

Boxing techniques based on the analysis of boxing tournament finals during Olympic Games in London in 2012

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Key words: boxing, fighting technique, automated boxing scoring system

Summary

Introduction. The goal of the study was to indicate the changes in boxing techniques connected with the automated boxing scoring system (ABSS), based on the observation of boxing Finals during the Olympic Games in London in 2012.

Material and methods. 10 final bouts were subjected to analysis and observation results were recorded in offense and defense sheets, including the division into rounds. The collected material was then subjected to analysis including to the most often used boxers' stances, the number and types of offensive techniques as well as the number and types of defensive techniques.

Results. The fighters, moving in the mirror reverse of the norm (southpaw stance) won more often and most of the punches were thrown during the second and the third round. Jabs were thrown most often while hooks and uppercuts were thrown significantly less often. Punches in the trunk were thrown very rarely; short series of punches were thrown significantly more often (four times) than the series of long punches. Blocked defense was used most often and defense through counterpunch and footwork were the second most frequent techniques. No parrying defense was used.

Conclusions. Due to the judge's preferences, some attack techniques with the highest probability of recording were used significantly more often. Parrying defense is preferred as it does not entail the risk of accidental scoring by the judge.

Introduction

Boxing is a discipline with a long tradition, dating back to ancient Olympic Games, however, its present form is explicitly divided into two trends. The first one has a rather basic and natural form and is connected with professional boxing where the judgment of bouts is based on score sheets. The second trend is amateur boxing where automated scoring system (ABSS) is a dominant form of scoring. This system forces the competitors to use other fighting techniques than these used in professional boxing [1].

Each rivalry in team sports or individual sports leads to the realization of the main goal which is success in sport. The final success in individual sports including boxing is determined by numerous factors, connected with preparing the athletes for competition.

The main trends of the study concern psychophysical [2, 3,4,5] fitness [6,7] and health safety [8,9] issue, being recently the subject of numerous arguments, resulting from AIBA's ban on using protective headgears in 2013 [10,11,12].

On the other hand, there are relatively few reports allowing to define the directions of changes in technical and tactical actions of the competitors [13,14,15,16].

Analysis of bouts is commonly practiced in professional sports and concerns all combat sports. Trainers and training teams create multi-aspect databases, allowing to prepare proper tactics of fighting considering the competitors' preferences of different fighting styles and techniques, both offensive and defensive ones [2,11,14,15].

The regulations serving to maintain the reputation of amateur boxing as a safe and justly judged sport were and still are subject to numerous modifications. This is mostly due to the pressure from the International Olympic Committee which, during the last 25 years, forced numerous changes, concerning also the scoring system. After the Olympics in Seoul, it was decided to replace the conventional scoring system by the automated one, however, due to the controversies evoked by the results of the boxing tournament during the Olympics Games in 2012, AIBA promised to reintroduce the old scoring rules (used in amateur boxing before the Olympics in 1988, which were still in force in professional boxing).

The goal of the study was to indicate the direction of changes in fighting techniques, based on the observation of the boxing tournament during the Finals of the Olympic Games in London in 2012.

Material and methods

10 bouts of the boxing tournament Finals during the Olympic Games in London in 2012 were subject to analysis. There were long distance bouts (3 rounds lasting 3 minutes) and were ended with a scoring verdict. In two cases the scores were equal and the judges decided who the winner was (Tab. 1).

The bouts subjected to analysis were studied using the direct observation method (from CDs), enabling watching each bout several times. The results of the observation were recorded in the sheets developed by T. Nowak [17]. They concern boxer's offensive actions and contain the data about the number, types and the effectiveness of the punches, the number and the series of punches and boxers' defensive activities. They contain the data on the number of defensive activities (containing data on the number, types and effectiveness of punches and types of series of punches and boxers, defensive actions as well as the data on the number of defensive actions (blocking, parry, counterpunch, dodge, sway, foot-work) during the entire bout divided into rounds.

The collected material was subjected to a comprehensive analysis, concerning the most often used offensive and defensive techniques.

For the statistical analysis Student's-t-test was used, the mean values and standard deviations (SDs) were calculated and the significance level was set at $p < 0.05$. Significance of the differences in the studied variables corresponding to the number of thrown punches, various punching techniques used during the bout, types of punches, punches in the head and in the trunk was determined as well as the effectiveness (accuracy) of the punches thrown, the number of punch series, and the number and types of defensive actions.

Results

Stances of winners and losers

In the Finals of amateur boxers during the Olympic Games in London in 2012, a large number of boxers assuming a "southpaw" stance (with the right arm "shifted" forward) participated in the competition. Among the twenty finalists, eleven assumed a "southpaw" stance and seven competitors in this group won golden medals during the Olympics in 2012. Among the four competitors who assumed a "southpaw" stance, two were beaten by "southpaws" and two were beaten by those assuming a normal stance (Table 1).

Elements of offensive techniques

The number of thrown punches

The number of punches thrown during the bout ranged from 86 (Fred Evans) to 357 (Seryk Säpijew). These competitors fought in the weight category up to 69 kg. The mean number of punches thrown during the Finals of the Olympic Games in 2012 was 188.75 per one competitor, ~ 63 punches per round and 21 punches per minute. Considering the distribution of punches during subsequent phases of the bout, significantly more punches were thrown during the second and the third round as compared with the first round (Table 2).

The types of punches thrown during the bouts

Significant differences were noted between the number of punches thrown using specific techniques. The average number of jabs was 116 while the average number of hooks and uppercuts was 48 and 25 respectively.

The average number of punches thrown by one competitor with the so called "extended" arm was 106 during the bout while the number of punches thrown with a withdrawn arm

Table 1. Comparison of the competitors fighting in Boxing Finals during the Olympic Games in London in 2012

Kategoria wagowa Weight category	Zwycięzca Winner	Przegrany Loser	Wynik Score
49 kg	(N) Zou Shiming	(N) Kaeo Pongprayoou	13 : 10
52 kg	(O) Robeisy Ramirez	(N) Njambajaryn Tögsgoqt	17 : 14
56 kg	(O) Luke Campbell	(N) John Joe Nevin	14 : 11
60 kg	(O) Wasył Łomaczenko	(N) Han Soon-Chul	19 : 9
64 kg	(O) Roniel Iglesias	(N) Denys Berinczyk	22 : 15
69 kg	(O) Seryk Säpijew	(O) Fred Evans	17 : 9
75 kg	(N) Ryōta Murata	(O) Esquiva Falcão Florentino	14 : 13
81 kg	(O) Jegor Mieczonec (zwycięstwo decyzją sędziów)(winner by the judges' decision)	(O) Ädylbek Nijazymbetow	15 : 15
91 kg	(O) Oleksandr Usyk	(N) Clemente Russo	14 : 11
91+ kg	(N) Anthony Joshua (zwycięstwo decyzją sędziów)(winner by the judges' decision)	(O) Roberto Cammarelle	18 : 18
Pozycja zawodnika normalna (N) Normal stance (N)	3	6	
Pozycja zawodnika odwrotna (O) "Southpaw" stance (O)	7	4	

Table 2. The average number of punches thrown during the Finals

Średnia liczba ciosów Average number of punches		runda 1 round 1		runda 2 round 2		runda 3 round 3	
188,75	±62,33	58	±41,6	65,15	±39,4	65,6	±48,3

was 83. Punches with an “extended” arm are thrown more often than the ones thrown with the “withdrawn” arm (on average, 1.3 times more often).

Hooks were thrown significantly more (twice) often with “extended” arm than with the “withdrawn” arm. Conversely, corkscrew punches were thrown significantly more often with a “withdrawn” arm than with an “extended” arm (Table 3).

Punches in the head and in the trunk

The average number of punches (per one competitor) thrown in the head was significantly greater than the average number of punches in the trunk. Punches in the head were thrown significantly more (six times) often than in the trunk (Figure 1).

The effectiveness (accuracy) of the punches thrown was on average 33.3%. Among the three types of punches, the higher accuracy was noted for uppercuts and the punches thrown with an “extended” arm. Hooks and the punches thrown with the „withdrawn” arm were significantly less accurate (Table 5).

The number of punches (long and short)

Short series (2-3 punches) were significantly more often (3.8 times) thrown than the long series (4 or more punches) (Table 6).

Elements of the defensive technique in the boxing tournament during the Olympic Games in IO 2012

The number of defensive actions

The average number of defensive activities used during the bout (per one competitor) was 123, which is 13.7 per minute. The number of defensive actions was significantly smaller than the number of punches thrown as some defensive actions (footwork, blocking) were used often for protection against the series of blows (Table 7). There were on average 1.54 punches per one defensive action.

Types of defensive actions

During the bout, on average 74 defensive actions using arms (blocking, parry, counterpunch), 24 defensive actions using the trunk (swaying, dodging) and 25 defensive actions using footwork (per one competitor) were performed.

Among the defensive actions using arms, the parrying turned ineffective due to the frequency of being used. Among twenty competitors, six did not use this technique at all. During each bout, only 2.35 parrying actions were performed. Blocking was the most popular technique. This technique was performed significantly more often than other techniques (20

Table 3. The percentage of punches thrown by the finalists of the olympic Games in 2013

	Ciosy proste Jabs	Ciosy sierpowe Hooks	Ciosy z dołu Uppercuts
% rodzajów ciosów Types of punches	61%	26%	13%
Ciosy ręką cofniętą Punches, arm withdrawn	43%	34%	67%
Ciosy ręką wysuniętą Punches, arm extended	57%	66%	33%

Table 4. The percentage values corresponding to the number of punches towards the head and trunk of the opponent during the Finals of the Olympic Games in 2012

	Ciosy w kierunku głowy Punches towards the head	Ciosy w kierunku tułowia Punches towards the trunk
% wyprowadzonych ciosów % of the punches thrown	86%	14%

Table 5. Effectiveness (accuracy) of the punches thrown by finalists of the Olympic Games in 2012

	proste Jabs	sierpowe Hooks	z dołu Uppercuts	„wysuniętą” ręką „Arm extended”	„cofniętą” ręką „Arm withdrawn”
Skuteczność ciosów Effectiveness of punches	37,1%	31,3%	36%	37,5%	31,9%

Table 6. The average number of punches thrown in short and long series by the finalists

	Ciosy w seriach krótkich Punches in short series	Ciosy w seriach długich Punches in long series
Średnia liczba ciosów na 1 zawodnika Average number of punches per 1 competitor	34,25	9

Table 7. The average number of punches and defensive actions during the Finals of the Olympic Games in 2012

	Działania w ataku Offense	Działania w obronie Defense
Liczba działań na 1 zawodnika Number of actions per 1 competitor	189	123

Table 8. The types of defensive actions used by the finalists

	Obrona rękami Defense using arms						Obrona pracą tułowia Defense using bodywork				Obrona pracą nóg Defense using footwork	
	blok blocking		zbiście parrying		kontra counterpunch		unik dodging		odchylenie sway			
	n	%	n	%	n	%	n	%	n	%	n	%
Liczba obron Number of defensive actions	47,25	38%	2,35	2%	24,15	20%	13,2	11%	10,8	9%	25	20%

times more often than parrying) – defense by counterpunch, footwork and upper body work) (Table 8).

Summing up of the results

1. In boxing tournament Finals during the Olympic Games in 2012 in London, the competitors assuming the “southpaw stance” won significantly more often.
2. Significantly more punches were thrown during the second and the third round.
3. Jabs were thrown most often while hooks and uppercuts were thrown significantly more seldom.
4. Significantly more punches were thrown with an extended arm than with a withdrawn arm. Especially hooks and uppercuts were thrown with a withdrawn arm. Punches in the trunk were very rarely thrown.
5. Punches in the head were significantly more often (six times) thrown than punches in the trunk.
6. Jabs and uppercuts, thrown with an extended arm, were most accurate (effective).
7. Short series of punches were more often (four times) thrown than the long series.
8. The most frequently used techniques included blocking defense and next, counterpunch and footwork. The rarely used techniques included upper body work. Parrying defense was hardly ever used.
9. The types and the number of the defensive activities, performed during the boxing tournament, depended on the individual competitors, fighting styles and the number of punches thrown by opponents.

Discussion

Significantly more finalists of the boxing tournament, who won their bouts in the Olympic Games 2012 were “southpaws” (n=7), (Table1). This fact may confirm the training tendency observed during recent years, involving the preference of an “southpaw stance” which, by definition, is used to increase the competitor’s chance for winning. Such an approach to training, even by young boxers, changes the so far used long term canons, aimed at mastering natural competitors’ predispositions, taking advantage of their right handedness and left handedness [18,19].

The results of the observation confirm that the most often used techniques included these which were best recorded in ABSS. Some of the offensive and defensive techniques were more often used than the other ones while other techniques were hardly ever applied. Most of the punches were thrown

during the second and the third round, which confirms the “recognizing” significance of the first round, typical for the bouts where scoring rivalry is expected from the beginning to the end of the bout and earlier finishing of the bout is not expected [1].

Among the offensive techniques, jabs were most often used. This type of punches constituted almost 2/3 of all the punches. There were over twice more jabs than hooks and almost five times more jabs than uppercuts. The remaining types of punches were significantly more used in short distance bouts, which are now avoided by competitors as the punches thrown during these bouts are more rarely recorded by ABSS. For this reason, the number of hooks and uppercuts was insignificant compared with the number of jabs. Similar findings are reported by Davis et al. [20].

The significantly more rare application of long series of punches as compared with short series can be explained in a similar way. A large number of punches thrown in long series makes it difficult to judge their accuracy, therefore they are rarely scored by judges [1,15,16,20].

Punches in the head were significantly more often (over six times) thrown than punches in the trunk. As a rule, these punches are more easy to note by the judges and thus, more often scored.

The number of punches thrown with the so called extended arm” was also significantly greater (by one third) than the number of punches thrown with the so called “withdrawn” arm. This may be explained by the fact that the former are closer to the target, thus the opponent has less time to react and it is easier to reach him. Hooks thrown with an extended arm were also thrown significantly (almost twice) more often than the punches thrown with a withdrawn arm while the uppercuts were thrown significantly more often (more than twice) with a “withdrawn” arm than with an “extended” arm. Such a structure of uppercuts seems to be in conformity with the training tendency, especially in the case of punches thrown in series, which must be effective and at the same time, easy to notice by judges. Sparse studies attempting to define the technical and tactical aspects of amateur boxing confirm the above thesis [18,19,20]. The difference in the number of jabs thrown with an “extended” and with a “withdrawn” arm turned out insignificant. This fact may confirm the popularity of such punches in ABSS.

Changes in fighting techniques due to the popularity of ABSS are indicated by numerous researchers and one of the most synthetic conclusions was presented by Nowak [17]. After having analyzed numerous boxing tournaments, he found

that the implementation of ABSS contributed to the decrease in the percentage of punches in the trunk in all weight categories, below the level of 20%. In tournament Finals using ABSS, the competitors of all weight categories thrown over 80% of punches in the head [17]. This tendency has also been confirmed in this study, which is indicative of its durability and it can even be called a rule.

With the judgment system using scoring sheets (in amateur and professional boxing)

The competitors fought in distance throwing jabs and in close distance using hooks and uppercuts [1]. Lateral punches (hooks) and uppercuts have a broader range than jabs, therefore it is better to use them in half-distance and tackle. ABSS allowed only long distance bouts, where jabs are easy to throw and are most often scored by judges. Regretfully, such a tendency causes technical and tactical limitations of boxing and makes the bouts less spectacular [1].

The differences in using individual defensive techniques also turned out significant as in the case of offensive techniques. Blocking, constituting almost 2/5 of all defensive actions, was the most often used defensive technique. Blocking was used significantly more often than counterpunch or footwork. Parrying was very rarely used by the finalists of the Olympic Games London 2012 and may be considered a negligible element of defensive techniques. The large number of defensive actions by blocking was due to the fact that this technique is easy to perform and enables defense against several punches. The significantly great number of defensive actions using footwork is connected with the technique allowing to avoid the whole series of punches and is typical for long-distance bouts [20,21].

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It should be accepted that although the types and the number of defensive actions depending, first of all, on the individual style of fighting as well as on the number of punches thrown during the bout, the stigma of ABSS also concerns defensive techniques [18,20]. The preferences for defensive techniques, like offensive techniques, seem to be regularly used, as indicated by the observation of the highest rank competition [1].

Conclusions

1. The significantly greater numbers of the "southpaws" assuming a "southpaw stance", who were winners of the Finals during the Olympic Games in 2012 may confirm the changes in canons concerning the so far used guidelines in basic training systems.
2. Due to the preferences of the judgment system, some offensive and defensive techniques are used significantly more often while other ones are almost completely neglected.
3. ABSS irrationally changes the course of the bout and makes the competitors use offensive techniques with the highest probability of recording, e.g., jabs thrown with an extended arm, but not uppercuts and punches in the head, instead of punches in the trunk.
4. Defensive techniques are also adjusted to the judgment system; blocking defense is most often used as it does not entail the risk of accidental scoring by the judge, as in the case of e.g. parrying.

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Received: 23.10.2015

Accepted: 17.02.2016

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