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ORIGINAL ARTICLE

Error manifestations occur in junior and senior judo bouts full names

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Summary

Introduction. Judo bouts were observed many times and in different aspects. Although still is little known about the typical errors made by top judokas during the struggle and the differences between seniors and juniors in aspect of amount and type of these errors. The aim of this study was to determine the most common technique and tactical errors and their manifestations that occurring during judo bouts.

Material and methods. Observation and the Estimate-Talk-Estimate (ETE) method were the two basic methods of data collecting. Two different groups of competitors (seniors and juniors) were observed. A total of 85 bouts (58 junior bouts and 27 senior bouts) were analysed. Observations were made within 2006-2008. An Errors Identity Protocol of our own device was used to determine the manifestations of errors.

Results. The findings suggest that senior competitors made the same amount of errors as juniors but that the manifestation of errors were different. Moreover, points given by referees in the form of different penalties are of great importance in judo bouts. The observation carried out observation shows also that the type of action related to the highest number of points is throwing. It gives 80% of the points from all actions at junior tournaments and 61% in senior tournaments (P=0.010). The second activity related to 10% of points obtained in all junior actions are points awarded to opponent for noncompliance with the bout rules. In comparison 29% of all points were for penalties to the opponent in senior bouts. In this respect the test again showed a significant difference (P=0.002).

Conclusions. The results indicate that the route to victory for juniors and seniors varies in terms of what should be considered by coaches.

Introduction

Competitive judo bouts have already been observed and analysed by many authors [1-20], however, the objectives of these observations were different. Some authors were interested in the psychology, physiology and biochemistry of effort aspects [8,10,16], while others studied the differences in bout strategy vs. gender [20] or the differences in the techniques used, when usually taking into account the differences between competitors who are of different age and different sports level [1-7,11-12,21-24] or changes in competitive level over the years of a competitive career [25].

Many different observation and recording techniques were used in bouts from manual recording of all events using specially designed symbols [1], through observation sheets, to the data digitization and computer analysis [14,26].

In judo scoring can be achieved by: throwing, pinning, choking, applying an arm lock and penalties [12]. Competitors can make errors in any of the above actions. Therefore, each of these sequences should be trained to be perfectly controlled and every individual motor action should be memorised as an unconditioned response. A judo competitor, who wants to win a bout, must demonstrate the highest effectiveness in attack, defense and counterattack. The ability to make use of the errors made by an opponent and the ability to commit as few own errors as possible is the key to success in a judo bout. In judo, information on the current course of the competition and, in particular, the errors made during the fight by a competitor may be of key importance in changing the course of a bout.

Bearing in mind the characteristics of this sports discipline, our study aimed to analyse the power of different errors and their manifestations. The aim of this study is also to compare manifestations of errors made by seniors and juniors and to correlate them with the way of conducting a judo bout.

Material and methods

Participants and Measurements

Junior and senior judokas of both sexes were the subject of the observation. They were all were the top elite interna-

tional competitors who took part in World Cup tournaments. Their nationality was different, but usually they came from European countries.

The research material was based on recordings from World Cup tournaments for junior and senior classes held in Cetniewo and Warsaw in Poland. The study material covers the years 2006, 2007, and 2008, both for the junior and the senior groups. A total of 85 bouts (58 junior bouts and 27 senior bouts) were observed. Recordings (video recordings) show the bouts of the top elite international competitors of different age groups. The video recordings from the Cetniewo Tournament (junior) in 2006 include all final bouts of men and women of all weight classes. Each group includes seven weight classes, which gives 14 video recordings from this tournament in total. The 2007 Cetniewo Tournament data was analyzed on the basis of 28 bouts.

All matches included 7 final men's bouts, 7 final women's bouts, 7 men's 3rd place bouts, and 7 women's 3rd place bouts. Also 16 bouts from the 2008 Cetniewo Tournament were analyzed: 7 men's final bouts, 7 women's final bouts, and 2 men's 3rd place bouts.

The Warsaw Tournament is a regular event. Senior-women take part in even-number years, and senior men – in odd-number years. Senior women participated in the Warsaw Tournament in 2006 and 2008, while senior men – in 2007. Therefore, the research material from the tournament in 2006 included seven women's final bouts in each weight class. Seven bouts from the Warsaw Tournament were analyzed for 2007. These were the men's final bouts. The research material from the year 2008 includes 13 women's bouts, i.e. 7 finals and 6 3rd place bouts.

The research was carried out on the basis of video recordings, 'which enabled detailed analysis of every action performed by the judokas; thereby qualifying the various attacking and defensive strategies. Video or DVD recording gives technical possibilities for freezing an image and repeating certain parts of a bout, often in slow motion' [5].

Procedures

The study was performed as follows: the observation was carried out on an ongoing basis, while the video recordings were used. Two researchers watched all the bouts, and then, when one of the players lost a point or points, the referee's score was recorded (*ippon, waza-ari, yuko*, or *koka*), which were recognized as manifestations of error for judokas who were opposite to the ones getting the points. Then the observer determined the type of action related to the error made. If the opinions differed, researchers watched again the arguable action and took the final decision.

The recording sheet shown in Table 2 was tabulated by Błach and Cych, and used for the registration and classification of errors observed during judo bouts.

According to the recording sheet and the classification of errors observed during judo bouts the following types of actions and manifestations of errors occurred during the Cetniewo and Warsaw Tournaments 2006/07/08 – throwing (scored as: *Ippon, Waza-ari, Yuko, Koka),* strangle grapples (scored as: *Ippon, Waza-ari, Yuko, Koka*), arm lock (scored as *Ippon*), a point awarded to opponent for a non-compliance with match rules (scored as: *Yuko or Koka*), and other actions (scored as *Ippon*).

Then the previously recorded actions and associated errors were evaluated by experts. Action resulting in a loss of points was considered an error based on the definition of the error given by Mudyń [27].

Statistical analysis

The numerical data obtained was evaluated statistically using the test of differences between the two structure indicators of the Statistica 9.0 software. The minimal essenciality level was established at $p<0,005$. The described variables were the action type and manifestation of error, when the describing variable was the age of the competitor. Neither weight class nor gender were taken under consideration.

Results

The technical-tactical actions analyzed in the paper include the 143 actions performed both in vertical and horizontal posture which can be classified as allowed (n=108) and penalty ones (n=35). The study results are shown separately for groups of juniors taking part in the tournaments held in Cetniewo (Figure 1) and for groups of seniors who participated in competitions in Warsaw (Figure 2).

Firstly the number of errors made by the junior and senior group, and reflected in the points awarded by referees, was evaluated with 110 scored actions were observed during junior bouts, which gave 1.91 actions per bout. The 54 such actions were observed in the senior group of which corresponded to 2,0 actions per one bout on average. Therefore these proportions look almost identical.

The observation carried out shows also that the type of action related to the highest number of points is throwing. It gave 80% of the points from all the actions at the junior Cetniewo Tournaments (2006/07/08) and 61% in the senior Warsaw Tournaments (2006/07/08). The difference proved to be significant (P=0.010) (Table 3). The second activity related to 10% of points obtained in all juniors' actions were the points awarded to an opponent for noncompliance with the fight rules (29% of all points scored by seniors). This time the test again showed a significant difference (P=0.002). No significant differences were observed for other actions (Table 4).

Therefore, when talking about the manifestations of errors reflected by the different referee scores, the differences between the numbers registered in the group of juniors and seniors were observed and expressed as a percentage of all errors. The score achieved most often by juniors was *Yuko*, while next was *Koka*, *Ippon*, lastly *Waza-ari* (Table 4). For comparison, the score achieved most commonly by seniors was *Koka* – 22 times, which corresponded to 41% of all the action scored. The second was *Yuko*, then *Ippon*, and *Waza-ari* (Table 4). So one can observe the differences in the number of different manifestations of errors – and their referee score – in the errors made by seniors and juniors. However, these

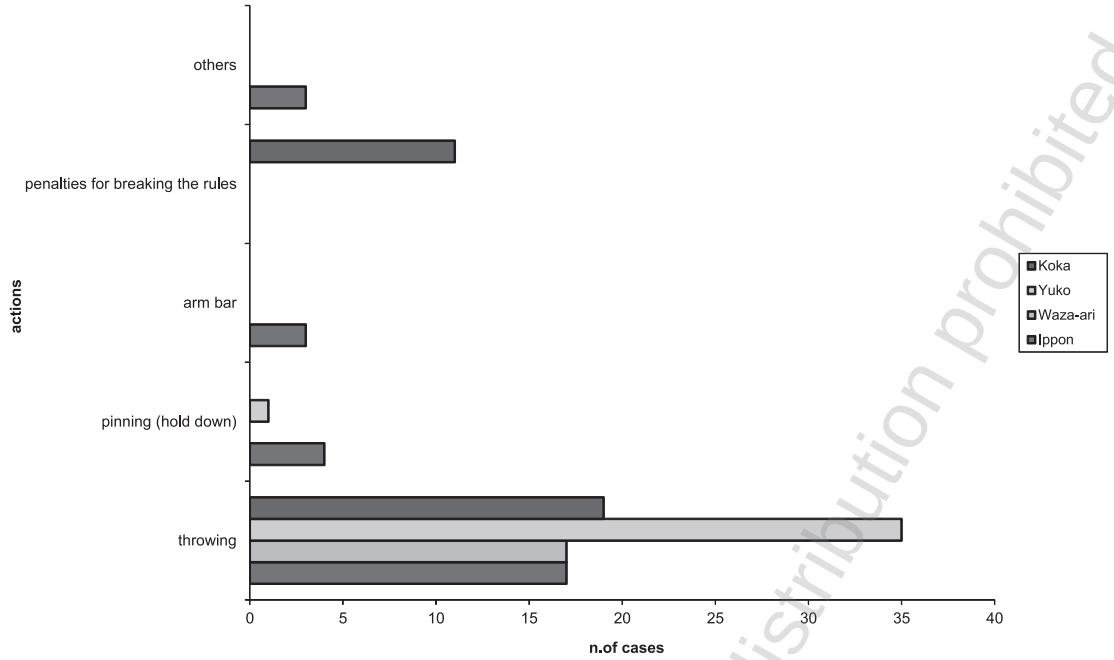

Figure 1. Junior's error manifestations referred as referees' scores related to different actions of judo bout in the Cetniewo tournaments (2006-2008)

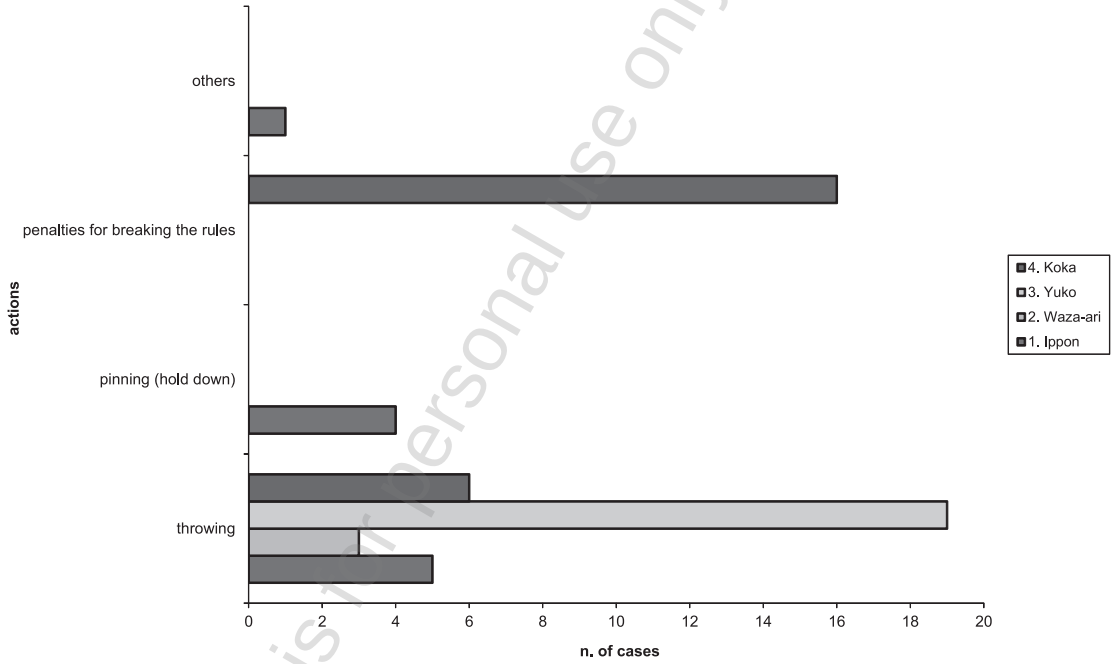

Figure 2. Senior's error manifestations referred as referees' scores related to different actions of judo bout in the Warsaw tournaments (2006-2008)

Table 1. An amount of recorded and analysed judo bouts

year → place ↓	2006 [n. of bouts]	2007 [n. of bouts]	2008 [n. of bouts]	total [n. of bouts]
Cetniewo (the junior tournaments)	14	28	16	58
Warsaw (the senior tournaments)	7	7	13	27

Table 2. An Errors Identity Protocol to register judo figthts

tournament's name ……. weight category…….… names of judokas…….. age…..
tournament's place……..…… gender ……... age…..

Actions → Error manifestation (scores) ↓	throwing	pinning (hold down)	arm lock	choking	penalties for breaking the rules	penalties for unfairness	others
ippon							
waza-ari							
yuko							
koka							

Table 3. The test values of differences between two structure indicators for senior and junior actions

The chosen actions	Junior (%) of all actions	Senior (%) of all actions	P*
- throws	(80%)	(61%)	**0.010**
- penalties for breaking the rules	(10%)	(30%)	**0.002**
- pinning (hold down)	(5%)	(7%)	0.603
- arm lock	(2,7%)	(0%)	0.200
- others	(2,7%)	(1%)	0.427

*Statistically significant differences set in bold (P < 0.05)

Table 4. The test values of differences between two structure indicators for senior and junior error manifestations exemplified as referees' scores

Error manifestations exemplified as referees' scores	**Junior (%) of all scores**	**Senior (%) of all scores**	**P**
-Ippon	24,5%	18,5%	0.392
-Waza-ari	15,5%	5,5%	0.063
-Yuko	33%	35%	0.799
-Koka	27%	41%	0.072

differences proved to be slightly below the accepted statistical significance threshold for the number of data collected. The greatest difference in the number was observed for *Waza-ari* referee score (Table 4).

Discussion

Sports errors are a matter of interest of for many researchers and trainers. They are commonly studied in the context of correctness of sport technique. Gutiérrez et al. [28] described and analyzed most frequent errors in the *uki goshi* technique using computer software and OSJUDO-UKG instrument. Quite a lot of errors were distinguished based on amateur judokas. In our study we tried to extract some judo bout actions inefficiencies. Judo bouts today are more dynamic than they were 20 or 30 years ago [17], thus more points are gained for standing actions, especially throwing. The most common manifestation of errors in Cetniewo and Warsaw Tournaments were, foremost, errors related to throwing made by competitors, while the second most common were errors resulting in points awarded to opponent for noncompliance with match rules. So, the most common manifestations of errors observed during the fight are also reflected in the most common actions carried out by the judokas. The results of other authors seem to confirm this. Deval et al. [9] report that the judokas use mainly *te-waza* techniques with a large proportion of *seoi-nage* and *kata-guruma* and techniques *sutemi-waza* and *ashi-waza*. The authors also indicate a large number of points awarded by referee as penalties. Errors made during the bout are manifestation of the competitor inefficiency.

The findings of Adam [1] refer directly to the examination of the techniques used in judo. He distinguished four groups of techniques with different efficiency. This efficiency allowed the distinguishing of groups of basic and auxiliary technique, that were named by the author as the individual or the favoured techniques. The remaining two groups of techniques are called situational and occasional. Adam indicated the significant differences in the usefulness and effectiveness of different techniques owing to their group status. He also stated that the training process can be streamlined by the permanent control of the effectiveness of the carried out attack techniques employed.

The aim of the study carried out by the authors of this paper was to determine the differences in the fighting technique of junior and senior competitors, when paying special attention to indicating errors typical for the competitors of the two age groups. The research showed that the junior and senior bouts were of a similar nature. However, the following differences may be indicated: juniors make significantly more errors in defense against throwing, because junior throws are related to 80% of awarded points, when senior throws are related to only 61%. Moreover in the senior group opponents are more often penalized for fights not in compliance with match rules. Also other authors observed differences in bouts of players of different age [9,15,21]. Moreover, successful competitive performance in early age in judo competition was not associated with later success in adulthood [25].

The competitor age is certainly related to his or her level of skills and motor potential. Hence, seniors are required a higher training level, and in relevance, a greater variety of techniques with a higher level of mastery. This is showed in studies by Franchini et al. studies, for example [13]. The group of super-elite judokas, selected by him, made use of the greater number of throwing techniques, which were reflected by the points scored. Moreover, the number of throwing techniques was significantly correlated with the number of bouts won, as was the case with effectiveness. Thus, the greater number of throwing techniques and the use of directions for attack seem to be important in increasing unpredictability during judo matches [13]. The same author states that the best players are characterised by the ability to create new defensive and offensive actions.

Conclusions

1. The action related to awarding the majority of points at the Cetniewo and Warsaw Tournaments was throwing (*Nage-waza*). Very few actions ended in successful horizontal position (*Katame-waza*). This is probably due to the dynamics of a judo bout and the referees' tendency to interrupt the horizontal actions, when it goes on at too slow dynamic pace.
2. Seniors make the same number of errors during the bout as juniors; but the errors are manifested in a different way, related to different referee scores.
3. Points awarded by the referee to an opponent for non-compliance with rules are of great importance in a judo match. This manifestation of error was the second most common during the Warsaw and Cetniewo Tournaments, Junior World Cup and Senior World Cup. This is probably due to the referees' desire to enforce more active bouts and thereby to increase the attractiveness of the match.
4. The observation of errors in judo requires further follow-up, because interesting phenomena were observed, which could not however be verified as statistical relations due to a too small number of reported cases.

Practical applications

1. Coaches and competitors should pay attention to the data obtained as a result of the observations made in this study, because they allowed identification of the significant differences in the typical manifestations of errors made by juniors and seniors.
2. The training process for seniors and juniors should differ in order to minimise the specific errors made by these two age groups.

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