

# The technique of indoors vertical rails “climbing” in sports tourism at individual distance

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## Abstract

**Problem Statement:** striving for high results in almost all kinds of sports requires the athletes to show the maximum of mental, tactical, technical and physical preparedness. The issue of the optimal correlation of the levels of physical qualities development is also of great importance. **Approach:** making historical review of scientific literature it was found out that velocity (speed), strength, endurance, agility and flexibility were purely speculatively referred the physical qualities. This approach was based on the observation of external, clearly manifested characteristics of a person's motor activity, easily measurable in physical measures of mechanical motion. At that, the physiological mechanism was not taken into account, since it was still little known. This approach was content with a descriptive function, developed on a purely logical basis and objectively relied on the results of various motor tasks fulfillment. **Purpose** is the determination of the optimal climbing technique, taking into account the structure of the competitive activity of tourists-athletes of the age group of 10-12 years. **Results:** based on the indicators it is expected that a technique of vertical rails “climbing” is an important indicator of distance overcoming. From the structure of the competitive activity it was noticed that those who use the extra equipment show better results. **Conclusions:** pedagogical experiment allowed proving that the technique of covering vertical rails climbing with the use “Pantin” is more effective than without its use. In the first and second groups the results at the segment of rope climbing significantly improved by 22.3% and 14.6% respectively, at a significance value of 0.05.

**Keywords:** sports tourism, technique, walking distance, indoor premises, vertical rails

## Introduction

Physical training is the process of developing the optimal ratio of an athlete's physical qualities in the chosen sport. But there is some uncertainty in each physical quality. Candidate of Pedagogical Sciences, Associate Professor R.Kh. Yarullin noticed this uncertainty, moreover, conducting research, he established that such well-known specialists as L.P. Matveev, B.A. Ashmarin and others understand the essence of these concepts in different ways. In his opinion, physical abilities are a kind of a person's abilities, his/her genetically and socially conditioned differences in the manifestation of physical properties (qualities) in improving his/her motor activity (Ashmarin, B.A., 1990; Matveev, L.P., 2003).

In the authors' opinion, the most reliable answer to this question is given by Yu.V. Verkhoshansky. Making historical review of scientific literature he found out that velocity (speed), strength, endurance, agility and flexibility were purely speculatively referred the physical qualities (Verkhoshansky, Yu.V., 1988). This approach was based on the observation of external, clearly manifested characteristics of a person's motor activity, easily measurable in physical measures of mechanical motion. At that, the physiological mechanism was not taken into account, since it was still little known. This approach was content with a descriptive function, developed on a purely logical basis and objectively relied on the results of various motor tasks fulfillment.

Everything abovementioned gives an opportunity to conclude that as a result of combinations (fusions, integration) of basic qualities, new (complex, integral, hybrid, synthetic, complex, secondary) qualities arise. The explosive force, for example, is the integration of force and speed; motor agility is a complex of strength, endurance and flexibility; speed endurance is a combination of speed and endurance, etc. Thus, further we will base upon physical (motor) abilities, which we understand as combinations of basic qualities, taking into account the physiological mechanism of man. After all, they comprise the structure of physical fitness for the chosen sport.

## Material and methods

At the first stage we conducted pedagogical observation with the aim of further study the competitive process in sports tourism. The observation was conducted during the Final of the Cup of the Krasnoyarsk Territory for indoors sports tourism in the town of Zelenogorsk at the 2<sup>nd</sup> class of walking (personal) distance for boys. At the second stage, we conducted a pedagogical analysis of the previous stage of the study, which helped to identify the ways that athletes-tourists use to cover the segment of “climbing”. This led to the need for conducting the cross experiment. At the third stage the comparative experiment was conducted. Such an experiment is always carried out on the basis of comparison of two similar parallel groups, classes, flows – experimental and control. Depending on the

adopted scheme of construction, comparative experiments can be direct, crossover and multifaceted with several levels (Verkhoshansky, Yu.V., 1988). To carry out the experiment in a specially equipped school gym, a distance of the 2<sup>nd</sup> degree of complexity fully meeting the “Regulations” and the Rules of the competition for sports tourism was set. The distance was set in accordance with the regulations for sports competitions in sports tourism, the disciplines of “walking distance”, namely: zip line, rails descent, hook-type stand climbing, rails descent, vertical rails climbing, zip line (Matveev, L.P., 2003, Filin, V.P., 1987).

10 athletes with the sports qualification of second senior degree took part in the pedagogical observation. The age of the participants was 10-12 years. For the frequency of the experiment, participants from different teams, who demonstrated a dense result at the distance, were selected. In the process of preparation for the competition, various tactical and technical methods for covering the distance were chosen by the athletes. 12 athletes from the Physical Culture and Sports Club “Akadem” on the basis of gymnasium No. 13 of the city of Krasnoyarsk, boys of 10-12 years age group took part at the second stage of the experiment. The athletes were divided into two homogeneous groups, 6 people in each, taking into account age characteristics and sports qualification. This age group was trained by one coach and in accordance with one method, one training session lasted two academic hours three times a week (Tuesday, Thursday, Saturday). The experiment was conducted from April 1 to May 28, 2016. During this period of time, athletes-tourists were improving two ways of vertical rails climbing (with the use of Pantin clamp and without it). At the end of the pedagogical experiment, on 24 and 28 May, an ascertaining experiment, which consisted in covering the walking distance of the 2<sup>nd</sup> class of complexity at a competitive pace, was carried out. On the first day of the experiment (May 24), during the main part of the training, the first and the second groups covered the walking distance of the 2<sup>nd</sup> class of complexity, the first group had a vertical climb at the distance, with “Pantin”, and the second without “Pantin”. The data are given in Tables 3 and 4 respectively. On the second day (May 28), in one training session, the final part of the experiment was carried out, the participants of the first had the second groups covered the same distance under the following conditions: the first group had a vertical climb at the distance without “Pantin” and the second group with “Pantin”.

In this study, to solve the above tasks, we have applied a set of methods that provide complete information and objectivity: pedagogical observation, timing, pedagogical experiment, mathematical processing of data. Timing was used to determine the time spent for each segment of the competition activity structure at the distance of the 2<sup>nd</sup> class of complexity as a whole, by measuring the time spent at individual technical segments of the distance for each athlete individually.

The video was divided into segments, which consisted of the distance segments shown in Table 1.

Table 1. Distance segments, “walking-individual”

Distance Segments	Techniques
A.	Crossing(start P3-3 - P3-1)
B.	Zipline–descent(TO-1-TO-7, TO-7-P3-5)
C.	Crossing(P3-5 - P3-8)
D.	CS climbing - descent (P3-8-TO - 10-P3-8)
E.	Crossing(P3-8 - P3-5)
F.	Railsclimbing(P3-5 - TO-7)
G.	Zip line(TO-7 - TO-1)
H.	Crossing(P3-1 - P3-3 finish)

Figure 1 shows the scheme of the distance “walking-individual” of the 2<sup>nd</sup> class of complexity in the gym.

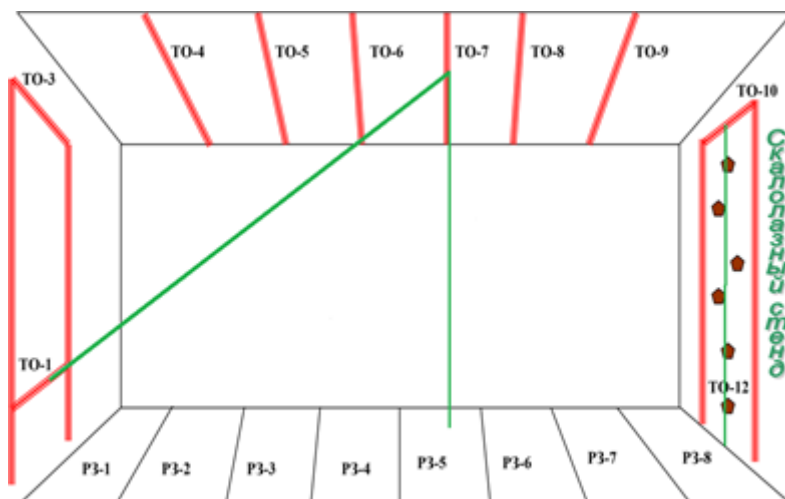


Figure 1. Scheme of the distance “walking-individual”

## Results

Based on the results of pedagogical observation, the obtained results are given in Table 2.

Table 2. The pedagogical observation results

Distance segment	Techniques	Athlete number										Arithmetic mean value
		1	2	3	4	5	6	7	8	9	10	
A.	Crossing (start P3-3 – P3-1)	00:02 (1)	00:02 (1)	00:02 (1)	00:03 (2)	00:02 (1)	00:02 (1)	00:02 (1)	00:02 (1)	00:02 (1)	00:03 (2)	00:03,2 (3,1%)
C.	Crossing (P3-5- P3-8)	00:05 (2)	00:05 (2)	00:05 (2)	00:05 (2)	00:05 (2)	00:04 (1)	00:06 (3)	00:05 (2)	00:05 (2)	00:01 (4)	00:05,6 (6%)
D.	CS climbing - descent (P3-8-TO-10- P3-8)	00:21 (4)	00:19 (3)	00:17 (1)	00:18 (2)	00:19 (3)	00:19 (3)	00:19 (3)	00:19 (3)	00:21 (4)	00:19 (3)	00:19,1 (20,2%)
E.	Crossing (P3-8- P3-5)	00:05 (1)	00:08 (4)	00:08 (4)	00:06 (2)	00:06 (2)	00:05 (1)	00:06 (2)	00:07 (3)	00:08 (4)	00:06 (2)	00:06,5 (6,9%)
F.	Rails climbing (P3-5-TO-7)	00:13 (2)	00:12 (1)	00:15 (3)	00:16 (4)	00:15 (3)	00:21 (6)	00:22 (7)	00:20 (5)	00:21 (6)	00:20 (5)	00:17,5 (18,5%)
G.	Zip line (TO-7- TO-1)	00:18 (2)	00:19 (3)	00:18 (2)	00:19 (3)	00:19 (4)	00:20 (4)	00:18 (2)	00:15 (1)	00:19 (3)	00:16 (2)	00:18,1 (19,1%)
H.	Crossing (P3-1 – P3-3 finish)	00:03 (3)	00:03 (2)	00:2,5 (1)	00:03	00:03 (1)	00:04 (4)	00:04	00:04 (5)	00:04	00:05 (2)	00:03,5 (3,7%)
Total time at the distance		1:29	1:30	1:31	1:32	1:32	1:34	1:37	1:38	1:41	1:42	1:34,6

Note that the best time for the segment of rails climbing is shown in yellow.

The obtained digital material has been subjected to mathematical processing that has allowed presenting structure of competitive activity, given in figure 1, visually.

The technical components of the competitive activity are given in Figure 2.

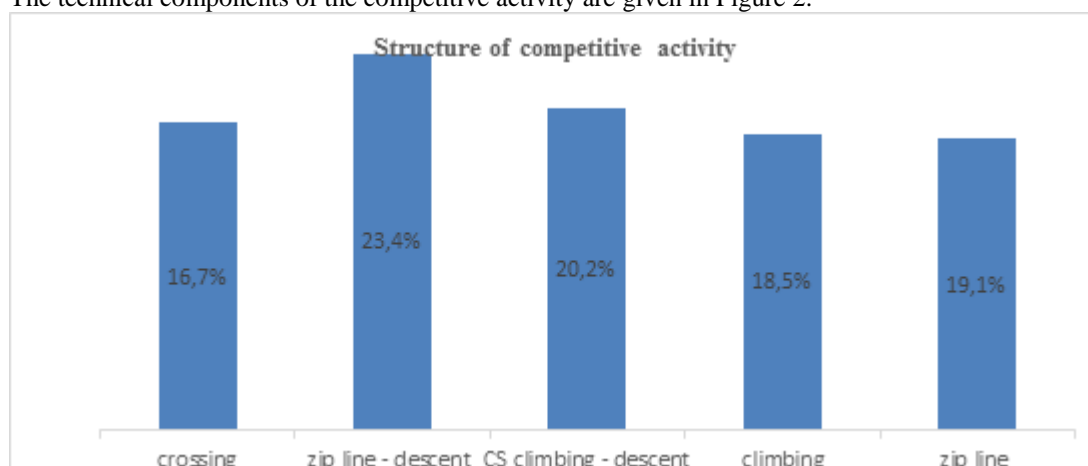


Figure 2. Technical components of the structure of competitive activity at the distance of the 2<sup>nd</sup> class of complexity

From the figure we can see that the percentage of time spent at these segments of the distance, at first glance, does not represent a significant difference, but if we consider the segments of the distance in more detail, we can see that climbing, at which the observed spend 18.5% of their time, is significantly different from the other segments of the distance in its characteristics. When climbing, athletes-tourists cover the distance of 6 meters and for covering the remaining segments of the distance, for example, athletes cover 12 meters minimum. Based on these indicators, we expect that vertical rails climbing is an important indicator of covering the distance. From the competitive activity structure we have noticed that those who used additional equipment have better results. For the visibility of the above factor Table 2 shows the time periods for the segment of climbing, where the athletes showed the best results.

### Dicussion

Analyzing the results of pedagogical observation, we have found out that:

1. At segment A (crossing) the athletes demonstrated a relatively equal result.
2. At segment B (zip line – descent) the athletes covered this segment without obvious differences in the indicators, participant number 8 showed the worst result, connected with the errors in the techniques of covering this segment (legs' slip), other differences in the indicators were attributed to the difference in the athletes' training.
3. At segment C (crossing) almost all the athletes showed the same time, athlete number 10 lost significant amount of time at this segment preparing equipment for the further segment of the distance. This tactical technique was considered to be ineffective.
4. At segment D (CS climbing – descent), participants had a good technique of climbing a stand climbing. The athletes showed results with a small difference in indicators, all the athletes covered this segment with the same tactics.
5. Segment E (crossing) was covered by the athletes almost identically, the difference in the indicators is associated with the physical preparedness of the athletes to cover small segments of the distance without the use of special technical skills.
6. At segment F (climbing) the majority of the participants experienced a decrease in speed associated with fatigue. When climbing athletes 1, 2, 3, 4 and 5 applied another technique of covering, namely used additional technical equipment that allowed demonstrating a higher result at the segment.
7. Segment G (zip line) was overcome by the athletes with a slight difference, since this segment is associated with minimizing techniques, and is overcome passively.
8. At segment H (crossing) athletes 6, 7, 8, 9 and 10 experienced decrease in speed associated with fatigue manifestation, connected with greater energy consumption at the distance.

Proceeding from the pedagogical observation data, it has been found out that the result of the athletes-tourists at the walking distance is largely determined by the time of vertical rails climbing. As a rule, the athletes-tourists apply two types of technique: climbing using the clamp on the leg, and without the use of this equipment.

The participants of the experiment were divided into two equal groups. In the first part of the experiment, two groups covered the distance using different techniques of vertical rails climbing. The first group covered the distance using "Pantin" during vertical rails climbing, and the second group did it without "Pantin".

In the second part of the experiment these groups covered the distance with different climbing techniques. The first group covered it without "Pantin" and the second group with "Pantin".

In the presented histogram Figure 3 demonstrates the differences in covering the segment of vertical climbing by the first and second group, with "Pantin" and without "Pantin".

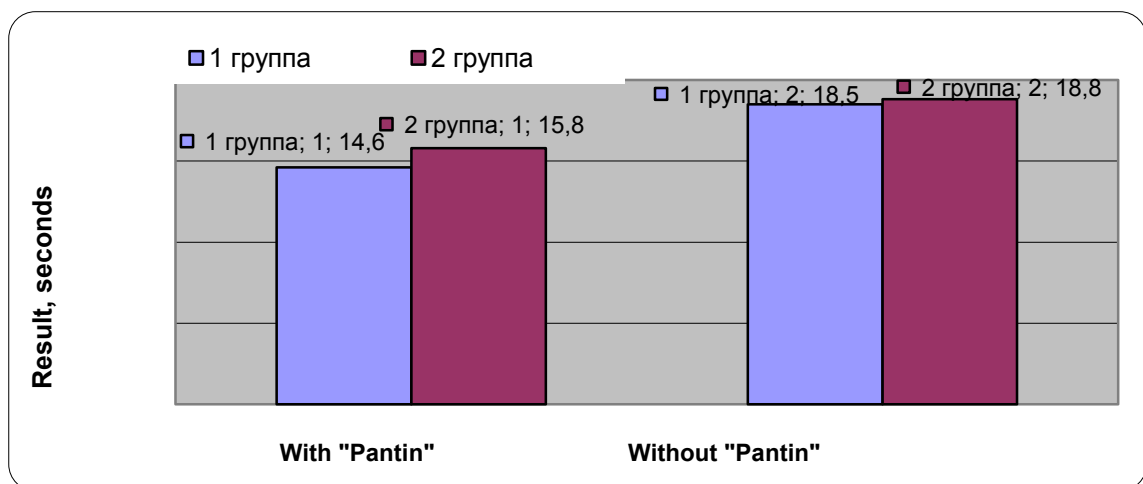


Figure 3. Results of covering the distance with "Pantin" and without "Pantin"

When comparing the average indicators of covering the segment of climbing, in the first and second groups with “Pantin” and without “Pantin” (horizontally), the difference in the average indicators was 22.3% and 14.6%. This allows saying that the differences between the average results are significant.

Comparisons of the technique of covering the distance with “Pantin” between the first and the second groups and without “Pantin” demonstrated (vertically) that the calculated t-criterion of student is less than the table one with a significance value of 0.05. This allows us to say that the differences between these average indicators are not significant. The results are shown in Table 3.

Table 3. The results of comparison of the first and second groups, vertical climbing

Indicator	Group	with Pantin	with Pantin	Difference	Significance of differences at $p \leq 0,05$	
					t emp.	t table=2,23
Vertical rope climbing	1 <sup>st</sup> group	14,6±0,8	18,8±0,4	22,3%	4,04	t emp.>2,23 significant
	2 <sup>nd</sup> group	15,8±0,7	18,5±0,3	14,6%	3,06	t emp.> 2,23 significant
	Difference	7,6%	1,6%			
	Significance of differences at $p \leq 0.05$	t emp.	1,06	0,43		
	t table=2,23	t emp.< 2,23 not significant	t emp.< 2,23 not significant			

Based on the above, we made comparisons between covering the distance by the first group with “Pantin” and the second one without “Pantin” and covering by the first group without “Pantin” and the second group with “Pantin”. The results showed that the student’s calculated t-criterion is more than the table one at a significance level of 0.05. This allows to say that the differences between these average indicators are significant. On the basis of the cross-sectional experiment, we have concluded that vertical climbing with “Pantin” is the most effective. The results of this experiment are presented in Table 4.

Table 4. The results of cross comparison of the first and second groups, vertical climbing

Way \ Group	Group		Difference	Significance of differences at $p \leq 0.05$	
	1	2		t emp.	t table=2,23
Without “Pantin”	18,8±0,6	18,5±0,3	21,1%	4,16	t emp.> 2,23 significant
With “Pantin”	14,6±0,8	15,8±0,5	16%	3,02	t emp.> 2,23 significant

### Conclusions

1. Studying the main concepts and the content of physical training of the athletes-tourists, we have found out that all the components of physical development are aimed at the correlation of physical qualities with technical training, with the goal of developing indicators in competitive activity. Technical training is a process of preparation aimed at mastering the technique of a chosen sport and improving such qualities as performance, efficiency, stability, variability, economy of technique and minimal tactical information in it.

2. The structure of competitive activity can be viewed from different perspectives. On the one hand, the structure of competitive activity can consist of the components that determine the physical fitness of an athlete. On the other hand, it consists of components that determine technical and tactical preparedness, or determine energy expenditure for the certain components of competitive activity. As a result of the pedagogical observation, it has been established that the structure of competitive activity consists of the following technical segments: crossing 16.7%, zip line – descent 23.4%, climbing on a climbing stand – descent 20.2%, rails climbing 18.5%, zip line 19.1%.

3. Pedagogical experiment allowed proving that the technique of covering vertical rails climbing with the use “Pantin” is more effective than without its use. In the first and second groups the results at the segment of rope climbing significantly improved by 22.3% and 14.6% respectively, at a significance value of 0.05.

The obtained results confirm suggested by the authors hypothesis that the technique for covering vertical rails climbing for the athletes-tourists who compete at distances in indoor spaces using "Pantin" allowed to improve the result of covering the distance.

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