STUDY REGARDING THE USE OF STRENGTH ELEMENTS IN THE AEROBIC GYMNASICS

NICULESCU GEORGETA¹, SABĂU ELENA¹

ABSTRACT. The Aerobic Gymnastics is a new discipline in Gymnastics, having a spectacular character and harmoniously combining elements of artistic gymnastics, rhythmic gymnastics, acrobatic gymnastics, sport dance as well as the seven basic specific steps: march, jog, jumping jack, lunge, knee, kick, skip. In this work we intend to realize the model of algorithmic type to learn and to perfect the element of dynamic strength - EXPLOSIVE A-FRAME ½ TURN TO WENSON – value of 0.8. This element of high value is included by gymnasts in their exercises for being spectacular and to raise the difficulty mark. In the performance aerobic gymnastics the elements are divided in four difficulty groups: Group A – Dynamic Strength, Group B – Static Strength, Group C – Jumps & Leaps and Group D – Balance and Flexibility. In each group there are different families of elements. The studied element belongs to the Group A, which has 10 families and 65 elements. At the same time, the work intends to analyze quantitatively the content of the dynamic strength element - EXPLOSIVE A-FRAME ½ TURN TO WENSON in the finalists’ exercises during the World Championships of Aerobic Gymnastics at Rodez, France, 2010.

Key words: performance aerobic gymnastics, difficulty elements, static strength, dynamic strength

REZUMAT. Studiu privind folosirea elementelor de forță în gimnastica aerobică. Gimnastica aerobică este o disciplină nouă a gimnasticii cu caracter spectacular, ce îmbină în mod armonios elemente atât din gimnastica artistică, gimnastica ritmică, gimnastica acrobatică, dansul sportiv, cât și cei șapte pași de bază specifici: march, jog, jumping jack, lunge, knee, kick, skip. În această lucrare ne propunem să realizăm modelul de tip algoritmic al învățării și perfeccionării elementului de forță dinamică EXPLOSIVE A-FRAME ½ TURN TO WENSON - valoare 0.8. Acest element cu valoare ridicată este introdus de către gimnaști în exercițiile deoarece este spectaculos și poate crește nota la dificultate. În gimnastica aerobică de performanță, elementele sunt împărțite în patru grupe de dificultate astfel: Grupa A – forță dinamică, Grupa B – forță statică, Grupa C – sărituri și Grupa D – echilibru și mobilitate. Fiecare grupă cuprinde mai multe famili de elemente. Elementul studiat face parte din grupa A care cuprinde 10

¹ Spiru Haret University, getanic52@yahoo.com
Introduction

The aerobic gymnastics is a relatively new sport branch, enjoying a larger and larger attention at both national and international levels, thanks to its attractiveness onto practicing gymnasts as well as further to its spectacular results.

The performance aerobic gymnastics represent the ability to carry out continuous specific and complex moves of high intensity using music, which origins are in traditional aerobic movements and therefore the exercise must demonstrate a continuous motion, mobility, strength, the use of the 7 basic steps as well as perfectly performed difficulty elements (www.fig-gymnastics.com).

The different modalities of its manifestation offer multiple solutions to coaches for the exercises’ compositions regarding the harmony of motion, aesthetics, spectator-appeal, difficulty, dynamism or an inspired transmission of ideas through movements.

The elements of the Group A render evident the muscular strength of gymnasts, it being the human motor aptitude to overcome the resistance or to oppose it by an intensive muscular effort (Manno, R. 1996). In this way, the strength of the human body consists in its capacity to realize efforts to win, to support or to give up depending on the external or internal resistance, by contracting one of different muscular groups (Dragnea, C, A., Mate-Teodorescu, S. 2002).

Performed by strength, speed, coordination and mobility, the elements will impress spectators by their accuracy and amplitude of moves.

A major role to achieve the planned targets is played by the technical preparation aiming first of all to form the general basis of the motion, to learn the basic techniques of specific steps, arm movements, traveling, change of levels, gradual assimilation of technical elements belonging to the 4 groups. All it is feasible using efficiently operational models based on an algorithmic system which supposes:

- to divide the structure in methodic and systematic steps;
- to conceive preparing elements to learn the basic ones;
- to realize optimum methodic succession of the technical structure and to exercise it;
- to incorporate the technical structure in other combinations.
From such perspective appears the objective necessity to thoroughly and correctly assimilate the difficulty elements, based on quantitative and qualitative accumulations thanks to scientific and high performing methods.

Method

As far as the analyzed content is concerned, our work intends to realize the algorithmic model of learning and perfecting the element EXPLOSIVE A-FRAME ½ TURN TO WENSON – p. value of 0.8 and quantitatively to evaluate all the elements integrating the difficulty Group A – Elements of Dynamic Strength, in the case of the finalists in the 2010 World Championships at Rodez, France.

The Group A of Dynamic Strength Elements consists of the following 10 Families of Elements: Push up, Wenson push up, Plio push up, A Frame, Cut, V & High V support, Leg circle, Flair, Helicopter, Capoeira with twist. (www.fig-gymnastics.com). All 65 elements belonging to this group require dynamic strength which express the strength during the execution of a movement (Bota, C., 2000). The dynamic strength is called also isotonic and it can be under a defeat or cession regime. If fibers are shorter, the dynamic strength is of defeat type (myometric regime) and the strength is directed against the motion, being released by agonist muscles action (motor ones) and if the muscular fibers are extended and the strength acts in the same sense of motion, the strength would be dynamic of cession type (pliometric regime) and would act the antagonistic (braking) muscles (Tudor, V. 1999).

This Group of elements has all range of difficulties. There are the following families:

- **PUSH UP FAMILY** having difficulties from 0.1 to 0.5
- **WENSON PUSH-UP FAMILY** having difficulties from 0.3 to 0.5
- **PLIO PUSH-UP FAMILY** having difficulties from 0.3 to 0.8
- **A-FRAME FAMILY** having difficulties from 0.5 to 0.9
- **CUT FAMILY** having difficulties from 0.4 to 1
- **V & HIGH V SUPPORT FAMILY** having difficulties from 0.2 to 1
- **LEG CIRCLE FAMILY** having difficulties from 0.6 to 0.8
- **FLAIR FAMILY** having difficulties from 0.6 to 1
- **HELICOPTER FAMILY** having difficulties from 0.4 to 0.7
- **CAPOIERA WITH TWIST FAMILY** having difficulties from 0.7 to 0.9

All elements of this Group, object of our analysis, have the following requirements of execution (www.fig-gymnastics.com):

- Starting and/or finishing when one or both hands are in contact with the floor, elbows must be extended. Shoulders must be parallel to the floor, head in line with spine and the pelvis must be tucked with abdominal muscles contracted;
- Flexion of elbows: all push-ups must have, at the end of the downwards phase, a maximum distance of 10cm from the chest to the floor;
- In the downwards and the upwards phases of a push up, the shoulders must be parallel to the floor;
- In Hinge and Lateral push up, 4 phases must be performed;
- In 1 arm and 1 arm/1 leg push up, the distance between the feet must not exceed shoulder width. Unless otherwise stated;
- A push up take-off or landing – during the airborne phases - hands and legs must leave and touch the floor at the same time. Unless otherwise stated;
- All the elements of the Wenson family require straight legs and excellent hip joint flexibility. In split, the leg must rest on the upper part of the Triceps of the same side;
- For Leg circle, Flair, Helicopter, Capoeira with twist leg may not touch the floor before the completion of the circle;
- During Leg circle, the hips must be lifted and extended without any angle at pelvis level.
- During Helicopter, legs will perform alternatively a complete circle as close as possible to the chest. The return will be made on the upper back.
- In Capoiera, after kicking the leg to the shoulder, the arm is pushed into airborne position followed by a turn. During the split support, the hips are higher than the shoulders.
- Any deviation from the general requirements entails a subtraction of points.

Results and Discussions

According to the Code of points, gymnasts’ exercises in competitions must represent a balance between the difficulty elements performed in an airborne, standing or floor-work manner, containing not more than 12 elements in Mixed Pairs, Trio and Groups and not more than 19 elements in Individual Women and Individual Men. The exercise has to contain at least one element from each group, while the combinations of two elements, from the 12 or 10, must be chosen from all groups, and from different families and their combination must be direct, without rest or hesitation. The difficulty score is got adding the first 12 (or 10) elements and then dividing by 2. The difficulty level goes gradually from 0.1 to 1 point.

We are presenting an algorithmic model to learn and to perfect the element EXPLOSIVE A-FRAME ½ TURN TO WENSON – p. value 0.8
Figure 1 - EXPLOSIVE A-FRAME ½ TURN TO WENSON

Technical description of the element EXPLOSIVE A-FRAME ½ TURN TO WENSON:

- Starting position – front support
- Pushing off the floor, the body is lifted upwards in order to allow it to pike while airborne and then the body turns 180°
- The airborne pike requires vertical legs and knees closest to the chest.
- The Wenson position is made when both hands and feet make contact with the floor

Starting level:
1. Push up
2. A-Frame – pike position
3. From PU position ½ turn to Wenson
4. A-frame ½ turn to Wenson

Series I – preparing necessary mechanisms and physical support
1. From supine position are lifted simultaneously trunk and feet finishing with a 360° turn.
2. Traction at horizontal bar
3. Front support with feet carried by the coach or other gymnast in prone walking.
4. Turning 180° from standing by hands
5. Push up
6. From prone position lateral balances
7. Basic elements of Wenson and Lifted Wenson.

Series II – learning the element
1. From supine position, arms upwards, quick lifting, square seated, palms at toetips and return.
2. From front support pushing legs to pike position, palms and foot sole on the floor, passing to push up position and then to Wenson.
3. Push ups.
4. Push up to pike position of the floor, hands and legs touching the floor, returning to push up and then passing to Wenson.

5. In elastic net: frontal fall, pike and returning to prone position; the same turning in pike position

6. On the floor, push up, pushing, \(\frac{1}{2}\) turn in pike position on hands and legs, returning to push up and then afterwards to Wenson.

7. Performing the element in the competition area.

**Series – III – perfecting the element**

1. Execution of element with maximum parameters for: height, legs amplitude, posture, landing.

2. Synchronous execution of the element, in pair or trio

3. Execution of the element with directed speed

4. Combined execution of the element, with previous variables of steps, transitions or eventual elements

5. Execution of the elements by parts or integral exercise

We will show the analysis of the finalists’ exercises in the World Championships at Rodez, France, 2010, regarding the use of the element \textit{EXPLOSIVE A-FRAME} \(\frac{1}{2}\) \textit{TURN TO WENSON} – Execution of the element – p. value 0.8.

### INDIVIDUAL WOMEN

**Table 1.**

<table>
<thead>
<tr>
<th>Place</th>
<th>Name</th>
<th>Country</th>
<th>Execution of the element</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MATOS LOPEZ Marcela</td>
<td>BRA</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>2</td>
<td>BIANCHI Giulia</td>
<td>ITA</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>3</td>
<td>MCMILLAN Angela</td>
<td>NZL</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>4</td>
<td>MORENO Sara</td>
<td>ESP</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>5</td>
<td>HUANG Jinxuan</td>
<td>CHN</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>6</td>
<td>NEDELCU Cristina Simon</td>
<td>ROU</td>
<td>-</td>
</tr>
<tr>
<td>7</td>
<td>PARICHKOVA Denitsa</td>
<td>BUL</td>
<td>-</td>
</tr>
<tr>
<td>8</td>
<td>NGAMPEERAPONG Roypim</td>
<td>THA</td>
<td>-</td>
</tr>
</tbody>
</table>

**Graph 1.** Percentage execution of the element in the Individual Women

- No element 50
- Execution of 0.6 variant 37.5
- Execution element 12.5
In the Table 1 and Graph 1, we can notice only one gymnast has incorporated this exercise in her exercise, which represents 12.5%. This gymnast won the golden medal, other 4 gymnasts used an easier variable (37.5%), and 3 gymnasts did not use any element of this Family.

### INDIVIDUAL MEN

In the Individual Men event we found once again the element proposed in our study in 4 exercises representing 50%. Only one competitor used the easier variable of 0.6 points, but the other 3 competitors did not use elements of A-FRAME family, according to the Table 2 and the Graph 2.
MIXED PAIR

Table 3.

Execution of the element – p. value 0.8

<table>
<thead>
<tr>
<th>Place</th>
<th>Team Country</th>
<th>Execution of the element</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SPANIA</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>2</td>
<td>FRANȚA</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>3</td>
<td>ROMANIA</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>4</td>
<td>ITALIA</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>5</td>
<td>FRANȚA 2</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>6</td>
<td>KOREA 2</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>7</td>
<td>RUSIA</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>8</td>
<td>KOREA 1</td>
<td>Variant of 0.6</td>
</tr>
</tbody>
</table>

According to the Table 3 and Graph 3, we can see in the Mixed Pair event the element was used 25% and the variable of 0.6 in all final exercises, which represents 75%.

TRIO

Table 4.

Execution of the element – p. value 0.8

<table>
<thead>
<tr>
<th>Place</th>
<th>Team Country</th>
<th>Execution of the element</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CHINA 1</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>2</td>
<td>ROMANIA</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>3</td>
<td>FRANȚA 2</td>
<td>Variant of 0.8</td>
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<tr>
<td>4</td>
<td>RUSIA 1</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>5</td>
<td>RUSIA 2</td>
<td>Variant of 0.8</td>
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<tr>
<td>6</td>
<td>VIETNAM</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>7</td>
<td>CHINA 2</td>
<td>Variant of 0.8</td>
</tr>
</tbody>
</table>
In the Trio event, took part 6 men teams, 1 mixed trio (2 men and 1 woman) and 1 women trio. All men trio included exercise of the 0.8 variable, percentage of 75%, while the other 2 trios (mixed and women) used the variable of 0.6 points. We can see for the gymnasts it is a frequent element especially in combinations of elements.

**GROUPS**

<table>
<thead>
<tr>
<th>Place</th>
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<th>Execution of the element</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ROMANIA 1</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>2</td>
<td>CHINA 1</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>3</td>
<td>FRANCE</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>4</td>
<td>RUSIA 2</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>5</td>
<td>KOREA</td>
<td>Variant of 0.8</td>
</tr>
<tr>
<td>6</td>
<td>RUSIA 1</td>
<td>Variant of 0.6</td>
</tr>
<tr>
<td>7</td>
<td>ROMANIA 2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>ITALY</td>
<td>Variant of 0.8</td>
</tr>
</tbody>
</table>

In the Groups event, took part 8 teams, with teams of 4 men or 2 men and 2 women. All teams included exercise of the 0.8 variable, percentage of 12.5%, while 2 teams (Romania 1 and Korea) used the variable of 0.6 points. We can see for the gymnasts it is a frequent element especially in combinations of elements.

**Graph 4.** Percentage execution of the element in the Trio event

**Graph 5.** Percentage execution of the element in the Groups event
The Groups event had in its Final 5 men groups, 2 women groups and one mixed group (5 men and one woman). In this Final all men groups performed the element of 0.8 p. value, single or combined with other element.

Conclusions

- The element EXPLOSIVE A-FRAME ½ TURN TO WENSON belongs to the Family A-FRAME.
- The Family A-FRAME incorporates 7 elements with values from 0.5 to 0.9.
- The element EXPLOSIVE A-FRAME ½ TURN TO WENSON is used particularly in the men exercise.
- The element is used in combinations.
- The execution of technical elements in this group requires from gymnasts: strength at the level of high and low legs, mobility of hip joint and scapular-humeral joint as well as coordination.

REFERENCES