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## ORIGINAL RESEARCH

### THE PATTERN OF IPPON APPEARANCE IN MAJOR JUDO COMPETITIONS IN THE PERIOD 2008 - 2009

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#### Abstract

**Purpose:** Determining the trends manifested in the current competition judo, in relation to the incidence of the Ippon.

**Methods:** 26 major judo competitions during 2008-2009 are analysed in terms of the incidence of Ippon, based on gender, age, weight category and the importance of competition.

**Results:** Ippon appears, on average, at 55.52% of the meetings of males and 51.95% of the meetings of the females. Independent Samples T-test shows that these averages are significantly different at  $p = 0.033$ .

In men's competitions Ippon represents an increasing share to the extent that increases the weight category: 52.34% in light categories, 57.15% in medium categories, 59.98% in heavy categories. One Way Anova shows that these differences are significant at  $p = 0.002$ . The lowest frequency of Ippon occurs in light female categories: 48.90%. The Independent Samples T-test shows that between this value and the frequency of 53.91% corresponding to the occurrence of Ippon in the middle categories, there are also statistically significant differences at  $p = 0.025$ .

**Conclusions:** in Judo competitions Ippon occurs following a normal statistical law, yet, some variables such as sex and the weight category can significantly influence the frequency of its occurrence. The age and the importance of the competition do not significantly influence the frequency of Ippon in the competition.

**Keywords:** Judo, competition, ippon.

#### Introduction

Judo is a sport of direct adversity, in which each of the partners is trying to surprise the opponent through projections made in the standing fight (in Nage Waza) and fixations, sprains or strangulations in the mat fight (in Ne Waza). In the competition of judo the referee evaluates these actions designating a winner at the end of the meeting. In certain circumstances the referee may grant Ippon<sup>1</sup>, which is a maximal score that determines the interruption of the meeting before the time limit. Obtaining Ippon represents the fundamental objective of each judo sportsperson, ensuring victory before the time limit. The extent to which Ippon is generally granted in competitions influences the spectacular character of the competition and represents the aspect most appreciated by sportspersons, specialists, spectators and mass-media factors.

<sup>1</sup> Ippon or victory before the limit is given to a judoka in the following situations: after making a perfect throw; after fixing the opponent on the ground for 25 sec.; for the application of an elbow sprain or a strangulation following which the opponent gives up fighting.

**Purpose:** Determining the trends manifested in current competition judo, in relation to the incidence of the Ippon.

**Working hypotheses:**

Hypothesis 1. It is assumed that the occurrence of Ippon in the Judo competitions is done observing a normal Statistic.

Hypothesis 2. It is alleged that certain variables significantly influence the Ippon in Judo competitions

**Methods:**

In this research we analysed part of the major judo competitions held in the years 2008 and 2009, coded as follows:

- Olympic Games 2008: OG 08,
- World Championships (W): U23 08, S 09, U17 09,
- European Championships (EU): U23 08, U20 08, U17 08, S 09, U17 09, U20 09,
- Grand Slam (GS): 09 BRA, 09 RUS, 09 FRA,
- Grand Prix (GP): 09 TUN, 09 GER,
- Super World Cup (SWC): 08 HOL, 08 RUS,
- World Cup (WC): 09 BRA, 09 EST, 09 ROU, 09 HUN, 09 SPA, 09 POR, 09 CZE, 09BUL

Legend: 08 or 09: year 2008 or 2009; S- Seniors judoka; U23- youngsters judoka under 23; U20- juniors judokas under 23; U17- cadets judokas under 23; BRA- Brazilia

The age and gender characteristics of the 25 competitions analysed are described in Table 1:

*Table 1. The types of the competitions*

Competition 2008/2009	Seniors	U23	U20	U17	Total
For Male	14	2	2	3	21
For Female	15	2	2	3	22
Total	18	2	2	3	25

Variables: considering the fact that the number of meetings that ended before the time limit due to Ippon is dependent on the number of meetings, the latter being dependent in its turn on the number of judoka enrolled in the competition, we'll calculate the indicator, called *the Ippon's % per contest (IP)*, based on the following formula:

$$IP = \frac{\text{no.ippon}}{\text{no.fights}} \times 100$$

IP analysis aimed at obtaining the pattern of Ippon's occurrence depending on the following criteria:

- a. Gender: males *versus* females
- b. Age: seniors, *versus* younger's (U23), juniors (U20), cadets (U17)
  - Weight categories: all seven or eight weight categories was grouping that:
  - Light categories: the first and the second categories (in classic competition) or first, second and third categories ( at U20 și U17).
  - Middle categories: next three weight categories
  - Heavy categories: the last two weight categories
- c. Olympic year (2008) *versus* post Olympic year (2009),
- d. Maximum importance competitions (Olympic Games, World Championships, European Championships) *versus* major competitions (Grand Slam, Grand Prix, Super World Cup, World Cup)
  - e. Combining the criteria above so that they reflect possible statistically significant differences All analyses were performed with the statistical software package SPSS v.13 for Windows. Statistical significances was set at  $p \leq 0,05$ .

**Results and interpretation of the data:**

**1. IP calculation for the main categories of data**

IP calculation for the male competitions is made in Table 2, and for female competitions in Table 3.

*Table 2. Average of IP (%) for major male competitions from periods 2008 and 2009*

No	Competition	-55kg	-60 kg	-66kg	-73kg	-81kg	-90kg	-100kg	+100kg	Average
1	OG 08		39	36	51	39	61	51	51	46,9
2	W 09		63	54	60	60	63	67	71	62,6



3	EU 09		49	63	61	59	56	56	83	61,0
4	GS 09 BRA		40	40	65	50	38	58	56	49,6
5	GS 09 RUS		39	60	53	53	44	57	42	49,7
6	GS 09 FRA		38	56	44	49	68	41	70	52,3
7	SWC 08 HOL		54	50	50	79	81	60	77	64,4
8	SWC 08 RUS		48	42	46	63	62	43	43	49,6
9	GP 09 TUN		63	46	52	41	53	60	63	54,0
10	GP 09 GER		58	54	58	62	50	55	70	58,1
11	WC 09 BRA		47	62	71	73	80	69	71	67,6
12	WC 09 EST		41	65	64	64	65	63	75	62,4
13	WC 09 ROU		50	48	65	63	59	55	42	54,6
14	WC 09 HUN		46	61	47	50	54	63	61	54,6
15	W 08 U23		63	63	54	50	66	69	64	61,3
16	W 09 U17*	46	45	46	45	67	45	69	52	51,9
17	EU U23 08		66	49	56	52	69	48	57	56,7
18	EU U20 08	67	39	45	42	74	53	61	58	54,9
19	EU U17 09*	60	48	69	58	34	54	59	43	53,1
20	EU U17 08*	54	61	51	59	59	65	66	67	60,3
21	CE U20 09	62	62	52	42	67	57	68	56	58,3
Male Average										56,36
Standard deviation										5,58

\*U17- weight categories in order left to right:-50kg, -55kg,-60kg, -66kg, -71kg, -81kg, -90kg, +90kg

Interpretation table 2: 60% of male's competition averages are in male average interval's  $\pm 1$  standard deviation, and 100% are in male average interval's  $\pm 2$  standard deviation.

Table 3. . Average of IP (%) for major female competitions from periods 2008 and 2009

No	Competition	-44kg	-48 kg	-52kg	-57kg	-63kg	-70kg	-78kg	+78kg	Average
1	OG 08		38	26	39	55	63	45	62	46,9
2	W 09		56	43	56	55	50	37	78	53,6
3	CU 09		54	71	38	46	60	50	65	54,9
4	GS 09 BRA		54	47	63	53	83	43	50	56,1
5	GS 09 RUS		44	30	45	37	48	65	67	48,0
6	GS 09 FRA		25	48	65	47	48	52	53	48,3
7	SWC 08 HOL		41	55	50	64	38	58	67	53,3
8	SWC 08 RUS		36	33	75	62	62	36	69	53,3
9	GP 09 TUN		67	67	50	80	40	44	50	56,9
10	GP 09 GER		40	58	52	41	41	28	65	46,4
11	WC 09 BRA		50	77	79	50	42	69	43	58,6
12	WC 09 SPA		56	36	68	25	50	47	40	46,0
13	WC 09 POR		67	69	59	35	61	25	14	47,1
14	WC 09 CZE		29	45	44	48	55	41	50	44,6
15	WC 09 BUL		61	59	61	70	63	68	65	63,9
16	W 08 U23		44	47	53	59	65	55	55	54,0
17	W 09 U17*	59	48	53	60	54	42	48	56	52,5
18	EU U23 08		63	38	48	47	53	60	67	53,7
19	EU U20 08	42	41	59	59	51	61	38	48	49,9
20	EU U17 09*	43	45	48	52	54	48	44	63	49,6
21	EU U17 08*	47	46	49	49	58	51	56	55	51,4
22	EU U20 09	27	67	48	63	65	50	61	56	54,6
Female average										51,97
Standard deviation										4,71

\*U17 weight categories in order left to right:-40kg, -44kg,-48kg, -52kg, -57kg, -63kg, -70kg, +70kg

Interpretation table 3: 63% of female's competition averages are in female of average interval's  $\pm 1$  standard deviation, 95% are in female average interval's  $\pm 2$  standard deviation and 100% are in female average interval's  $\pm 3$  standard deviation.

## 2. Comparison of IP means based on the gender criterion

Se aplică Independent-Samples T test (table 4)

*Table 4. Analiza statistică a diferențelor dintre medii pe criteriul sex*

Gender	n	average	Sx	t	p	0,05
male	21	55,52	5,73	2,213	0,033	p<0,05
female	22	51,95	4,82			

*Interpretation table 4:* the means of the share in which they obtain Ippon in the male and female competitions differ significantly in the male competitions, the Ippon being achieved to a greater extent (in approx. 56% of meetings) than in the female ones (in about 52% of meetings).

### 3. Analysis of IP variance on the criterion of light, medium and heavy weight categories

Results of application One Way Anova for male IP și female IP is in table 5.

*Table 5. Comparison the groups of weight categories (IP average)*

Gender	Weight categories	n	average	Sx	Homogeneity of variances (sig.)	Anova (sig.)
males	light	47	52,34	9,26	0,930	0.002
	medium	62	57,15	10,46		
	heavy	41	59,98	10,32		
females	light	49	48,90	12,51	0,428	0,089
	medium	66	53,91	11,09		
	heavy	44	52,45	13,15		

*Interpretation table 5:*

- There is a significant difference between the three groups of weight regarding male categories comparatively, and the frequency of Ippon is growing almost proportionally with the increase of the weight class.
- One can notice that variances are not homogeneous, and a One Way ANOVA indicates that women's groups do not differ significantly.
- We must, however, compare the means of the light categories (48.90) compared to the middle categories (table 6).

*Table 6. Comparison light and medium female weight categories (IP average)*

Part of female weight categories	n	average	Sx	t	p	0,05
Light	49	48,90	12,51	2,269	0,025	p<0,05
Medium	66	53,91	11,09			

*Interpretation table 6:* The means of the female light categories differs significantly from the corresponding female medium categories (p<0,05)

### 4. Comparison of IP based on age criterion (table 7)

*Table 7. Comparison seniors IP average versus U23, U20, U17(IP average)*

Gender	Age	N	average	Sx	t	p
Male	Seniors	14	56,24	6,47	0,151	p>0,05
	U23, U20, U17	7	56,64	3,55		
Female	Seniors	15	51,86	5,61	0,234	p>0,05
	U23, U20, U17	7	52,24	2,00		

*Interpretation table 7:* The calculation of the statistical meaning of IP regarding the age criterion based on the Independent Samples T-test did not identify significant differences between the IP media of the seniors versus U23, U20 and U17, both in males (p> 0.05) and females (p> 0.05).

### 5. Comparison of IP based on the importance of competitions criterion (table 8)

*Table 8. Comparison maximum importance competitions versus major competitions (IP average)*

Gender	Competition	N	average	Sx	t	p
Male	OG, W, EU	11	56,67	4,75	0,024	p>0,05
	GS,GP,SWC,WC	10	56,73	6,21		
Female	OG, W, EU	11	51,87	6,06	0,114	p>0,05
	GS,GP,SWC,WC	12	52,11	2,60		

*Interpretation table 8:* The calculation of the statistical meaning of IP based on the Independent Samples T-test did not identify significant differences between the IP media of the maximum importance competitions (Olympics, World Championships and European Championships) versus major competitions (GS, GP, SWC and WC), both in males (p> 0.05) and females (p> 0.05).

## 6. The Comparison of IP for different year (table 9)

Table 9. Comparison Olympic year versus a post-Olympic year (IP average)

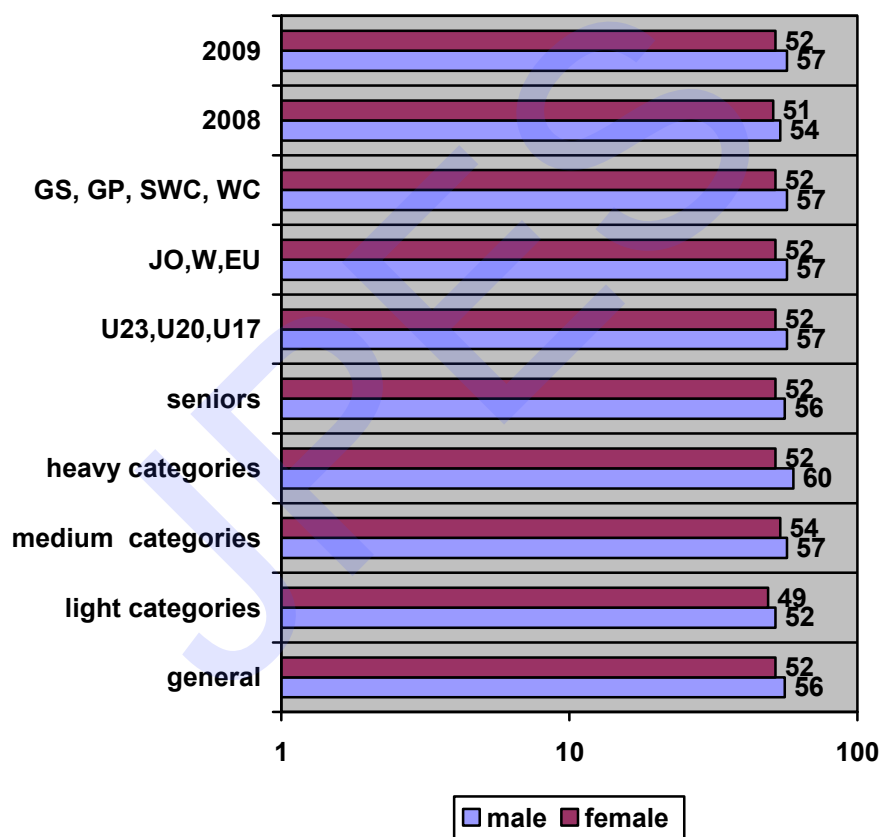
Gender	Competition	N	average	Sx	t	p
Male	2008	3	53,63	9,42	0.776	p>0,05
	2009	11	56,95	5,83		
Female	2008	3	51,16	3,69	0,231	p>0,05
	2009	12	52,03	6,12		

Interpretation table 9: The Comparison of IP for an Olympic year versus a post-Olympic year for the competitions for seniors did not reveal statistically significant differences in males or female, either.

### Conclusion

- The occurrence of the Ippon in major Judo competitions happens based on a normal law, validating the research hypothesis no 1. (table 1, table 2, graph. 1). Under this law Ippon appears, on average, at 55.52% of the meetings of males and 51.95% of the meetings of the females. Independent Samples T-test shows that these averages are significantly different at  $p = 0.033$ .

Graph 1. General model of IP (ippon%/contest)



- In men's competitions Ippon represents an increasing share to the extent that increases the weight category: 52.34% in light categories, 57.15% in medium categories, 59.98% in heavy categories. One Way Anova showed that these differences are significant at  $p = 0.002$ . The lowest frequency of Ippon occurs in light female categories: 48.90%. The Independent Samples T-test shows that between this value and the frequency of 53.91% corresponding to the occurrence of Ippon in the middle categories, there are also statistically significant differences at  $p = 0.025$ . These results validate the research hypothesis 2.
- Common to the male and female light weight categories is the aspect of occurrence of the lowest rate of Ippon situations (about 52% in the male categories and 49% in the female categories).
- The age of the competitors (seniors, youth, juniors or cadets) does not significantly influence the rate of occurrence of the Ippon in the competition.
- The importance of the judo competition does not significantly influence the rate of occurrence of the Ippon in the competition.

6. Between the share of the Ippon in the senior competitions in the Olympic and post-Olympic years there are no statistically significant differences.
7. The identification of the specificities of occurrence of the Ippon, can be fructified in the various areas of functioning and development of judo as a sport, of which one can notice:
  - a. Optimising the conduct of differentiated sports training, by weight categories in particular in males.
  - b. Identification of the technical ways through which the rate of the Ippon increases for some of the competition sectors.
  - c. Identification of the 'health of competitions': the competitions with a very low rate of the Ippon suggest a weak technical training of the judokas registered, while the competitions with too high a rate suggest a great technical imbalance among the judokas.
  - d. The promotion of Judo image based on capturing the most spectacular moments by the mass-media factors.

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