

# The attractiveness of judo contests as a sports entertainment

## Authors' Contribution:

- A** Study Design
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- C** Statistical Analysis
- D** Manuscript Preparation
- E** Funds Collection

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## Abstract

- Background & study aim:** The rules in judo are changed in the last years many times. The main reason was make judo more attractive for spectators. The main purpose of the research was the factors determining the attractiveness of judo fights as sport spectacles.
- Material & methods:** The research was carried out on a group of 159 people (51 women and 108 men). All research participants saw the recordings of 10 judo fights and were asked, using a 1-10 scale, to grade to what degree each of the fights was interesting and attractive. Each fight was thoroughly analysed in order to separate the factors which have the greatest impact on us in considering a fight spectacular entertainment. Kalina's struggle dynamics measurement method was applied for this very purpose.
- Results:** The average grading of the fights generally correlated ( $r=0.91$ ,  $p<0.001$ ) with their general dynamics expressed with the Struggle Dynamics Index (SDI). What was also recorded that strong positive correlation between the grades and offensive activeness ( $r=0.84$ ,  $p<0.001$ ), general activeness ( $r=0.7$ ,  $p<0.001$ ) and the total of points gathered ( $r=0.55$ ,  $p<0.001$ ).
- Conclusions:** In order to make judo more spectacular and attractive as a spectacle and in order to accurately present its utilitarian character, the rules governing this sport should be changed to raise the level of activity, offensive activity and general dynamics. In the face of radical changes in the regulations and their interpretation, introduced for the purpose of making judo a more media-friendly discipline, it should be examined how these factors impact the attractiveness of combats as sports entertainment.
- Key words:** judo, combat sports, martial arts, sports show, spectators
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**Combat sport** –

a competitive contact sport with one-on-one combat. Determining the winner depends on the particular contest's rules. In many combat sports, a contestant wins by scoring more points than the opponent or by disabling opponent.

**Olympic combat sports** –

combat sports which is contained in Olympic program: wrestling, fencing, boxing, judo and taekwondo WTF.

**Judo** – means “gentle way” is a modern Japanese martial art and combat sport that was created by Jigoro Kano on the basis of the techniques of various ju-jitsu schools.

**Struggle dynamics** – as restricted to sport contests, is a specific reflection of the functioning ability of subjects competing in a direct contest and combines their disposition (biological and mental potentials, training experience, etc.) and situational capacity of functioning of both contestants, limited by mutual interfering, observing sport rules and unpredicted incidents (e.g. injuries). It depends also on the tactics used, related to the momentary status of the fight.

**INTRODUCTION**

Judo is a Japanese combat sport developed in the second half of the 19<sup>th</sup> century by prof. Jigoro Kano on the basis of the techniques of various schools of ju-jitsu. Since the 50s of the 20<sup>th</sup> century, the regulations governing this sports discipline have been changed dozens of times. The grounds for changing the regulations differed from case to case. Sometimes they raised controversies [1].

The changes introduced in the last several years generally aimed at making judo more attractive as sports entertainment. To make it more viewer-friendly, the Committee decided to introduce colourful uniforms (*judogi*) for contestants – white and blue, to dismiss the traditional red and green colours of floor mats (*tatami*), and to restrict fights in non-standing positions (*ne-waza*). Fundamental changes in the regulations took place in the first decade of the 21<sup>st</sup> century. According to research carried out in this matter, these changes had great impact on the courses of particular fights. The modifications have caused lower activity of competitors, especially on top rank world tournaments [2-7]. The lower were number of throws and also diversity of technics [4-6]. The changes did not result in increased interest in this sports discipline. Other Olympic combat sports (wrestling, amateur boxing) are also going through a popularity crisis. In order to meet the demand for spectacular combat sports entertainment, various institutions began to organize combat sports galas, where the fights conducted by contestants were governed by few regulations – these were Mixed Martial Arts (MMA). Combat sports became popular and entertaining. There are currently numerous MMA federations operating all over the world, which are generally concerned with organizing shows and galas. However, apart from being highly profitable, such events provide no benefits whatsoever. The brutality of fights basically replaces the educative and pro-health function of sport. Moreover, according to various research MMA contestants are particularly prone to injuries (injuries to the head and the cervical vertebrae), whereas gala organizers are not particularly eager to undertake any steps to minimize the incidence of injuries [8-10]. MMA fans attending numerous galas consider this form of entertainment interesting due to such aspects as interest in sports, dramaturgy and dynamism or fights [11]. Therefore, in this aspect, MMA fans do not differ much from the fans of Olympic combat sports [12].

The main cognitive aim of the study was the relationships between subjectively perceived attractiveness

of judo contest and struggle dynamics. The applied purpose of the research was the assumptions for possible changes in the regulations governing this sport and the principles of organizing judo tournaments, in order to make them more spectacular.

**MATERIAL AND METHODS****Participants**

The research was carried out on a group of 159 people (51 women and 108 men), who answered “yes” to the question whether they were interested in combat sports and whether they did not perform judo (or had performed in the past). The average age of people taking part in the research was 26.33 ( $\pm 10.42$ ). The majority of them (67%) were physically active (attended in organized physical exercises minimum twice a week), and 76% of them practiced sport for competition in the past. Nearly one third of them (31%) trained or has trained combat sports (the majority practiced karate  $n=11$ , wrestling  $n=6$ , taekwondo  $n=5$  and fencing  $n=5$ ). All of them admitted to watch or being willed to watch broadcasts of combat sports contests.

**Procedures**

All people participating in the research were asked to watch the recordings of ten judo fights (tab. 1) and to grade them in a scale from 1 to 10 (where 1 – very weak fight, 10 – very good fight) with respect to their entertaining value. The material presented to them included fights from the most important world tournaments conducted by men and women from the light, medium and heavy weight categories. Leading world judokas took part in all fights.

After having watched the films, the assessors were asked to fill in an authorial questionnaire raising such issues as sports and recreational activity, interests, preferences regarding sports entertainment and general opinions on combat sports.

Each fight was analysed in detail in order to separate the factors which had the greatest impact on the reception of judo fights as entertainment. Kalina's [13] fight dynamics measurement with the Boguszewski's [14] modification were applied. All actions taking place in each 10-second fragment of the fight were recorded. These were attacks and counterattacks (throws, grapples, strangulation, joint techniques), and defence without counterattack. Their effectiveness was evaluated together with preparatory actions, breaks and referee decisions. The events

**Table 1.** Characteristics of analysed fights

#	competition	year	fight	weight category [kg]	gender	competitors country	total time [s]	effective time [s]
1	World Championships	2007	Repachage final	+100	men	JPN CUB	70	63
2	Olympic Games	2008	Final	+100	men	JPN UZB	67	60
3	Olympic Games	2008	Final	100	men	MGL KAZ	84	80
4	World Cup	2006	Final	+78	women	RUS BLR	117	107
5	Olympic Games	2008	Final	63	women	JPN FRA	69	66
6	World Cup	2007	Final	81	men	FRA FRA	227	179
7	Asian Games	2006	Final	73	men	KOR JPN	72	57
8	Olympic Games	2008	Final	48	women	ROU CUB	33	29
9	Olympic Games	2008	Final	66	men	JPN FRA	63	52
10	World Championships	2005	Final	66	men	BRA JPN	46	44

from each category were entered as proportions of relations: the number of successful actions in relation to the number of observed actions falling in the same set, which were expressed with an index of 0 to 1. The average value of particular components applied in the description of events taking place in particular fights was a general struggle dynamics index (SDI). Certain events (taking place in 10-second sequences) were entered using particular symbols or in the form of brief descriptions. The main criteria for evaluating the dynamics of judo fights were the following variables expressed by corresponding indexes:

Ability to take up offensive and defensive activity (offensive/defensive activity index **IA**), which is the ratio of the number of 10-second contest sequences with at least one action undertaken (attack, counter-attack and defence without counterattack) to the total number of 10-second sequences;

Ability to take up offensive activity, which is a proportion of the number of 10-second combat

sequences, during which the contestant attempted at one offensive action (attack), aiming at gaining advantage, to the number of all sequences in a fight (offensive activeness index – **OA**);

Ability to take up offensive activity (index of effective offensive actions – **EA**), which is the ratio of the number of rated attacks to the total number of offensive actions;

Ability to counterattack (index of effective counterattacks – **EC**), which is the ratio of the number of rated counterattacks to the total number of undertaken counterattacks;

Ability to take up defensive activities without counterattacks (index of effective actions, without counterattacks – **ED**), which is the ratio of the number of effective defences (without counterattacks) to the total number of offensive actions undertaken by the opponent without those responded by counterattacks;

Global index of struggle dynamics (SDI), which is the mean value of enumerated indices above, which were used to register events taking place during the contest.

Such a universal and detailed record of events taking place during particular fights (on specially prepared sheets) was only possible after the fights have taken place, hence with the use of the VHS or DVD technology.

The presentation of offensive actions performed by contestants assumed the Kodokan division into throwing techniques (*nage-waza*) carried out in the vertical position, sacrifice techniques (*sutemi-waza*) and grapples (*katame-waza*), executed in the horizontal position [1].

The presentation and analysis of defensive actions assumed a division into 12 defence methods: hand lock, hip lock, round walk, twist onto belly, hand and hip lock, hand lock and round walk, setting leg aside, breaking lock, leaving the mat, locking the leg, bridging, return to *tachi-waza* [15].

#### Statistical methods

Arithmetic mean and standard deviation was calculated for each category of actions, together with the number of successful actions, the number of undertaken actions and the effectiveness of particular techniques (relation of successful actions to undertaken actions). The t-Student test and Pearson's correlation coefficient were used to describe the data.  $P < 0.05$  was assumed as the minimal significance level.

## RESULTS

### Characteristic of fights

The actions undertaken by contestants in analysed fights were diversified. The contestants of fights 2 and 6 were the least active:  $AI = 0.333$ , which means that the judokas did not undertake any actions aiming at acquiring advantage for 67% of the duration of the fight, but carried out preparatory actions only. In fight no. 7, on the other hand, the contestants were very active ( $AI = 0.857$ ). The winner of this fight was very active with respect to offensive actions ( $OA = 0.714$ ). The most successful technical actions ( $n = 3$ ) were observed in fight no. 3. The effectiveness of attacks ( $EA$ ) of this fight's winner was 0.6 (tab. 2). The significant differences between winners and losers were observed in effectiveness of attacks ( $p < 0.001$ ), offensive activity ( $p < 0.05$ ) and global struggle dynamics ( $p < 0.001$ ). There were no differences in struggle dynamics between men and women.

**Table 2.** Values of struggle dynamics indices

fight	competitor (country)	AI	OA	EA	EC	ED	SDI
1	JPN	0.429	0.286	0.5		1	0.554
	CUB	0.429	0.143	0		0.5	0.268
2	JPN	0.333	0.333	0			0.222
	UZB	0.333	0			1	0.444
3	MGL	0.625	0.625	0.6			0.617
	KAZ	0.625	0			0.4	0.342
4	RUS	0.364	0.182	0.5		1	0.511
	BLR	0.364	0.182	0		0.5	0.261
5	JPN	0.429	0.286	0	1	1	0.543
	FRA	0.429	0.286	0		1	0.429
6	FRA	0.333	0.182	0.5		1	0.504
	FRA	0.333	0.364	0		0.5	0.299
7	KOR	0.857	0.714	0.25	0	1	0.564
	JPN	0.857	0.286	0		0.8	0.486
8	ROU	0.667	0.333	1		1	0.75
	CUB	0.667	0.667	0		0	0.333
9	JPN	0.667	0.667	0.2		1	0.633
	FRA	0.5	0.167	0		0.6	0.317
10	BRA	0.6	0.6	0.5	1		0.675
	JPN	0.6	0.2	0		0.333	0.283

Forty five offensive actions (41 in *tachi-waza* and 4 in *ne-waza*) were recorded in ten selected fights, out of which twelve (27%) were graded by referees. Judokas usually ( $n = 22$ ) attempted at performing hand throws (*te-waza*). Nearly one third of them ( $n = 7$ ) proved to be successful. However, the most successful (50% effectiveness) were hip throws (*goshi-waza*) and joint techniques (*kansetsu-waza*). The throw which judokas attempted at performing the most often ( $n = 9$ ) was *uchi-mata*, whereas the throw which was the most effective (67% effectiveness) was *kata-guruma*. The most popular defensive actions were hand lock ( $n = 17$ ), and twist onto belly ( $n = 9$ ). These forms of defence were not, however, the most effective ones (70% effectiveness). Lock break and round walk proved to be the most effective (100%) (taking into account actions which were undertaken at least twice).

### Assessment of fights

Fight no. 10 (the finals of the 2005 World Championships in the 66 kg category) received the highest notes (7.94). Fight no. 2 (the finals of the 2008 Olympic Games in +100 kg category) received the

lowest notes (2.42). The differences between notes of above fights was significant ( $p < 0.001$ ). Heavy-weight fights (1 to 4) were graded considerably lower than the rest ( $p < 0.001$ ). Fights ending with *ippon* (1, 4, 5, 6, 7, 8 and 10) and fights in which counterattack decided on the final win (5 and 10) were graded considerably higher ( $p < 0.001$ ). No differences, however, were recorded between fights conducted by men and women (fig. 1).

Differences in the grading of fights of particular subgroups were recorded. The fights presented received higher grades by men ( $p = 0.074$ ) and by physically

active people ( $p = 0.086$ ). Women graded three fights (2, 8, and 10) higher than men. However, essential differences were recorded only in the case of fight no. 8 – women Olympic finals in the 48 kg category. People practicing combat sports and non-training people gave similar notes ( $p = 0.994$ ), although considerable differences were recorded in four fights. The notes given by physically active and non-active people were completely different. Physically active people would give considerably higher notes four times more often than non-active people, whereas the opposite situation was recorded only once. The grading provided by younger people (under the age of 25) and

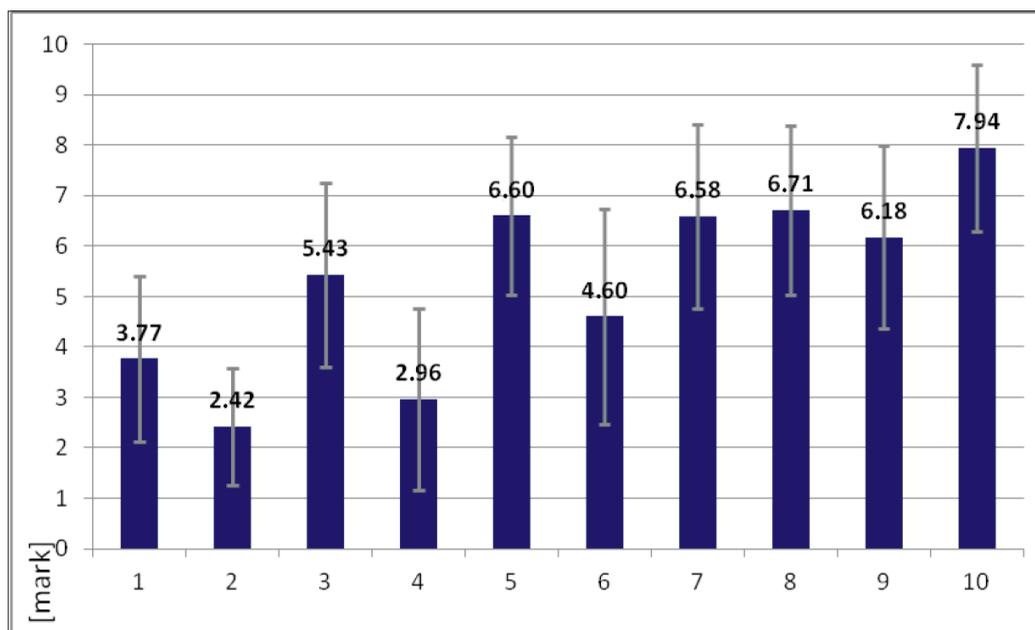


Figure 1. Average marks of fights

Tab. 3. Average marks and differences between marks made by various subgroups

		1	2	3	4	5	6	7	8	9	10
gender	women	3	2.451	5.118	2.667	6.294	4.176	6.078	7.078	6.137	8.059
	men	4.13	2.398	5.583	3.093	6.75	4.806	6.824	6.537	6.194	7.889
	p	0.000	0.791	0.092	0.202	0.11	0.069	0.017	0.049	0.849	0.514
training experience	combat sp.	4.367	2.408	4.796	2.714	6.857	3.755	6.551	7.306	6.347	8.102
	others	3.5	2.418	5.718	3.064	6.491	4.982	6.6	6.445	6.1	7.873
	p	0.005	0.96	0.005	0.232	0.218	0.003	0.883	0.003	0.443	0.388
physical activity	active	3.953	2.529	5.824	3.306	6.741	4.918	6.882	6.565	6.106	7.694
	non-active	3.554	2.284	4.986	2.554	6.446	4.243	6.243	6.878	6.257	8.23
	p	0.13	0.189	0.004	0.008	0.241	0.05	0.027	0.24	0.606	0.041
age	under 25	3.505	2.505	5.67	2.835	6.495	4.945	6.578	6.294	5.936	7.817
	over 25	4.34	2.22	4.92	3.22	6.84	3.86	6.6	7.62	6.7	8.22
	p	0.007	0.12	0.024	0.243	0.231	0.006	0.948	0.000	0.019	0.138

by older people (over the age of 25) differed in many aspects. All sub-groups gave the highest notes to fight no. 10 (finals of the Cairo World Championships in the 66 kg category), whereas fight no. 2 (finals of the Beijing Olympic Games in the +100 kg category) received the lowest score (tab. 3).

**Correlations between chosen features and marks of fights**

The average grading of fights correlated ( $r=0.91$ ,  $p<0.001$ ) with their general dynamics expressed with the SDI index (fig. 2). Moreover, the grades of particular fights correlated positively with the offensive activeness of contestants ( $r=0.84$ ,  $p<0.001$ ), with the general activeness of contestants ( $r=0.7$ ,  $p<0.001$ ), the total of points gathered ( $r=0.55$ ,  $p<0.001$ ), and negatively with the effectiveness of defence ( $r=-0.43$ ,  $p<0.001$ ) and the duration of the fight ( $r=-0.43$ ,  $p<0.001$ ). No significant relations were claimed with respect to the grading and the number of actions in *tachi-waza* ( $r=0.18$ ), the number of actions in *ne-waza* ( $r=0.09$ ,  $p<0.001$ ), or the number of successful throws ( $r=0.34$ ,  $p<0.001$ ).

**Motives of watching combat sports**

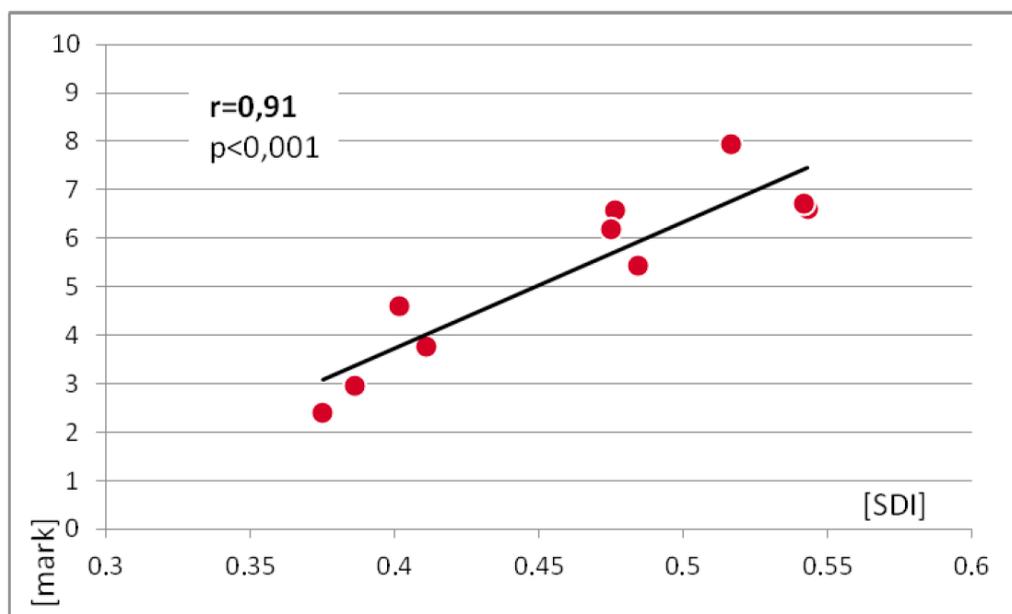
Aesthetic values – physical fitness of contestants (79.25% of indications) and dramaturgy or unpredictability of fights (74.21%) were stated to be the primary advantages of combat sports in the context of entertainment. Over a half of the people participating

in the research (60.38%) also pointed to the realism as an element having great impact on the entertainment value. The remaining answers, such as music and lights, as well as brutality were selected by less than 30% of the people (tab. 4).

No significant differences were recorded in the majority of answers provided by men and women. Men, physically active people and people practicing combat sports saw more advantages in combat sports. People practicing combat sports were more liable to emphasize the realism of fights, the setting of the gala and identification with the contestant, whereas people who do not practice combat sports usually emphasized the dramaturgy of fights and their brutality (tab. 4).

**DISCUSSION**

The role of viewers is an indispensable element of sports entertainment. Fans may be the active co-participants of large sports events. For instance, football fans spare no efforts to prepare spectacular settings to the matches played by their teams (singing, flags, colourful uniforms, gadgets). Sometimes emotions may evoke negative reactions [16]. This is because this communication is bilateral – from the audience to the stage (field, ring) and the other way round, although, as research tends to indicate, the engagement of players in the game does not always impact the loyalty of their fans [17].



**Fig. 2.** Correlation between marks and value of Struggle Dynamics Index

**Table 4.** The main benefits of combat sports according to research participants [%] (it were possible to choose more than one answer)

		performance contestants- aesthetic	dramaturgy, unpredictability	the reality of combat	spectacle framework (lights, music)	brutality, aggression	identification with the players	others
gender	women	80.39	72.55	52.94	19.61	17.65	17.65	1.96
	men	78.70	75.00	63.89	34.26	25.93	13.89	5.56
training experience	combat sports	79.59	65.31	75.51	42.86	18.37	26.53	8.16
	others	79.09	78.18	53.64	23.64	25.45	10.00	2.73
physical activity	active	84.71	81.18	56.47	24.71	25.88	10.59	7.84
	non-active	72.97	66.22	64.86	35.14	20.27	20.27	2.78
age	under 25	80.73	78.9	59.63	24.77	28.44	12.84	3.67
	over 25	76	64	62	40	12	20	6
all		79.25	74.21	60.38	29.56	23.27	15.09	4.41

Attending a sports event may evoke a sense of community and belonging to a group of people. This is particularly valid in the case of competitions involving national teams. The success of our national sportsmen and sportswomen is often the motivation for us to attend sports events [18]. Identifying with contestants, forming informal groups, fan clubs is usually the domain of team games [19-21]. Individual disciplines are governed by a different motivation to attend sports events. For instance, in gymnastics or ice skating, the aesthetic values are most important, whereas in combat sports – it is the dramaturgy and unpredictability [11, 12, 22]. According to various research the fans of individual sports which are more peculiar and more difficult to watch are more liable to engage emotionally [23].

Numerous sports organizations have been adapting and changing the rules of competition to increase the interest in their disciplines. This phenomenon also refers to combat sports. In the last years, the rules governing Olympic combat sports (boxing, judo, wrestling) have been changed several times, in order to make the contests more viewer-friendly and to raise the dynamics of particular fights. This is why analyses of actions performed by contestants during fights should be an indispensable element of planning changes in regulations. Yet what we are currently witnessing is a lack of coherence between the directions of changes and the expectations of contestants, trainers and judo fans. Own research revealed no concept to make judo more attractive for viewers. The current changes of rules rather decreased the activity and dynamics of judokas.

It should be emphasized, that a mere analysis of the effectiveness and frequency of particular throws and grapples may be insufficient. This is because preparatory actions, which may sometimes take about a half of duration of the entire fight, are equally important. Moreover, very often a contestant scores points from penalties imposed on the opponent instead of offensive actions, which has negative impact on the entertainment value [24-28]. The actions performed by contestants at start are thus primarily determined by the rules in force. Therefore, any changes in the regulations result in changes in the way fights are conducted by contestants [2, 3, 29-31]. In conclusion, modifications enforced should take into account the expectations of the viewers, but should not influence the internal values of the discipline. The changes introduced so far have already limited the number of technical elements applied by contestants [25, 32]. Hence, the utilitarian character of judo as a martial art, a form of self-defence, and a system of physical education, is gradually being lost [13, 33-35].

## CONCLUSIONS

Changes in the regulations governing judo fights (i.e. randomization of interpretations regarding penalties) translated into a lowering of offensive activeness and effectiveness, which proves the lack of reasonable concept for modifying judo to meet the criteria of effective sports marketing and to emphasize (and not to lose) the utilitarian mission of judo.

In order to make judo more attractive, while still conveying its utilitarian character, proper regulations

should be introduced to raise the dynamics of this sport. Shortening the duration of fights seems to be the most reasonable solution.

In the face of radical changes introduced in the regulations and their interpretations, aiming at making judo a more media-friendly discipline, the factors having primary impact on the

attractiveness of judo fights as sports entertainment should be examined.

## COMPETING INTERESTS

Authors declare that do not have any financial or personal relationships with other people or organisations that could inappropriately influence paper.

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