

*Translated from the original in spanish*

## **The logical relations of opposition between technical-tactical actions in table tennis**

### **Las relaciones lógicas de oposición entre las acciones técnico-tácticas en el tenis de mesa**

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**Received:** April 11<sup>th</sup>, 2019.

**Approved:** September 2<sup>nd</sup>, 2019.

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#### **ABSTRACT**

The technical-tactical actions that characterize the actions of the table tennis player keep between them a close relation of the cause-effect type, called by the authors of this work, logical relations of opposition. The objective of this paper is to determine the logical relations of opposition existing between the different technical-tactical actions of table tennis for the evaluation of technical-tactical performance. This component is evaluated outside the context of the game and in no way in terms of performance, in addition the opposition of the rival is not taken into account, which reduces the objectivity of its evaluation. Survey and observation methods were used during the 2016-2017 academic year, as well as specialist criteria to evaluate the proposed result. A compendium of the different technical-tactical actions possible in table tennis, and opposition relations that are established between them either before or after each action.

**Keywords:** technical tactical actions; opposition actions; logic opposition; logical opposition relationships.

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#### **RESUMEN**

Las acciones técnico-tácticas que caracterizan el accionar del jugador de tenis de mesa guardan entre ellas una estrecha relación del tipo causa-efecto, denominada por los autores del presente trabajo, relaciones lógicas de oposición. Este artículo tiene como objetivo determinar las relaciones lógicas de oposición existentes entre las diferentes acciones técnico-tácticas del tenis de mesa para la evaluación del rendimiento técnico-táctico. Este componente se evalúa fuera del contexto de juego y en ninguna medida en función del rendimiento, además no se tiene en cuenta la oposición del rival, lo cual resta objetividad a su evaluación. Se utilizaron los métodos de la encuesta y observación, y criterio de especialistas para evaluar el resultado propuesto durante el curso 2016-2017. Como principal resultado se obtiene un compendio de las diferentes acciones técnico-tácticas posibles en el tenis de mesa, y

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relaciones de oposición que se establecen entre ellas ya sea de forma previa o posterior a cada acción.

**Palabras clave:** acciones técnico-tácticas; acciones de oposición; oposición lógica; relaciones lógicas de oposición.

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## INTRODUCTION

In sports with balls or sports games a constant opposition of the rival is observed, this opposition is sharpened in the table tennis where each technical-tactical action has a narrow relation with the action of the rival to which it faces. In this sense Rudick (1998, p. 106) expresses,

"A psychological and essential element of the technique in these types of sports are the processes of reaction to external stimuli, the opposite, for example. (...) the movement of the sportsman in these types of sports will have importance not by itself, but in relation to the stimuli that signal about the particularities of the situation that has arisen in the sport fight".

Table tennis is a sport of opposition par excellence and even more of opposition without collaboration, Pérez de Castro, (2005) defines it as a sport of confrontation without physical contact between rivals, while Pérez, (2011) assumes that,

"(...) the tasks that the table tennis player must undertake during the course of a game are very complex and changeable all the time, since they are activities that are developed in a highly variable context, the indeterminate nature of the game environment is increased by rigid limits of time and space and by the low predictability of the opponent's actions".

On the other hand, Matytsin, quoted in Oliva, (2012) considers it an activity that is conditioned by the low index of prediction of the rival's actions, while Malagoli, Di Michele and Merni, (2014) qualify table tennis as a direct duel between two players.

Consequently, both Munivrana, Petrinović and Kondrič, (2015) and Iino and Kojima, (2016) consider table tennis as an intelligent game of intentions with low organization of the actions, where the sequence of movements is not known neither in the development nor in the end of them; while the Cuban National Table Tennis Commission (2016), in its athlete preparation program, defines as one of the fundamental tasks, within the technical-tactical preparation, the development of complexes of game actions, establishing combinations where mutual dependency relations are observed between the actions that take place.

Finally, Sáez et al. (2018), when conducting a study on the evaluation of performance in table tennis, considered the relationships between rivals and specifically between their actions to be decisive.

The cited authors agree that table tennis is characterized primarily by the opposition of the opponent, agreeing with them it is logical to consider the relationship of opposition and dependence that is established between the actions, which is justified

from the very fact that in table tennis all performance is relativized by the measure constituted by the opposition of the opponent. In this sense, Molodsoff (2008, p. 223) states: this sport is classified among the opposition activities, once to win you have to obtain two points more than your opponent does. Therefore, it is mandatory to consider the following sentence: "All victories become relative and are characterized only by the opposition encountered. Molodsoff himself refers,

"(...) the red thread of victory in table tennis lies in the knowledge of the opponent in order to control him (...) this quality lies both in the quantity and quality of the technical weapons available (technique) and in their intelligent and astute use (tactics).

The relation actions of the rival - own actions takes on a very specific link in table tennis, given by the specificity of the actions of responses determined by factors such as: type of effect, depth, type of tires; which mean that for each action there are specific responses and even responses that are considered incompatible and that would inevitably result in erring; it is for this reason that determining the logical opposition relations established between the different technical-tactical actions in table tennis is of great importance for the work in the technical-tactical component of preparation in this sport.

To date, no studies have been found that refer to the logical relations of opposition between technical-tactical actions in table tennis, an aspect that the authors of the present study consider to be of great importance since, based on these relations, actions with a direct incidence on the performance of a given technical-tactical action can be determined. Hence, it is essential to identify the particularities of the opposition relations that are established with the action of the opponent as an external stimulus of greater incidence in the technical-tactical performance. From all of the above, it can be inferred that not considering the opposition relations that are logically established between the technical-tactical actions of table tennis limits knowledge about the level of incidence of the opponent's opposition in the technical-tactical performance of the tennis players.

By virtue of what has been expressed, the authors of this paper consider it appropriate, first, to characterize the technical-tactical actions potentially possible in table tennis and, later, to determine the logical relations of opposition that are established between them, the latter being the general objective of this paper.

## **MATERIALS AND METHODS**

In order to determine the logical opposition actions in table tennis, it was first necessary to characterize the technical-tactical actions of this sport and thus define all the game actions potentially possible to occur in table tennis; for this purpose, the survey and observation methods applied during the events of the competitive calendar of table tennis in Cuba during the academic year 2016-2017 (National Cups and School Games) were used.

The criteria of specialists was also used, who fulfilled the role of external evaluators who assessed the technical and tactical actions defined as potentially possible in table tennis, as well as the logical relations of opposition between them that were determined.

The survey was related to the need to take into account the existing relationships between the game actions in table tennis, as well as to determine such relationships and was applied to ten sports technicians whose exercise of the profession links them directly with table tennis and can be considered specialists capable of offering important assessments for the development of this work, are professionals linked both directly to the sports training of table tennis, as directors and federative of this sport, were selected taking into account the following attributes:

1. Willingness to collaborate.
2. Awareness of the need, importance and relevance of the purposes of the work.
3. Professionals with satisfactory results in their sphere of action.
4. Aware of the sport preparation in table tennis as an uninterrupted process of many years, that they were creative, with capacity of analysis and synthesis.
5. With the capacity to offer evaluations about the aspects that are valued in the study

The specialists selected to be surveyed later formed the committee of specialists that assessed the results of the study, that is, the technical-tactical actions defined and the logical relations of opposition between them. The characterization of the specialists in terms of profession, scientific degree, ITTF level and experience is shown in the following chart. (Chart 1)

**Chart 1.** - Characterization of the specialists participating in the study

ATTRIBUTES	QUANTITY
Profession	Graduate in Physical Culture 10
Con grado científico	Doctor in Sciences of the Physical Culture 2
	Master in Sciences of the Physical Culture 3
	Specialist 5
	Level I coach ITTF 10
Level II coach ITTF	5
Years linked to table tennis	More tan 10 years 10
Work experience	More tan 10 years 10
Experienced as an athlete or coach in the Cuban national table tennis team in national teams	8
Experienced as an athlete or trainer abroad	10

The survey was applied from the questionnaire in order to assess the need to determine the logical relations of opposition between the technical and tactical actions of table tennis.

The observation method allowed, at first, to define all the potentially possible actions in table tennis, for which 10 matches were observed during the cups "Luis Augusto Turcios Lima", Matanzas, November 2016; and Yayabo, Santi Spíritus, May 2017.

The technical-tactical actions defined as potentially possible in table tennis as a result of the first observations were divided into: offensive actions, defensive actions and liaison actions.

After defining the potentially possible actions to be carried out by the tennis player in his actions during the competition (20 types of potentially possible technicaltactical actions were defined), the logical relations of opposition that are established between the different technicaltactical actions of table tennis were determined on the basis of the actions of response to the actions of the opponent carried out by each of the opponents in a match of table tennis, for this purpose, the method of observation applied in ten other matches during the championships was again used: Nacional de Mayores, Villa Clara in 2017; Nacional Juvenile, Matanzas in 2017 and the table tennis tournament of the school games, Pinar del Rio, in 2017; by means of a new guide.

The ten specialists selected assessed the logical opposition relations determined in terms of aspects from the assessment categories established by Tabares (2004). (Chart 2)

**Chart 2.** - Dimensions and indicators to be assessed

Aspects to be assessed	Not acceptable	Acceptable	Fairly acceptable	Very Acceptable
The determined opposition relations correspond to and describe objectively what happens in table tennis.				
Its methodological conception guarantees a logical treatment of the mutual dependence between table tennis actions.				
The logical relations of opposition are necessary for the work with the technical-tactical component in table tennis.				
The proposal is novel and of great significance in the pedagogical process of sports training and specifically for the work with the tactical technical component of table tennis.				

**Source:** Own elaboration.

## RESULTS AND DISCUSSION

The applied survey showed as a result that the total of the specialists consulted estimate that there is a close relationship between the actions carried out by the contenders in a match of table tennis, attributing a high level of dependence between one action and another to the point that one determines the other and vice versa, finally, the factors considered to have the greatest impact on this dependency relationship are: the effect. The speed and depth of the ball in that order. It became evident the need to: first, define all the potentially possible actions in table tennis and later determine the relations of opposition between them.

From the first applied observation guide, all the potentially possible actions in a table tennis match were defined. (Chart 3)

**Chart 3.** - Observation (Actions)

Type of action	Receive	Defensive	Offensives	Liaison
Services	Receive	Defensive	Offensives	Liaison
Service with effect below (cut-off or backspin)	With right Flip	Effect top right vs. effect bottom right	Blocking from the right	Right cut
Service with side effect (sidespin)	With Flip reverse	Effect upside down versus effect down	Reverse block	Reverse cut
Service with effect up (Topspin)	With cut, (backspin) right	Top right effect against balls without effect	Counterpoint of right	Right hit without effect
Service with combinations of the above effects	With reverse backspin	Effect upside down against balls without effect	Reversing counterpoint	Reverse hit without effect
Without effect	With topspin effect from right	Remate o smash de derecha	Rear defense	
	With reverse topspin effect	Backhand smash		
	With hitting without right-hand effect			
	With hitting without reverse effect			

**Source:** Own elaboration.

With the application of the observation in a second moment and using the corresponding guide in relation to the answers of the rivals the logical relations of opposition between the technical-tactical actions of the table tennis were determined. These relationships are presented below. (Chart 4) and (Chart 5)

**Chart 4.** - Actions relating to the services sector

Type of services	Logical opposition actions
Services with short backspin to the opponent's right	<ul style="list-style-type: none"> <li>· Right Backspin</li> <li>· Right Flip</li> <li>· Right Push</li> </ul>
Services with a short backspin towards the opponent's backhand	<ul style="list-style-type: none"> <li>· Backspin cutting</li> <li>· Flip backwards</li> <li>· Reverse Push</li> </ul>
Services with short sidespin to the opponent's right	<ul style="list-style-type: none"> <li>· Right-hand side lock</li> <li>· Right Flip</li> </ul>
Services with short sidespin to the opponent's backhand side	<ul style="list-style-type: none"> <li>· Lateral reverse locking</li> <li>· Flip backwards</li> </ul>
Services with long downward effect to the opponent's right	<ul style="list-style-type: none"> <li>· Right Backspin</li> <li>· Right Topspin</li> </ul>
Services with long downward effect towards the opponent's backhand	<ul style="list-style-type: none"> <li>· Backspin</li> <li>· Reverse Topspin</li> </ul>

**Note:** The services constitute the only technical-tactical action in table tennis that does not have a previous action and therefore does not have a relationship of opposition prior to its realization. All other actions are opposed both in the previous action and in the subsequent action of the opponent.

**Source:** own elaboration

**Chart 5.** - Other actions (offensive, defensive and liaison)

Pre-opposition actions	Potentially possible actions	Post-opposition actions
Short backspin to the right	Start of attack with right flip	a-Right hits with or without topspin b-The backhand strike with or without topspin
Short backspin towards reverse	Start of attack with reverse flip	a- Right hits with or without topspin b-The backhand strike with or without topspin
a-Long cut to the right b-Long ball to the right	Start of attack with reverse flip	a-Right hits with or without topspin b-The backhand strike with or without topspin
a-Long cut to the right	Start of attack with	a-Right hits with or without topspin

b-Long ball to the right	right topspin	b-The backhand strike with or without topspin
a-Long cut to the right b-Long ball to the right	Start of attack with right topspin	a-Right blocking b-Reverse blocking c-Right counter-attack d-Counterattack (counter-point) backwards e-Defense cut from behind (defensive or knit player)
a-Long cut backwards b-Long ball upside down	Start of attack with backhand topspin	a-Right blocking b-Reverse blocking c-Right counter-attack d-Counterattack (counter-point) backwards e-Defense cut from behind (defensive or point player)
Slow and high ball to the right	Smash or right-hand shot	a-Blocking b-Contrapique c-Candles or balloons d-Cut defence (point player)
Slow ball and high ball upside down	Smash or reverse shot	a-Blocking b-Contrapique c-Candles d-Cut defence (point player)
Smash	Candles or balloons	A-Topspin from the right b-Smash the right
a-Topspin from the right b-Topspín de revés c-Smash	Blocking from the right	a-Topspin from the right b-Topspin de revés c-Smash
a-Topspin de derecha b-Backhand Topspín c-smash	Backspin from the right point or defensive player	a-Topspin from the right b-Backhand Topspin c-Backspin from the right d-Backhand Backspin e-Push from the right f-Backhand Push
a-Topspin from the right b-Backhand Topspin	Backhand backspin point or defensive player	a-Topspin from the right b-Backhand topspin c-Backspin

c-Backspin from the right		from the right
d-Backhand		d- Backhand
Backspin		Topspin
		e-Push from the right
		f- Backhand
		Push

**Source:** Own elaboration.

The ten specialists assessed the logical opposition relationships determined from the evaluative aspects presented in the previous section as shown in the following chart. (Chart 6)

**Chart 6.** - Assessment made by the specialists as to the aspects referring to the logical actions of opposition determined

Aspect	Very acceptable	Fairly acceptable
<b>1</b>	<b>10</b>	<b>0</b>
<b>2</b>	<b>9</b>	<b>1</b>
<b>3</b>	<b>10</b>	<b>0</b>
<b>4</b>	<b>8</b>	<b>2</b>

As can be seen, all the specialists consulted rated the proposal in the categories of very acceptable and quite acceptable.

It can be said that from the study carried out all the potentially possible actions to be carried out in table tennis were defined in order to determine the opposition relations among them, which were divided into actions of opposition to the services as the only action that does not present opposition prior to its execution and were divided into relations of opposition prior to and opposition subsequent to the opposition relations existing between the rest of the technical and tactical actions of table tennis, these relations were considered by the consulted specialists as objective, logical, necessary and novel for the work with the technical-tactical component of the preparation in table tennis.

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