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Original article

Study on the selection process of junior weightlifters in Romania

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Abstract

Aim. Our study aims to provide a clearer picture of how weightlifting coaches in Romania make the selection of future performers. In performance sports, the selection process is extremely important, and weightlifting is no exception to this rule. In the 21st century, in order to hope for the best possible results, this process should be based on studies and research of the relevant literature.

Methods. In view of the proposed objective, a questionnaire was created for weightlifting coaches in Romania. The questionnaire consists of two parts, the first requesting demographic data (4 items) and the second requesting the expert opinion on the selection process (15 items). For each item in the second part, the coaches had to choose from 5 options of answer designed based on the Likert scale.

Results & Discussions. Out of the total number of active weightlifting coaches in Romania in 2021, 56,3% agreed to complete the questionnaire (N = 33). Given the criteria on the basis on which these coaches make the selection, we can say that many of them are not in conformity with specialized studies. For example, many of the coaches said that the technical and tactical factor represent important criteria in the selection process.

Conclusion. In Romania, for the weightlifting branch, there is a need for a professional selection system, based on the latest research in the field, in order to help coaches.

Keywords: weightlifting, selection-system, coaches, selection-criteria.

Introduction

In recent decades, along with the development of science, sport has experienced an impressive development. Information, as the main tool for improving training strategies, has produced a real revolution in this field. Along with training strategies, the selection process of future athletes is another essential aspect for success in any sport.

It is impossible to create a selection model that identifies future performers without error - this is because there are an infinity of influences that work together for this result. But identifying potential performance athletes should not be just a matter of luck, at a time when so much research and study is available.

When making the selection, coaches should not be bettors, but rather entrepreneurs who take controlled risks, based on the information provided by specialized studies. From this perspective, it is highlighted the need to delimit as clearly as possible the criteria to be taken into account, for each branch of sport, when making the selection of young athletes.

Specialization in a sporting branch: Most of the time, specialization in a sporting branch is associated with the moment when an individual begins to participate frequently in the training sessions of a certain sport. But in order to be able to talk about the specialization in a sporting branch, a series of changes must be identified in the attitude of the one who participates in the training sessions. (Ericsson, 2003) Thus, specialization in a branch of sport is synonymous with what Ericsson et. al (1993) called the development of *deliberate practice* - that is, the time when the individual is willing to make an effort to improve his/her performance without seeking immediate satisfaction. Unfortunately, more and more parents and coaches who are eager for immediate performance pass on to young athletes these visions that seek shortcuts in the training process. Too early engagement of the athlete in competitions often leads to major long-term deficiencies, even abandonment. (Balyi, 2004)

Selection in weightlifting: If we refer to a certain sport, in our case weightlifting, in the process of identifying and selecting the potential athletes, there must be taken into account those physical or mental aspects that give an individual an advantage in practicing that sporting branch.

The distinctive features of high-performance weightlifters have been intensively studied by specialists for more than 50 years (Stone et. al, 2006; Badiu et al., 2000; Carter & Lindsay, 1984; Fahey et. al, 1975). Thus, in terms of body fat percentage, weightlifters competing in the light and medium categories (between 56 kg and 85 kg), have

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a percentage of body fat between 5% and 10% (Fry et al, 2006). These characteristics are similar to those of the athletes competing in sprints or jumps. On the other hand, when we refer to weightlifters who compete in the heavyweight category or in the category without weight limit (starting with 94 kg /> 105 kg), the percentage of body fat is of + 17% (Paavo, 2003). These figures are similar to those of athletes competing in the discus, weight or hammer throw events. Vizcaya et. al (2009) demonstrated that the deep squad jump test is a test that differentiates weightlifters who have the ability to perform from those who are less likely to win.

If in terms of fat percentage and explosive force values there are similarities between athletes and weightlifters, the differences appear especially when we refer to lengths, perimeters and body diameters. Thus, weightlifters have shorter arms, the length of the tibia is also shorter, they have smaller heights and larger biacromial breadths. (Storey & Heather, 2012) These features offer two considerable advantages when trying to lift a maximum weight: (1) the mechanical torque required to lift a load is smaller due to the smaller lengths of the resistance arm; (2) the amount of muscular effort required to lift the load is reduced by a reduction in the distance on which the bar must be moved. (Keogh et. al, 2007)

All these distinctive characteristics of weightlifters should be important criteria in the selection of future performance athletes. Without the benefit of certain anatomical advantages, it will be almost impossible for a sportsman to recover these differences, in comparison to a sportsman who possesses them - no matter how much he trains.

Objective

Considering those presented so far and concerning, on the one hand, the specialization in a sporting branch, and, on the other hand - the selection in the weightlifting sporting branch, we intend to offer an x-ray of the selection process of future weightlifters in Romania.

To be more specific, this study aims to provide a clearer picture of how the specialized coaches in Romania look at the selection in weightlifting. We also aim to find out if these coaches feel the need for a selection model to help them identify future sportsmens who can perform at the highest levels.

Methods

In order to successfully achieve the proposed objectives, the present study was conducted in 4 stages: (1) creation of a questionnaire; (2) identifying and obtaining the contact details of as many weightlifting trainers operating in Romania ; (3) contacting each coach to request the completion of the questionnaire; (4) collecting and interpreting the results ;

1. Creation of the questionnaire**:** In order to collect the opinions of the weightlifting coaches, a questionnaire was created within the Google Forms platform. This type of questionnaire offers the advantage that it is easy to complete by respondents and that it can be completed from any device connected to the Internet (including from the phone) - just by accessing a link. The questionnaire contains three sections: (1) a section with the title and a short description, (2) a section requesting the demographics of the person completing it, and (3) a section requesting specialist opinions on 15 items.

Section no. 1 is the first interface that appears to the respondent immediately after accessing the link. Here, the person who is to complete the questionnaire can read the title: "Questionnaire on the selection process in weightlifting" and a short description that informs about the persons to whom the questionnaire is addressed, the approximate time required to complete and the destination of the collected data.

Section no. 2 - starting with this section, for each item, the respondent has several answer options. He is also obliged to choose one of the answer options he has, otherwise the questionnaire cannot go to the next page. The four items that make up the second section, with adjacent answer options, are exemplified in table no. 1.

Table 1 - Section 2 of the questionnaire: Demographic data

Item no.	Content	Answer options
1	Are you a coach at a private or at a state club?	Private / State
2	For how long now have you been a weightlifting coach?	0-5 years / 5-10 years / 10-15 years 15-20 years / over 20 years
3	What is your classification as a coach?	assistant coach / coach / senior coach / master coach
4	For what age do you train?	6-9 years / 9-12 years / 12-15 years / 15-20 years / over 20 years

Section 3- Within this section, 15 items were designed covering 3 areas of interest: (1) general aspects of how coaches perceive the weightlifting sporting branch, (2) the criteria on the basis on which they make the selection and (3) whether these coaches feel the need for a specialized selection system for weightlifting. The answer options were designed on the basis of the Likert scale, where the first answer was constructed as to express "total disagreement", the second answer as to express "disagreement", the third as to express "neutral position", the fourth - "agreement", and the fifth - "total agreement". Exception only with item no. 18 where the respondents had to choose an age range. Table no. 2 presents the contents, the answer options and the fields of interest of the items that make up section no. 3.

Table 2 - Section 3: Specialized opinion

Zone of interest	Item no.	Item content	Answer options
General aspects regarding the weightlifting sporting branch	**5**	Do you think that weightlifting ensure the harmonious growth and development of children?	Not at all / A little / Enough / Much / Very much
	6	Do you consider weightlifting a safe and beneficial sport for children?	Not at all / A little / Enough / Much / Very much
	7	Do you consider weightlifting a high-risk sport?	Not at all / A little / Enough / Much / Very much
Selection in weightlifting	**8**	Do you consider selection important in sports?	Not at all / A little / Enough / Much / Very much
	9	Do you think that early selection in weightlifting may contribute to high performance?	Not at all / A little / Enough / Much / Very much
	10	Do you think that genetic factors can play a significant role in the selection process in weightlifting?	Not at all / A little / Enough / Much / Very much
	11	Do you think that the physical factor is important in the selection process for the Weightlifting discipline?	Not at all / A little / Enough / Much / Very much
	12	Do you consider that the technical factor is important in the selection process for the Weightlifting discipline?	Not at all / A little / Enough / Much / Very much
	13	Do you consider that the theoretical factor is important in the selection process for the Weightlifting discipline?	Not at all / A little / Enough / Much / Very much
	14	Do you think that the tactical factor is important in the selection process for the Weightlifting discipline?	Not at all / A little / Enough / Much / Very much
	15	Do you think that the psychological factor is important in the selection process for the Weightlifting discipline?	Not at all / A little / Enough / Much / Very much
	16	Do you think that anthropometric measurements are relevant to the selection process in weightlifting?	Not at all / A little / Enough / Much / Very much
	17	Do you think biomotor measurements are relevant to the weightlifting selection process?	Not at all / A little / Enough / Much / Very much
	18	What is the age at which it would be recommended to start initiation in weightlifting?	6-8 years / 9-12 years 12-15 years / 15-18 years /> 18 years
Weightlifting selection system	**19**	Do you find it useful to have a weightlifting selection system?	Not at all / A little / Enough / Much / Very much

2. Identifying and obtaining the contact details of as many weightlifting coaches operating in Romania: In this stage we received the help of the Romanian Weightlifting Federation which provided us with updated statistics on existing and active clubs in Romania in year 2021. We were also provided with the total number of active coaches in 2021. (Table 3)

Table no. 3 - The situation of weightlifting clubs and coaches active in year 2021

Weightlifting clubs and coaches active in Romania in year 2021	
Type of structure	**No. of active units**
CS / CSM / CSO / ACS / SCM	23
School structures	7
County structures	3
Private structures	2

Total active clubs	35
Total active coaches	55

After obtaining this statistical information from the Romanian Weightlifting Federation, we started (we started, all formulations must be in the plural person) an action to identify and collect the personal phone numbers of as many coaches as possible. In this approach we started with some direct contacts that the authors of this paper had, and with their help we proceeded to increase the number of contacts.

3. Contacting each coach to request the completion of the questionnaire: Due to the fact that the number of active weightlifting coaches in Romania is relatively small (N = 55), we considered it necessary to use a more personal approach to increase the percentage of coaches who respond positively to our request to complete the questionnaire. So we chose to contact each coach by phone to propose them to participate in our study, by completing the questionnaire. Only after they expressed their verbal agreement, the link of the questionnaire was sent by e-mail or a chat application, depending on everyone's preferences.

4. Collecting and interpreting results: One of the advantages of the Google Forms platform is, in addition to storing results, the ability to import data into an Excel spreadsheet. Furthermore, the Excel program allowed us to make several correlations regarding the answers of the coaches who agreed to participate in the study. The next chapter, "Results & Discussions" represents the materialization of this last stage that focused on collecting and interpreting the results.

Results and discussions

According to the information provided by the Romanian Weightlifting Federation, in year 2021, a number of 55 coaches registered activity. Using the methods described in the previous chapter, we were able to identify and contact a number of 31 coaches who were asked to complete the questionnaire.

Considering the coaches contacted who expressed agreement to participate in the study, all 31 completed the questionnaire. This was due on the one hand to the personal nature of contacting each coach by phone, and, on the other hand, the same approach allowed us to send messages to remind coaches who expressed their agreement but forgot to complete the questionnaire.

The 31 responding coaches represent a percentage of 56.3% of the total number of active coaches in Romania in the current year. This percentage, representing a majority, adds relevance to the results collected.

Demographic data: The following results are those recorded in the second section of the questionnaire, which asked respondents for demographic information. (see Table 1) Thus, among the coaches who accepted the participation in the study, 74,2% work at state clubs and 25,8% at private clubs (item 1), regarding the experience as a weightlifting coach (item 2), 12,9% are within the period of 0-5 years of experience in coaching, 19,4% have between 5 and 10 years of experience, 22,6% have between 10 and 15 years, 3,2% are within the period of 15-20 years, and 41,9% of coaches have over 20 years of experience in coaching. Item no. 3 requested information regarding the classification of coaches. Among the coaches who completed our questionnaire, 48,4% are master coaches, 22,6% are senior coaches, 12,9% have the classification of coaches, and 16,1% are qualified as assistant coaches. The last item among those requesting domegraphic data (item 4) focused on the age level at which they train. Thus, 41,9% deal with the training of sportsmen aged between 15 and 20 years, then 22,6% train sportsmen aged between 12 and 15 years, 19,4% train sportsmen between 9 and 12 years , 12,9% deal with those over 20 years, and 3,2% said they deal with the sector aged 6-9 years.

The main usefulness of this information is obvious when combined with that of the third sector. This combination shall allow us to see if there are differences of opinion related to the selection in weightlifting, to coaches with different levels of experience, or to those with different classifications etc.

Looking only at these results separately, we can see that, among the coaches who agreed to participate in the study, we have representatives from all categories of classification and experience, but also coaches who work in both state and private environment.

Regarding the age levels at which they train, in addition to the fact that here we have representatives for all levels, we also notice a percentage of 3,2% who stated that they train at the level of 6-9 years. This early initiation, according to the relevant literature, is far too early. Authors such as Côté et. al (2011) and Balyi (2004) consider that during this period the child should have activities aimed at developing basic motor skills, those specific to sporting branches being intended for a future stage. From this perspective, initiation at the level of age of 6-9 years is a wrong approach, which the authors believe will show its negative effects later. Effects materialized in saturation and possible abandonment of the training process. On the other hand, a correct approach at this age will turn the individual into a highly appreciated type of sportsman, namely "a trainable sportsman".

Specialized opinion: This last section of the questionnaire aimed at requesting the specialized

opinion of the coaches participating in the study, regarding the selection process in weightlifting in Romania. The items that make up this section have been formulated to address three topics: (1) general aspects of the weightlifting industry; (2) weightlifting selection; and (3) weightlifting selection system. (see Table 2) Following this division, we shall proceed to present the results collected for each item and discuss them.

General aspects regarding the weightlifting branch: this topic was covered by 3 items, and the registered results are presented in Table 4

Table 4 - Coaches' answers regarding the general aspects concerning the weightlifting sporting branch

Themes of interest	item no.	Item formulation		The results of the coaches' answers				
				Not at all	A little	Enough	Much	Very much
general aspects	5	Do you think that weightlifting ensure the harmonious growth and development of children?		0%	3,2%	12,9%	25,8%	58,1%
	6	Do you consider weightlifting a safe and beneficial sport for children?		0%	3,2%	6,5%	38,7%	51,6%
	7	Do you consider weightlifting a sport with a high degree of risk?		12,9%	45,2%	32,3%	6,5%	3,2%
selection in weightlifting	8	Do you consider important the selection in sports?		0%	0%	3,2%	6,5%	90,3%
	9	Do you think that early selection in weightlifting may contribute to high performance?		6,5%	6,5%	9,7%	32,3%	45,2%
	10	Do you think that genetic factors can play a significant role in the selection process in weightlifting?		0%	0%	9,7%	25,8%	64,5%
	11	Do you think that the physical factor is important in the selection process for the Weightlifting discipline?		0%	0%	9,7%	38,7%	51,6%
	12	Do you consider that the technical factor is important in the selection process for the Weightlifting discipline?		6,5%	6,5%	6,5%	29%	51,6%
	13	Do you consider that the theoretical factor is important in the selection process for the Weightlifting discipline?		0%	6,5%	16,1%	51,6%	25,8%
	14	Do you think that the tactical factor is important in the selection process for the Weightlifting discipline?		3,2%	9,7%	12,9%	45,2%	29%
	15	Do you think that the psychological factor is important in the selection process for the Weightlifting discipline?		3,2%	0%	3,2%	35,5%	58,1%
	16	Do you think that anthropometric measurements are relevant to the selection process in weightlifting?		3,2%	6,5%	9,7%	45,2%	45,2%
	17	Do you think biomotor measurements are relevant to the weightlifting selection process?		0%	3,2%	6,5%	51,6%	38,7%
	18	What is the age at which it would be recommended to start initiation in weightlifting?	vârsta (ani)	6-9	9-12	12-15	15-18	18+
			rezultate	22,6%	51,6%	25,8%	0%	0%
Selection system	19	Do you find it useful to have a weightlifting selection system?		0%	3,2%	0%	12,9%	83,9%

Analyzing the results collected from coaches, we shall start discussing with them starting with the items that questioned the general aspects of the weightlifting sporting branch (items 5,6 and 7). This topic of interest is gaining importance due to preconceived notions surrounding the weightlifting sport, which states that weightlifters are obese people who will destroy their spine and knees because of the heavy weights that they lift in training and competitions.

If we look at the answers of coaches, we notice that this idea is not one embraced by them. For items 5 and 6, that focus on the fear of injury and on the benefits of weightlifting in the harmonious growth and development of children, over 90% answered with the option "much" or "very much" - which indicates that, on the one hand, coaches consider weightlifting a beneficial sport for the harmonious development of children, and, on the other hand, the

same coaches do not believe that this sport is one with a high percentage of injuries.

These results are in agreement with specialized studies that indicate a percentage of 3,3 injuries per 1000 hours of training (Ingo, 2020). Another statistic that confirms this opinion is the one that ranks the sports in the 2008 Olympics according to the percentage of sportsmen who suffered injuries. Consequently, weightlifting is ranked on 5th place, with a percentage of 16,9% - sportsmen who have suffered injuries. In the top places there are sports around which do not revolve the same concern about injuries - such as handball (17,4%), hockey (20,4%), taekwondo (27%) and football (31,5%). (Jha, 2021)

Ingo (2020) considers that the weightlifting sport is beneficial in the harmonious development of the children, if the training is properly structured and if the lifting weights are adapted to the level of the sportsman/sportswomen. In this way, the child's strength develops harmoniously, which will not only not lead to the deformation of the spine, but it will also offer it a much superior support to children who practice other sports.

Item no. 7 wants to know if coaches consider weightlifting a high-risk sport. The risks of this sport, as explained by Jha (2021), are manifested especially when the sportsman, after moving the dumbbell vertically, will have to position himself under weight. Looking at the answers collected from coaches regarding this risk, it is observed that they are not worried about this topic. This fear for the moment of positioning himself under weight is also refuted by the specialists in the field, who say that this risk is almost completely eliminated if, in the first 2-3 years of the sportsman's training, the focus is mainly on learning and perfecting an execution technique as good as possible (Abernethy et al, 2013). Otherwise, as Morris et al (2020) warns, execution errors in the first years shall be paid later and will be very difficult, or maybe even impossible to fix.

We conclude the discussion of these 3 items that aim at general aspects by stating that most of the opinions of the coaches are in agreement with the researchers in the field. The way coaches perceive this sport is extremely important, because all these visions will be transmitted to young sportsmen both directly (voluntarily, verbally) and indirectly (through gestures, actions or even inaction) .

Going further to the second topic of interest of this section, the one which deals with the selection in weightlifting, we will discuss, for the start, items number 8 and 9. We notice here that coaches consider the selection process very important (item 8) and believe that an early selection can lead to high level performance (item 9). Here is a first disagreement with relevant literature. In weightlifting sport, as we have shown above, it is crucial to learn and then improve the execution technique. From this perspective, the authors consider that weightlifting is not a sport in which early specialization is recommended. (Balyi, 2004). For high, long-term performance, it is recommended, instead of early specialization, a step that Côté et. al (2011) calls it " *early sampling"*, and Balyi,(2004) using a game of words, calls it "FUNdamental stage". This stage should aim, on the one hand, a basic physical and motor dimension, and, on the other hand, a psycho-social one.

The following 6 items (from item no. 10 to no. 15) question the coaches regarding the criteria on the basis of which the selection process takes place. Each of these items takes into account one of the factors of sports training. It can be seen, from the coaches' answers, that in the selection process, they offer a high degree of importance to all factors: genetic, physical, technical, theoretical, tactical and psychological. These results indicate that, when making the selection of future performance sportsmen, coaches seek to find children already trained - since the technical factor and especially the tactical factor is a selection criterium. This conclusion confirms a remark made by Jha (2021), who provided an example from a school weightlifting competition in which the student who finished the competition on first place is selected, and the one on 3rd place, who was two years younger and had enormous potential, remains unselected.

These results lead to the opinion that the selection process for weightlifting in Romania is performed following a series of components that do not have much significance when looking for the identification of potential performers.

The following items (No. 16 and no. 17) require expert opinion on the relevance of anthropometric and biomotor measurements in the selection process. And here, the coaches respond, with very high percentages, with the answers "very much" or "much".

These results, this time, are in line with research in the relevant literature that shows the anthropometric characteristics that a weightlifter should have (short lengths of segments and larger dimensions of perimeters and diameters). The same research shows that, without these characteristics, a sportsman, no matter how much he prepares, will not be able to recover the advantages with which the one who has the anthropometric dimensions adapted for this sport starts. (Keogh et. al, 2007; Storey & Heather, 2012: Iconomescu et al., 2013).

Regarding biomotor measurements, Vizcaya et. al (2009) demonstrated that the deep squad jump test is a test that differentiates weightlifters who have the ability to perform from those who are less likely to win. This vertical jump test is fast, easy to implement and does not require expensive material resources. Thus, coaches can easily predict, with the help of this

test, if the sportsman has physical skills that recommend him for this sport.

The answers of the coaches to item no.18 highlight what are their opinions regarding the optimal age for starting the weightlifting initiation. We notice here a division of opinions: just over half of the coaches (51,6%) consider the 9-12 years interval as the most favourable, while 22,6% have selected the 6-9 years interval and 25,8% have said that initiation would be recommended between 12 and 15 years.

Regarding this topic of optimal age, it seems that the age range between 6 and 9 years is much too early. Although some coaches may consider that making early selection will provide more time for specific training, this approach is a wrong one and it will show its long-term effects. (Côté et. al, 2007; Balyi, 2004) The strategy in which children are first involved in an environment based on fun and experimental games until the age of 9 has been a topic addressed by many researchers who have concluded that it is the safest way to create the child's intrinsic motivation to engage in performance sports in the future. (Brandon et. al, 2006; Treasure, 2001).

The next stage in chronological order, i.e., the interval 9-12 years, is extremely important for acquiring motor skills specific to sporting branches and, thus, it represents the starting point in specialized sports. If this opportunity is missed, the chances of the sportsman to reach his maximum potential are considerably reduced. So, given that weightlifting sport is one in which the technical factor is extremely important (Jha, 2021), the age range 9-12 years should be used for acquiring and improving specific motor skills.

The complete transition from play to training is made completely only in the next stage (12-15 years). Only after the age of 12 may coaches expect a "change of position" in which athletes are able to truly understand the effects that effort, practice and skills can have - on personal performance. (MacPhail et. al, 2003; Horn and Harris, 2002)

Also, in this item (no. 18) we made a correlation with the demographic data filled in by each coach in the first section of the questionnaire. So, we wanted to see if the opinion about the optimal age of the selection in weightlifting varies depending on the classification of coaches. Thus, Table 5 illustrates the percentage of responses of each category of coaches to item 18. We mention that the reason why the other two answer options do not appear in this table is because no coach chose to answer with these options.

Table 5 - Coaches' answers regarding the optimal age for the selection in weightlifting

Classification of coaches	Answer options		
	6-9 years	9-12 years	12-15 years
assistant coach	25%	75%	0%
coach	20%	20%	60%
senior coach	0%	57%	43%
master coach	33%	53%	14%

From these results it is observed that opinions are as divided. It is not possible to distinguish a category of coaches in which the opinion on this subject is in agreement.

The last topic of interest of the questionnaire is represented by a single item, the one that asks the coaches if they feel the need for a selection system in weightlifting. The answers to this item are extremely clear, 83,9% answered "very much" and 12,9% answered "much". These results, combined with the results of the previous items in which a high degree of ambiguity was observed regarding the selection criteria, highlight a need, also recognized by coaches, for a clear selection system for the weightlifting branch.

Conclusions

The data collected from the coaches who agreed to participate in the study lead us to the conclusion that, in Romania, the selection process for weightlifting sport is a confusing one, and it is not based on specialized research and studies. The criteria on the basis of which coaches select future performance athletes are not always those demonstrated by research in the field as being essential.

The need for a selection system to be used by Romanian weightlifting coaches is highlighted, not only by the criteria according to which these coaches said they make selection, but also by the clear statement they make at item no. 19 - 83,9% said that they feel very much the need for a selection system and 12,9% said that they feel very much the need for such a system.

That being said, the weightlifting selection process in Romania requires more attention from specialists, for being perfected; only based on a good selection process one can hope to obtain performances at least similar to those that Romania has obtained in this sport in recent decades.

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