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## ORIGINAL

### VOLLEYBALL SPANISH CHILD. STUDY LEVEL OF PARTICIPATION IN THE GAME

### EL VOLEIBOL ESPAÑOL INFANTIL. ESTUDIO DEL NIVEL DE PARTICIPACIÓN EN EL JUEGO

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## ABSTRACT

The aim of this study was to establish the factors which affect the level of participation among players of different youth male volleyball teams. Number of transitions, continuity, point finalization and its result, were analyzed.

The study was focused on the 2002 Male under 14 Scholar Spanish Championship, through a synchronic, symmetric and multidimensional investigation design.

The Number of transitions to the other court and continuity had a straight relation with the focus of the research; however, there is no statistical signification between the increased participation with more likely of completing finish points and achieving a most points.

We concluded that it can be considered that this volleyball category is characterized by the existence of a specialized and hierarchical game style, in which the best players show a highest level of involvement during the game.

**KEY WORDS:** "Game Analysis", "sports initiation", "regulations", "tactical", "volleyball".

## RESUMEN

El objetivo del estudio fue determinar qué factores inciden sobre el nivel de participación de los jugadores de equipos infantiles de voleibol masculino. Se analizaron número de transiciones hacia el campo contrario, la continuidad, forma de culminación del punto y resultado de éste.

El estudio se centró en el Campeonato de España Escolar masculino del año 2002, en torno a las edades de 12- 14 años, mediante un diseño de investigación sincrónico simétrico y multidimensional.

El número de transiciones hacia el campo contrario y la continuidad mostraron relación directa con el criterio focal del estudio produciéndose, sin embargo, significación estadística entre un incremento de la participación con una mayor probabilidad de culminar los puntos en remate ni con una consecución de mayor cantidad de puntos.

Podemos concluir que en esta categoría predomina un estilo de juego especializado y jerarquizado donde los mejores jugadores tienen mayor participación en el juego.

**PALABRAS CLAVE:** “Análisis del juego”, “iniciación deportiva”, “reglamento”, “táctica”, “voleibol”.

## INTRODUCTION

Participation is considered as one of the cooperation typical values (Vanzan, 2000) considering that, cooperate as a team require all components participation, each one from their own personal possibilities and functions, more or less specific, to be developed during the game.

Likewise, we can point out what participation entails, in one hand, a mental-emotional commitment towards the goals, being a personalized reflection which allows to share responsibilities for the objectives achievement (Cañizares, 2002) and the evident contribution to the player's motivation increasing (Moreno, 2000; Santos, 1995).

The sport commitment is determined by the athlete grade of enjoyment obtained in the sport participation, personal investment, implication opportunities, as well as implication alternatives influence and social back up (García, Leo, Martín&Sanchez, 2008; Scanlan, Russell, Beals&Scanlan, 2003).

Therefore, a low participation could contribute to some players sport practice withdrawal (González, Tabernero&Márquez, 2000; Salguero, Tuero&Márquez, 2003) meanwhile a higher level of participation is the fundamental objective

looked for in the teaching-learning process, considering that the joint of motor experiences will have an effect on the individual improvement.

Thus, in order to obtain a higher player's participation and continuity in the game actions, Pérez&Caño (2000), consider that during the formative phase the low hand serve usage is important. In the other hand, reception should be dominated for the construction success and victorious attack achievement (Ureña et al., 2001).

About previously mentioned, it dislodges the possibility to alter the regulations and adapt it for formative goals proposed in youth volleyball categories, with the only pretension of a successful game development (Arias, 2008; Arias, Argudo&Alonso, 2008, 2009; Boyce, Coker &Bunker, 2006; Dyson, Griffin& Hastie, 2004; Garoz, 2005; Piñar, 2005; Piñar et al., 2008). The objectives adaptation of the practical conditions summarize in the kids playing possibility: play and enjoy in accordance with their possibilities; develop technically correct motor patterns; increase motor actions success; and, the creation of sport habits (Arias, Arguda& Alonso, 2011).

In this way, the study main goal was establish the connection between participation and the number of transitions, understanding this last concept as the quantity of exchanges between two teams. In the other hand, the connection existing between participation and continuity, understanding the term as the number of contacts produced in a team during the different transition. As well, the relation of the participation with the point finalization, understood through the spike technical action. Lastly, between participation and point finalization, that is, with or without success.

## **METHOD**

The sample studied was extracted from the 2002 Male under 14 Scholar Spanish Championship, aged from 12 to 14 years old.

For the observation, 13 of 24 games played were recorded, what supposed 2021 cases (54.26%). In order to avoid the game structures and set ups of some teams were imposed in relation with events number registration during the observation, a minimum number of two game registrations were established per team and a maximum of three. Therefore, it is a random stratified sampling.

The analyzed events perception was controlled locating in the observation site (playing court) a video camera, Panasonic PVDV52, placed in a clear, sharp and without interferences position, likewise where game actions were recorded in its entirety. Was raised 4 meters from the floor and established 8 meters from the middle of the baseline.

The images were registered without modification of zoom and great angular in Mini DV cassette. The recordings were visualized using a Acer Aspire 300 and

Windows Media Player 9.0. Furthermore for the statistical analysis SPSS 11.5 for Windows XP was used.

A synchronic investigation design was conducted (nomothetic and punctual), symmetrical and multidimensional. Observation units were complex events and of a categorical nature, with a high molecular level.

The definition process and redefinition of the observation categories, linked with the exhaustive conditions and mutual exclusivity achieved by the observation system developed, determined that all the behavior manifestations of the study object are represented. Following, the different criteria are detailed and the respective codified answer levels are showed:

1. Player's participation: Null (None team player hits the ball during the point), Very Low (only one player), Low (two players), Medium (three), Medium-high (four), High (five), Very High (Six players intervention).
2. Number of ball transition to the opponent's court (None, One transition, More than one transition).
3. Continuity during game actions:
  - 3.1. Null
  - 3.2. Low; the analyzed team achieve between one and three hits but without obtaining a transition to the opponent's court during the observed action.
  - 3.3. Medium; different possibilities of the observed team:
    - Team in Complex 2 (K2: defence, set and attack) and only achieves one transition of the ball, the serve, however counter-attack is not completed.
    - Team in K2 and manage the transition with the serve and form counter-attack hitting the ball once or twice.
    - Team in Complex 1 (K1: reception, set and attack) achieves the attack using two or three hits, but without a counter-attack during the point length.
    - Team in K1 and achieves the attack with one contact and one counter-attack hitting once during the observed action.
    - Team in K1 and obtains the attack construction with one or two contacts and one or two counter-attacks hitting once or twice the ball.
  - 3.4. High; two possibilities could be observed:

- Team in K1 starting situation and achieves the attack and more than one counter-attack using 4 or more ball hits.
- Team in K2 starting situation and obtains the transition with the serve and more than one counter-attack hitting the ball four or more times.

4. Does the team finalize spiking? (Yes, No)

5. Result of the point (Positive, Negative).

Reactivity was discarded conducting the observation in natural context and not informing the team players about the competition games recording and evaluation, beyond of the team habits.

The interpretation bias was avoided providing a good data contextualization, developing a flux behavior fragmentation which has escaped from radicalization, based on an adequate unit molecularization.

Previous knowledge and expectancy were controlled avoiding the author's participation in the observation, as well as with the observers training. This training, based on the model established by Medina & Delgado (1999), providing the observers all the information about the study methodology, but hiding the study object. Furthermore, observation tool was redesigned, so that any influence bias was neutralized.

At the end of the training phase an inter-observer and intra-observer concordance study was carried out. For the calculation was used the formula: (higher number/lower number) x 100 recommended by Anguera (1986). The inter-observer concordance demonstrate that none result was lower than 0.80 in each registered code, considering the minimum reliable grade necessary to be reached by an observer before the participation in a study (Medina & Delgado, 1999), being always over the 0.85. In the same way, the inter-observer levels showed to be over the 0.80 coefficient.

Contingency tables were used for the Chi-square test, as much in the obtaining of the unilateral signification as in the bilateral producing a variables crossing. The existence of statistical signification was established at  $p < 0.05$ .

The validity condition for the Chi-square test application was the inexistence of any less than one expected frequency, and no more than the 20% of table boxes with expected frequencies lower than 5.

For the corrected reminders analysis was took as criterion a value  $> 2$  to establish the excitatory relation and  $< -2$  for the inhibitory.

## RESULTS

Following, are showed the results from the association between the game participation and the different study objects criterions, as the number of transitions to the opponent's court, continuity index, point finalization and point result.

- *Number of ball transitions to the opponent's court per team*

Chi-Square test indicated a statistical signification of  $p < 0.001$ , between player's participation in each point and the number of transitions (table 1).

**Table 1.** Relation of the player's participation with the ball transitions to the opponent's court achieved per team.

		PARTICIPATION							TOTAL
		Null	Very low	Low	Medium	Medium-high	High	Very high	
NONE	Count	336	463	152	163	0	0	0	1114
	% of Participation	100%	38.0	25.5%	15.9%	0%	0%	0%	27.6%
	% Number of transitions	30.2%	41.6%	13.6%	14.6%	0%	0%	0%	100%
	Corrected reminders	31.0	9.7	-1.2	-9.6	-16.8	-8.9	-4.2	
ONE TRANSITION	Count	0	753	300	578	136	9	0	1776
	% of Participation	0%	61.7%	50.3%	56.4%	21.8%	4.6%	0%	43.9%
	% Number of transitions	0%	42.4%	16.9%	32.5%	7.7%	0.5%	0%	100%
	Corrected reminders	-16.9	15.0	3.4	9.3	-12.1	-11.4	-6.0	
MORE THAN ONE TRANSITIONS	Count	0	4	144	283	488	187	46	1152
	% of Participation	0%	0.3%	24.2%	27.6%	78.2%	95.4%	100%	28.5%
	% Number of transitions	0%	0.3%	12.5%	24.6%	42.4%	16.2%	4.0%	100%
	Corrected reminders	-12.1	-26.1	-2.5	-0.7	29.9	21.3	10.8	
TOTAL	Count	336	1220	596	1024	624	196	46	4042
	% of Participation	100%	100%	100%	100%	100%	100%	100%	100%
	% Number of transitions	8.3%	30.2%	14.7%	25.3%	15.4%	4.8%	1.1%	100%

0 boxes (0%) have an expected frequency lower than 5. The minimum expected frequency is 12.68

Corrected reminders analysis showed an excitatory association between more than one transition plays and medium-high and high participation. When a unique transition was observed the association was inhibitory when related with medium-high or high participation.

- *Continuity in game actions*

Higher percentage belonged to those points finished by medium continuity teams, followed in decreasing percentage by those finished with a high, low and null continuity (table 2).

In the table 2 are showed the corrected reminders of the player's participation criterions in each game point and continuity of the game actions associations, which obtained a statistic signification of  $p < 0.001$  using the Chi-square test.



**Table 2.** Relation of the player's participation and game actions continuity

		PARTICIPATION							TOTAL	
		Null	Very low	Low	Medium	Medium-high	High	Very high		
CONTINUITY	NULL	Count	336	0	0	1	0	0	0	337
		% of Participation	100%	0%	0%	0.1%	0%	0%	0%	8.3%
		% of Continuity	99.7%	0%	0%	0.3%	0%	0%	0%	100%
		Corrected reminders	63.5	-12.6	-8.0	-11.0	-8.2	-4.3	-2.1	
	LOW	Count	0	466	152	162	0	0	0	780
		% of Participation	0%	38.2%	25.5%	15.8%	0%	0%	0%	19.3%
		% of Continuity	0%	59.7%	19.5%	20.8%	0%	0%	0%	100%
		Corrected reminders	-9.4	20.0	4.2	-3.3	-13.3	-7.0	-3.3	
	MEDIUM	Count	0	0	432	634	137	9	0	1966
		% of Participation	0%	0%	72.5%	61.9%	22.0%	4.6%	0%	48.6%
		% of Continuity	0%	0%	22.0%	32.2%	7.0%	0.5%	0%	100%
		Corrected reminders	-18.6	-18.6	12.6	9.8%	-14.5	-12.6	-6.6	
HIGH	Count	0	0	12	227	487	187	46	959	
	% of Participation	0%	0%	2.0%	22.2%	78.0%	95.4%	100%	23.7%	
	% of Continuity	0%	0%	1.3%	23.7%	50.8%	19.5%	4.8	100%	
	Corrected reminders	-10.7	-10.7	-13.5	-1.4	34.7	24.2	12.2		
TOTAL	Count	336	1220	596	1024	624	196	46	4042	
	% of Continuity	8.3%	30.2%	14.7%	25.3%	15.4%	4.8%	1.1%	100%	

1 boxes (3.6%) have an expected frequency lower than 5. The minimum expected frequency is 3.84

Paying attention to the corrected reminders analysis, an excitatory association occurred between null continuity and null participation and also between high continuity and medium-high participation. The inhibitory association was observed when a relation was established including the medium continuity and null participation, moreover during high continuity and very low participation.

- *Spike finalization*

Chi-square test indicated a statistical signification of  $p < 0.001$ , which suppose a significant dependency between the two criterions (Table 3).

**Table 3.** Relation between player's participation and spike finalization

		PARTICIPATION							TOTAL	
		Null	Very low	Low	Medium	Medium-high	High	Very high		
SPIKE FINALIZATION	YES	Count	0	237	344	700	435	132	29	1877
		% of Participation	0%	19.4%	57.7%	68.4%	69.7%	67.3%	63.0%	46.4%
		% Spike finalization	0%	12.6%	18.3%	37.3%	23.2%	7.0%	1.5%	100%
		Corrected reminders	-17.8	-22.6	6.0	16.3	12.7	6.0	2.3	
	NO	Count	336	983	252	324	189	64	17	2165
		% of Participation	100%	80.6%	42.3%	31.6%	30.3%	32.7%	37.0%	53.6%
		% Spike finalization	15.5%	45.4%	11.6%	15.0%	8.7%	3.0%	0.8%	100%
		Corrected reminders	17.8	22.6	-6.0	-16.3	-12.7	-6.0	-2.3	
	TOTAL	Count	336	1220	596	1024	624	196	46	4042
		% Spike finalization	8.3%	30.2%	14.7%	25.3%	15.4%	4.8%	1.1%	100%

0 boxes (0%) have an expected frequency lower than 5. The minimum expected frequency is 21.36

Paying attention to the corrected reminders analysis, an excitatory association was observed between spike point finalization and medium and higher participation. Likewise, the excitatory association was also produced between finalization without spike and a very low and null participation.



- *Point result*

Chi-square test showed a statistical signification of  $p < 0.001$  when player's participation in each game point was related with point result (table 4).

**Tabla 4.** Relation between player's participation and point result

		PARTICIPATION							TOTAL	
		Null	Very low	Low	Medium	Medium-high	High	Very high		
POINT RESULT	POSITIVE	Count	277	589	216	521	309	92	20	2024
		% of Participation	82.4%	48.3%	36.2%	50.9%	49.5%	46.9%	43.5%	50.1%
		% of Result	13.7%	29.1%	10.7%	25.7%	15.3%	4.5%	1.0%	100%
	Corrected reminders	12.4	-1.5	-7.3	0.6	-0.3	-0.9	-0.9		
NEGATIVE	Count	59	631	380	503	315	104	26	2018	
	% of Participation	17.6%	51.7%	63.8%	49.1%	50.5%	53.1%	56.5%	49.9%	
	% of Result	2.9%	31.3%	18.8%	24.9%	15.6%	5.2%	1.3%	100%	
Corrected reminders	-12.4	1.5	7.3	-0.6	0.3	0.9	0.9			
TOTAL	Count	336	1220	596	1024	624	196	46	4042	
	% of Participation	100%	100%	100%	100%	100%	100%	100%	100%	
	% of Result	8.3%	30.2%	14.7%	25.3%	15.4%	4.8%	1.1%	100%	

0 boxes (0%) have an expected frequency lower than 5. The minimum expected frequency is 22.97

In this case it is important to report that a null participation was associated positively with a positive result, due to points gained by opponent's serve mistake. If we focus in the low level participation, an excitatory association is found when it is related to negative result and inhibitory with positive results.

## DISCUSSION

Know how many contacts have realized with the ball each team is not enough data if we situate in the sport initiation field and youth categories formation, then, so important or more than know the number of contacts is to find out in which form the contacts are distributed in the competitive process. The results obtained indicated that the higher percentages correspond to points solved with only one player hitting the ball, which represents the points through the serve, achieving an ace or serve mistake.

Sanchez (2001) expresses that all the players are important in a group, without differentiate between first-team player and substitutes. Hence, deficit in the player's participation grade, whether by inhibition or due to an excessive prominence of some of them, would be a problem. In this last case, is an observed fact, although not registered, that most of the teams count on some player that due to his or her anthropometric (height mainly), technical and tactical, psychological and social characteristics or playing experience, stands out from the others, focusing the team over that player the higher number of contacts with the ball. Ortega, Cárdenas & Velasco (1999) emphasize as not adequate during formation periods.

Therefore, mentioned problem would influence, not very much in the competition result, but mostly, in youth categories players, in their future sport development deficit and the lack of motivation and personal satisfaction in the game (Cañizares, 2002; González, 2001; González et al., 2000).

About ball transition from the defensive phase to the attack phase, this is a key concept to achieve a high continuity level during the game actions (Díaz, 2000). In this sense, serve could be considered as a fundamental action which facilitate or complicate the ball transition possibilities to the receiving team (Quiroga et al., 2010).

Analyzing the results obtained, we reach the conclusion that three fourths of the points were solved using less than two transitions, which is indicative of a game with continuous interruptions and a few alternatives between teams action, thus decreasing the participation index.

If we take in consideration the criterion of Banachowski (1992) and Ejem (1995), the lack of ball transition from one court to the other during the game is demonstrative information of the lack of ball control and, therefore, shortage of quality and technical-tactical skills dominance maturity of the observed team players. It not seem to exist coincidence, in relation with the available data, between the formative process performed by the observed team players and the existing guidelines on the literature about the topic which advocate active ball maintenance during the initiation phase (Díaz, 2000).

In relation with continuity, data provided, both in the analysis and in participation, confirm the affirmation by Baacke (1993), according to which high number of ball contacts indicate a high participation, which is directly related with continuity. However, an increasing of them is not related necessarily with higher possibilities to achieve a positive point result.

Callejón & Hernández (2009) confirm that the last year's modifications applied by the International Federation focused their attention in find balance between attack actions supremacy compared to defensive. The purpose of these changes was to achieve a higher game continuity, obtaining in this way more spectacular actions increasing play duration and participation, by the relation directly proportional that, as we observed in the results, exists between continuity and participation. Nevertheless, in a previous study, Ureña, Gallardo, Delgado, Hernández & Calvo (2000), about the game rules evolution from 1947 to 1999, was observed that the rules created a 42% boost defence and a 9% attack. This last were all established during the first years, part of a period of basic game diagram configuration, and not appearing again since the fifties.

Paying attention to the relation between participation and spike finalization or not, as we had the possibility to check with the results obtained, not necessarily a higher player's participation induce to a higher probabilities to finalize spiking. The participation levels were more propitious for the point finalization when this technical-tactical action was developed by three or four players. Although, analyzed studies confirm the logic and place the spike as the more frequent way to finalize the play (Bellendier, 2002; Fröner & Zimmermann, 1996; Marcelino, Mesquita & Afonso, 2008; Merelic, Resetar & Jankovic, 2004; Monteiro, Mesquita & Marcelino, 2009), we should emphasize that all refers to high level.

The negative results that showed the association of participation and success were specifically due to the serve. Callejón (2006) observed that, in high level male categories, a 25.2% of the plays end with the serve, either by mistake or achieving an ace, which clearly, damages game participation. Similarly, as we can observe in the results obtained in a study by Ureña, Vavassori, León & González (2011), during the plays commenced with a jump serve, receiving team attack and spike finalization options decreased. An important game quality factor, according to Ejem (1995), even when the contacts number per team was high.

A game style well specialized and hierarchical, as show the results, generate conflict to the sport initiation precepts, even though, it is not strange for the youth Spanish volleyball experts.

Nonetheless, it seem revealing, the association produced between plays finalized spiking, which need a higher capacity and technical skill when three or four player participate. This could be the key association in the formative potential improvement in these categories.

As study limitation we could find the sample, taken in 2002, is not current. However, that championship was taken, exceptionally, because it was the first year of the libero's inclusion in youth competitions. Therefore, the purpose of the study was not to reflect the youth volleyball current situation, but complete an historical empty for the continuum of investigation field which interest has increased during the last years.

## CONCLUSIONS

- 1) Player's participation was low or very low, ending the third part of the plays with only one player intervention and not achieving in more than a half plays the intervention of three different players during the action development.
- 2) Number of transitions to the other court, as well as continuity contributes to a higher player's participation. Considering that this elements are related to player's ball control, showing the importance of a technical development of the aforementioned.
- 3) A higher player's participation does not necessarily entail higher probabilities in points obtaining. Therefore, will result more difficult to instill to the teams a more participative game, because there is no relation between this concept and successful results on the court. Include rules' adaptations at this ages, could be a compensatory option.
- 4) Finalize the play spiking is an aspiration from the technical player's development point of view and, we checked that the three or four player's

participation associate positively with this situation. Hence, if the regulations take precedence over or adjust spiking actions, indirectly, would be encouraging desired level of participation.

- 5) Participation analysis study let us conclude in this category that a specialized and hierarchical game style predominate, where best players participate more during the game. Mentioned conclusion is taken from the results obtained, in spite of initiation experts' recommendations.

## APPLICATIONS

- a) Generally, from a formative perspective it seems relevant the promulgation of regulation check at this ages and look for adaptation in order to develop player's needs considering participation as a formative goal, an option could be the implementation of rules which limit the number of interventions of a player in each transition or play.
- b) In this same direction of rules' check and as it was previously, clearly stated in above conclusions, it is proposed an adjustment of those point obtained spiking, which means directly enrich internal game logic and player's technical development, as well as indirectly, such as results, which obtained, a positive participation grade in this study.
- c) Likewise, would result interesting to carry out a quasi-experimental design case study and evaluate performance fluctuation in a team using a more participative game strategy.

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*Innovaciones y nuevas perspectivas en la didáctica-entrenamiento de los deportes colectivos y la formación del jugador de base*, 133-146.

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