that the dominant setting area for men was zone 4. This corroborates the study of Tsvika and Papadopoulou (2008) who found that setters participated in the Men's European Volleyball Championship 2005 directed their settings mainly to zone 4 (35,2%). This could be partially explained by the ability of the outside hitters to attack effectively (Millan Sanchez, Morante Rábago, & Ureña Espa, 2017) or by the fact that male setters intended to play in a fast tempo to the left end of the net trying to counteract the strong tendency of the opposing middle blockers to block the zone with the most attacks recorded (Pinto, Vale, & Vicente, 2018). Another explanation could possibly rely on the fact that under difficult situations setters very often sent the ball to position 4 (Grantov, Jelaska, & Dragutin, 2018), and in a slower tempo especially when they have to move outside the ideal setting zone (Afonso et al., 2010). Besides, zone 4 is characterized as security attack zone and the left outside hitter as security player (Araujo, Castro, Marcelino, & Mesquita, 2010). More specifically, the results of this study showed that in the case of moderate reception quality male setters don't follow any particular tactical plan since there was not found any differentiation between their setting distribution choices. However, under these difficult situations zone 4 and the left outside hitter seemed to be their dominant setting choice, possibly because of their role as security players (Araujo et al., 2010) or their ability to attack effectively (Millan Sanchez et al., 2017) even when they confronted organized block formations (Araujo et al., 2010). When reception was good they set the ball more frequently to zone 4 and less to zone 6. It is nevertheless noticeable that even under these reception conditions male setters showed their intention to distribute their settings in a balanced manner to both ends of the net (i.e. 44.4% to the left outside hitter and 36% to the opposite hitter) causing the opponent middle blocker into difficulty. Concerning their choice to avoid the setting to zone 6 this seemed quite logical, as previous research has found that the attack carried out from this position was fast and derived from high quality receptions (Costa, Castro, Evangelista, Malheiros, Greco, & Ugrinowitsch, 2017). On the contrary, under very good reception conditions male setters sent the ball mainly to position 4. However, it's of great importance the fact that under these circumstances setters tried to carry out a more complete setting tactical plan as far as the multiplicity of the setting areas involved were concerned. Indeed, a 29.3% of the total setting actions were directed to the right side of the net and to the opposite while almost the same actions percentage was directed to the zone 3 (29.4%). This showed that even when setters have to move into the setting area between the acceptable and the perfect one, they were intended to distribute their settings in a balanced manner taking advantage of the entire length of the net probably aiming to create uncertainty in the opponent team in order to increase the defence deficit of time (Fröhner & Zimmermann, 1996; Palao et al., 2005). When reception was excellent the attacking area chosen by men setters was zone 3, possibly because most of the attacks executed from this zone were fast, not allowing the double or triple block formation. Besides, when possible, the attack from the central zone demonstrated a significant correlation with the point scoring (Castro & Mesquita, 2008). However, under these reception conditions setters seemed to have a completely balanced distribution setting plan taking advantage of not only the entire length of the net, but also of all the attacking possibilities of their team. Indeed, a 27.9% of the total setting actions were directed to the right side of the net and mainly to the opposite hitter while a 26.7% of them were sent towards the left side and the

outside hitter of the front court. Additionally, a remarkable part of the setting actions was carried out to position 6 verifying that this attacking area was incorporated into the tactical plans of the male setters and exploited by them mainly in offensive actions derived from high quality receptions (Costa et al., 2017).

With regard to the women, the results of this study showed that most of the receiving actions carried out by them, evaluated as good while the next more frequent ones in a hierarchical order were evaluated as excellent. As found with men, the results of this study revealed that, irrespective of the reception quality, the dominant setting zone for women was also zone 4. This was in line with other studies which observed that in general, high level women volleyball setters chose mainly the setting to zone 4 (Costa et al., 2017; Inkinen, Häyriinen, Linnamo, 2017). It was also found that the second and third setting distribution choices of the women were the zones 2 and 3, respectively. According to Paschalli (2005) the female setters took part in the 2004 Olympic Games in Athens, chose mostly the attack zones of the front court. Concerning the attacks from the back court setters preferred to set the ball mainly to zone 6. (Inkinen et al., 2017) who based on an analysis made in 4 matches from the 2010 Women's Volleyball World Championship observed that the setting distribution between the back court attacking zones (i.e.1 and 6) was about the same. More specifically, the results of this study showed that in the case of moderate reception quality women set the ball mostly to the left outside hitter who elsewhere is referred as security player (Mesquita & Cezar, 2007) since her role is to attack effectively even when the setting tempo is slow (Afonso et al., 2010) and the opponent block is organized. Besides, Costa et al. (2017) found a positive association between low quality reception and setting to position 4. The current study also showed that the second distribution choice of the women was zone 2 corroborating the results of Costa et al. (2017) who found a positive correlation between moderate reception quality and setting to zone 2. However, a noticeable setting distribution percentage was directed to the back court (13%). This showed that when setters have to move out of the acceptable setting area used not only the attack by the extremities of the net but also the back court attackers, possibly due to the restrictions imposed on the distribution. When reception was good women set the ball mostly to zone 4 although it was obvious that they tried to implement a more balanced setting plan. Indeed, a 14.4% of the good receiving actions were set to position 2 while a 15.4% was set to position 3. Additionally, a not negligible percentage of setting actions were directed to the back court and especially to position 6 (9%). On the contrary, under very good reception conditions female setters sent the ball mainly to position 2 where the opposite and/or the middle hitter attacks. However, it's of great importance the fact that under these circumstances setters carried out a more complete setting tactical plan as far as the multiplicity of the setting areas involved was concerned. Indeed, a 27.8% of the total setting actions were directed to zone 3 while almost the same actions percentage was directed to zone 4 and to the left outside hitter. When reception was excellent the attacking area chosen by women was zone 2 possibly because of the contribution of both the opposite and the middle hitter who under these circumstances attacked in a fast tempo not allowing a double or a triple block formation. However, under these reception conditions setters seemed to have a completely balanced distribution setting plan taking advantage of the entire length of the net but without implementing all the attacking possibilities of their team. Indeed, a 23.7% of the total excellent setting actions were directed to the left side of the net and mainly to the left outside hitter while a 32.1% of them were sent to the middle hitter. On the other hand, just a 7% was set to position 6 and a 3.8% to position 1 reinforcing the indications that the back court attack for women was not a part of a tactical plan but just a necessity. In conclusion, it seems that under moderate and good reception quality, women set more frequently to the extremities of the net and to zone 6. Possibly, under difficult reception conditions setters choose mainly the outside hitters irrespective of their position and the opposite (Costa et al., 2017).

Concerning the setting distribution differences between genders, this study showed that irrespective of the reception quality, men set to position 1 more times than women who set to position 2. More specifically, under moderate and good reception conditions, men transferred the ball to position 1 while under excellent reception conditions to positions 1 and 6, more times than their female counterparts. On the other hand, women under moderate to good reception conditions transferred the ball to zones 4 and 6 more times than men, while under very good and excellent conditions set the ball to zone 2. The above, indicates that male setters have incorporated into their offensive strategy the setting to positions 1 and 6, compared to their female counterparts in order to increase the offensive opportunities of their team. Besides, Costa et al. (2017) found that in men's Brazilian Championship the attacker in position 6 incorporates mainly offensive actions, derived from high-quality receptions in order to increase the number of attackers in relation to the number of blockers, that is, the use of 4 attackers against 3 blockers. Thus, attack from position 6 has as priority to increase the number of attack options, generating uncertainties in the adversary defensive system and giving greater efficiency to the offensive construction. On the other side, the female setters' motive for setting the ball to position 6 seemed to be quite different. Indeed, they chose this attacking area more times than men, but only under suboptimal reception conditions i.e. moderate to good reception. This highlighted the fact that their choice was a necessity rather than a tactical option to increase the offensive construction of their team. Taking into consideration that the distribution strategy of the men was more balanced in comparison to the women, their preference to transfer the ball under excellent reception conditions to position 1 shows that they intended to use the whole length of the net in order to increase the uncertainty of the opponent blockers, not allowing them to appropriately block the attacking zone. Indeed, according to the study of González-Silva, Fernández-Echeverría, Claver, Conejero, &

Moreno (2017) the set's area and tempo were shown to be predictors of the block participation, obtaining that when the setter sent the ball to zones 6, 1 or 2, instead of zone 4, and the set's tempo was first and/or second there was a decrease in the number of the opponents jumping to the block. Notwithstanding the above mentioned differences between genders in setting distribution, it's noteworthy that under excellent reception conditions, men preferred the setting to zone 3 while women preferred the setting to zones 3 and 2. This is partly in accordance with the study of Costa et al. (2017) who found a positive association between the excellent quality of reception and the attacks from position 3, after the observation of the 2015-16 Brazilian women's Superliga Champion team.

In conclusion, it seemed that irrespective of the reception quality, men preferred to transfer the ball to zones 1 and 6 more frequently than women. This demonstrated that they have incorporated into their offensive strategy the setting to positions 1 and 6 in order to increase the offensive opportunities of their team, multiplying the number of attackers in relation to the number of blockers. On the other hand women, under moderate and good reception conditions transferred the ball to positions 4 and 6 while under very good and/or optimal conditions preferred the setting to position 2.

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