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**TECHNICAL CONSIDERATIONS ON THE EUROPEAN**  
**WEIGHTLIFTING CHAMPIONSHIPS, BUCHAREST 2018, 48KG**  
**WEIGHT CLASS**

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*Abstract*

In weightlifting, as in other sports, the fight for the first places within each weight class involves at least 4 to 6 athletes with approximately equal performances. The continuous improvement of the lifting technique must represent a permanent concern, without which the achievement of outstanding performances remains a random phenomenon. Among the main qualities required by weightlifting, an essential element in achieving sports performance is the lifting technique. This study focuses on the recording and analysis of execution times (from the moment when the discs are lifted off the platform until the upper limbs are stretched up with the barbell overhead). The study is part of an extensive research that aims, in this stage, at all categories of athletes participating in weightlifting competitions. The recording and measurement were performed using the AviSynth program that consisted of: camera - JVC digital camera, electronic computer, tripod, laptop, video monitor and video cassettes. The research presents the recording and analysis of execution times in the snatch event for some women weightlifters of European value, participants in the 2018 European Weightlifting Championships that took place in Bucharest, Romania. The research includes seven female athletes aged 21 to 30 years, from different countries, namely two athletes from Italy and one athlete from Bulgaria, Poland, France, the United Kingdom and Romania, respectively. This study is the continuation of a research on execution times in the snatch event, which finally aims to compare the Romanian athletes with those from other countries.

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**Keywords:** Analysis, weightlifting, performance sport, technique, execution time.



## **1. Introduction**

Major international competitions bring together athletes who have about the same level of physical and technical-tactical preparation. Under complex competitive conditions, the results are determined by the athletes' psychological qualities and ability to maximally exploit their personal resources. Rational training for competitions is related not only to focusing on motor actions, thoughts and sensations which are important for a given activity, but also to the disconnection from factors of another nature, which are abundantly present in direct preparation and while participating in competitions.

Experienced coaches carry out a systematic and careful activity in this regard: together with their athletes, they study in detail the technical and tactical characteristics, the strengths and weaknesses of the main competitors; at the same time, they get their athletes familiar with the competition venues: the sports facilities, the conditions provided for their warm-up, rest and recovery (Platonov, 2015).

Performance sport is a limit activity of man's physical and mental capabilities. Sports performance results from the interrelation of a particularly large number of factors, the weight of which is different both structurally and circumstantially (Epuran, 2013).

Identifying execution times for the snatch event is one of the most common aspects in the activity of weightlifters, regardless of their level. Research on intermediate execution times for the weightlifting techniques has enriched due to the significant contribution of some authors, such as Fronov, Lenkov, Efimov and Vangas.

It is worth noting that the Italian weightlifting school has developed a model that divides the snatch style into 4 periods and 8 phases (Urso, 2011).

Using the video method, experts highlight that the level of technical training has improved for each indicator assessing the phases of technical procedures (Ulăreanu, 2014).

We also recall that the rules governing the weightlifting competitions have undergone changes related to the temporal aspect. Some authors believe that the speed with which the barbell is lifted depends on its weight and the athlete's sport mastery. With heavier weight, the speed decreases, and the duration of initial acceleration decreases in direct relation with the sport mastery (Dvorkin, 2005).

## **2. Problem Statement**

1. Checking the possibilities of using the computerised imaging technique in barbell lifting for the snatch event. 2. Identifying execution times in snatch weightlifters through recording and measurement, using the AviSynth software program.

## **3. Research Questions**

Identification of execution times in the snatch event provides the opportunity to compare weightlifters, namely to establish connections and make observations on the achieved performances.

## **4. Purpose of the Study**

The research is part of a broader study that aims to investigate weightlifters (of both genders and different classes) with regard to certain moments related to the analysis of execution times characterising the lifting styles. This study addresses the recording and analysis of execution times (from the moment

when the discs are lifted off the platform until the upper limbs are stretched up with the barbell overhead). In this respect, our research presents the recording and analysis of execution times in the snatch event for some top European women athletes in value group “A”, 48kg weight class.

The research includes seven female athletes aged 21 to 30 years, from different countries, namely two athletes from Italy and one athlete from Bulgaria, Poland, France, the United Kingdom and Romania, respectively. The research was conducted in two main stages: stage 1, carried out between March 26<sup>th</sup> and April 1<sup>st</sup>, 2018, at the Polyvalent Hall within the “Sydney 2000” Olympic Complex of Izvorani, during which the athletes were selected and video recorded; stage 2, during which the results were processed and analysed using the AviSynth software program; processing the data obtained from recordings (ordering the data: number of frames per execution, converting the frames into seconds etc.); drawing conclusions and making observations (based on the obtained results).

## 5. Research Methods

This is an ascertaining research, more precisely an evaluative-ameliorative one. We used several research methods, such as scientific documentation, observation and data recording, but mostly the statistical information method. The instruments through which we obtained the necessary information were related to the computerised technology, where we used the AviSynth software program connected with the video technique. We mention that, in our study, video recordings were processed using the AviSynth software program, which was made available to us by the managers of the National Institute for Sport Research in Bucharest. This is a Windows frameserver developed by Ben Rudiak-Gould and Edwin van Eggelen, under the GNU GPL license (AviSynth, 2014). This research was based on the imaging technique. The main research method was computerised technology connected with the video technique. The recording and measurement were performed using the AviSynth software program that consisted of: camera - JVC digital camera, electronic computer, tripod, laptop, video monitor and mini video cassettes. The most experienced competitors in this weight class are the athletes from Italy and France, aged 30 years, while the second Italian competitor will be ranked 3<sup>rd</sup> in the finals, being the youngest female athlete – only 21 years old (Table 01).

## 6. Findings

To make easier the identification of the terms used in the tables below, we give the following explanations: S.N. (surname and name - initials); COU (country); Time 1 (first contact of the foot with the competition platform); Time 2 (feet are planted under the barbell axis); Time 3 (hands grasp the barbell); Time 4 (barbell is lifted off the platform); Time 5 (barbell is fixed overhead); Kg (lifted kilograms); S (successful attempt); F (failed attempt).

At this event, Romania was represented by a group of 16 athletes, 8 women and 8 men, whose goal was to win four medals. Our representative in the 48kg class, Elena Ramona Andries, managed to win all three gold medals.

This research is part of a broader study, which is reflected in the structure of Tables 02, 03 and 04 that reveal the value of concentration times for each athlete, but especially the theme of the present paper,

“Technical considerations on the European Weightlifting Championships, Bucharest 2018, 48kg weight class”, for the seven participants included in the value group “A”, aspirants for a place on the podium.

Analysing the technical performance behaviour (Tables 02 and 08) for the two-hand snatch technique, we can note the following: average execution speed for the first attempt is 3.26 seconds. The difference between the fastest and slowest execution speed for the first attempt is 1.6 seconds. The percentage of success for the first attempt is 90% (Table 05). Average execution speed for the second attempt is 3.24 seconds (Tables 03 and 09). The difference between the fastest and slowest execution speed for the second attempt is 1.07 seconds. The percentage of success for the second attempt is 80% (Table 06). Average execution speed for the third attempt is 3.76 seconds (Tables 04 and 10). We mention that the percentage of success for the third attempt is very low, only one of the seven athletes managing to lift the proposed weight and being ranked 3<sup>rd</sup> (Table 06).

**Table 01.** Subjects of the research group

Item no.	Competition number	S.N.	COU	Born	Body weight
1	46	P.D.	BUL	16.09.1994	48.00
2	215	P.G.	ITA	15.10.1988	47.96
3	507	G.N.	GBR	06.09.1995	47.94
4	629	A.E.	ROU	21.09.1994	47.86
5	639	M.A.	FRA	12.01.1988	47.98
6	650	Z.A.	POL	21.08.1992	47.98
7	811	P.A.	ITA2	16.07.1997	46.40

**Table 02.** Structure of the two-hand snatch and duration of times – first attempt

Item no.	S.N.	COU	Time 1	Time 2	Time 3	Time 4	Time 5	Kg	Successful/ Failed attempt
1	G.N.	GBR	1075	1211	1421	1564	1652	65	Successful
2	Z.A.	POL	2710	2808	2905	3057	3145	65	Successful
3	P.D.	BUL	12018	12146	12266	12425	12558	69	Successful
4	P.G.	ITA	13945	14050	14140	14332	14417	70	Successful
5	P.A.	ITA2	15412	15539	15660	15934	16039	70	Successful
6	A.E.	ROU	30946	31112	31172	31262	31351	75	Successful
7	M.A.	FRA	34234	34355	34617	34797	F	78	Failed

**Table 03.** Structure of the two-hand snatch and duration of times – second attempt

Item no.	S.N.	COU	Time 1	Time 2	Time 3	Time 4	Time 5	Kg	Successful/ Failed attempt
1	G.N.	GBR	6482	6707	6843	6978	F	68	Failed
2	Z.A.	POL	8208	8298	8425	8628	8740	68	Successful
3	P.D.	BUL	19107	19250	19317	19458	19560	71	Successful
4	P.G.	ITA	21675	21795	21945	22060	22140	73	Successful
5	P.A.	ITA2	23232	23396	23583	23808	F	73	Failed
6	M.A.	FRA	38524	38645	38855	39165	39250	78	Successful
7	A.E.	ROU	40938	41072	41163	41250	41358	79	Successful

**Table 04.** Structure of the two-hand snatch and duration of times – third attempt

Item no.	S.N.	COU	Time 1	Time 2	Time 3	Time 4	Time 5	Kg	Successful/ Failed attempt
1	G.N.	GBR	9917	10225	10360	10492	F	68	Failed
2	Z.A.	POL	17308	17397	17517	17726	F	70	Failed
3	P.D.	BUL	26394	26514	26596	26783	F	74	Failed
4	P.A.	ITA2	29056	29221	29334	29529	29642	74	Successful
5	P.G.	ITA	32191	32401	32484	32559	F	75	Failed
6	M.A.	FRA	43553	43658	43890	44134	F	80	Failed
7	A.E.	ROU	45729	45864	45969	46149	F	80	Failed

**Table 05.** Difference between the barbell lifting off the competition platform (T4) and its fixing/ lowering at the referee’s signal (T5) – first attempt

Item no.	S.N.	COU	Time 4	Time 5	Kg	Successful/ Failed attempt
1	G.N.	GBR	1564	1652	65	Successful
2	Z.A.	POL	3057	3145	65	Successful
3	P.D.	BUL	12425	12558	69	Successful
4	P.G.	ITA	14332	14417	70	Successful
5	P.A.	ITA2	15934	16039	70	Successful
6	A.E.	ROU	31262	31351	75	Successful
7	M.A.	FRA	34797	F	78	Failed

**Table 06.** Difference between the barbell lifting off the competition platform (T4) and its fixing/ lowering at the referee’s signal (T5) – second attempt

Item no.	S.N.	COU	Time 4	Time 5	Kg	Successful/ Failed attempt
1	G.N.	GBR	6978	F	68	Failed
2	Z.A.	POL	8628	8740	68	Successful
3	P.D.	BUL	19458	19560	71	Successful
4	P.A.	ITA	22060	22140	73	Successful
5	P.G.	ITA2	23808	F	73	Failed
6	M.A.	FRA	39165	39250	78	Successful
7	A.E.	ROU	41250	41358	79	Successful

**Table 07.** Difference between the barbell lifting off the competition platform (T4) and its fixing/ lowering at the referee’s signal (T5) – third attempt

Item no.	S.N.	COU	Time 4	Time 5	Kg	Successful/ Failed attempt
1	G.N.	GBR	10492	F	68	Failed
2	Z.A.	POL	17726	F	70	Failed
3	P.D.	BUL	26783	F	74	Failed
4	P.A.	ITA2	29529	29642	74	Successful
5	P.G.	ITA	32559	F	75	Failed
6	M.A.	FRA	44134	F	80	Failed
7	A.E.	ROU	46149	F	80	Failed

**Table 08.** Identification of subjects and results achieved relative to the execution time – conversion of frames into seconds in the snatch event – first attempt

Item no.	COU	Born	Body weight	Kg	Attempt	Frames	Execution time
1	GBR	06.09.1995	47.94	65	I	88	2.93
2	POL	21.08.1992	47.98	65	I	88	2.93
3	BUL	16.09.1994	48.00	69	I	133	4.43
4	ITA	15.10.1988	47.96	70	I	85	2.83
5	ITA2	16.07.1997	46.40	70	I	105	3.5
6	ROU	21.09.1994	47.86	75	I	89	2.96
7	FRA	12.01.1988	47.98	78	I	F	F

M 19.58/6 = 3.26 sec.

**Table 09.** Identification of subjects and results achieved relative to the execution time – conversion of frames into seconds in the snatch event – second attempt

Item no.	COU	Born	Body weight	Kg	Attempt	Frames	Execution time
1	GBR	06.09.1995	47.94	68	II	F	F
2	POL	21.08.1992	47.98	68	II	112	3.73
3	BUL	16.09.1994	48.00	71	II	102	3.4
4	ITA	15.10.1988	47.96	73	II	80	2.66
5	ITA2	16.07.1997	46.40	73	II	F	F
6	FRA	12.01.1988	47.98	78	II	85	2.83
7	ROU	21.09.1994	47.86	79	II	108	3.6

M 16.22/5 = 3.24

**Table 10.** Identification of subjects and results achieved relative to the execution time – conversion of frames into seconds in the snatch event – third attempt

Item no.	COU	Born	Body weight	Kg	Attempt	Frames	Execution time
1	GBR	06.09.1995	47.94	68	III	F	F
2	POL	21.08.1992	47.98	70	III	F	F
3	BUL	16.09.1994	48.00	74	III	F	F
4	ITA2	16.07.1997	46.40	74	III	113	3.76
5	ITA	15.10.1988	47.96	75	III	F	F
6	FRA	12.01.1988	47.98	80	III	F	F
7	ROU	15.05.1985	47.86	80	III	F	F

M = 3.76 sec.

M1+M2+M3 = 3.26+3.24+3.76 = 10.26/3 = 3.42 sec.

## 7. Conclusion

We believe that, on the one hand, the data obtained from this research will induce changes in the characteristics of athletic training performed by female weightlifters and, on the other hand, the differences between the values obtained by the Romanian athlete will become important landmarks in the specific training of women athletes from our country.

We have also found that each of the female athletes participating in the research has different execution speed, which requires a reconsideration of individualisation in the specific training.

After analysing the research results, some issues regarding execution speed in the snatch event have been highlighted, for instance: average execution speed for the three statutory attempts; average execution speed for each attempt; the ratio between the weight of the barbell and execution speed.

Concerning the results obtained in this research, we mention the following aspects: average execution speed for the first attempt is 3.26 sec.; average execution speed for the second attempt is 3.24 sec.

Increasing the weight of the barbell leads to increased execution speed.

The difference between the fastest and slowest execution speed is 1.77 sec.

Average execution speed for the three attempts is 3.42 sec.

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