

Analysis of motor praxiology in invasion sports

Análisis de la praxiología motriz en los deportes de invasión

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Abstract

The involvement of sport science in the analysis of the different sport disciplines led to the emergence of the field of motor praxiology, with the work of Parlebas, 1976; Delgado, 1991 or Famose, 1999 being decisive, which initiated the path for the study of sport. The aim of this research is to analyse the elements that characterise invasion sports. For this purpose, starting from the elements that structure the internal logic, three categories were established starting from the elements that structure the internal logic with different subcategories ($n=22$), to later relate them to the types of invasion sports (individual and collective), and thus establish the description of this type of motor situations. In addition, this sport analysis was related to the complexity of this type of sport, proposing a series of elements that help to understand its dynamics. The results indicate that, in general terms, keeping in mind the different elements of the internal logic in invasion sports helps us to describe their structure and to understand the dynamics that develop in them, indicating very important parameters that should be taken into account when we want to analyze the performance in competition, the training process or the analysis or study of the game itself.

Keywords: Motor situation; Sport analysis; Internal logic, Invasion sports.

Resumen

La implicación de la ciencia del deporte en el análisis de las diferentes disciplinas deportivas hizo que surgiese el campo de la praxiología motriz, siendo determinantes los trabajos de Parlebas, 1976; Delgado, 1991 o Famose, 1999, los cuales iniciaron el camino para el estudio del deporte. El objetivo de esta investigación es analizar los elementos que caracterizan a los deportes de invasión. Para ello, partiendo de los elementos que estructuran la lógica interna, se establecieron tres categorías a partir de los elementos que estructuran la lógica interna con diferentes subcategorías ($n=22$), para posteriormente relacionarlos con los tipos de deportes de invasión (individuales y colectivos), y así establecer la descripción de este tipo de situaciones motrices. Además, este análisis del deporte se relacionó con la complejidad de este tipo de deporte, proponiendo una serie de elementos que ayudan a comprender su dinámica. Los resultados indican que, en términos generales, tener en cuenta los diferentes elementos de la lógica interna en los deportes de invasión nos ayuda a describir su estructura y a comprender la dinámica que se desarrolla en ellos, indicando parámetros muy importantes que deben ser tenidos en cuenta cuando queremos analizar el rendimiento en competición, el proceso de entrenamiento o el análisis o estudio del propio juego.

Palabras clave: Situación motriz; Análisis del deporte; Lógica interna; Deportes de invasión.

Introduction

Sport has long been interpreted as a discipline linked to art, understood from a purely practical point of view. Subsequently, when sport is incorporated into the scientific field, a change in the analysis of it arises, trying to provide this discipline with arguments from research and study. It is here when professionals and scholars of sport science begin to investigate and deepen on the different elements that compose it, and therefore begin to define its motor nature, emerging the field of motor praxiology (PM) (Parlebas, 1976; Delgado, 1991; Famose, 1999), since, in order to transform the teaching of sports, it is necessary to know and study in depth the fundamentals and motor actions of each modality, which represents what Parlebas calls the internal logic of the game (Oliveira and Magno, 2010), which requires the player to actively participate in the relationships he/she maintains with team mates, opponents, space, time and material (Alonso et al., 2011; Parlebas, 2001; Daiane et al., 2016; Alcaraz Muñoz et al., 2017), as it simultaneously puts into action its different dimensions: organic, affective, cognitive and relational (Lavega, 2017). However, the analysis in certain sports where a logical behaviour is not followed, has led to think that such actions correspond to chance factors (Dufour, 1990).

Following Parlebas (2001), we can define PM as "the science of motor action, main characteristics or relevant features of a given motor situation", where every sports game constitutes a praxeological system possessing its own order and a unique structure derived from a logic, from which the game actions acquire meaning, so games and sports can be understood through interactive environments (Dos Santos Soares et al., 2012; Andueza & Lavega, 2017), where the players's participation has its essence in the act of human communication and/or counter-communication, in which participants interpret the messages of team mates and opponents, choosing the best decision at each moment. This is where motor praxiology appears as an area of knowledge that systematizes the internal logic of all these practices (Largadera & Lavega, 2003; Menezes & Magno, 2017), not being understood as a teaching methodology, but as scientific knowledge about the functioning of games and sports (Oliveira & Magno, 2010; Araujo, Souza & Ribas, 2014). This science of motor skills conceives motor practices as interacting elements, relating to each other following a certain order (Lavega & Lagardera, 2004), which imposes a system of obligations and guides players to be subject to certain codified relationships determined by the rules of the game (Lavega et al., 2018).

Therefore, the relationship of this science with sport has been to define the characteristics of each one of them; because of this, it has been possible to begin to understand its complexity, finding that it is not the addition of small isolated learning that allows to reach the complex movement, but the acquisition of experiences in global learning environments, where all the compositional elements are integrated (Jaqueira & Araujo, 2013). From behind the practices we teach there are more important objectives than the technique itself, and that is the understanding of the different duel episodes that constantly occur during the game, based on the interaction between all the elements that compose it, which is its internal logic (Magno & Franco, 2020), in order to adapt the practice as an essential variable on which other pedagogical foundations affect the learning of motor behaviors (Arias et al., 2011).

One of the categories of sports that constitute this field of study are invasion sports. According to Otero et al. (2011), the bibliographic review of these sports disciplines allows us to recognize three meanings to designate them: i) team sports, ii) invasion sports and iii) cooperative opposition sports in shared space. As for invasion sports, there are different classifications. Thorpe et al. (1986) divide them into two categories: focused on a closed target and focused on an open target. Also from the classification proposed by Hernandez et al. (2000), they are called collaboration, opposition and common space sports. Even the possibility of the appearance of a mobile that must be displaced is also added (Otero et al. 2014). But on the other hand, there are other authors who consider it important to take into account those that have a tactical component, regardless of the sociomotor relationships (Mitchell, 1996; Sola, 2005). The presence of tactical actions establishes that interaction with an opponent is an important component in this type of situations, and therefore this last characteristic, together with the need to dominate a common space, makes us think that the concept of invasion refers to a very varied repertoire of sports games, regardless of the presence or not of cooperators.

In this paper we define the analysis of the components of PM in invasion sports, in order to relate and to categorize the different elements of the internal logic of invasion sports, to study the principles that govern this type of motor situations, taking into account that sports of these characteristics constitute a complex object of study (Martin & Lago, 2005).

SAMPLE AND METHODOLOGY

As indicated by the PM or the science of motor action, the internal logic composes its conceptual corpus or conceptual components at different levels of abstraction. The logic

of the game can be divided into internal and external, but for the methodological development of this work, we have taken the considerations of Hernández, Rodríguez & Castro (2008) who indicate that it is important to take into account this concept, because when the external elements have no relation with the motor action, or rather, they do not modulate or condition in a relevant way the motor praxis.

A quantitative methodology was applied with expert ($n=10$) assessment using a Likert-type scale of 1-10 in relation to pertinence ($M=8.89$). Coefficient for content validity Aiken's V was applied with a confidence interval of 99%.

The sample was drawn after analysing the components of the internal logic and the categorisation of the types of invasive sports. In order to define the different elements or configuring parameters (Bayer, 1992; Hernandez, 1994, Lago, 2000; Oliveira and Ribas, 2010; Saraví, 2012) that make up invasion games we will assume the following structure proposed by Martín-Barrero (2019); from it, 3 categories will be established: motor nature, formal or structural elements and functional elements.

As a final instrument we used a matrix including all of the components and variables: i) element of the internal logic, ii) characteristic of the elements and iii) type of sport.

In order to categorize each of the invasion sports, we consider it is appropriate to use the following classification:

- a) Individual invasion sports (DII): mainly composed of fighting or combat sports. For example Taekwondo.
- b) Team invasion sports (DIE): made up of cooperative sports that confront two groups and allow them to invade the opponent's space.

RESULTS

In relation to the motor nature (Table 1), its elements were divided into two major categories: anatomical involvement (composed of 4 subcategories) and form of execution (composed of 4 subcategories). In total, both DIE and DII made up 6 of the 8 proposed subcategories, with a difference in categories 1, 5, 7 and 8.

Table 1. Differentiating characteristics of invasion sports according to their motor nature

Internal logic element	Characteristics of the elements	Type of sport		
Motor nature	Anatomical involvement	Predominant use of the foot	Team	Fútbol
		Predominant use of hands	Individual and team	Boxing, basketball and handball
		Use of both feet and hands	Individual and team	Judo, kárate, taekwondo and rugby
		Use of implements	Individual and team	Fencing, kendo and hockey
	Form of execution	Traction and grip	Individual	Judo, wrestling, sumo, etc
			Individual and team	Taekwondo, kárate, beisball, soccer and hockey
		Shooting	Team	Basketball, waterpolo and handball
		Projection	Individual	Judo and Jujitsu

Respect to the formal elements of the internal logic (Table 2), the DIEs are present in all the formal elements ($n=7$) and the DIIs are present in 4 of the 7 possible ones, with a difference between subcategories 1, 2 and 4.

Table 2. Differentiating characteristics of invasion sports according to formal elements

Internal logic element	Characteristics of the elements	Type of sport	Remarks
Formal elements	Mobile	Team	Rugby: ball Basketball: ball Handball: ball Hockey: disc or pad
	Goals	Team	Soccer: goals Basketball: Baskets
	Space	Individual and team	Playing field shared with the opponent
	Teammates	Team	Equipment components
	Adversaries	Individual and team	One opponent in individual sports and more than one in team sports
	Time	Individual and team	Dependent on each sport
	Rules	Individual and team	Dependent on each sport

Regarding the functional elements (Table 3) of the internal logic, the DIEs are present in all the formal elements ($n=7$) and the DIIs are present in 5 of the 7 possible ones, with a difference between subcategories 6 and 7.

Table 3. Differentiating characteristics of invasive sports according to functional elements

Internal logic element	Characteristics of the elements	Type of sport	Remarks
Functional elements	Main objective of the game	Individual and team	Achieve a higher score than the opponent
	Sequential objective of the game	Individual and team	Different sub-objectives to achieve the final objective
	Roles	Individual and team	Strategic roles (Hernández, 1994)
	Game cycle	Individual and team	Duality of attack and defense
	Individual technical-tactical fundamentals	Individual and team	Basketball: shooting Judo: the falls
	Basic collective technical-tactical fundamentals	Team	Soccer: the wall Basketball: Odd Fixing
	Complex collective technical-tactical fundamentals (game systems)	Team	Handball: Defense 5:1

In total, 3 categories ($n=3$) with 22 subcategories ($n=22$) were established, determining a very high presence of the elements in collective sports (90.9%) and a lower presence (68.1%), although also considerable, in individual sports.

Discussion

Based on the structural elements of the internal logic, three categories were established with different subcategories ($n=22$), to subsequently relate them to the types of invasion sports (individual and collective), and thus establish the description of this type of motor situations, relating this analysis to the complexity of this type of sports, thereby proposing a series of elements that help to understand its dynamics.

Invasive sports are made up of a wide variety of sports, which can be divided into two types, DIE and DII. Within a similar internal logic, they both share common

characteristics, but also important differences. In relation to the different classifications proposed by Blázquez & Hernández (1984), what mainly characterizes this type of sports is, on the one hand, the relationship established between the player or players, the opponent(s), establishing a simultaneous participation and the space, which is common and which needs to be invaded or assaulted in order to overcome the opponent.

Respect to their motor nature, a great variety is observed in the form of execution for both DIE and DII, highlighting that the hitting and throwing situations are predominantly of DIE, while those of grip, traction and projection are related to DII. Continuing with the formal aspects, it is logical that the element of partners is only present in the DIE, while the great difference in this typology of sports is also found in the presence of a mobile and goals. In relation to the functional elements, although we find some differences, there are many elements that are present in both types of sports, but with some nuances. For example, in terms of strategic roles (Hernández, 1994) we can differentiate in team sports up to four roles, as is the case of soccer (ball holder, player without ball of the ball-holding team, player without ball of the non ball-holding team and goalkeeper), and only one role in individual sports.

Among the singularities, it is worth mentioning the presence of the game cycle in both types of sport, being the same for both DIE and DII, coexisting in the attack-defense duality. With respect to the major differences in this section, we find the absence of game systems in the DII and the non-existence of collective technical-tactical means, limited by the individual character of this type of sport.

Within the elements that make up the internal logic of invasion sports, some principles can be established in common to these sports that define the complexity of their dynamics (Martín-Barrero, 2019), understanding these as the set of principles that originate from the interaction of the different elements that make up the internal logic of a type of sport. According to Martin & Lago (2005), complexity carries implicitly the concept of uncertainty, understanding this as an information deficit. In relation to the analysis made above, we could consider that the greater the number of unpredictable elements interacting with each other, this information deficit generates a lack of certainty about the events that originate. Complexity is the uncertainty of the observer (Morin, 1993; 1999; Ruano, 1996; Zolo, 1992), which, transferred to the context of sport, would be the uncertainty of the athlete in the situation he/she is facing. On the other hand, there is a relationship between disorder or chaos (Atlan, 1990) and the fact that its dynamics and

structures cannot be reduced to cyclical, periodic, regular or predictable explanations or management (Maldonado, 2014), which transferred to the functional point of view would be the opposite of stability.

If we return to the analysis of the internal logic of this type of sports, we could highlight that the element that gives an unstable character to invasion sports is the constant and unpredictable changes of the phases of the game, keeping in a constant disorder or alteration to the dynamics of the game. Also for Gréhaigne (2001), the study of the interaction that occurs between players (opponents and team-mates) is an element that underlies the study of complexity. For Martín & Lago (2005), the interaction processes between players provoke new behaviors in athletes, influencing the interpersonal motor relationships that communicate athletes. As Oliveira & Ribas (2010) state, the starting point is the operating rules that clarify the relationships between the driving action, the driving situation and the driving behavior; allowing the revelation of their internal logic.

Therefore, we could establish a series of principles or laws that originate from the internal logic of the game, i.e., that originate from the different elements that compose it, and that try to define and configure the complexity of its dynamics. From the analysis carried out in this work, we could consider that these principles in invasion sports are characterized by the following features (Figure 1):

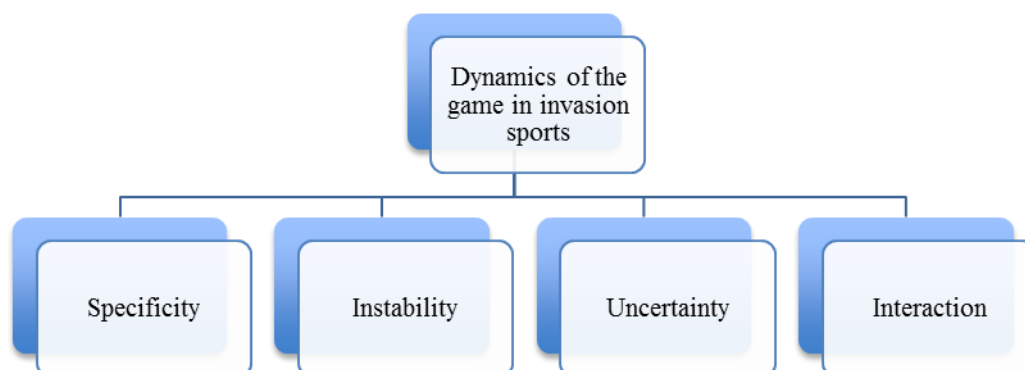


Figure 1. Elements that make up the dynamics of the game in invasion sports

- a. Specificity: defines the characteristics of the game or sport itself, influenced by its formal elements and motor characteristics. The set of rules of the game and its relation with the motor nature would establish the sense of its specific character.
- b. Instability: invasion sports are sports that are in a constant state of alteration due to the continuous change in its phases (game cycle) and its influence on the roles adopted by the players during this change of phases.

c. Uncertainty: due to the relationship that occurs between athlete-opponent or players and opponents, there is a constant variation of conditions and space/time situations that greatly limits the certainty about the actions to be developed.

d. Interaction: the game is defined by the constant communication between athletes acting in the same environment (player-opponent or team-adversary team), which involves a constant relationship between the different subsystems (micro and macro). It should also be added that the interaction of players and their capabilities leads to the emergence of emerging qualities.

Conclusions

1. The study and analysis of sports from the motor action and more specifically its internal logic, is a very useful tool to determine the different characteristics that make up its activity.
2. From the analysis carried out we can determine that invasion sports have a very variable internal logic, where the opponent's opposition always generates a great uncertainty in the game and that together with the interaction with its environment, interactions are established between opponent-players that are determinant to understand its functioning, which is dynamized through game cycles that generate instability to it and which has to be solved, together with the uncertainty, by the different technical-tactical means and operative strategies.
3. To keep in mind the different elements of the internal logic in invasion sports helps us to describe their structure and to understand the dynamics developed in them, indicating very important parameters that should be taken into account when we want to analyse the performance in competition, the training process or the analysis of the game itself. In addition, taking these aspects into account is very important due to the great variety of sports that are found in the invasion sports branch.
4. Could be interesting to establish a similar structure of categories and subcategories to compare different sports with very different characteristics and even those belonging to the same branch, thus establishing a sort of guide to help describe the elements that make up its internal logic.
5. Understanding in depth the internal logic of the different sports will allow us to optimize the design of the tasks in our practical sessions, thus stimulating a better

training of the players, who will make a more adequate and intelligent use of the necessary tools to solve the problems posed by the game, transforming them into competent motor subjects, capable of attributing meaning to their actions and acting effectively in such situations (Parlebas, 2018), and what is more important, they will solve all those episodes by themselves, since, as Etxebeste, Urdangarin, Lavega, Lagardera & Alonso (2015) state, what really matters is what is discovered.

Bibliographic References

- Alcaraz-Muñoz, Verónica, Alonso Roque, José Ignacio, Yuste & Lucas, Juan Luis (2017). Jugar en positivo: género y emociones en educación física. *Apunts. Educación Física y Deportes*, 129, 51-63. [https://doi.org/10.5672/apunts.2014-0983.es.\(2017/3\).129.04](https://doi.org/10.5672/apunts.2014-0983.es.(2017/3).129.04)
- Alonso, J. I., López de Sosoaga, A., & Segado, F. (2011). Análisis de la relación entre preferencia lúdica y la estructura de las actividades programadas en festivales lúdico-deportivos. *Cultura, Ciencia y Deporte*, 6(16), 15-25. <https://doi.org/10.12800/ccd.v6i16.28>
- Andueza, J. & Lavega, P. (2017). Incidencia de los juegos cooperativos en las relaciones interpersonales. *Movimento*, 23(1), 213-228. <https://doi.org/10.22456/1982-8918.65002>
- Araújo, P. A., Souza, M. S., & Ribas, J. F. M. (2014). Praxiología motriz e a abordagem críticosuperadora: Aproximações preliminares. *Motricidade*, 10(4), 3-15. [https://doi.org/10.6063/motricidade.10\(4\).2658](https://doi.org/10.6063/motricidade.10(4).2658).
- Arias, J.L., Argudo, F.M. & Alonso, J.I. (2011). Las reglas como variables didácticas. Ejemplo en baloncesto de formación. *Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte*, 11(43), 491-512. <https://doi.org/10.15366/rimcafd>
- Atlan, H. (1990). *Entre el cristal y el humo: ensayo sobre la organización de lo vivo*. Madrid: Debate.
- Bayer, C. (1992). *La enseñanza de los juegos deportivos colectivos*. Barcelona: Hispano Europea.

- Blázquez, D. & Hernández, J. (1984). *Clasificación o taxonomías deportivas*. Barcelona: Monografía. Inef.
- Daiane, Dalla Nora, Welter, Janaíne, Welter, Jaqueline, Buffon, Elciana & Magno Ribas, João Francisco (2016). Praxiología motriz, trabajo pedagógico y didáctica en la educación física. *Movimento*, 22(4), 1365-1378. <https://doi.org/10.22456/1982-8918.65268>
- Delgado Noguera, M.A. (1991). Hacia una clarificación conceptual de los términos didácticos de la educación física y el deporte. *Revista de Educación Física*, 40, 2-10.
- Dos Santos Soares, Leys Eduardo, Gomes da Silva, Pierre Normando & Magno Ribas, João Francisco (2012). Comunicação motriz nos jogos populares: uma análise praxiológica *Movimento*, 18(3), 159-182. <https://doi.org/10.22456/1982-8918.26645>
- Dufour, W. (1990). Las técnicas de observación del comportamiento motor. *Revista de Entrenamiento Deportivo*, 4, 16-22.
- Etxebeste Otegi, Joseba, Urdangarin Liebaert, Clara, Lavega i Burges, Pere, Lagardera Otero, Francisco & Alonso Roque, José Ignacio (2015). El placer de descubrir en praxiología motriz: la etnomotricidad. *Acción Motriz*, 15, 15-24.
- Famose, J.P. (1999). *Cognición y rendimiento motor*. Barcelona: INDE.
- Gréhaigne, J. (2001). *La organización del juego en el fútbol*. Barcelona: INDE.
- Hernández, J. (1994). *Fundamentos del deporte. Análisis de las estructuras del juego deportivo*. Barcelona: INDE.
- Hernández, J., Castro, U., Cruz, H., Gil, G., Guerra, B., Quiroga, M. & Rodríguez, J. (2000). *La iniciación a los deportes desde su estructura y dinámica. Aplicación a la educación física escolar y al entrenamiento deportivo*. INDE.
- Hernández, J. Rodríguez, J.P. & Castro, U. (2008). De cómo separar los elementos de la lógica interna y de la lógica externa. *Acción Motriz*, 1, 5-9.
- Jaqueira, A.R. & Araújo, P.C. (2013). Análise praxiológica do primeiro regulamento desportivo da capoeira. *Movimento*, 19(2), 31-53. <https://doi.org/10.22456/1982-8918.31035>

- Jiménez Jiménez, F. (2000): *Estudio praxiológico de la estructura de las situaciones de enseñanza en los deportes de cooperación/oposición de espacio común y participación simultánea: balonmano y fútbol sala*. Tesis doctoral (inérita). Universidad de Las Palmas de Gran Canaria.
- Largadera, F. & Lavega, P. (2003). *Introducción a la praxiología motriz*. Barcelona: Paidotribo.
- Lago, C. (2000). *La acción motriz en los deportes de equipo de espacio común y participación simultánea*. Tesis doctoral. A Coruña: Universidad de A Coruña.
- Lavega, P. & Lagardera, F. (2004). *La ciencia de la acción motriz*. Universitat de Lleida.
- Lavega, P. (2017). Educar conductas motrices. Reto necesario para una educación física moderna. *Acción Motriz*, 20, 73-88.
- Lavega, P., Prat, Q., Sáez de Ocariz, U., Serna, J. & Muñoz-Arroyave, V. (2018). Aprendizaje basado en la reflexión sobre la acción a través de los juegos tradicionales. *El caso de la pelota sentada*, 30(1), 142-176. <https://doi.org/10.1080/11356405.2017.1421302>
- López, M.P. (2008). *Análisis observacional de los comportamientos técnico-tácticos individuales defensivos en balonmano en categoría juvenil masculino*. Tesis Doctoral. A Coruña: Universidad de A Coruña.
- Magno Ribas, J.F. & Franco, F. (2020). Praxiología motriz y la organización del trabajo pedagógico y la didáctica en la educación física: entrevista con Pierre Parlebas, profesor de la Universidad París Descartes (Paris V-Sobornne Cité). *Movemento*, 26(e26008). <https://doi.org/10.22456/1982-8918.94580>
- Maldonado, C. (2014). ¿Qué es un sistema complejo? *Revista Colombiana de Filosofía de la Ciencia*, 29, 71-93.
- Martin-Barrero, A. (2019). *El proceso de enseñanza-aprendizaje en el fútbol: aproximación a un enfoque basado en competencias en el fútbol formativo*. Sevilla: Wanceulen.
- Martín, R. & Lago, C. (2005). *Deportes de equipo. Comprender la complejidad para elevar el rendimiento*. Barcelona: INDE.
- Menezes Fagundes, F. & Magno Ribas, J.F. (2017). La decisión motriz del levantador en el voleibol: revisión de literatura y sistematización para enseñanza y aprendizaje

- según la praxiología motriz. *Movimento*, 23(4), 1161-1176.
<https://doi.org/10.22456/1982-8918.71854>
- Mitchell, S. (1996) Improving Invasion Game Performance. *Journal of Physical Education, Recreation & Dance*, 67(2), 30-33.
<https://doi.org/10.1080/07303084.1996.10607197>
- Morin, E. (1993). *El método I: La naturaleza de la naturaleza*. Madrid: Cátedra.
- Morin, E. (1999). *L'intelligence de la complexité*. Paris: L'Harmattan.
- Oliveira, G. & Ribas, J.F. (2010). Articulaciones de la praxiología motriz con la concepción crítico-emancipadora. *Movimento*, 16(1), 131-151.
<https://doi.org/10.22456/1982-8918.9680>
- Otero, F., Calvo, A. & González, J. (2011). La enseñanza de los deportes de invasión: metodología horizontal vs. metodología vertical. *EmásF, Revista Digital de Educación Física*, 12, 74-86.
- Otero, F.M., Carmona, J., Albornoz, M., Calvo, A. & Díaz, J.A. (2014). Metodología de enseñanza de los deportes de invasión en primaria. *Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte*, 14, 69-87.
<https://doi.org/10.15366/rimcafd2019.75.009>
- Parlebas, P. (1976). *Activités physiques et éducation motrice*. Paris: Éditions Revue éducation physique et sport.
- Parlebas, P. (2001). *Juegos, deportes y sociedades. Léxico de praxiología motriz*. Barcelona: Paidotribo.
- Parlebas, P. (2018). *Pedagogy of motor skills. Acción Motriz*, 20, 89-96,.
- Ruano, J. (1996). *Autoorganización: entre el orden y el caos*. A Coruña: Universidad de A Coruña.
- Saraví, J.R. (2012). La Praxiología motriz: presente, pasado y futuro. Entrevista a Pierre Parlebas. *Movimento*, 18(1), 11-35. <https://doi.org/10.22456/1982-8918.27065>
- Sola, J. (2005). Caracterización funcional de la táctica deportiva. Propuesta de clasificación de los deportes. *Apunts Educación Física y Deportes*, 4(82), 36-44.

Thorpe, R., Bunker, D. & Almond, L. (1986). *Rethinking games teaching*. Department of Physical Education and Sport Science. Loughborough, UK: University of Technology of Loughborough.

Zolo, D. (1992). *Democracy and complexity*.