2. Cercetările de piață în sfera turismului nu vizează doar studiul cererii turistice ci, firesc, înglobează şi studiul ofertei turistice. Această a doua categorie a pieței turistice trebuie abordată, la rândul său, atât *în profil static,* cât şi *în dinamica sa.* Doar astfel este posibilă obținerea unor informații detaliate, complete, asupra componentelor sale, dar şi surprinderea direcțiilor evoluției ei. Multilateralitatea abordării ofertei obligă la folosirea unor *surse variate de informații* şi a unor *metode diferite* de obținere şi prelucrare a acestora. Principala sursă o constituie *sistemul de evidență statistică a turismului,* cu indicatorii săi specifici - ex. număr unități de cazare (din care: hoteluri, vile, cabane etc.), număr locuri de cazare, număr zile/turist, structura capacității hoteliere pe categorii calitative (hotel 5, 4, 3, 2 stele şi o stea) etc.
3. Piata turistică are o structura internă deosebit de complexă, în care pentru a putea adopta cele mai potrivite strategii de marketing este necesară segmentarea acesteia.
4. Astfel spus produsul turistic oferit de județul Argeş (în cazul nostru) trebuie divizat în subgupe cu nevoi şi preferințe specifice, care formează o parte suficient de mare din cererea totală, pentru a justifica o strategie de marketing separate.
5. Cunoaşterea caracteristicilor argumentelor identificate este indispensabilă, doar în baza acestora putându-se stabili modalitățile de abordare distinctă a diferitelor clienți-țintă.

Aşadar, cererea pieței turistice oferite de județul Argeş presupune şi investigarea dimensiunilor specifice ale acesteia, obținându-se astfel informații asupra distribuției teritoriale a ofertei şi cererii turistice, a punctelor lor de contact.

Bibliografie

1. FORȚU, A., CÎRSTOCEA, V., VISULESCU, N., (1987), Curs de turism şi orientare, Edit. M.E.I.-I.E.F.S., Bucureşti.
2. FRATU, I., BELEAUA A., FRATU, O., (1991), Pe custurile făgărăşene, Edit. pentru turism, Bucureşti.
3. FRAZZEI, F.,(2004), Manual pentru turismul de munte, Edit. Cartea Universitară, Bucureşti.
4. GAFIȚA, V., NEDEL, P., (1980), Pe cărări de munte, Edit. Ceres, Bucureşti.
5. GAGEA, A., (1999), Metodologia cercetării ştiințifice în educație fizică şi sport, Edit. Fundației „România de Mâine", Bucureşti.

THE STRUCTURE OF THE KINEMATIC CHAINS IN THE POLE VAULT EVENT

Liliana MIHAILESCU
University of Pitesti

Key words: technique, technical mechanism, kinematic chain.

Abstract

The pole vault jump is a mobile support event. Because of the support, the athlete can influence in the first part the event the trajectory of general mass center and, as a consequence, this can't be a parabola anymore. The whole system pole – athlete can be compared to a pendulum that oscillates around the support point on the ground. In the first part of the flight the jumper doesn't hang in a passive way by the pole, but executes active movements that determine the change of his position through the pole from the hang position in standing on the hands.

As a very complex event, the pole vault requires multiple kinematic chains whose components (muscles, bony levers, and joints) involve all the human body segments. On the structure of the jump phases there are indentified the muscular groups, joints and bony levers that cause the motive action in all the motive structure's moments.

Introduction

The kinematic chains are mobilized by the muscular chains, joints and bony levers. Here, the muscular groups are bounded one to another by the movement's needs that has to perform.

The pole vault jump is a mobile support event. Because of the support, the athlete can influence in the first part the event the trajectory of general mass center and, as a consequence, this can't be a parabola anymore. The whole system pole – athlete can be compared to a pendulum that oscillates around the support point on the ground. In the first part of the flight the jumper doesn't hang in a passive way by the pole, but executes active movements that determine the change of his position through the pole from the hang position

in standing on the hands.

The pole vault jump is based on the kinetic energy developed on the running, combined with the impulse force of the hit that gives the body a pendulum movement on the pole which is continued with a pull and a raise of the body above the pole's grabbing level.

Our **research purpose** is to emphasize the motive and functional structure of the pole vault by indentifying the involved kinematic chains in the achievement of the effort specific to every phase of the basic mechanism of the technique, in order to improve the physical training specific in this event.

Research hypothesis

The kinematic chains specific to the basic mechanism of the pole vault event can be objectified by presenting the chains' structural elements on the jump's phases.

Content, methodology

The muscular activity during the running is specific to the velocity runners; an important contribution is brought by the chain of the triple extension of the inferior limbs by the "overcome" dynamic work. This is accompanied by the "maintain" static activity of the vertebral ditches' muscles that provide the body position and the chain realized by the fingers, elbow flexors and the adductors in the scapula-humeral joint that provide the pole's grab.

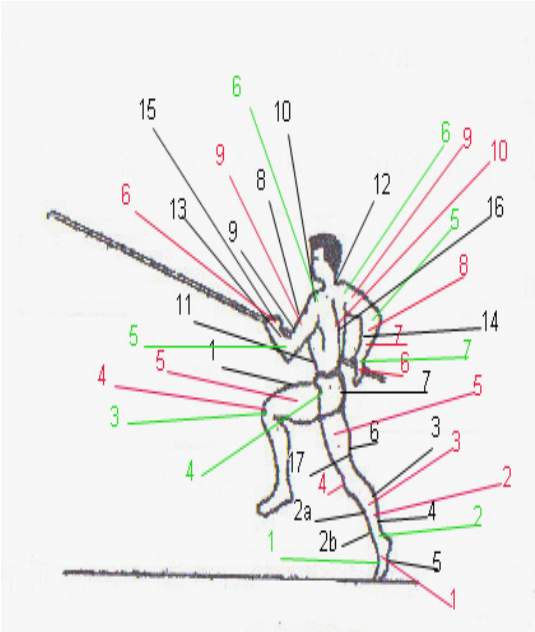

Fig.1. The kinematic chains involved in the pole vault's running

Crt no	The effort muscles	The used joints	The bony levers
1	femoral quadriceps	Leg toes	Leg bones (tarsus, metatarsus, phalange)
2a 2b	anterior tibia peroneal	ankle	tibia
3	Intern and extern gastronemian	knee	patella
4	solear	coxal-femoral	femur
5	Haluce flexor	elbow	Hand bones (carpal, metacarpal, phalange)
6	biceps femoral	Scapular bond	ulna
7	nappies	fist	radius
8	brachial biceps		humerus
9	brachial		Spinal column
10	deltoid		
11	abdominals		
12	trapezes		
13	Forearm extensors		
14	Forearm flexors		
15	thenar and hypothenar		
16	paravertebral		
17	semitendinos.		

The hit is the result of the ballistic and strong contraction of the triple extension's chain from the left/right lower limb. The hit provides by, the overcome dynamic effort, the first part of the body's trajectory, which is continued then by the contraction of the lower limbs and body muscles. During the ascent of the center of mass, the pendulum limb brings an important contribution by the overcome dynamic effort of the triple flexion's chain.

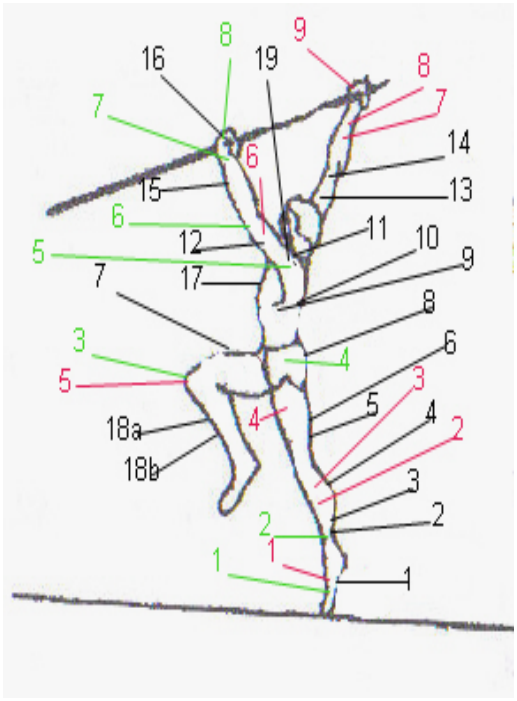

Fig.2. The kinematic chains involved in the pole vault's hit

Crt. No.	The effort muscles	The used joints	The bony levers
1	Haluce flexor	Leg toes	Leg bones (tarsus, metatarsus, phalange)
2	achillis tendon	ankle	tibia
3	solear	knee	fibula
4	femoral biceps	coxal-femoral	femur
5	semitendinos	elbow	patella
6	intern and extern gastrocnemian	hand fingers	ulna
7	femoral quadriceps		radius
8	nappies		humerus
9	big toothed		Hand bones (carpal, metacarpal, phalange)
10	paravertebrals		
11	trapeze		
12	brachial triceps		
13	brachial biceps		
14	brachials		
15	fingers common flexor		
16	hand		
17	great chest		
18a 18b	anterior tibia fibula		
19	deltoid		

The specific *flight* of the pole vault is divided in three phases: the long pendulum, the short pendulum and the passing over the lath.

The movement of the *long pendulum* is realized by the kinetic energy of the running, the rotation axe being at the level of the hand pole grab. The maximum amplitude of the pendulum is effectuated by the

lower limbs' extremities.

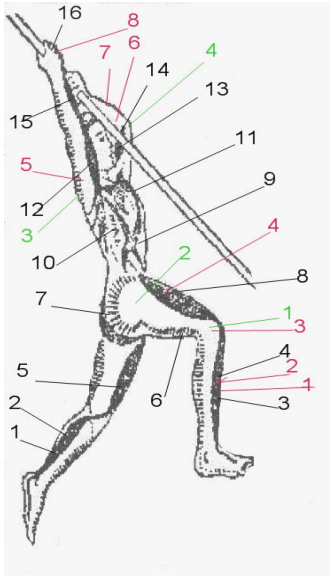

Fig. 3. The kinematic chains involved in the pole vault's long pendulum

Crt. No.	The effort muscles	The used joints	The bony levers
1	Solear	knee	tibia
2	intern and extern gastrocnemian	coxal-femoral	fibula
3	anterior tibia	scapula belt	patella
4	fibula	elbow	femur
5	semitendinos		humerus
6	femoral biceps		ulna
7	nappies		radius
8	femoral quadriceps		hand bones (carpal, metacarpal, phalange)
9	abdominals		
10	big toothed		
11	great chest		
12	brachial triceps		
13	brachial biceps		
14	brachials		
15	fingers common flexor		
16	hand muscles		

The short pendulum of the ensemble of the body reversal and legs lifting movements that begins after the body that is hanged on the pole past it with a 45^0 angle. The mass center is lifted and the head and shoulders swung down. That request many muscular chains and between the most important is the chain realized by the fingers, fist, elbow, retroductors and adductors flexors in the scapula-humeral joint, the muscles that are moving down and swung the scapula in the medial direction. This chain is continued on the ventral part of the body with the crossed chains of the abdominal wall muscles and at the lower limbs level with the hip flexors on the pelvis, the knees' extensors and foot flexors. Another muscle chain at the same length is realized from the respective antagonists that act by "stretch" dynamic effort.

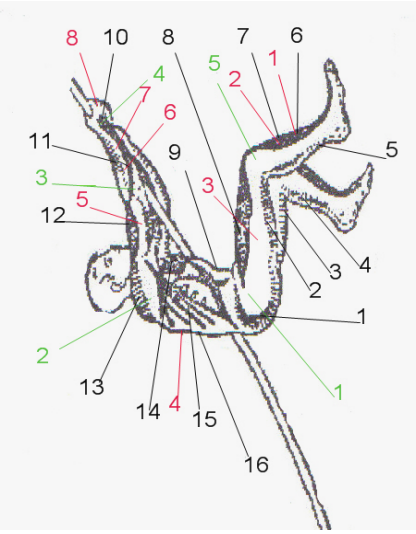

Fig. 4. The kinematic chains involved in the pole vault's short pendulum

Further on an arm push is happening that lifts the body higher and it is provided by "contraction" dynamic effort realized by the muscular chain of the fingers flexors, elbow extensors, retroductors from the scapula-humeral joint, and the muscles that swung in a medial direction. As a result of this muscular activity the body passes the lath through a rotation movement.

Crt. No.	The effort muscles	The used joints	The bony levers
1	nappies	coxal-femoral	fibula
2	semitendinos	scapular belt	tibia
3	biceps femoral	elbow	femoral
4	intern and extern gastrocnemian	fist	vertebral column
5	solear	knee	humerus
6	fibula		ulna
7	anterior tibia		radius
8	femoral quadriceps		hand bones (carpal, metacarpal, phalange)
9	abdominals		
10	hands		
11	common flexors of fingers		
12	brachial biceps and brachial		
13	deltoid		
14	great pectoral		
15	intercostals		
16	paravertebral		

Passing over the lath and the releasing of the pole

The left/right hand is the one which releases the pole first, the left/right shoulder is lifted, and the elbow flexes in order to pass over easily the lath. At the same time the right upper limb gives a final impulse to lift the body and pass over the lath. This impulse is realized by overcome dynamic activity supported by a muscular chain made up by the finger flexors, the elbow extensors, the retroductors in the scapula-humeral joint and the muscles that lower and medial swung the scapula. The jumper's body passes over the lath describing a circle vault up and around the lath with the ventral part orientated down.

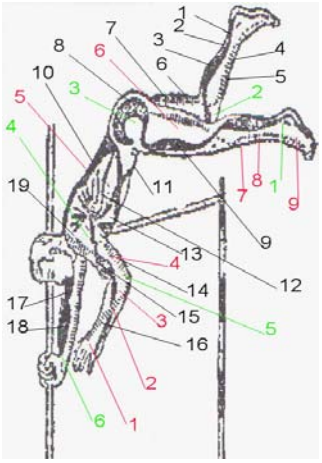

Fig. 5. Passing over the lath and releasing the pole

Crt. no.	The effort muscles	The used joints	Bones
1	solear	ankle	hand bones (carpal, metacarpal, phalange)
2	intern and extern gastrocnemian	knee	ulna
3	fibula	coxal-femoral	radius
4	anterior tibia	scapula belt	humerus
5	femoral biceps	elbow	vertebral column
6	semitendinos	fist	femoral
7	nappies		tibia
8	femoral quadriceps		fibula
9	paravertebral		leg bones (tarsus, metatarsus, phalange)
10	abdominals		
11	intercostals		
12	great pectoral		
13	brachial triceps		
14	brachial biceps		
15	common flexor of the fingers		
16	brachial		
17	deltoid		

Conclusions

As a very complex event, the pole vault requires multiple kinematic chains whose components (muscles, bony levers, and joints) involve all the human body segments. On the structure of the jump phases there are indentified the muscular groups, joints and bony levers that cause the motive action in all the motive structure's moments.