

## Review of rule modification in sport

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### Abstract

The goal of this qualitative review was to analyze the state of the bibliography about rule modification in sport. In the literature reviewed, there are few studies of rule modification and related aspects. Most studies omit mentioning the purpose of the modifications, but they do refer to the goals of their analysis (improving players' performance, attracting spectators and athletes, attending to commercial pressure, adapting the sport to children's needs and interests, preventing injuries). Eighty percent of the studies did not report the outcome of the previous modifications they analyzed. More than half of the studies (60%) achieved the proposed goals. Nearly two-thirds (63.83%) analyzed the effect of rule modification on game actions occurring during the game or through a test. Most of the studies (91.5%) did not consult the participants. Three-fourths of the studies (74.46%) examined the effect of rule modification without any knowledge of a previous analysis or without any previous analysis, and 74.47% studied rule modification related to internal logic. Modifications to be introduced in a sport should be analyzed through a reflective process before their final introduction. The following points should be considered: establishing goals, respecting the basic rules without modifying them, becoming familiar with players' and coaches' opinions, determining the effect of the modification on a wide spectrum of variables, elaborating useful proposals for the organizations that are responsible for competitions, using more than one type of data, modifying the internal logic and, preferably, the functional rules, and following some basic stages to consolidate rule modification.

**Key words:** Rule, game, game analysis, game action, economic interest, injury prevention.

### Introduction

Concern about modifying game conditions has increased in the last two decades. Modifying the rules is a common way to change game conditions. Rules provide the unique, differentiating character to the game (Lagardera and Lavega, 2003; Parlebas, 1999) and they specify the requirements of game action. According to Parlebas (1999), rules determine four types of participants' relationships that cause game action to emerge: (a) with other participants, (b) with the game space, (c) with the equipment, and (d) with how they should adapt to the game time.

The internal logic of the game (i.e., the result of the dynamic of the relations of the structural and functional elements and the players) is not exclusively explained by the rules. The rules should determine all the necessary conditions to be able to play, that is, the internal logic

should be reflected in them. However, the rules allow for a degree of variability in the players' motor behaviors. This means that the players' personal adaptation or the way they execute their motor behaviors produces different responses because all the players interpret the game actions according to their own experience, capabilities, knowledge of the opponent, etc. Along with the complexity of all the variables that interact in the game, this makes it more difficult to determine the implications of rule modification (Eaves et al., 2008a; Gréhaigne and Godbout, 1998; Kew, 1990; Usabiaga and Castellano, 2005). In the literature reviewed, there are few studies of rule modification and little related information. The modification of a rule cannot take place in the absence of objective knowledge that serves as a foundation for the decision. The purpose of this qualitative review was to analyze the state of the bibliography about rule modification in sport.

This manuscript presents the results of a bibliographic search and its analysis, which was conducted over three years. The review was completed using various databases (Science Citation Index, Scopus, SPORTDiscus, EbscoHost) and the catalogs of five European universities. The bibliographic search included manuscripts that met the following criteria: (a) published from 1989 until January of 2009 in journals that use a double-blind peer-review process, (b) written in English, (c) included an empirical study, (d) used elements that were defined by rules that are characteristic of a certain sport, (e) involved a typical motor behavior of the sport, and (f) referred to the modification of at least one element that was influenced by a rule of the sport in the title, key words, objectives, or conclusions. The authors discarded all the studies of modifications of the quality of the equipment or simply to improve training. The researchers read the selected documents and reached a consensus to include them in the study. Lastly, a search was conducted using the snowball technique, by which the titles in the reference lists of the selected research articles were reviewed. The keywords were: adaptation, change, modification, rule, law, adaptation of rules, change of rules, modification of rules, game, competition, game analysis, modified game and youth sport. Of the 139 studies reviewed, only the 47 marked with an asterisk in the References met the established inclusion and exclusion criteria. Along with five experts (who had a Ph.D. in Physical Educational and Sport and coaches with more than six years' experience in training children and high performance athletes), the authors of this article then selected a set of data to be analyzed in the review (see Tables 1, 3 and 4). In addition to the search

for empirical studies, the authors carried out a complementary search of theoretical studies (not marked with an asterisk in the references).

In type of study, the authors differentiated studies that analyzed a previous modification not proposed by the authors and studies that analyzed a modification proposed by the authors of each study (see Table 1). This review differentiates the purpose of the proposed modifications and the purpose of the authors when conducting their studies (see Table 3). We also differentiated whether the goals were achieved and what motivated the authors to carry out the modifications or to conduct the studies.

**Table 1. Data extracted about study type.**

Variables	n	%
<b>Type of study</b>		
Did the studies analyze a previous modification or a modification proposed by the authors?	35	74.46
Studies that analyzed a previous modification not proposed by the authors	10	21.28
Studies that analyzed a modification proposed by the authors	2	4.25

### Classification of the rules

Based on the review of rule modification, diverse authors have proposed various classifications (Table 2). Following the game configuration established by Parlebas (1999), most of the proposals coincide in differentiating two types of basic rules. Firstly, are the rules that refer to internal logic. These rules define the criteria that mark the relationships between a player and the rest of the players, game time, space, and game equipment. These rules can be structural and functional. Structural rules determine

measurable (quantitative) aspects of space, time, equipment, and number of players. These aspects are static and establish the necessary conditions for executing game actions. Functional rules (also called qualitative rules) determine the form, use, and the players' use of the structural elements, indicating obligations, rights, and prohibitions concerning space, time, equipment, and relationships with other players. For example, with regard to basketball players, a structural rule determines the number of individuals per team who can participate at the same time in the game space, whereas a functional rule indicates the constraints of body contact between players and the penalties if they exceed these restrictions.

Secondly, rules that refer to the external logic are the criteria concerning elements that are further from or nonessential to the game. These elements include the nature of the competition, the scoring system, the characteristics of the material, team differentiators, game moments or seasons. Game action can emerge without these elements, although this could influence game dynamics.

### The goals of rule modification

Fifty-one percent of the studies pursued the same goal as that of the rule modification. The remaining studies (48.94%) analyzed how rule modification affected other aspects that were not the object of the modification. It does not seem reasonable for studies to analyze rule modification proposed by other people with a different goal. However, it is necessary to analyze the modified rules with other goals in order to obtain information about how they affect other aspects of the game. Of all the studies, 74.46% analyzed a previous modification, 21.28% proposed a modification, and 4.25% analyzed a previous

**Table 2. Classifications of rules by various authors.**

Source	Type of rule	Definition
Robles (1984)	Ontic	Essential aspects (space, time, subjects, competences, and procedures).
	Technical-conventional	Necessary requirements for carrying out the game action.
	Deontic	Non-permitted behaviors with the goal of monitoring the game.
Elias and Dunning (1986)	Fixed	Stable delimitation.
	Elastic	Game actions and the strategies to achieve the game objective.
	Regulatory	More efficient game administration and management.
Shogan (1988)	Constitutive	Characteristics of a game.
	Descriptive	Dimensions of the game space, size, and equipment size and shape.
	Prescriptive	Actions that the individuals can execute during the game.
	Proscriptive	Dangerous actions that the individuals cannot execute.
Hernández (1998)	Formal	Structural aspects of the game (game space, players, time, way of scoring, and materials).
	Functional	Development of the game action (way of using the equipment and the game space, participation of each player, relationship between teammates and opponents, and penalties for infractions).
	Quasi-moral	Actions of honorability during the game.
Drewe (2000)	Regulatory	Character of discipline.
	Constitutive	Nature of the game.
Navarro (2002)	Agreement	Informal, previous establishment with consent and agreement.
	Regulation	Conventional and obligatory character.
	Norm	Sanctioned layout that establishes the limits of the action.
Lagardera and Lavega (2003)	Ontic (descriptive)	Basic conditions so that the game is possible (space and time, equipment and objects, subjects and their competences).
	Deontic (norms)	Inappropriate behaviors and their sanctions.
	Prescriptive (of the game)	Necessary requirements to execute the action (obligations, rights, and prohibitions together).
Cudd (2007)	Constitutive	Permitted movements, how to achieve the goals of the game, and the sanctions for violations.
	About decency and fair play	Movements, strategies, and behaviors that are informally allowed.

**Table 3.** Data extracted about modification and study goal.

Variables	Modification		Study	
	n	%	n	%
<b>Attempted goal</b>				
To improve performance	12	25.53	20	42.55
To attract spectators and attend to commercial pressures and interests	12	25.53	4	8.51
To adapt sport to children	10	21.28	10	21.28
To prevent injury	5	10.64	13	27.66
To attract athletes	3	6.38	3	6.38
<b>Was the goal achieved?</b>				
Yes	7	20	6	60
No	5	14.28	4	40
Not mentioned	23	65.71	0	0

modification and proposed an alternative (Table 1). This last option seems to be influenced by a deeper research process of the modification analyzed. In effect, the study of rule modification should involve the elaboration of alternative proposals.

Nearly one-third (31.91%) of the studies do not mention the purpose of the modifications. However, all the studies reported the purpose of the analysis of such modifications. Kew (1987) affirms that there is little knowledge of the interactive processes that produce changes in the rules, which seems logical. The most frequently mentioned goals of rule modification (see Table 3) were: to improve performance (25.53%) and to attract spectators and to attend to commercial pressures and interests (25.53%). Most of the studies analyzed the modifications with the goal of improving performance (42.55%). According to Kew (1987), rule changes are motivated primarily by the need to improve the characteristics of the game. Elias and Dunning (1971) provided two explanations for rule changes in sport. The first was the need to modify the threshold of behavior disorders that occur during the game. The second was the need to develop game dynamics and motor skills that allow for improving the game over time.

Attracting spectators and attending to commercial pressures and interests was one of the goals with the least influence (8.51%) on the study of rule modification. However, Steen-Johnsen (2008) identified commercial interests as one of the primary sources of rule change. Abrevaya (2004) and Easton and Rockerbie (2005) pointed out that sports have a continual strategy for maintaining the business that they generate. Rule change indirectly causes an increase in spectatorship, which in turn affects the public's interest as well as the revenue. Kew (1990) indicated that commercial interests, along with the demands of the media, are the engines that drive rule change.

Adapting sport to children's possibilities was the third goal both for modifying rules (21.28%) and for conducting the studies (21.28%). With the idea that children are not miniature adults, the authors refer to the fact that children normally lack the strength and physical characteristics of adults (Chase et al., 1994; Regimbal et al., 1992; Satern et al., 1989). Numerous studies proposed game modifications as a strategy for adapting the game to children's interests, possibilities, and needs (Arias et al., 2009a; Buekers and Billiet, 1998; Evans, 1980; Rink, 1993).

One of the goals with the least impact on rule

modification was preventing injury (10.64%). However, this was one of the goals with the greatest influence on researchers to conduct the studies (27.66%). The unsuitability of game rules may directly cause injuries (Albright et al., 2004; Grimmer and Williams, 2003; Macpherson et al., 2006; Otago, 2004) and indirectly cause stressful situations that can result in injuries (Maddison and Prapavessis, 2005; Palmi, 1997). According to Palmi (1997), a series of external factors can influence athletes' actions and increase the risk of injury. Among these factors is highlighted the unsuitability of the game rules for the individuals. Various studies call for the need for rule modification to prevent injuries, and not only to serve commercial interests (Livingston and Forbes, 2003; Putukian, 2004). Putukian (2004) emphasized that rule change is vitally important to protect athletes' health and safety. Rule modification and strict adherence to rules may minimize the frequency of injuries (Livingston and Forbes, 2003; McCrory et al., 2009).

Attracting athletes to practice a sport was the goal with the least influence on rule modification (6.38%) and on the corresponding studies (6.38%). Agozino (1996) indicated that rule modification responds more closely to other interests, and that the excitement that is aroused in the players is neglected. For this purpose, those in charge of the administration of the sport should change the rules to generate situations that are more meaningful and gratifying for the players. This would involve the analysis of diverse aspects related to the participants' motivation (satisfaction, self-efficacy, ability to achieve success, fun, economic reimbursement). In recreational sport, the goal would be to achieve satisfaction in the practice of the sport (Pellet and Lox, 1997, 1998). In amateur sport, the goal seems to be professionalization (Eaves et al., 2008b; Williams et al., 2005). In professional sport, the aim appears to be to improve one's economical conditions (Eaves et al., 2008b; Harris, 1992).

#### **Are the goals achieved?**

Nearly two-thirds (65.71%) of the studies did not mention whether the previous modifications they analyzed achieved the proposed goals (see Table 3). The goal was achieved in 20% of the cases, and it was not achieved in 14.28%. According to Mathes and Flatten (1982), the lack of information about the effect of the modifications on the players' behavior causes some rule modifications to be questioned. On the other hand, all the studies that proposed a modification stated whether or not the modifications that they analyzed achieved the goals. Thus, 60% of

the studies achieved the goals that prompted the study. The results of the review seem to corroborate previous research data. Several authors suggest that most of the studies conducted to verify the effect of rule modification produce results that are far from or contrary to what was intended with the change (Eaves et al., 2008a; Kew, 1987; Krauss, 2004; Usabiaga and Castellano, 2005).

Nearly half (48.6%) of the studies that analyzed a previous modification achieved a different goal from that originally proposed. This datum seems to coincide with the fact that rule modification can interfere with aspects that, theoretically, should not be affected (Kew, 1990; Krauss, 2004). We need to know how rule modification interferes with a wide range of variables, and not only how it interferes with the variables that the researchers intended to change. All the studies that analyzed a previous modification and proposed an alternative achieved the intended goals of the modification and of the study. However, these cases are scarce (only two studies). Studies should not only analyze a modification proposed by others. They should also elaborate useful proposals that serve the organizations that are responsible for competitions. Evans (1980) acknowledged that research has done very little to provide information to guide the people in sport administration who are responsible for competition.

#### Data registered and methods

Nearly half (48.94%) of the studies analyzed the effect of rule modification on the game actions that occur during the game (see Table 4). Game action was also one of the data in the studies that was most often registered through a test (14.89%). Registration of injuries during the game was common in various manuscripts (12.76%). Other data used in the studies to analyze the effects of rule modification were: (a) injuries, by questionnaire and database (10.64%); (b) psychological variables, by questionnaire (6.38%); (c) game statistics (6.38%); (d) physiological parameters during the game (6.38%); (e) physiological and anthropometric parameters, by test (6.38%); (f) mechanical variables, by power plates and accelerometers (4.25%); and (g) result of the games (2.13%). Furthermore, two studies (4.25%) did not mention the data they used to analyze the effect of rule modification. The effect of rule modification cannot be evaluated easily. Observational analysis can be used as an objective method and technique of analysis. Game actions are important data that are directly affected by the modifications (Arias et al., 2009a; 2009b; Parlebas, 1999; Williams et al., 2005). Due to the changes undergone in game actions, rule modification indirectly causes changes in: (a) game conditions (Hammond and Hosking, 2005; Hammond et al., 1999), (b) energy demands (Ben Abdelkrim et al., 2007; Cormery et al., 2008; Platanou and Geladas, 2006), (c) players' conditions (Carter et al., 2005; Ekstrand et al., 2006), and (d) players' motivation (Chase et al., 1994; Pellett and Lox, 1998). Sixty-eight percent of the studies used only one type of data from a single register procedure, and 31.11% based used more than one type of data. We consider that it is necessary to use more than one type of data that allows us to confirm the results. This methodological strategy leads to more powerful results. Therefore, it would be interesting to utilize qualitative and quantita-

tive methodologies.

**Table 4.** Data extracted about data and register method, participants consulted, analysis before the modification and rules modified.

Variables	n	%
<b>Data and register methods</b>		
Game action during game	23	48.49
Game action, by test	7	14.89
Injuries during game	6	12.76
Injuries, by questionnaire	5	10.64
Psychological variables, by questionnaire	3	6.38
Game statistics	3	6.38
Physiological parameters during the game	3	6.38
Physiological and anthropometric parameters, by test	3	6.38
Mechanical variables, utilizing power plates and accelerometers	2	4.25
Result of the games	1	2.13
Not mentioned	2	4.25
<b>Were participants consulted?</b>		
Yes	4	8.51
No	43	91.49
<b>Was there an analysis before the modification?</b>		
Yes	12	25.53
No	2	4.25
Not mentioned	33	70.21
<b>Modified rules</b>		
Internal logic	35	74.47
Structural	25	71.43
Functional	8	22.86
Structural and functional	2	4.25
External logic	7	14.89
Internal and external logic	3	6.38
Not mentioned	2	4.25

A great majority of studies (see Table 4) did not consult the participants (91.5%). However, when studying rule modification, we need to know the players' and coaches' opinions (Chase et al., 1994; Evans, 1980; Kew, 1990, 1992; Palacios-Huerta, 2004). The four studies that collected participants' data only took the players into consideration. None of the studies considered the coaches or other people. According to Kew (1990), the rule modification entails a process of social interrelation between the administrators of the sport, the players, and the coaches. Of the four aforementioned studies, two registered data about psychological variables, one about preferences, and another requested the participants' opinions. According to Agozino (1996), few studies examine the players' or coaches' opinions of the rules and the changes to be made in them. Although this is lacking in most of the studies, it would be interesting to consult the protagonists' viewpoint of the need to modify the game and the modifications that may be included (Evans, 1980). Specifically, studies that pursue goals that are directly related to people—that is, attracting spectators and athletes and adapting the sport to children's possibilities—should make a special effort to ask the people involved.

#### Evidence of analysis prior to rule modification

More than two-thirds (70.21%) of the studies did not mention whether the modifications that were introduced were previously analyzed by the organizations that proposed them (see Table 4). Except for two, in all cases, the

modification was proposed by the organizing body of the competition. Very few of articles (4.25%) reported that the promoters of the rule modification did not carry out previous analyses. Therefore, most of the studies (74.46%) researched the effect of rule modification without knowing whether there had been a previous analysis or without any previous analysis. According to Evans (1980) and Pellet et al. (1994), most of the studies analyzed rule modifications that were introduced intuitively and subjectively instead of on the basis of objective evidence. Only 25.5% of the modifications were proposed after a previous analysis. In 83.33% of these cases, the authors proposed the modification, and only in two cases, the authors analyzed a modification that was introduced by the organizing bodies of the competition. Due to the various options of many rules, the administrators of the sport cannot precisely anticipate the consequences of their modification. However, changes to be made should be designed and analyzed through a reflective process to determine their influence before finally introducing them into the game (Easton and Rockerbie, 2005; Krauss, 2004; Parkkari et al., 2001; Usabiaga and Castellano, 2005).

In more than half of the studies (58.33%), modifications proposed after a previous analysis achieved the desired goal. According to Evans (1980), it is necessary to study rule modification objectively to obtain valid information through empirical methodology. Modifications carried out using a scientific design are more likely to be effective. The stages followed by most of the studies (72.72%) that conducted a prior analysis were: (a) to analyze the literature, (b) to identify deficiencies, (c) to modify the rules and (d) to conduct an analysis after the modification. Three studies proposed establishing the goals before rule modification. Recent publications suggest the need for sport administrators to consider studies of rule modification before modifying any rules (Arias et al., 2009a; Eaves et al., 2008a; Hammond et al., 1999; Hammond and Hosking, 2005; Platanou and Geladas, 2006; Usabiaga and Castellano, 2005).

We found two proposals of models that established stages for the study and modification of game rules. Evans (1980) proposed three stages to adapt a sport to children's characteristics: (a) analyze the game with adult rules; (b) identify game deficiencies with regard to children's needs, interests, and possibilities and (c) recommend the modifications to transform the game. Usabiaga and Castellano (2005) established that the study and modification of game rules should follow the following stages: (a) structural analysis of the sport, (b) descriptive analysis of the game action in the sport, (c) structural modification of the sport, (d) descriptive analysis of the game action in the modified sport, and (e) optimization and descriptive analysis of the game action in the modified sport.

### Modified rules

Three-fourths of the studies (74.47%) analyzed rule modifications related to internal logic and few studies (14.89%) analyzed rules related to external logic. Only three studies analyzed a rule modification about both the internal and external logic, and two studies did not mention all the modifications that they analyzed (see Table 4).

It seems logical for the modified rules to be related to internal logic. Although the aspects that designate the rules related to external logic can influence game dynamics, they are expendable when determining the game actions. However, the rules related to internal logic conceive the particular way of predetermining the game actions of each sport (Parlebas, 1999). When examining these latter rules in detail, 71.43% of the studies analyzed structural modifications, 22.86% analyzed functional modifications, and two studies dealt with both types of rules. The strategies adopted to modify game conditions seem to focus on structural rules. Some of the following are emphasized: (a) number of participating players, (b) game duration, (c) game space and (d) equipment. These rules establish the basic conditions that make the game possible; they determine an important part of the contextual conditions in which players develop their actions. Rink (1993) suggested that an effective way to modify game conditions is through the structural rules. The literature about prevention of injuries also emphasizes that more attention should be paid to these rules in order to decrease the risk of injury (Krauss, 2004; Parkkari et al., 2001; Schieber et al., 1996).

None of the studies that analyzed the modification of rules related to external logic reported whether the proposed goal was achieved. Of the studies that provided this information, the following achieved the proposed goal: (a) two studies modified rules related to both internal and external logic, (b) 65% modified rules related to internal logic, (c) 71.43% modified functional rules and (d) 61.54% modified structural rules. It seems reasonable that fewer studies were able to achieve their proposed goal through structural rules, because these rules only determine the formal aspects of the game. Structural rules allow for the player's personal interpretation. Their responses are different because each player is different. Functional rules study the development of game action but the complexity of variables that interact in the game make it more difficult to achieve the goals when these rules are modified (Eaves et al., 2008a; Gréhaigne and Godbout, 1998; Kew, 1990; Usabiaga and Castellano, 2005).

### Conclusion

The purpose of this review was to analyze the state of the bibliography about rule modification in sport. Rule modification involves processes that attempt to change the game conditions with a certain goal in mind. Studies tend to omit the goals underlying the modifications but they do mention the goals of their analysis. These goals are: (a) to improve players' performance; (b) to attract spectators and attend to commercial pressures and interests; (c) to adapt the sport to children's needs, possibilities, and interests; (d) to prevent injuries and (e) to attract athletes.

The reviewed literature seems to reflect awareness that it is necessary to modify rules in order to achieve certain goals, but few empirical studies report valid arguments on which the process is based. Furthermore, the studies consulted provide conflicting results about the same modifications. Despite underlining that rule modifications should be carried out based on scientific knowl-

edge, there is a lack of studies that analyze the appropriate modifications to change rules. This makes it more difficult for people in charge of sports competitions to propose suitable rule modifications.

Modifications in a sport should be analyzed after a reflective process before they are finally introduced. In this process, the following aspects should be considered: (a) establishing the goals; (b) respecting the basic rules that are not recommended to be modified; (c) knowing the players' and coaches' opinions; (d) knowing how the modification interferes with a wide range of variables; (e) elaborating useful proposals that serve the organizations; (f) using more than one type of data; (g) modifying rules of internal logic and, preferably, functional rules and (h) following some basic stages in the process. The basic stages to follow in the study of rule modification are: (a) structural and functional analysis of the sport, (b) descriptive analysis of game action and other complementary data, (c) identification of the deficiencies of the game and establishment of the goals pursued by the modifications, (d) game modification, (e) descriptive analysis of game action and other complementary data with the modified rules and (f) optimization of the modifications and/or inclusion of other modifications if the goals are not achieved.

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### Key points

- Rule modification involves processes that seek change in the game conditions with a certain goal in mind.
- The rules related to internal logic model the game actions that are characteristic of a sport.
- Functional rules facilitate achieving the goals.
- There are few valid research studies on which to base the modifications.
- Modifications in a sport should be validated after a reflective process before they are introduced.

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